

1

00:00:00,000 --> 00:00:07,000

Mr. Crichton, having made it almost impossible for me to speak without it sounding like an

2

00:00:07,000 --> 00:00:16,000

anti-climax, I will say very briefly what I want to give you is a review of the scientific

3

00:00:16,000 --> 00:00:25,000

evidence for there possibly being something in UFOs, and then my own particular theories

4

00:00:25,000 --> 00:00:32,000

as to the possible relationship between unidentified flying objects and parapsychology.

5

00:00:32,000 --> 00:00:39,000

I'm deliberately sticking close to the text of the articles which have appeared in Flying

6

00:00:39,000 --> 00:00:44,000

Salsa Review. This will for one thing make it easier for you to follow the argument, it

7

00:00:44,000 --> 00:00:50,000

will also make it easier for you to get the end of it, which will be in the next issue

8

00:00:50,000 --> 00:00:56,000

of the review. I'm cutting as much of it as I can in a moment without going over the copyrighted

9

00:00:56,000 --> 00:01:06,000

lab. It has taken approximately 2,500 million years or in modern terminology 2.5 aons for

10

00:01:06,000 --> 00:01:12,000

biological life to evolve upon Earth and to attain a state of technological development

11

00:01:12,000 --> 00:01:19,000

where we can now break away from the gravitational pull of our planet and visit other worlds.

12

00:01:19,000 --> 00:01:24,000

So far we have been restricted to the use of unknown vehicles, but I think it would be quite

13

00:01:24,000 --> 00:01:31,000

unrealistic not to believe that within the next decade we are going to visit the moon

14

00:01:31,000 --> 00:01:38,000

and probably the nearer planets as well. These possibilities of interplanetary flight have

15

00:01:38,000 --> 00:01:45,000

only been known for about 30 years, and the possibilities of communication between worlds

16

00:01:45,000 --> 00:01:54,000

have only been known for about 60. Now after that vast time of 2,500 million years required

17

00:01:54,000 --> 00:01:59,000

for intelligent beings to develop on Earth out of primitive chemicals, the time required

18

00:01:59,000 --> 00:02:05,000

to go from a condition where we had no knowledge at all of communication by means of electromagnetic

19

00:02:05,000 --> 00:02:12,000

radiation to the time now when we can transmit television pictures from Mars to Earth is less

20

00:02:12,000 --> 00:02:19,000

than 100 years. That same brief period has also covered the transition from no knowledge

21

00:02:19,000 --> 00:02:26,000

of powered flight to the launching of interplanetary probes and the transition from no knowledge

22

00:02:26,000 --> 00:02:33,000

of electronics to the construction of computers which near human thinking ability. I would

23

00:02:33,000 --> 00:02:38,000

like you to get this idea quite clear of a vast period during which development goes

24

00:02:38,000 --> 00:02:43,000

on at a very very slow rate and then a sudden enormous technological leap. What happens after

25

00:02:43,000 --> 00:02:51,000

that we don't know. First slide please. The picture is quite familiar to you I am sure

26

00:02:51,000 --> 00:02:59,000

the endometre medulla and the reason why I am showing it to you is because it is believed

27

00:02:59,000 --> 00:03:07,000

that if we were beings on a planet of a sun within that galaxy our own galaxy would look

28

00:03:07,000 --> 00:03:15,000

very much the same. It is of similar type. It contains something like 100,000 million

29

00:03:15,000 --> 00:03:25,000

stars and so does our own galaxy. We will see presently what this means in terms of the

30

00:03:25,000 --> 00:03:34,000

probability of life on other worlds. The next slide please. The idea of there being other

31

00:03:34,000 --> 00:03:41,000

beings at all and of there being life on them couldn't arise until people realise that the

32

00:03:41,000 --> 00:03:47,000

little bites of crops that you see in the sky and I can't pin holes in the floor of heaven

33

00:03:47,000 --> 00:03:56,000

but sounds like our own. Probably the earliest story about life on other worlds was that written

34

00:03:56,000 --> 00:04:03,000

by Plato a couple of thousand years ago and medieval ideas were largely affected by ignorance

35

00:04:03,000 --> 00:04:08,000

and the fact that between us and other worlds there is an airless gulf. The atmosphere doesn't

36

00:04:08,000 --> 00:04:13,000

continue so that this idea from the middle ages due to Bishop Godwin of flying to the

37

00:04:13,000 --> 00:04:19,000

moon by means of a set of train geese wasn't realised to be impactable at the time. Next

38

00:04:19,000 --> 00:04:27,000

one please. And Serano de Berverac who is better known for his swordsmanship than for his

39

00:04:27,000 --> 00:04:33,000

science fiction thought that it was possible by means of battles of dew which are lifted

40

00:04:33,000 --> 00:04:40,000

up by the sun's rays he believed to fly similarly and the astronaut was not going to be inconvenienced

41

00:04:40,000 --> 00:04:45,000

by having no air to breathe because he didn't know there would be no air for him to breathe.

42

00:04:45,000 --> 00:04:53,000

Next one please. A little further on you had this 16th century picture of life and it's

43

00:04:53,000 --> 00:05:07,000

not altogether irrelevant to our subject because the very great astronomer Kepler in his famous

44

00:05:07,000 --> 00:05:14,000

Somnium had the idea that the theops builder his mother was a witch and that she had flown

45

00:05:15,000 --> 00:05:23,000

to the moon in the conventional way. Next one please. This most of you will recognise from

46

00:05:23,000 --> 00:05:31,000

Jules Verne's very fine book of A Marriage to the Moon. It's of great interest to us

47

00:05:31,000 --> 00:05:40,000

now because at the time Verne was slated by the scientists for suggesting that you could

48

00:05:40,000 --> 00:05:45,000

use the projectile with a few hundred rates of gun cotton because quite apart from what

49

00:05:45,000 --> 00:05:50,000

would happen to the inhabitants of the projectile the projectile itself if given sufficient

50

00:05:50,000 --> 00:05:56,000

velocity to break away from our gravitational pull would be flattened and of course it's

51

00:05:56,000 --> 00:06:02,000

interesting to note now that Project Heart which is the Canadian scheme for launching

52

00:06:02,000 --> 00:06:09,000

satellites by means of an Aval gun shows every sign of being quite successful. Next one please.

53

00:06:09,000 --> 00:06:15,000

Finally you have the more conventional type of satellite launcher and I would just like

54

00:06:15,000 --> 00:06:23,000

at this point to suggest that in the 300 years between the time when it was thought that

55

00:06:23,000 --> 00:06:28,000

witches might fly to the moon on broomsticks to the development of this rocket there's been

56

00:06:28,000 --> 00:06:34,000

quite a change and that change may be reflected in the next 300 years. This thing may look

57

00:06:34,000 --> 00:06:41,000

just like a broomstick by then. Next please. Thank you. We are still a long way from having

58

00:06:41,000 --> 00:06:47,000

control of our environment but with current progress with rain making by the chemical

59

00:06:47,000 --> 00:06:53,000

seeding of clouds and the French work in the Sahara with the meteor from making artificial

60

00:06:53,000 --> 00:06:59,000

thunderstorms and tornadoes it seems improbable that the final attainment will take more than

61

00:06:59,000 --> 00:07:06,000

now the 100 years and after that unless the irresponsibility of our leaders holds us into

62

00:07:06,000 --> 00:07:12,000

a final free societal war it seems reasonable to look forward to a long time during which

63

00:07:12,000 --> 00:07:19,000

we can enjoy the mastery of ourselves and our planet. Earth will remain habitable for

64

00:07:19,000 --> 00:07:24,000

thousands of millions of years yet so if we look from the distant past to the distant

65

00:07:24,000 --> 00:07:31,000

future we see and I reiterate it that the change over from a non-technological society

66

00:07:31,000 --> 00:07:36,000

to one with complete mastery of its planet occupies but the twinkling of an eye in the

67

00:07:36,000 --> 00:07:42,000

process of developing life. The consequence of all this is that the possibility of our

68

00:07:42,000 --> 00:07:49,000

ever discovering or being discovered by a race of extraterrestrial beings in a similar

69

00:07:49,000 --> 00:07:56,000

way to our own is negligible. The phase of transition from no technology to mastery

70

00:07:56,000 --> 00:08:02,000

of interplanetary flight is so brief that it can be ignored in relation to the time for

71

00:08:02,000 --> 00:08:07,000

which a planet stays habitable. The only race which could discover us would be one of the

72

00:08:07,000 --> 00:08:12,000

commander spaceflight and therefore one of the highly developed technology. The only races

73

00:08:12,000 --> 00:08:16,000

which we could discover ourselves would be either those which have not yet invented

74

00:08:16,000 --> 00:08:22,000

machines or those which are tremendously advanced. It's more likely then that they will have

75

00:08:22,000 --> 00:08:29,000

discovered us first and they may have done so. The probability of finding life in the

76

00:08:29,000 --> 00:08:35,000

course of an interstellar exploration is obviously related to the time for which a community

77

00:08:35,000 --> 00:08:40,000

endures. One of the things we want to know is do they always destroy themselves within a

78

00:08:40,000 --> 00:08:45,000

few decades of discovering atomic energy or do they survive the phase through which we

79

00:08:45,000 --> 00:08:52,000

are now going when technology advances faster in human compassion and go on to sociological

80

00:08:52,000 --> 00:08:57,000

attainments which we can't conceive. I think that in view of the opportunities for the

81

00:08:57,000 --> 00:09:03,000

triumph of brute force over reason or even for the triumph of inanimate nature over

82

00:09:03,000 --> 00:09:08,000

organized life which have failed to prevent the evolution of man so far, that there is

83

00:09:08,000 --> 00:09:14,000

reason to hope that communities do continue to endure until in the course of astronomical

84

00:09:14,000 --> 00:09:22,000

ages their planet is engulfed in the death struggles of its sun. Next slide please. This

85

00:09:22,000 --> 00:09:29,000

many of you will recognize as being a Hertzsprung Russell diagram which gives the relationship

86

00:09:29,000 --> 00:09:36,000

between the stellar type shown at the bottom. You probably remember the full mnemonic for

87

00:09:36,000 --> 00:09:43,000

the types OBA fine girl kiss me right now sweetest. The important thing to note is that

88

00:09:43,000 --> 00:09:53,000

the relationship between mass and temperature and the next slide please. And this gives

89

00:09:53,000 --> 00:10:02,000

you the, um, the first years or areas in which life could develop on the planet surrounding

90

00:10:02,000 --> 00:10:12,000

a sun. Where you have these very small stars here stars like the five type. The only

91

00:10:12,000 --> 00:10:19,000

heat up a very small zone. On the other hand because of this and the relationship between

92

00:10:19,000 --> 00:10:26,000

and the rate at which a planet, a star is consumed and it's mass they last for quite a long time.

93

00:10:26,000 --> 00:10:35,000

Period on the main sequence here 100,000 million years for an M5 but it's only developing a

94

00:10:35,000 --> 00:10:40,000

habitable zone which is about the size of the orbit of Venus. It's really quite small. On

95

00:10:40,000 --> 00:10:45,000

the other hand when you come to some of the giant stars they develop a very large area

96

00:10:45,000 --> 00:10:50,000

indeed but their time on the main sequence is consequently so short that it's doubtful

97

00:10:50,000 --> 00:10:58,000

whether they could evolve life in the way in which it evolved upon Earth. Next please.

98

00:10:58,000 --> 00:11:05,000

Now when you consider these various factors together with others, ellipticity of orbits

99

00:11:05,000 --> 00:11:14,000

most stars that you see are not single stars or either binary or multiple and consequently

100

00:11:14,000 --> 00:11:20,000

you can't get a stable orbit for a planet unless either you've got the two stars fairly close together.

101

00:11:20,000 --> 00:11:26,000

The planet is travelling in an enormous orbit around both which means that it is probably going from a fairly hot

102

00:11:26,000 --> 00:11:31,000

phase when it's close to both of them to a cold phase when it's a long way out. Or it's pursuing

103

00:11:31,000 --> 00:11:38,000

some very complicated orbit like a figure of 8 in between 2 which is likely also to be highly unstable.

104

00:11:38,000 --> 00:11:44,000

When you consider all these it seems that only about 2% of multiple star systems could possibly

105

00:11:44,000 --> 00:11:52,000

have habitable planets. Only about 10% of single stars. About 67% of the stars you see are binary

106

00:11:52,000 --> 00:12:00,000

and multiple so it's fairly simple mathematics to get 4.5% of all visible stars as the maximum

107

00:12:00,000 --> 00:12:09,000

number which could have planets which might give rise to intelligent life. As we saw earlier

108

00:12:09,000 --> 00:12:16,000

the content of stars in the galaxy is about 100,000 million which is quite a few stars.

109

00:12:16,000 --> 00:12:25,000

So even on that basis with 100,000 million galaxies around the number of planets which could have

110

00:12:25,000 --> 00:12:34,000

habitable life as we know it developed in the way in which we know it is enormous. If we stick to our own

111

00:12:34,000 --> 00:12:39,000

galaxy which is the only one we're ever likely to know much about the number is still somewhere around

112

00:12:39,000 --> 00:12:50,000

4,000 million possible habitable planets. Now of these stars which may have planets like a

113

00:12:50,000 --> 00:12:58,000

some of them are very much older than the Sun. Some as much as 5,000 million years older

114

00:12:58,000 --> 00:13:05,000

a few possibly as much as 10,000 million years older and this means that if life developed upon

115

00:13:05,000 --> 00:13:10,000

their planets at the same rate that it developed here it could have been technologically in

116

00:13:10,000 --> 00:13:21,000

advance of ours long before we climbed out of the primeval seas. The thing is it implies that they

might

117

00:13:21,000 --> 00:13:26,000

have been watching us long before we were capable of wondering whether we could watch anything at all.

118

00:13:26,000 --> 00:13:31,000

It's possible that as Arthur Cox addressed it in one of his books, aliens faced of their

119

00:13:31,000 --> 00:13:37,000

specials may have descended to Earth's service countless times in the course of the ages.

120

00:13:38,000 --> 00:13:45,000

I'm rather interested in how the surveillance would be carried out. We're not really in a position to imagine

121

00:13:45,000 --> 00:13:51,000

the achievements of a race that's head science and engineering for a few million years any more than a

122

00:13:51,000 --> 00:13:59,000

near end air tower could understand the international bank or atomic energy station. It is almost certain

123

00:13:59,000 --> 00:14:05,000

that if ancient races do exist they would already have linked themselves up in some kind of interstellar

124

00:14:05,000 --> 00:14:14,000

community. Next slide please. Earth as you know is somewhere out from the centre of the galaxy

125

00:14:14,000 --> 00:14:23,000

which is in the region of the constellation Sagittarius. So here's the sun with Earth and its other planets

126

00:14:23,000 --> 00:14:29,000

and here is a region near the centre of our galaxy where I've indicated possible inhabited planets

127

00:14:29,000 --> 00:14:36,000

which are in communication with radiation. It seems to me that it might be a profitable thing to do

128

00:14:36,000 --> 00:14:43,000

to see whether you could detect any radiation in that way. The chances of course are very slim

129

00:14:43,000 --> 00:14:49,000

because with any form of transmission that we know at present you've got to beam it pretty tightly

130

00:14:49,000 --> 00:14:54,000

in order to make it travel even a few light years. So the chances of picking up radiation due to

131

00:14:54,000 --> 00:15:03,000

side loads are very small. Next slide please. In the stars we can extrapolate current lines of

132

00:15:03,000 --> 00:15:10,000

progress it seems more likely the interstellar exploration which involves journeys of thousands of light

133

00:15:10,000 --> 00:15:21,000

years would be achieved by highly evolved machines rather than by a biological organism. Machines which

134

00:15:21,000 --> 00:15:29,000

are an allusion from our own Mars vehicles and that sort of thing but vastly more complex are going

to be

135

00:15:29,000 --> 00:15:36,000

capable of analysing and photographing and recording and computing and finally transmitting back to their bases

136

00:15:36,000 --> 00:15:42,000

neatly documented surveys of everything they can pick up. The fingerprints of our newborn

137

00:15:42,000 --> 00:15:50,000

civilisation may in fact already be known to the records department of some vastly distant older race.

138

00:15:51,000 --> 00:15:57,000

Before considering the ways the other ways in which that surveillance could be conducted we have to realise that the

139

00:15:57,000 --> 00:16:05,000

ways vary according to the types of entity that wish to know about us. We have seen a high probability for

140

00:16:05,000 --> 00:16:11,000

man being non-unique as an intelligence in the universe but it doesn't imply that the other

141

00:16:11,000 --> 00:16:21,000

intelligences have to be like man. Although many animal lovers will claim a high order of intelligence for their

142

00:16:21,000 --> 00:16:29,000

pets the only really intelligent organism at present known to man is man. By intelligence we don't

143

00:16:29,000 --> 00:16:34,000

mean here the dictionary definition of intellectual understanding which doesn't get through any further.

144

00:16:34,000 --> 00:16:42,000

That's specifically a capacity for abstract thought. Within the compass of terrestrial scientific knowledge we can

145

00:16:42,000 --> 00:16:50,000

conceive the possibility of three groups of intelligent organism excluding man. Firstly humanoid or non-humanoid

146

00:16:50,000 --> 00:16:58,000

biological species, secondly mechanical intelligences and thirdly stable intelligent plasmids.

147

00:16:59,000 --> 00:17:07,000

Despite the claims of spiritualists psychic phenomena provide no evidence for the existence of disembodied intelligences.

148

00:17:07,000 --> 00:17:16,000

That is because these phenomena can all be explained equally well by alternative hypotheses based upon the powers of the

149

00:17:16,000 --> 00:17:26,000

human mind. We will now consider in some detail three classes of possible intelligent organism.

150

00:17:26,000 --> 00:17:34,000

First of all biological organisms. I thought it was very interesting that the 1964 meeting of the British Association, the opinions of

151

00:17:34,000 --> 00:17:42,000

the scientists there, quite a number of quite orthodox biologists who thought that baguette monsters were a lot more probable than

152

00:17:42,000 --> 00:17:53,000

humanoid species. Baguette monsters of course because an animal is only adapted to its environment, it's only successful if it is

153

00:17:53,000 --> 00:18:02,000

adapted to its environment, it's only adapted to its environment if it collages changes closely. Therefore if an organism, if a race has

154

00:18:02,000 --> 00:18:09,000

developed upon a planet vastly different to ours it will probably have developed a vastly different form of body. And since we always call a

155

00:18:09,000 --> 00:18:16,000

monster anything that isn't familiar to us, baguette monsters. If we make the assumption that within limits the physical

156

00:18:16,000 --> 00:18:24,000

properties of material are not the same wherever they occur then we can predict quite a lot of things. For example the limit to the

157

00:18:24,000 --> 00:18:31,000

height of a living creature is reached at the point where its legs can't support its weight. So in general the height of living organisms

158

00:18:31,000 --> 00:18:39,000

must vary inversely as the gravitational field of the planet. So you would expect giant planets to have animals which were something

159

00:18:39,000 --> 00:18:48,000

like armor plated tortoises with multiple legs and you would expect very small planets to have something like a cross between a giraffe and a jellyfish.

160

00:18:48,000 --> 00:18:57,000

These physical characteristics of biological organisms now bear a direct relationship to the possibility of the organisms being intelligent.

161

00:18:57,000 --> 00:19:07,000

Intelligent seems to be a function of the number of interconnections between the neurons of the brain. There is therefore a minimum number of neurons.

162

00:19:07,000 --> 00:19:17,000

And neurons themselves are quite complex things. They have to have a finite size. There is therefore a limit to the smallness of an intelligent organism.

163

00:19:17,000 --> 00:19:29,000

The brain of a man has somewhere around 10,000 million neurons all of a finite size. So it's unlikely that a really intelligent organism is going to be very much

164

00:19:29,000 --> 00:19:40,000

smaller than a man that might be larger within limits. But there are limits again here because for one thing of the finite velocity of propagation of nervous impulses,

165

00:19:40,000 --> 00:19:54,000

nervous impulses very somewhat in speed, that they are really quite slow. In a branch of source it must have taken about one and a half to two seconds for a message from its big toe to get up to its little pea sized brain

166

00:19:54,000 --> 00:20:04,000

and say, how is somebody nibbling me? So by retiring a message we got back from the brain to big toe to say, well get out of it silly, the toe wasn't there.

167

00:20:04,000 --> 00:20:10,000

This probably had something to do with the branch of source dying off.

168

00:20:10,000 --> 00:20:17,000

Now, all of this means then that there are very definite limits to the size of an organism. It can't be too big, it can't be too small.

169

00:20:17,000 --> 00:20:31,000

Two other factors which come into limited size. The square cube ratio, the clinical exchange which can take place on surfaces, that is the absorption of food from the gut or respiration in the lung,

170

00:20:31,000 --> 00:20:42,000

is proportional to the square of the size of the organ. The total energy which the animal consumes is proportional to its bulk and this is the cube of the size of the organism.

171

00:20:42,000 --> 00:20:49,000

Clearly then, as you go up in size it gets more and more difficult for you to get enough energy quick enough to keep you going.

172

00:20:49,000 --> 00:20:56,000

So we expect that biological organisms are going to be within our fairly limited range of sizes.

173

00:20:56,000 --> 00:21:08,000

There are other requirements for intelligence. You need sensory organs to get data about your environment. You need motor organs in order to react back upon the environment.

174

00:21:08,000 --> 00:21:22,000

Coming to senses, we have five well known ones and in addition to that we have senses which relate to movement, position, acceleration, pain, pressure and temperature.

175

00:21:22,000 --> 00:21:31,000

If I ask any of you at this moment to think much of big toe on the right hand side feels like you

know whether it's hot or cold, whether you were thinking about it before or not.

176

00:21:31,000 --> 00:21:35,000

You've got a temperature sense. It's not normally counted as a sense but it's quite real.

177

00:21:35,000 --> 00:21:42,000

Also if this whole room started to rotate rapidly you would know it. This is your sense of acceleration.

178

00:21:42,000 --> 00:21:55,000

When you do the on-man you start looking at some of the other animals on earth. They have senses which make one dog or the elasmobranch which includes the sharks, rays and dogfish.

179

00:21:55,000 --> 00:22:01,000

I have some little organs known as the ampullae of Lorenzini and these are voltage detectors.

180

00:22:01,000 --> 00:22:14,000

Now they're pretty good. The gill movements of a common place generate voltage gradients of the order of about a thousandth of a volt per centimeter.

181

00:22:14,000 --> 00:22:21,000

The organs of Lorenzini can detect something about a million times weaker than this.

182

00:22:21,000 --> 00:22:34,000

This means that a place can bury itself completely in the sand and a shark swimming by within about ten meters, thirty feet, can detect it because of the total voltage is given up by its gill muscles.

183

00:22:34,000 --> 00:22:44,000

And this is by no means the most remarkable. Mad snails and planarians have built in magnetic compasses.

184

00:22:44,000 --> 00:22:49,000

Bees and king crabs can detect the plane of polarisation of polarised light.

185

00:22:49,000 --> 00:22:59,000

Lipid wrappers including rattlesnakes are extremely sensitive to heat. They can detect a few hundredths of a degree so they can strap a warm-blooded prey in the dark.

186

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

The eyes of a common snail are sensitive to X-rays so is the nose of a cat.

187

00:23:04,000 --> 00:23:09,000

Bees and butterflies cannot see red but they can see ultraviolet.

188

00:23:10,000 --> 00:23:19,000

So in addition to these senses possessed by various creatures but not by men, there are undoubtedly lots of others which we haven't even yet thought of.

189

00:23:19,000 --> 00:23:29,000

And the sort of collection of senses and motor organs which perfectly realistic creatures on another planet might have,

190

00:23:29,000 --> 00:23:34,000

they probably exceed anything the science fiction writer can dream up.

191

00:23:34,000 --> 00:23:40,000

Limbs, whilst a convenience for locomotion, are also a requirement for intelligence.

192

00:23:40,000 --> 00:23:50,000

The story of man's early travels to intelligence was the story of his travel to develop hands and then to free himself from the need to walk on them so he could use some of the tools.

193

00:23:50,000 --> 00:24:01,000

It's interesting the number of limbs employed by higher forms of life has stayed around for an awful long time, although the insects have tried anything from six to a few hundredths.

194

00:24:04,000 --> 00:24:08,000

Now, biological to mechanical intelligences.

195

00:24:08,000 --> 00:24:12,000

Twenty years ago, electronic computers were almost unknown.

196

00:24:12,000 --> 00:24:15,000

To do it, they were used by tens of thousands.

197

00:24:15,000 --> 00:24:25,000

They are dealing with everything from routine addition and subtraction to advanced accountancy, astronomical calculations and the economic planning of all industries.

198

00:24:25,000 --> 00:24:35,000

The latest machines, although they're still in the experimental stage, not only think for themselves, but in some cases think better than we tend.

199

00:24:35,000 --> 00:24:44,000

I won't go into the arguments now for describing what a machine does its thinking, except that I do believe that if a machine can't think neither can we.

200

00:24:44,000 --> 00:24:51,000

But I would like to show you a slide briefly. Some of you will have seen it in other worlds than ours.

201

00:24:52,000 --> 00:25:00,000

And this is a very frequent reaction to the suggestion that a machine can be intelligent.

202

00:25:00,000 --> 00:25:05,000

I call it the encounter of mechanical intelligence with human rage.

203

00:25:06,000 --> 00:25:08,000

Lightspeers.

204

00:25:11,000 --> 00:25:21,000

In spite of the evidence, whenever mechanical intelligence is discussed, there are strong emotional denials that machines can ever think creatively.

205

00:25:21,000 --> 00:25:28,000

But our brains are relatively barely organized, they are inaccurate and they're slow.

206

00:25:28,000 --> 00:25:36,000

They won't even evolve for the purpose of abstract thought, or for the pursuit of elusive concepts like truth, beauty and goodness.

207

00:25:36,000 --> 00:25:42,000

They were developed slowly over millions of years as a product of the struggle for survival.

208

00:25:42,000 --> 00:25:52,000

As Lord Balfour put it, our brains are essentially a food-finding system, therefore no more necessarily truth-finding than the snout of a pig.

209

00:25:52,000 --> 00:25:59,000

It's very well to bear these things in mind when we think about the problem of how long it's going to be before we build mechanical minds.

210

00:25:59,000 --> 00:26:09,000

Particularly since we now build mechanical muscles, bulldozers, that sort of thing, millions of times stronger than we are.

211

00:26:09,000 --> 00:26:14,000

The next thing is machines millions of times more intelligent.

212

00:26:14,000 --> 00:26:20,000

Most of the work on the early design of machines was done by a teacher to play games.

213

00:26:20,000 --> 00:26:25,000

The chest is particularly suitable. It's a microcosm of human struggles.

214

00:26:25,000 --> 00:26:29,000

It has its own hierarchy, rules, aims, logic.

215

00:26:29,000 --> 00:26:38,000

And the first chest-playing machine was this one, built in 1769 by Baron Wolfgang von Kempelheim.

216

00:26:38,000 --> 00:26:45,000

You can see the chest-player here. It's a life-size figure of a turk. There's the board.

217

00:26:45,000 --> 00:26:49,000

Under here you can see some sort of mechanism. It doesn't make a lot of sense.

218

00:26:49,000 --> 00:26:54,000

The machine is alleged never to have been beaten in the 80 years that it was around.

219

00:26:54,000 --> 00:26:58,000

It played against Mara Theresa and against Napoleon and beat both of them.

220

00:26:58,000 --> 00:27:04,000

It was possibly a thorn. Edgar Allen Poe suggested it was operated by a legless dwarf,

221

00:27:04,000 --> 00:27:08,000

as he couldn't imagine anything else that would be small enough to get in.

222

00:27:08,000 --> 00:27:15,000

And it was only the fact that other people had objected that stopped Edgar Allen Poe saying a totally limitless dwarf,

223

00:27:15,000 --> 00:27:18,000

which of course would appear to him more.

224

00:27:18,000 --> 00:27:21,000

The next slide, please.

225

00:27:21,000 --> 00:27:32,000

Now, Baron Kempelheim's robot makes a bit more sense if you consider it in comparison with the machines of its time.

226

00:27:32,000 --> 00:27:44,000

Around about 1740, the brothers Brots in Switzerland produced a series of animated dolls, which this is one.

227

00:27:44,000 --> 00:27:50,000

These were wound up and you press the button and the thing then started to write,

228

00:27:50,000 --> 00:27:55,000

I am Jan Brots. I am five years of age. I like to play the spin it.

229

00:27:55,000 --> 00:28:00,000

And various other things, making a total in all of about 60 lines,

230

00:28:00,000 --> 00:28:06,000

written in a very nice copper plate handwriting, at the end of which it shook the impetus pen and switched itself off.

231

00:28:06,000 --> 00:28:10,000

Now, for 200 years ago, that's not bad.

232

00:28:10,000 --> 00:28:13,000

The next slide, please.

233

00:28:13,000 --> 00:28:27,000

A big jump forward to 1914 when the senior Torres Cabrado, who was the director of the automation laboratory of Madrid,

234

00:28:27,000 --> 00:28:34,000

first showed this machine, which could win most games of chess against a human player.

235

00:28:34,000 --> 00:28:39,000

When I say that it could only play a limited game of chess, it couldn't use a full range of pieces.

236

00:28:39,000 --> 00:28:43,000

It could just play a king and a rook against a king.

237

00:28:43,000 --> 00:28:50,000

And it's not too difficult to push your opponent into a corner and finally beat him.

238

00:28:50,000 --> 00:28:52,000

Thank you.

239

00:28:52,000 --> 00:28:56,000

Lights.

240

00:28:56,000 --> 00:29:03,000

So today, there are numerous electronic computers which are able to program themselves.

241

00:29:03,000 --> 00:29:08,000

That is to say, they play a game of chess and when they make a move that doesn't pay off, they remember this.

242

00:29:08,000 --> 00:29:12,000

When they make a move which does pay off, they remember this.

243

00:29:12,000 --> 00:29:17,000

They then substitute this move in their memory bank for the unsuccessful one and play it next time.

244

00:29:17,000 --> 00:29:19,000

This isn't too difficult.

245

00:29:19,000 --> 00:29:27,000

It does give you an inkling, however, of how a machine can progress towards something which simulates intelligence.

246

00:29:27,000 --> 00:29:36,000

The rate of progress in less than 200 years from Baron Ron Kempelins, according to Edgar Allen Poglieland, chess player,

247

00:29:36,000 --> 00:29:44,000

to our electronic computers, which can beat their designers, is fairly typical of the advance of modern technology.

248

00:29:44,000 --> 00:29:53,000

I've got a slide here which on a rather arbitrary scale shows you what's going on.

249

00:29:53,000 --> 00:30:02,000

Starting up here with Ron Kempelins here and going on through the machines of the Bardo to the first machine

250

00:30:02,000 --> 00:30:07,000

for playing noughts and crosses, produced at NPL and on...

251

00:30:07,000 --> 00:30:12,000

I think it's fair to say that the rate of progress, as in so many things, is exponential.

252

00:30:12,000 --> 00:30:18,000

And where this is going to leave us in a few hundred years time, again, your guess is as good as mine.

253

00:30:18,000 --> 00:30:20,000

Next, please.

254

00:30:22,000 --> 00:30:29,000

It is possible, too, that a new phase of evolution is already beginning here, mechanical evolution.

255

00:30:29,000 --> 00:30:36,000

It could be that the change from biological evolution to mechanical evolution

256

00:30:36,000 --> 00:30:43,000

will prove to be of greater importance than the change which took place when we went over from chemical evolution to biological,

257

00:30:43,000 --> 00:30:46,000

two and a half thousand million years ago.

258

00:30:46,000 --> 00:30:53,000

It is even possible, conceiving the idea of similar biological races on other worlds,

259

00:30:53,000 --> 00:31:00,000

that whenever the biological organism gets to a stage at which it can begin to understand its own physiology,

260

00:31:00,000 --> 00:31:05,000

it starts to plan to improve upon it and to make mechanical replacements.

261

00:31:06,000 --> 00:31:10,000

The report from the New York Memorial Hospital about two years ago now

262

00:31:10,000 --> 00:31:16,000

of surgeons cutting a man in half from the ribs down and fitting him with an artificial crump,

263

00:31:16,000 --> 00:31:20,000

pair of his hand legs, points to one way in which this sort of thing is going.

264

00:31:20,000 --> 00:31:27,000

And the Russian experiments of about the same period of keeping alive and supposedly conscious a monkey brain,

265

00:31:27,000 --> 00:31:30,000

points to another way.

266

00:31:30,000 --> 00:31:37,000

There is another game which could lead computers to rule in the world if you don't watch out,

267

00:31:37,000 --> 00:31:40,000

and that is real-life monopoly.

268

00:31:40,000 --> 00:31:45,000

It won't be very long before political leaders realize, as scientists did quite a long time ago,

269

00:31:45,000 --> 00:31:53,000

that machines of superhuman thinking ability can be built and that they could completely alter human existence.

270

00:31:53,000 --> 00:31:57,000

The new nation which put out the tremendous effort, and it would be a big effort,

271

00:31:57,000 --> 00:32:00,000

to produce a mechanical minister.

272

00:32:01,000 --> 00:32:09,000

We're going to get a fair return for its money, and that means it would use it to the maximum capability,

273

00:32:09,000 --> 00:32:13,000

that would use it for the most complicated thing known to man, apparently,

274

00:32:13,000 --> 00:32:16,000

that is making political decisions.

275

00:32:16,000 --> 00:32:20,000

Any restriction to the range of data that you supply to the mechanical minister

276

00:32:20,000 --> 00:32:24,000

would limit his ability to make effective political decisions.

277

00:32:24,000 --> 00:32:32,000

But if you don't place any restrictions, then you surrender the control of your country to a machine.

278

00:32:33,000 --> 00:32:38,000

Of course the other side is doing the same, and it ends up with the machine fighting the machine.

279

00:32:38,000 --> 00:32:42,000

If they've got any sense, they're not going to get involved, they'll just put the men in,

280

00:32:42,000 --> 00:32:44,000

and we'll be back to where they are now.

281

00:32:44,000 --> 00:32:46,000

It depends how you plan it.

282

00:32:46,000 --> 00:32:51,000

If you've listened to the fine robots theorizers at Asimov,

283

00:32:51,000 --> 00:32:57,000

you will build into all your machines, a class one rule, that you must never do anything to hurt people.

284

00:32:57,000 --> 00:33:02,000

And secondly, if someone does get hurt, you minimize it.

285

00:33:02,000 --> 00:33:06,000

So they would figure out that wars were going to be down-bared things all the way around,

286

00:33:06,000 --> 00:33:10,000

and perhaps they would work it out the way that we should have worked our pages down,

287

00:33:10,000 --> 00:33:13,000

just to play it out at not some crosses.

288

00:33:15,000 --> 00:33:20,000

Another thing about mechanical life, one of the arguments aimed against the possibility

289

00:33:20,000 --> 00:33:28,000

of such a thing, reproduction, usually thought of as something exclusively biological, isn't.

290

00:33:28,000 --> 00:33:31,000

It's a phenomenon of wide occurrence.

291

00:33:31,000 --> 00:33:39,000

It is something which begins to take place in all dynamic systems of more than a certain very high degree of complexity.

292

00:33:39,000 --> 00:33:41,000

You see this well in chemistry.

293

00:33:42,000 --> 00:33:48,000

The problem, and American engineers are already working on it, is to program a machine,

294

00:33:48,000 --> 00:33:55,000

to make another machine like itself, and to equip the new machine with a copy of the instructions so it can go on.

295

00:33:55,000 --> 00:33:57,000

Slide please.

296

00:34:00,000 --> 00:34:04,000

And of course, one of them is saying to the other one, I wonder where it will all end.

297

00:34:07,000 --> 00:34:09,000

Lights please.

298

00:34:09,000 --> 00:34:26,000

John von Neumann was the first mathematician to find out that it is theoretically possible for a computer to design a better computer than itself,

299

00:34:26,000 --> 00:34:30,000

and for the two of them then to get together and design a third.

300

00:34:30,000 --> 00:34:37,000

And this is a way in which mechanical evolution could follow closely on the heels of mechanical interactions.

301

00:34:37,000 --> 00:34:42,000

And now for the third form of intelligence, stable intelligent plasmoids.

302

00:34:42,000 --> 00:34:44,000

A plasma is an ionized gas.

303

00:34:44,000 --> 00:34:52,000

That is to say, it is an aggregation of ionized and neutral molecules and atoms together with free electrons.

304

00:34:52,000 --> 00:34:56,000

And it is possible for such a system to store large amounts of energy.

305

00:34:56,000 --> 00:34:58,000

Plasmas are not a new discovery.

306

00:34:58,000 --> 00:35:06,000

Every time you look at a neon tube, you see a plasma, and all the old fashioned wireless valves which are now given place to transistors

307

00:35:06,000 --> 00:35:08,000

had plasma in them.

308

00:35:08,000 --> 00:35:16,000

The properties of plasmas were based upon two discoveries made by the same chap nearly 400 years ago,

309

00:35:16,000 --> 00:35:20,000

William Gilbert, the physician between Elizabeth I.

310

00:35:20,000 --> 00:35:24,000

In 1600, Gilbert found that an electrically charged metal knob,

311

00:35:24,000 --> 00:35:27,000

and usage of charge, when it brought near to a flame.

312

00:35:27,000 --> 00:35:33,000

That's a plasma property that a hot gas, which is an ionized gas, can conduct electricity.

313

00:35:33,000 --> 00:35:40,000

And Gilbert is also a member of the first man to carry out systematic experiments on magnetism.

314

00:35:40,000 --> 00:35:45,000

And so you get the name magnetotasmodynamics phenomena,

315

00:35:45,000 --> 00:35:49,000

which is a scientific way of complicating things and describing the action of plasma

316

00:35:49,000 --> 00:35:55,000

as the induced combined action of electrical charges and magnetism.

317

00:35:55,000 --> 00:35:59,000

How can a ball of hot ionized gas be stable?

318

00:35:59,000 --> 00:36:04,000

Well, at present we don't know the answer, but that they can be stable is abundantly proven.

319

00:36:04,000 --> 00:36:08,000

For one thing, natural ball lightning, thunderbolts,

320

00:36:08,000 --> 00:36:15,000

have frequently been observed to persist for 5 or 10 minutes at on rare occasions for more than a quarter of an hour.

321

00:36:15,000 --> 00:36:24,000

A study of magnetically confined plasmas was made at the University of California in their radiation laboratory about nine or possibly 10 years ago now.

322

00:36:24,000 --> 00:36:31,000

They made bone-actuate plasmoids, which they shot magnetically out of the ground at 120 miles an hour.

323

00:36:31,000 --> 00:36:37,000

And although they moved so fast, they could be photographed at a high speed camera.

324

00:36:37,000 --> 00:36:45,000

It was one of the first experiments in a chain of research going on in America with a double purpose.

325

00:36:45,000 --> 00:36:54,000

If you can produce artificial ball lightning, you've solved two things which are quite important militarily at any rate.

326

00:36:54,000 --> 00:36:58,000

The first one, the ultimate weapon.

327

00:36:58,000 --> 00:37:06,000

Artificial ball lightning, if it's anything like natural ball lightning, could result in shooting an almost massless charge

328

00:37:06,000 --> 00:37:14,000

with an energy content at the rate of something like 400 pounds of TNT for the finger size of a football.

329

00:37:14,000 --> 00:37:19,000

It would also, of course, solve the problem of limitless cheap power.

330

00:37:19,000 --> 00:37:26,000

When your donor cell is preparing a year on electricity, this is the sort of thing that thermonuclear power promises you.

331

00:37:26,000 --> 00:37:31,000

And the answer to both would be contained in the production of artificial ball lightning.

332

00:37:31,000 --> 00:37:33,000

Next slide, please.

333

00:37:34,000 --> 00:37:40,000

This is a reproduction of a drawing from a 100-year-old book.

334

00:37:40,000 --> 00:37:42,000

A little more than that, actually.

335

00:37:42,000 --> 00:37:44,000

A Rague sur le planer.

336

00:37:44,000 --> 00:37:54,000

And it shows a lightning strike on a conductor and the formation of three lightning beams at the end of the strike.

337

00:37:54,000 --> 00:37:57,000

Next one, please.

338

00:37:58,000 --> 00:38:11,000

This is a photograph, repeatedly taken in a world in Switzerland in 1907, and supposed to be of a lightning ball of about five feet in diameter.

339

00:38:11,000 --> 00:38:13,000

Next one, please.

340

00:38:14,000 --> 00:38:28,000

This is the Bendix Corporation in the States apparatus for the production of small artificial lightning balls or plasmas.

341

00:38:28,000 --> 00:38:37,000

They use a conventional radar, the energy of which is concentrated into a partly-evectuated tube.

342

00:38:37,000 --> 00:38:50,000

And when you're getting a nice output of energy into that conducting gas, they suddenly reduce the pressure in the chamber and you then get a lightning ball formed.

343

00:38:50,000 --> 00:38:52,000

Next, please.

344

00:38:54,000 --> 00:38:56,000

For now, we're going to ask, where does the intelligence come in?

345

00:38:56,000 --> 00:38:59,000

And I have to admit that it hasn't at the moment.

346

00:38:59,000 --> 00:39:06,000

But Dr. Kenneth Scholders of Stanford Research Institute in the States is working on this.

347

00:39:06,000 --> 00:39:17,000

The United States Navy had commissioned him to produce a very compact computer, run with 100,000 million components per cubic inch.

348

00:39:17,000 --> 00:39:22,000

In other words, about a thousand times more effective than the human brain.

349

00:39:22,000 --> 00:39:33,000

They hope that by making it smaller like this, it will be able to record information at the rate of 10,000 million primary units per second.

350

00:39:33,000 --> 00:39:37,000

Now, Dr. Scholders' first model is going to be something fairly ordinary.

351

00:39:37,000 --> 00:39:43,000

It's going to be conducting strips of molybdenum on an aluminium oxide base and it's going to run at red heat.

352

00:39:43,000 --> 00:40:01,000

But then, he's working already on the long-term project, which is to use the plasma in which electrons and ions whirling in a matrix of magnetic fields will store the information, the information being proportional to charge density.

353

00:40:01,000 --> 00:40:08,000

So, you have the possibility now of a computer which consists of nothing but a mass around ours, guess.

354

00:40:08,000 --> 00:40:14,000

So, it seems that there's another bit of science fiction likely to come true.

355

00:40:14,000 --> 00:40:17,000

Most of you will remember Fred Hoyle's Black Cloud.

356

00:40:17,000 --> 00:40:29,000

And the suggestion now is that instead of it coming from the direction of the constellation of Iran, it's going to come out of a North American university.

357

00:40:29,000 --> 00:40:35,000

Now, we consider three types of intelligent organism which might exist in other parts of the universe.

358

00:40:35,000 --> 00:40:41,000

We now have to consider the means which they would have to employ in order to make contact.

359

00:40:41,000 --> 00:40:44,000

The first is direct visitation.

360

00:40:44,000 --> 00:40:52,000

We can begin by noting that alleged sightings have reported entities which could be any of the types of intelligent organism discussed.

361

00:40:52,000 --> 00:40:58,000

Among the reports, every year we have humanoid and semi-humanoid species.

362

00:40:58,000 --> 00:41:06,000

I guess which could be described as humanoid robots, though I don't see what advantage a machine gets by making it look like a human being unless it does the job properly.

363

00:41:06,000 --> 00:41:13,000

And also things like willow the wisp, meteors, barrels of fire, all of which could be plasma intelligences.

364

00:41:13,000 --> 00:41:18,000

Next two slides please.

365

00:41:18,000 --> 00:41:23,000

One of them and the next one.

366

00:41:23,000 --> 00:41:36,000

Both of these are from a book on physics written about 120 years ago by Dr Dionysius Ladner who described these things as slow-moving meteorites.

367

00:41:36,000 --> 00:41:41,000

Without a lot more evidence, it's very difficult to say what they are.

368

00:41:41,000 --> 00:41:50,000

They don't appear from the descriptions to have been beryllite or marsh gas, and for the want of anything else, I would think the most descriptive term is unidentified flower object.

369

00:41:50,000 --> 00:41:55,000

Next please.

370

00:41:55,000 --> 00:42:05,000

As for the means of transportation, we will try and simplify matters by discarding right at the start all transcendental devices of science fiction.

371

00:42:05,000 --> 00:42:13,000

That is, we are not going to have automatic dematerialization and rematerialization by a totally unspecified ray.

372

00:42:13,000 --> 00:42:23,000

We are not going to have doors through a hypothetical higher dimension or hyperdrives which permit velocities in excess of light.

373

00:42:23,000 --> 00:42:31,000

So the distant entities, whether they use their own bodies to space ships or employ vehicles for the purpose,

374

00:42:31,000 --> 00:42:42,000

so machines with no reason why they shouldn't use themselves, are going to be limited by the velocity of light and perhaps even more severely by problems of acceleration and deceleration.

375

00:42:42,000 --> 00:42:55,000

And it's also probable, even with machines, that as for human astronauts, there are limitations set by the need to minimize sensory deprivation and social deprivation.

376

00:42:55,000 --> 00:43:11,000

It's quite important to notice here that the recent work on sensory deprivation suggests that unless your means for analyzing external data and sorting it and working on it is more or less constantly employed, it very rapidly deteriorates.

377

00:43:12,000 --> 00:43:20,000

The probability of visits from communities at more than a few hundred light years from Earth becomes very small then under these conditions.

378

00:43:20,000 --> 00:43:31,000

Even a visit from our own galactic center and at a velocity of one half that of light, that is 335 million miles an hour, would require 100,000 years.

379

00:43:32,000 --> 00:43:39,000

Now we can't conceive even a machine. No machine has yet been built on Earth which continues around for that length of time.

380

00:43:39,000 --> 00:43:47,000

So he progressed long before, let alone by our legible organisms with their life spans at most of around about 100 years.

381

00:43:47,000 --> 00:43:55,000

It would be an unwarrantable dogmatism to assert that such marriages will always be impossible.

382

00:43:56,000 --> 00:44:01,000

But I do think they're so highly improbable as not to justify speculation.

383

00:44:01,000 --> 00:44:10,000

In the light of present day science and technology it seems very unlikely that it will ever be possible for men to visit worlds more than a few light years away.

384

00:44:10,000 --> 00:44:18,000

Or for man-made machines to visit worlds at more than a few tens of light years. Except on a one-way ticket.

385

00:44:19,000 --> 00:44:29,000

Redland is the prospect for advanced communities being situated within a few light years from Earth and of them finding us or of us finding them.

386

00:44:29,000 --> 00:44:30,000

Next slide please.

387

00:44:33,000 --> 00:44:44,000

One of the things that is fairly obvious, the number of communities on the assumption that they are distributed more or less uniformly throughout the galaxy as a whole,

388

00:44:44,000 --> 00:44:53,000

is that they go up as the cubists of radius. In other words, as your radius of search goes up from 10 to 100 to a thousand light years,

389

00:44:53,000 --> 00:44:58,000

the number that you are likely to find goes up from round about zero to round about a million.

390

00:44:58,000 --> 00:45:05,000

If you are going to go into this drop at all, it's worth building a machine with lots of power in it.

391

00:45:05,000 --> 00:45:07,000

Next slide please.

392

00:45:08,000 --> 00:45:17,000

And this is the sort of thing with which of course we are thinking of doing it, the Jobville Bank radio telescope at present engaged on other work.

393

00:45:17,000 --> 00:45:26,000

Though we shouldn't forget the Project Osmo, which was the first serious attempt made by scientists to detect messages coming from other worlds,

394

00:45:26,000 --> 00:45:34,000

was really originated at the suggestion from Cacione and Morrison that Jobville Bank should be used for the job.

395

00:45:34,000 --> 00:45:35,000

Next slide please.

396

00:45:37,000 --> 00:45:39,000

So we come to remote communications.

397

00:45:39,000 --> 00:45:51,000

Project Osmo was the name given to the attempt by Dr. Frank Drake of West Virginia to detect intelligent signals from Epsilon Eridani.

398

00:45:53,000 --> 00:45:58,000

I think that was the one that he concentrated on, but Paul said it was the other one he was interested in.

399

00:45:58,000 --> 00:46:06,000

The name of the project Osmo of course comes from Queen Osmo, who was the queen of the land of Oz in the storybook,

400

00:46:06,000 --> 00:46:13,000

which was very, very far away, very difficult to reach and full of wonderful and delightful things, and knows that name for the project.

401

00:46:13,000 --> 00:46:19,000

They used an 85 foot radio telescope fitted with the very latest receiving apparatus.

402

00:46:19,000 --> 00:46:25,000

They worked on it for about three months, during which they had done about 150 hours of actual listening in.

403

00:46:25,000 --> 00:46:31,000

They terminated in May 1961 when after recalculating they found that it wouldn't have worked anyway.

404

00:46:31,000 --> 00:46:42,000

They based it on the assumption that the people at the other end were using a telescope of at least the size of the job at all banks,

405

00:46:42,000 --> 00:46:50,000

and they were working on the assumption that a transmitted power of 160 megawatts per megacycle was enough.

406

00:46:51,000 --> 00:46:54,000

Fresh calculations indicate that it probably isn't.

407

00:46:54,000 --> 00:47:00,000

You're going to need a radio telescope of something like 500 feet to make it work under those conditions.

408

00:47:00,000 --> 00:47:02,000

This isn't impossible.

409

00:47:05,000 --> 00:47:09,000

Now we come to the problem of how to carry on a two-way exchange of information.

410

00:47:09,000 --> 00:47:15,000

It's too complex to be gone into in detail, but there are some schemes which overturn the worst difficulties.

411

00:47:15,000 --> 00:47:20,000

The only real problem is how to get information across at any speed at all.

412

00:47:20,000 --> 00:47:21,000

There are two aspects.

413

00:47:21,000 --> 00:47:26,000

The first is that if you reduce the amount of information, the number of bits as an engineer would say,

414

00:47:26,000 --> 00:47:35,000

which you want to transmit in unit time, it's easier to get a good signal-to-noise ratio, and so get a bigger range for a given power.

415

00:47:35,000 --> 00:47:40,000

The second is that for anything like a conversation, you've got this enormous difficulty,

416

00:47:40,000 --> 00:47:44,000

that you've got to wait for your message to get to a distant star and come back.

417

00:47:44,000 --> 00:47:51,000

If you consider Torsetian Exand Arodani, which is what Project Osmo was listening to,

418

00:47:51,000 --> 00:47:56,000

and there are the nearest stars likely to be able to support life as we know it,

419

00:47:56,000 --> 00:47:59,000

it takes 21 years for a simple question and answer.

420

00:47:59,000 --> 00:48:02,000

This is worth some getting somebody to marry you.

421

00:48:02,000 --> 00:48:07,000

With planets that still are greater distances, it gets quite ludicrous,

422

00:48:07,000 --> 00:48:11,000

and you can't hope to get more than one or two questions across in a lifetime.

423

00:48:11,000 --> 00:48:16,000

So all you can do then is to transmit an account of your own civilization,

424

00:48:16,000 --> 00:48:21,000

and hope that the people the other side will take it in and send you an account back of theirs.

425

00:48:21,000 --> 00:48:24,000

This is the way in which it suggests that it should be done.

426

00:48:24,000 --> 00:48:25,000

Next slide, please.

427

00:48:25,000 --> 00:48:30,000

I think most of you have seen it, you're probably familiar with it, but I'll go over it.

428

00:48:30,000 --> 00:48:36,000

This represents, once the pulses zeroes the spaces, they all occupy a unit of time.

429

00:48:36,000 --> 00:48:39,000

We'll say it's a second, it doesn't have to be.

430

00:48:39,000 --> 00:48:41,000

And it goes...

431

00:48:45,000 --> 00:48:47,000

and so on until it reaches the end.

432

00:48:47,000 --> 00:48:51,000

Then there's a gap, and after a fair time you repeat it.

433

00:48:51,000 --> 00:48:54,000

The idea is that if you go on doing this long enough, some will say,

434

00:48:54,000 --> 00:48:58,000

it's funny, you know, but that series of puzzles always sounds very much the same.

435

00:48:58,000 --> 00:49:00,000

Supposedly tape it down.

436

00:49:00,000 --> 00:49:04,000

And when you tape it down, you find out that it comes out to a number,

437

00:49:04,000 --> 00:49:09,000

which is the product of two primes, in this case 19 by 11.

438

00:49:09,000 --> 00:49:13,000

And again, you reckon that it is not a terribly bright thing, but you'll say,

439

00:49:13,000 --> 00:49:17,000

well, let's arrange it in 11 rows of 19 or 19 rows of 11.

440

00:49:17,000 --> 00:49:22,000

One way you get this, which doesn't mean much, the other way you get that, which is quite suggestive.

441

00:49:22,000 --> 00:49:26,000

Very suggestive to us, might still be quite suggestive to another race.

442

00:49:26,000 --> 00:49:29,000

Now, of course, you can go on further on this basis.

443

00:49:29,000 --> 00:49:33,000

If they can work out the product of two primes, they can work out the product of three.

444

00:49:33,000 --> 00:49:39,000

And this means that you can send a set of instructions to make a three-dimensional object,

445

00:49:39,000 --> 00:49:42,000

that you could turn out a bull, a banjo, or a bicycle.

446

00:49:42,000 --> 00:49:44,000

If you thought it would be instructive for them.

447

00:49:44,000 --> 00:49:46,000

Right, please.

448

00:49:47,000 --> 00:49:51,000

I think this is the more likely way of going about it.

449

00:49:51,000 --> 00:49:54,000

I call it ambassadorial liaison.

450

00:49:54,000 --> 00:50:00,000

The Nessar organisation in the States is now working on plans for the Mars exploratory vehicles.

451

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

Roughly, they hope to put pretty large satellites in orbit around Mars,

452

00:50:05,000 --> 00:50:12,000

and to drop vehicles onto the Martian surface that are not fast or to the size of a London double-decker bus,

453

00:50:12,000 --> 00:50:17,000

and which are fully equipped with automatic apparatus for soil sampling,

454

00:50:17,000 --> 00:50:27,000

the detection of bacteria, and all the other things which give you anything as to whether there is whatever has been left on the surface.

455

00:50:27,000 --> 00:50:37,000

So, we're within striking distance now of a pretty colossal technological feat.

456

00:50:37,000 --> 00:50:42,000

What the other people might be doing could be Mars in advance.

457

00:50:42,000 --> 00:50:49,000

If we accept this probability of innumerable other habitable worlds, many of them drastically older than our own,

458

00:50:49,000 --> 00:50:55,000

then we have to accept the idea that there could be probes around already,

459

00:50:55,000 --> 00:51:00,000

which are vastly more complex than anything that's yet on our drawing boards.

460

00:51:02,000 --> 00:51:08,000

It seems very likely, too, that the way a more advanced race would go about it,

461

00:51:08,000 --> 00:51:12,000

even if it was so advanced that it consisted of one giant mechanical mine,

462

00:51:12,000 --> 00:51:19,000

would not be to go on these explorations itself, but to build lots of probes and pump them out.

463

00:51:19,000 --> 00:51:26,000

A very good way would be for these probes to go into a system that it wanted some information about,

464

00:51:26,000 --> 00:51:32,000

and to listen out for any sign of organised radiation indicating that lab was there.

465

00:51:32,000 --> 00:51:37,000

It could then copper the radiation, amplify it, and send it back again.

466

00:51:37,000 --> 00:51:45,000

And this would give some indication that there was something up there that could detect messages and do this.

467

00:51:45,000 --> 00:51:50,000

Subsequently, if it got useful information, it would take it,

468

00:51:50,000 --> 00:51:59,000

and on this process of using high-pulse powers and long intervals, it would slowly transmit it back to its base.

469

00:52:00,000 --> 00:52:06,000

Now, the 68-dollar question here is, have there any evidence for anything like it?

470

00:52:06,000 --> 00:52:08,000

And we may have.

471

00:52:08,000 --> 00:52:16,000

Forty years ago, Sturmer and Vanderpoel, who were both distinguished engineers in the then relatively new field of radio,

472

00:52:16,000 --> 00:52:20,000

reported powerful and long-delayed echoes from radio stations,

473

00:52:20,000 --> 00:52:24,000

echoes for which at that time there was no explanation at all.

474

00:52:24,000 --> 00:52:29,000

They were looking for squeakers, they were sending out a pulse, listening to go round Earth,

475

00:52:29,000 --> 00:52:32,000

they should get seven echoes back in a second.

476

00:52:32,000 --> 00:52:36,000

What they were getting was a desigrate echo after eight seconds.

477

00:52:37,000 --> 00:52:39,000

There was no explanation.

478

00:52:39,000 --> 00:52:45,000

Today, apparatus capable of producing these echoes is familiar to all microwave engineers.

479

00:52:45,000 --> 00:52:50,000

It closely caught to the public about the time of the U-2 incident.

480

00:52:50,000 --> 00:52:56,000

Military aircraft like that are equipped with apparatus which listens out for enemy radars.

481

00:52:56,000 --> 00:52:58,000

It coppers their characteristics.

482

00:52:58,000 --> 00:53:01,000

It amplifies the interrogating signal.

483

00:53:01,000 --> 00:53:03,000

It distorts them suitably.

484

00:53:03,000 --> 00:53:05,000

Then we radiate them.

485

00:53:05,000 --> 00:53:10,000

Certainly interrogating station gets the impression of an aircraft which is a lot nearer than it really is,

486

00:53:10,000 --> 00:53:12,000

and over there, not over there.

487

00:53:12,000 --> 00:53:15,000

So all the guns start poking up in the wrong direction.

488

00:53:16,000 --> 00:53:20,000

Now, quite clearly, space probes could use similar equipment.

489

00:53:20,000 --> 00:53:24,000

But not with a view to military deception, but a simple statement which says,

490

00:53:24,000 --> 00:53:28,000

here I am, I can analyse and copy your signals, ain't I a bright boy?

491

00:53:28,000 --> 00:53:31,000

Would you like to send me more information?

492

00:53:31,000 --> 00:53:35,000

Well, Stoner and Vanderpoel made just have missed such an opportunity,

493

00:53:35,000 --> 00:53:39,000

and the visiting probes would then have gone on to other planetary systems,

494

00:53:39,000 --> 00:53:44,000

having reported back to their base that there was radio emission from the planet Earth,

495

00:53:44,000 --> 00:53:48,000

that it was a census jumble like that which we get from Jupiter.

496

00:53:49,000 --> 00:53:52,000

This brings us to another interesting possibility,

497

00:53:52,000 --> 00:53:57,000

that the emission from planets like Jupiter and Venus is only crazy natural.

498

00:53:57,000 --> 00:54:02,000

That is to say, that they are caused by something like the artificial control of weather,

499

00:54:02,000 --> 00:54:07,000

and that they have been given permanence and form by the artefies of intelligent beings.

500

00:54:08,000 --> 00:54:13,000

Visiting space probes which found evidence of communities just emerging from savagery,

501

00:54:13,000 --> 00:54:17,000

just starting on the long struggle towards technological development.

502

00:54:18,000 --> 00:54:23,000

Mike set up a repeater station, hoping that when the local race was intelligent enough,

503

00:54:23,000 --> 00:54:26,000

it would decode the message and then reply.

504

00:54:26,000 --> 00:54:31,000

So it is quite possible that the various phenomena which we accept as entirely natural,

505

00:54:31,000 --> 00:54:34,000

are in fact artificially induced.

506

00:54:34,000 --> 00:54:39,000

Radio emanations from Jupiter, in particular, are very peculiar,

507

00:54:39,000 --> 00:54:44,000

because instead of being incoherent outbursts of radio energy, which was the original idea,

508

00:54:44,000 --> 00:54:48,000

they would address things like gigantic thunderstorms in the Jovian atmosphere,

509

00:54:48,000 --> 00:54:54,000

they are now known to occur as tightly defined beams of frequency modulated waves,

510

00:54:54,000 --> 00:54:58,000

so that they are a lot more like a radio lighthouse than a natural noise source.

511

00:54:59,000 --> 00:55:00,000

Jupiter?

512

00:55:03,000 --> 00:55:08,000

I don't know whether we can see it, but you can just see it on this picture.

513

00:55:08,000 --> 00:55:11,000

We've got the familiar red spot there,

514

00:55:11,000 --> 00:55:19,000

and here you've got a faint shadow, which is the shadow of EO, the third largest satellite.

515

00:55:19,000 --> 00:55:27,000

And the interesting thing is that it seems to be EO, which carries out the modulation of the Jodian radio waves.

516

00:55:27,000 --> 00:55:35,000

How it does it, we don't know, but the waves always modulate when there is a particular angular relationship

517

00:55:35,000 --> 00:55:38,000

between Jupiter's magnetic field and the position of EO.

518

00:55:39,000 --> 00:55:41,000

Next, a lattice.

519

00:55:43,000 --> 00:55:49,000

And perhaps two, while we're looking around at things like the radio emanations from Jupiter and Venus,

520

00:55:49,000 --> 00:55:53,000

we ought to pay more attention to the Lagrange nodes.

521

00:55:54,000 --> 00:55:59,000

These are the five points in space in the vicinity of every pair of celestial bodies,

522

00:55:59,000 --> 00:56:02,000

where there is zero gravitational potential.

523

00:56:02,000 --> 00:56:08,000

If you are not familiar with the idea, and these are two celestial bodies,

524

00:56:08,000 --> 00:56:13,000

you have a zero here, where the gravitational field balance.

525

00:56:13,000 --> 00:56:18,000

You also have another zero on each side of the two primary bodies,

526

00:56:18,000 --> 00:56:25,000

and two further narrows on either side of the point intermediate between the two bodies.

527

00:56:25,000 --> 00:56:31,000

These nodes were predicted by the mathematician, Joseph Lagrange, about 200 years ago,

528

00:56:31,000 --> 00:56:37,000

and it's only recently that evidence has been produced to suggest that they have a real existence.

529

00:56:37,000 --> 00:56:45,000

That is, that radio echoes have been found implying certainly a concentration of space dust at these points.

530

00:56:45,000 --> 00:56:50,000

A small probe, of course, would not be distinguishable from a space dust at that distance.

531

00:56:50,000 --> 00:56:58,000

And in fact, Saturn machine could be lying out there, waiting for the appropriate signal to start up its recorded message.

532

00:56:59,000 --> 00:57:07,000

Right, that finishes the review of scientific evidence for the possibility of something.

533

00:57:07,000 --> 00:57:12,000

And I now want to go on to my own ideas about parapsychology.

534

00:57:13,000 --> 00:57:15,000

Can I have a slide, please?

535

00:57:18,000 --> 00:57:23,000

This, in the time of Louis Cartour's, was the idea of a ghost.

536

00:57:23,000 --> 00:57:31,000

We don't see many ways to have got very far away from it, that the inhabitants of other worlds were so far in advance of us.

537

00:57:31,000 --> 00:57:38,000

When I say other worlds now, I'm not talking about other worlds in the astronomical sense, but in the spiritual sense,

538

00:57:38,000 --> 00:57:43,000

that they haven't got anything better to do than to tweak our bedclothes on and try and try and ask.

539

00:57:43,000 --> 00:57:45,000

Right, please.

540

00:57:47,000 --> 00:57:48,000

Right, please.

541

00:57:49,000 --> 00:57:50,000

Thank you.

542

00:57:50,000 --> 00:57:51,000

Thank you.

543

00:58:20,000 --> 00:58:27,000

But in the way and at the time desired by the sitters, by means of a code of signals they could give answers to questions.

544

00:58:27,000 --> 00:58:35,000

There are plans and messages obtained in this way were trivial, but they sometimes revealed facts known to only one of the sitters.

545

00:58:35,000 --> 00:58:39,000

Five, the phenomenon required arbitrary conditions.

546

00:58:39,000 --> 00:58:46,000

It was noted that, above all, the presence of certain people seemed to be necessary to their production, while others seemed to it.

547

00:58:46,000 --> 00:58:51,000

But it didn't seem to depend upon the belief or skepticism of the people in question.

548

00:58:51,000 --> 00:58:58,000

Nevertheless, the production of phenomena could not be guaranteed by the presence or absence of any particular person.

549

00:58:58,000 --> 00:59:07,000

The committee was quite unanimous on this, but there were various other matters such as the alleged apparitions of hands and faces,

550

00:59:07,000 --> 00:59:15,000

spontaneous playing of musical instruments, apparent invulnerability of some persons to injuries by red-hot cold,

551

00:59:15,000 --> 00:59:20,000

accrups of various objects, and the prediction of future events they couldn't agree on.

552

00:59:20,000 --> 00:59:22,000

Slide, please.

553

00:59:23,000 --> 00:59:35,000

This is a photo of Kula Bucks, which is quite a classical name in the field of far walking, as he appeared at the car show in Saturday, 1946.

554

00:59:36,000 --> 00:59:46,000

I make no further statement about far walking, except that it seems to depend very much upon the mind of the individual,

555

00:59:46,000 --> 00:59:51,000

more than playing around with things like alum and sulfuric acid on the feet,

556

00:59:51,000 --> 00:59:57,000

because at all the modern demonstrations there have always been university students present who are willing to have a go.

557

00:59:57,000 --> 01:00:03,000

A proportion of them always get over unscathed, and a proportion of them always get burnt, as I'm sure I would.

558

01:00:03,000 --> 01:00:05,000

Slide, please.

559

01:00:08,000 --> 01:00:18,000

Well, after a hundred years, during which psychical research has increased to an enormous extent, it is deflating to admit that there's been very little real progress.

560

01:00:20,000 --> 01:00:28,000

The books on psychical research, published in large numbers, are mainly devoted either to summoning the faithful with the rallying cry

561

01:00:28,000 --> 01:00:34,000

that where there have been several thousand years of spiritualist smoke there must be metaphysical fire,

562

01:00:34,000 --> 01:00:41,000

or else to attempt to debunk the whole thing by pointing to the admittedly numerous cases of fraud.

563

01:00:43,000 --> 01:00:48,000

Now, there are six possibilities behind the paranormal.

564

01:00:49,000 --> 01:00:56,000

One, the skeptical interpretation, which says it's all fraud and philocyberal, as Dr. Priestley puts it, a lot of boss.

565

01:00:57,000 --> 01:01:04,000

The negative attitude isn't Dr. Priestley's, by the way, he regards such an attitude as stupid, bigotry, and dangerously unscientific,

566

01:01:04,000 --> 01:01:08,000

but it is the view of a very large group of orthodox scientists.

567

01:01:08,000 --> 01:01:16,000

Two, the theory of natural anomalies. This postulates that the paranormal occurs, that it is utterly without significance.

568

01:01:16,000 --> 01:01:21,000

It is a sport, a statistical fluke, an exception which proves the rule.

569

01:01:21,000 --> 01:01:24,000

To my mind, that's just nonsense.

570

01:01:24,000 --> 01:01:30,000

Three, scientific monism. This suggests that paranormal phenomena are genuine,

571

01:01:30,000 --> 01:01:35,000

but they belong to an order of physical occurrences beyond the scope of present-day science.

572

01:01:35,000 --> 01:01:41,000

With further advances in science, the paranormal will become normal, as the laws recognized by science

573

01:01:41,000 --> 01:01:47,000

become more representative of nature as she is, instead of as the scientist thinks she ought to be.

574

01:01:47,000 --> 01:01:52,000

This theory then provides justification for serious investigational phenomena,

575

01:01:52,000 --> 01:01:58,000

and it has the merit that in course of time something will be proved, whether it is popular or not.

576

01:01:58,000 --> 01:02:04,000

Four, the theory of substantial dualism, which asserts that paranormal events occur,

577

01:02:04,000 --> 01:02:09,000

that belong to an order of mental events, which cannot be explained by physical science.

578

01:02:09,000 --> 01:02:15,000

Then we have the synchronicity theory of Jung. This is the most difficult theory to follow.

579

01:02:15,000 --> 01:02:19,000

It supposes that paranormal events are not based on the causal principle,

580

01:02:19,000 --> 01:02:24,000

but rather based upon any kind of parameternal mind-matter interaction.

581

01:02:24,000 --> 01:02:30,000

Paranormal events, according to Jung, are events connected by an e-cursal principle.

582

01:02:30,000 --> 01:02:33,000

I hope you can understand it. I can't.

583

01:02:33,000 --> 01:02:35,000

Jung, please.

584

01:02:35,000 --> 01:02:43,000

You may also remember Jung for his book about unidentified flying objects.

585

01:02:43,000 --> 01:02:51,000

It seems to have changed his mind once or twice, but by and large his assertion has been that they are wishful thinking.

586

01:02:51,000 --> 01:02:56,000

That seems to be the basic thing, although it is tied up in rather more complicated languages,

587

01:02:56,000 --> 01:03:03,000

to being the necessity for the belief in something a down-site wiser and more stable than we are.

588

01:03:03,000 --> 01:03:06,000

Like, please.

589

01:03:06,000 --> 01:03:10,000

Finally, we have the supernatural interpretation.

590

01:03:10,000 --> 01:03:15,000

Paranormal phenomena are caused or mediated by disembodied intelligences.

591

01:03:15,000 --> 01:03:20,000

Spirits, ghosts or what have you. They are supernatural and beyond both reason and explanation.

592

01:03:20,000 --> 01:03:24,000

That's much the simplest one. Anyone want to stick to it?

593

01:03:24,000 --> 01:03:30,000

Now, it's only a personal opinion, but of the six possible theories, only two seem worthy to me,

594

01:03:30,000 --> 01:03:34,000

that scientific monism and substantial dualism.

595

01:03:34,000 --> 01:03:39,000

The second of these, although it involves a difficulty which has puzzled philosophers throughout the ages,

596

01:03:39,000 --> 01:03:44,000

that is, how to explain the interaction of physical and non-physical entities,

597

01:03:44,000 --> 01:03:52,000

has the advantage that it is obviously suited to deal with the one special peculiarity of paranormal phenomena.

598

01:03:52,000 --> 01:03:59,000

Often overlooked, which is that they are almost invariably connected in some way with a human being.

599

01:03:59,000 --> 01:04:08,000

Scientific monism, on the other hand, has the advantage that it can be backed up by the whole army of organized science.

600

01:04:08,000 --> 01:04:12,000

Now, there are two parapsychological phenomena.

601

01:04:12,000 --> 01:04:18,000

They are the names of prosopod pieces and idioplasty, which we'll get used to before long if you don't know them already,

602

01:04:18,000 --> 01:04:26,000

which no matter how erroneous they may be in theory, are such valuable concepts that you couldn't get on far without them.

603

01:04:26,000 --> 01:04:33,000

Prosopod pieces is a word derived from the Greek prosopos, a theatrical costume or a stage character.

604

01:04:33,000 --> 01:04:40,000

It's used to denote any sudden change, whether induced or spontaneous, in an individual's personality.

605

01:04:40,000 --> 01:04:47,000

Sometimes people take leave of their usual personality and assume an utterly different one.

606

01:04:47,000 --> 01:04:54,000

They may lose their memory, their character may be completely changed, they may take a new name, they may hold new ideas.

607

01:04:54,000 --> 01:04:59,000

The new personality may remember the old one, but speak of it as if it were a complete stranger.

608

01:04:59,000 --> 01:05:08,000

The change from Dr. Ducal to Mr. Hyde or the other way round may be ephemeral, or it may be a crazy stable state and last for years.

609

01:05:08,000 --> 01:05:13,000

Despite the name derivation, it is not a question of play-acting.

610

01:05:13,000 --> 01:05:18,000

It is not a question of the person taking on a role for reasons best known to himself.

611

01:05:18,000 --> 01:05:21,000

It is a genuine change in the personality.

612

01:05:21,000 --> 01:05:25,000

It is a phenomenon that has been known for thousands of years.

613

01:05:25,000 --> 01:05:30,000

It is one which has been intensively studied since the beginning of this century.

614

01:05:30,000 --> 01:05:35,000

The name by which the phenomenon was known in the past was of course possession.

615

01:05:35,000 --> 01:05:42,000

And this must not be confused in any way with Schizophrenia, which although the name suggests a splitting of the personality,

616

01:05:42,000 --> 01:05:50,000

only involves a splitting away of the emotions from the rest of the personality, from the rational sentiments.

617

01:05:50,000 --> 01:06:00,000

And this together with hallucinatory tendencies leads to grotesque changes in the personality, but it is still the same person.

618

01:06:00,000 --> 01:06:03,000

Three slides, please.

619

01:06:03,000 --> 01:06:09,000

The first one here I think is rather delightful. Can you sharpen the focus a little?

620

01:06:09,000 --> 01:06:13,000

That's better.

621

01:06:13,000 --> 01:06:20,000

This is a 16th century painting of the 4th century Saint Xenobius.

622

01:06:20,000 --> 01:06:26,000

And can you see the little demons which he is exorcising from the mouths of his patients?

623

01:06:26,000 --> 01:06:32,000

And these are the little beings who speak with many tongues.

624

01:06:32,000 --> 01:06:35,000

The next slide, please.

625

01:06:35,000 --> 01:06:43,000

In Schizophrenia we have a change in the personality which causes the individual to see the world differently.

626

01:06:43,000 --> 01:06:49,000

This is one of the 20th century painter Louis Wayne's pictures of pussycats.

627

01:06:49,000 --> 01:06:56,000

There's a whole series of them. The first one is quite an obvious picture of a pussycat like you or I might draw.

628

01:06:56,000 --> 01:07:02,000

Then he goes on to this furry beast and the last one looks more like a dailier than a pussycat.

629

01:07:02,000 --> 01:07:13,000

The interesting thing of course is that this is precisely the sort of thing, is precisely the sort of view of the world which Schizophrenia appears to have when he speaks to you.

630

01:07:13,000 --> 01:07:19,000

And it also seems to be the sort of thing which one sees in a psychedelic experience.

631

01:07:19,000 --> 01:07:24,000

And it is also the sort of thing that you produce under the influence of drugs like mescaline.

632

01:07:24,000 --> 01:07:27,000

Next slide, please.

633

01:07:27,000 --> 01:07:37,000

Just in case you should think it's anything new, this painting is by the famous 15th century, a famous Bosch.

634

01:07:37,000 --> 01:07:41,000

This is his idea of hell, I can well believe it.

635

01:07:41,000 --> 01:07:56,000

And incidentally, of course, it is a very well known Schizophrenic characteristic that the victim believes that his body is transparent and that he can see inside it.

636

01:07:56,000 --> 01:08:08,000

It is alleged, I think there is a good deal of evidence for it, that in many cases they have the paranormal ability to diagnose their own diseases although they have no medical knowledge.

637

01:08:08,000 --> 01:08:15,000

But certainly they do have a great preoccupation with their own bodies as this person appears to have.

638

01:08:15,000 --> 01:08:17,000

Next, please.

639

01:08:18,000 --> 01:08:20,000

Now, idioplasty.

640

01:08:20,000 --> 01:08:27,000

The personalities which manifest themselves as seemingly new psychological individuals in process of pieces,

641

01:08:27,000 --> 01:08:37,000

arise from a central idea which has either been implanted by a suggestion on the part of a hypnotist or infrajected as an axi-auto suggestion.

642

01:08:37,000 --> 01:08:47,000

The term was coined by Durand of Gros about 1800 to denote the implantation of ideas in minds made receptive by hypnosis.

643

01:08:47,000 --> 01:08:53,000

And later, Akhorevits used the word to mean the physiological realisation of an idea.

644

01:08:53,000 --> 01:08:58,000

Idioplasty has for centuries been thought to occur during gestation.

645

01:08:58,000 --> 01:09:15,000

Kalk Kozol published an account in 1922 illustrated with photographs which were never proved to be fakes of a cat whose kittens were marked with a date and some stars which were printed on a sack on which the mother was lying.

646

01:09:15,000 --> 01:09:19,000

The markings were formed by groups of black hairs on a white background.

647

01:09:19,000 --> 01:09:22,000

An older example occurs in the Bible in Genesis.

648

01:09:22,000 --> 01:09:32,000

And Jacob took him rods of green poplar and of the hazelnut and chestnut trees and he pulled white streaks in them and he made the white appear which was in the rods.

649

01:09:32,000 --> 01:09:41,000

And he set the rods which he had pulled before the flocks in the gatters, in the watering crops, when the flocks came to drink, that they should conceive when they came to drink,

650

01:09:41,000 --> 01:09:48,000

and the flocks conceived before the rods and they brought forth cattle, winged streaks, speckled and spotted.

651

01:09:48,000 --> 01:09:55,000

A more recent medical example is the following. A 25 year old woman was two months pregnant.

652

01:09:55,000 --> 01:10:03,000

She was badly frightened by her two year old son nearly cutting off his left thumb, the member hanging only by a shred of flesh.

653

01:10:03,000 --> 01:10:08,000

She was in the backwood, she had no one to assist her. She'd rest the injury as best she could.

654

01:10:08,000 --> 01:10:16,000

Her mind constantly dwelt on the subject and in due course she gave birth to a boy whose left thumb hung from his hand by a pedicle of flesh.

655

01:10:16,000 --> 01:10:23,000

This was published in 1910 in the Journal of the State Medical Association of Tennessee.

656

01:10:23,000 --> 01:10:28,000

There aren't many similar cases in the medical journals.

657

01:10:28,000 --> 01:10:37,000

The foregoing all relates to an idea manifesting as a bodily change. The stigmata of the saints are precisely similar.

658

01:10:37,000 --> 01:10:46,000

But the concept of idiopastigos a lot further than this, it proposes that where there is no physiological mechanism to materialize the implanted idea,

659

01:10:46,000 --> 01:10:52,000

where you're really aching to do something that there's no way by which you can bring it about normally,

660

01:10:52,000 --> 01:11:01,000

or where the mechanism is inhibited from working, as in the case of a medium, has been strapped down to her chair so she can't move,

661

01:11:01,000 --> 01:11:06,000

then the idea still tries to manifest itself paranormally.

662

01:11:06,000 --> 01:11:17,000

Thus, the levitation of objects beyond a medium's reach, or the apportionation of objects from other rooms, are supposed to take place by some sort of action at a distance.

663

01:11:17,000 --> 01:11:24,000

This notion is both too crude and too far-fetched to win scientific support without a great deal of observational evidence,

664

01:11:24,000 --> 01:11:31,000

but something of the kind may occur, and idiopastig in a more limited sense definitely does seem to occur.

665

01:11:31,000 --> 01:11:35,000

Incidentally, I'd like to give you my opinion on levitation.

666

01:11:42,000 --> 01:11:46,000

The cartoon is due to Charles Adams. I think it's absolutely delightful.

667

01:11:50,000 --> 01:11:51,000

Lights, please.

668

01:11:55,000 --> 01:12:02,000

There are many ways in which the concepts of precipitices and idiopastig are related to the subject of unidentified flying objects.

669

01:12:02,000 --> 01:12:10,000

For the start, precipitices, particularly in the form of rapidly alternating personalities such as we have studied,

670

01:12:10,000 --> 01:12:15,000

clearly has a bearing on the so-called contactee experiences.

671

01:12:15,000 --> 01:12:19,000

Nothing all of them, but there's a group which you can definitely recognize it.

672

01:12:19,000 --> 01:12:22,000

There is one very interesting application.

673

01:12:22,000 --> 01:12:29,000

Charles Bowen pointed out to me some time ago that there are lots of instances where observers report seeing an object,

674

01:12:29,000 --> 01:12:37,000

supposedly a spacecraft, swoop down as if it's going to land, and it passes behind a hill or a wood or something like this, at a little distance.

675

01:12:37,000 --> 01:12:44,000

Within a minute or less, long before the observers have had a chance to get themselves together and approach the landing site,

676

01:12:44,000 --> 01:12:46,000

figures are seen approaching.

677

01:12:46,000 --> 01:12:51,000

They're stereotyped. They are usually dwarfs or giants and often described as peary.

678

01:12:51,000 --> 01:12:57,000

Usually there is no encounter, sometimes an exchange of signals is reported,

679

01:12:57,000 --> 01:13:00,000

and then the visitors turn back towards their ship.

680

01:13:00,000 --> 01:13:05,000

Instantly, the minute they disappear from view, the ship is seen to take off.

681

01:13:05,000 --> 01:13:12,000

As Mr. Bowen has remarked, this odd cycle of events has been reported too many times to be casually dismissed.

682

01:13:12,000 --> 01:13:14,000

There has to be a mechanism for it.

683

01:13:15,000 --> 01:13:17,000

Well, you may suggest your own.

684

01:13:17,000 --> 01:13:25,000

Mine is that some of the reported landings are genuine, but I think they're the routine sample collection crypts of robot probes.

685

01:13:25,000 --> 01:13:32,000

This seems to me by far the most likely thing, that whatever the state of technology of other races is going to be,

686

01:13:32,000 --> 01:13:35,000

you'll find their probes long before you find them.

687

01:13:35,000 --> 01:13:40,000

But the craft which visit Earth are the creations of arse superior beings.

688

01:13:40,000 --> 01:13:45,000

Their science does embrace a good deal of what is still parisant to us.

689

01:13:45,000 --> 01:13:52,000

Suppose then that in addition to radars which can listen for our emanations and send back false signals to confuse our tracking stations,

690

01:13:52,000 --> 01:13:55,000

and there seems to be evidence for this.

691

01:13:55,000 --> 01:13:59,000

Suppose they have equipment which can track our thoughts.

692

01:13:59,000 --> 01:14:06,000

The landing vehicle then receives from a group of human beings some confused thoughts something like this, a flying saucer, fear,

693

01:14:06,000 --> 01:14:10,000

perhaps they're giants or hairy monsters. Let's run for it.

694

01:14:10,000 --> 01:14:14,000

Where no sooner received than the reflected thought images on its way,

695

01:14:14,000 --> 01:14:21,000

the human observers are met by visions of precisely the kind of alien creature they most feared to see.

696

01:14:21,000 --> 01:14:26,000

As soon as the craft has finished its job, which it's at a collecting soil cell, this is only a minute or so,

697

01:14:26,000 --> 01:14:30,000

they lift the fear barrier and the creatures disappear.

698

01:14:31,000 --> 01:14:41,000

Another obvious application of these parapsychological principles is to be a notion of an elite in our midst.

699

01:14:41,000 --> 01:14:48,000

Demygods of normal human descent are perhaps infiltration by the beings of an extraterrestrial race.

700

01:14:48,000 --> 01:14:55,000

The usual reaction to these ideas, at least on the part of orthodox psychologists, is that they are schizophrenic.

701

01:14:55,000 --> 01:15:03,000

And certainly it is a common schizophrenic symptom to believe that one is constantly in the presence of beings who are visible to oneself alone,

702

01:15:03,000 --> 01:15:06,000

and who command one's every action.

703

01:15:06,000 --> 01:15:10,000

In olden times these were thought of as demon familiars from the infernal to regions,

704

01:15:10,000 --> 01:15:14,000

and today sometimes they're thought of as the pilot supplying sources.

705

01:15:14,000 --> 01:15:18,000

But what about the people who claim extraordinary after-the-body experiences,

706

01:15:18,000 --> 01:15:22,000

or position by the minds of extraterrestrial beings?

707

01:15:22,000 --> 01:15:34,000

Idioclasti and Proscripti pieces here explain how a central compelling idea that of a race of supermen who will save mankind from his own homicidal stupidity

708

01:15:34,000 --> 01:15:40,000

can produce subsidiary or alternate personalities with the reported characteristics.

709

01:15:40,000 --> 01:15:43,000

But where does the central idea come from?

710

01:15:43,000 --> 01:15:47,000

I'd now like to show another small group of slides.

711

01:15:47,000 --> 01:15:49,000

First one, please.

712

01:15:50,000 --> 01:16:04,000

This is a modern psychologist attempt to estimate the intelligence of a number of outstanding people.

713

01:16:04,000 --> 01:16:13,000

As it's been projected back to front, I can't read them at the moment, but I'll give them to you, because I've also gotten them noted on my script.

714

01:16:13,000 --> 01:16:15,000

The next one, please.

715

01:16:17,000 --> 01:16:19,000

This is very interesting.

716

01:16:19,000 --> 01:16:27,000

It's one of the drawings of helicopters made by Leonardo da Vinci, and the date for it is somewhere around 1500.

717

01:16:27,000 --> 01:16:29,000

Next, please.

718

01:16:29,000 --> 01:16:35,000

This is also very interesting, because it's taken from a painting of that time.

719

01:16:35,000 --> 01:16:45,000

It's just a detail from a large canvas, and it shows what is obviously a child's toy helicopter produced by pulling a string.

720

01:16:45,000 --> 01:16:56,000

Until I saw this, I never had any realization that these things which you used to be able to go and buy in Woolworth were in fact 400 years old, nearly 500 years old.

721

01:16:56,000 --> 01:16:58,000

Next one, please.

722

01:16:58,000 --> 01:17:13,000

And this, many of you will recognize, is the common Sangamang, about whom I don't propose saying anything more in the moment, except that in connection with this idea of an elite, this is perhaps the most outstanding character of all.

723

01:17:14,000 --> 01:17:25,000

You probably know that Bernard de Fontanel was supposed from the age of 45 until he died on his 100th birthday, never to have aged visibly.

724

01:17:25,000 --> 01:17:35,000

But the common Sangamang did very much better than that, because according to the historical records, he seems to have stayed at about middle age over a period of very nearly 200 years.

725

01:17:35,000 --> 01:17:39,000

You can definitely trace him over a period of about 17.

726

01:17:40,000 --> 01:17:46,000

This could just be a freak of human longevity. It could be something else. That's please.

727

01:17:48,000 --> 01:18:00,000

Yes, over that group of people that you saw, there was the car estimated at 19 of 150, Luther 170, Kent 175, Newton 190, Gertrude 210.

728

01:18:00,000 --> 01:18:10,000

Notes are at 165, Gertrude 190, Da Vinci 180, Galileo 185. We reckon we're doing damn well if we knock out 140.

729

01:18:10,000 --> 01:18:22,000

There certainly are, even if it is only a purely human manifestation, there certainly are among us a subspecies very different from the general one.

730

01:18:23,000 --> 01:18:31,000

The audio-plastic and proselytical piece is then can explain this compelling idea of a race of supermen.

731

01:18:31,000 --> 01:18:41,000

But is this idea picked up from others in the course of our workaday lives, or are we all, as some people believe, in contact with each other at a subliminal level?

732

01:18:41,000 --> 01:18:49,000

And if there is a universal unconscious telepathy between men, then why not between men and other intelligences?

733

01:18:49,000 --> 01:19:01,000

And perhaps the Russians are right, and their attempts to develop telepathy as a cheap and effective way of communication between Earth and the Moon is more realistic than things like the abortive attempt to Project Osma.

734

01:19:01,000 --> 01:19:18,000

It could be that many of the strange mental disturbances which we put down to madness, genius, historical dissociation, or just plain drunkenness on a Saturday night, are the early stirrings of idioplastic concepts produced by cosmic telepathy.

735

01:19:18,000 --> 01:19:30,000

On the subject of telepathy, I would like to show you just three slides. I'm not going into any further, you'll find this dealt with in detail in the next issue of the Flying Salsa Review.

736

01:19:30,000 --> 01:19:32,000

Next one, please.

737

01:19:33,000 --> 01:19:37,000

This little page is precisely what it appears to be.

738

01:19:37,000 --> 01:19:44,000

A metal page can sharpen up the both just a little bit, with inside of a bed and some apparatus.

739

01:19:44,000 --> 01:19:46,000

And it is that? Thank you.

740

01:19:46,000 --> 01:19:53,000

News by the Russian Professor Vasiliy, who's done a great deal of work on telepathy.

741

01:19:53,000 --> 01:20:00,000

In his experiment, the chapter he was being experimented upon didn't know that he was engaged in a telepathic experiment.

742

01:20:00,000 --> 01:20:08,000

He thought that he was carrying out a routine medical examination. He had to squeeze a bulb with one hand, and try and keep up a regular rhythm.

743

01:20:08,000 --> 01:20:16,000

Meanwhile, unknown to him, away in another room, some spooky bloke was trying to do a Houdini on him, saying, go to sleep, go to sleep.

744

01:20:16,000 --> 01:20:21,000

And he was marking down on the tape the times at which he made his suggestions.

745

01:20:21,000 --> 01:20:26,000

The chapter was squeezing the bulb, unknown he was marking down on the tape his own efforts.

746

01:20:26,000 --> 01:20:34,000

And the thing was to find whether there was a coincidence between the attempt of the hypnotist to put him to sleep, and the time at which he did fall asleep.

747

01:20:34,000 --> 01:20:40,000

Because if the experiment went on long enough, he always fell asleep. Sometimes took a long while.

748

01:20:40,000 --> 01:20:43,000

Next slide please.

749

01:20:43,000 --> 01:20:51,000

In America, Dr. Duren has been carrying out some remarkable experiments on telepathy. This isn't Dr. Duren.

750

01:20:51,000 --> 01:21:04,000

He had rather similar apparatus. What he did in fact was to control the alpha rhythm of his brain. We can all do this.

751

01:21:04,000 --> 01:21:15,000

If our eyes are open or shut, there's a difference in our alpha rhythm. If we think about a problem, such as something complicated like twice two, our alpha rhythm is immediately reduced.

752

01:21:15,000 --> 01:21:22,000

If we think of something really complicated, such as nine times nine times nine, it's quite suppressed for a moment or so.

753

01:21:22,000 --> 01:21:32,000

So Duren figured that he could pick up this change in his alpha rhythm since it easily appears on an electro-encephalograph, and end-perfect to do useful things.

754

01:21:32,000 --> 01:21:39,000

So then he found this work quite nicely. He could think or not think and switch the lights on or open the door for his car.

755

01:21:40,000 --> 01:21:49,000

This pussycat, which has nothing to do with that, is one of a series of experiments which have been conducted by Israeli scientists.

756

01:21:49,000 --> 01:22:02,000

So if you can measure an animal's reactions without the difficulty of having lots of electrical wires trailing all over the place, this little cat can transmit certain physiological stimulus,

757

01:22:02,000 --> 01:22:06,000

and then transmit by the temperatures, blood pressure and so on, back to base.

758

01:22:06,000 --> 01:22:15,000

What is more interesting is that other scientists have recently produced a very similar box of cooks mounted on their head or some call of a puss.

759

01:22:15,000 --> 01:22:23,000

Whereby, by pressing one button, they can command a thing to come, and by pressing another button, they can command it to go.

760

01:22:23,000 --> 01:22:32,000

This is simply by either producing in it the attraction due to food, or the repulsion due to a loud noise.

761

01:22:32,000 --> 01:22:36,000

In fact, it receives neither. It only receives an electrical signal, but different wavelengths.

762

01:22:36,000 --> 01:22:52,000

What I'm trying to bring home to you now is the fact that although it may not be possible to transmit a complex idea, it is perfectly possible to transmit an idea, the idea of come or the idea of go,

763

01:22:52,000 --> 01:23:00,000

but for even an inert apparatus in the brain of a cat, recently a number of people in America have reported hearing meteorites.

764

01:23:00,000 --> 01:23:07,000

Experiments have now been carried out which show that certainly some servicemen can hear radar waves.

765

01:23:07,000 --> 01:23:13,000

To be strictly truthful, they don't hear the radar waves, but they can hear what is called the pulse for current frequency.

766

01:23:13,000 --> 01:23:21,000

In other words, if they've got a radar which is working with a few thousand repetitions per second, they hear a high-pitched whistle.

767

01:23:21,000 --> 01:23:25,000

But this is not detected by their ears, if they're stoned therefore, if they're ears are plugged.

768

01:23:25,000 --> 01:23:29,000

They still hear the whistle inside their heads.

769

01:23:29,000 --> 01:23:34,000

And this also reminds us of certain experiments recently carried out on rhesus monkeys in the States,

770

01:23:34,000 --> 01:23:42,000

which have shown that you can produce a mental breakdown, or even drive them completely insane, by just transmitting television to them.

771

01:23:42,000 --> 01:23:46,000

You don't see the pictures, they only get the radar waves.

772

01:23:46,000 --> 01:23:50,000

The Lord knows what will happen if they saw the pictures as well.

773

01:23:50,000 --> 01:23:53,000

Can I have the next?

774

01:23:53,000 --> 01:24:00,000

This shows you what happens when a bird gets sucked into the air intake of a jet plane.

775

01:24:00,000 --> 01:24:06,000

It's fatal for the bird, it could be fatal for the pilot and his crew.

776

01:24:06,000 --> 01:24:14,000

Consequently, the Americans have become very worried about this, and they've done a lot of work on clearing birds, particularly large species, off their airfields.

777

01:24:14,000 --> 01:24:18,000

And how do they do it? Yes, you'd guess it, they do it by electromagnetic radiation.

778

01:24:18,000 --> 01:24:27,000

If you take a beam of radio waves, round about 10 centimeters wavelength, or an even longer wavelength, out to say 600 megacircles,

779

01:24:27,000 --> 01:24:35,000

if you beam this down, it doesn't have to be a very intense radiation, it is not a radiation strong enough to warm up the brain.

780

01:24:35,000 --> 01:24:39,000

There is no direct, obvious, mechanical effect like that.

781

01:24:39,000 --> 01:24:44,000

At a very low intensity, the bird becomes paralyzed and just falls down.

782

01:24:44,000 --> 01:24:51,000

This is what they do on the airfields, they have a beam like this which is swept around the airfield when a large jet is about to take off or come in,

783

01:24:51,000 --> 01:24:54,000

and all the birds are paralyzed for a few minutes.

784

01:24:54,000 --> 01:25:01,000

Within minutes or so of the beam being turned off, they're happily flapping around and getting in everybody's way again.

785

01:25:02,000 --> 01:25:06,000

I think that's the last slide, is it? Thank you, it lasts.

786

01:25:09,000 --> 01:25:19,000

Right, I don't propose breaking into the copyright of the mixed article in the Blind Salsa Review,

787

01:25:19,000 --> 01:25:25,000

which is the final one in my present series, in which I go over this matter and a number of other things,

788

01:25:25,000 --> 01:25:28,000

and draw it out into a more coherent theme.

789

01:25:29,000 --> 01:25:38,000

But I would like you thinking back over what we've gone through to realise that we had a perfectly good scientific evidence,

790

01:25:38,000 --> 01:25:43,000

quite partly in terms of feeling that lots of us may possess about life on other worlds,

791

01:25:43,000 --> 01:25:49,000

perfectly good scientific evidence that there are suitable environments available,

792

01:25:49,000 --> 01:25:53,000

there are homes for life elsewhere, if it has evolved there.

793

01:25:54,000 --> 01:26:00,000

And having looked at the possible ways in which communication could take place between worlds,

794

01:26:00,000 --> 01:26:06,000

there appears to be evidence or attempts having taken place, although we've got nothing terribly concrete to go on.

795

01:26:06,000 --> 01:26:12,000

There is also the possibility that we have overlooked a tremendously important field,

796

01:26:12,000 --> 01:26:20,000

that of parapsychology, the possibility that the emanations of the planet Jupiter, for example,

797

01:26:21,000 --> 01:26:28,000

may not merely be attempts to influence our minds, for all we know they are effective in influencing our minds.

798

01:26:28,000 --> 01:26:34,000

There are so many things that go on in our minds that we can't explain,

799

01:26:34,000 --> 01:26:40,000

that there is always a possibility that they are due to an external influence.

800

01:26:40,000 --> 01:26:45,000

The one piece of scientific evidence which shows that this is an all-utter moonshine

801

01:26:45,000 --> 01:26:52,000

is this recent series of electrical experiments indicating that you can paralyse birds,

802

01:26:52,000 --> 01:27:00,000

you can drive monkeys mad, little old human beings with television, and that you can transmit information.

803

01:27:00,000 --> 01:27:08,000

And finally, we must briefly consider the social implications of coming into contact with superior races.

804

01:27:08,000 --> 01:27:13,000

There can be no question of there having any fear of us, crude, though we may seem,

805

01:27:13,000 --> 01:27:21,000

since even a slightly more advanced society could, if it wished, completely exterminate terrestrial life with little or no effort,

806

01:27:21,000 --> 01:27:26,000

in much the same way as we exterminate lot of rum into us.

807

01:27:26,000 --> 01:27:29,000

On the other hand, it is probable that we have little to fear.

808

01:27:29,000 --> 01:27:36,000

Very superior races, societies of vast intellect, may well possess equally vast compassion.

809

01:27:37,000 --> 01:27:44,000

Although this is an idealist view, and I'm sorry to say it cannot be deduced from observations of human behavior.

810

01:27:44,000 --> 01:27:50,000

The establishment of contact with any superior community would obviously be of unparalleled importance,

811

01:27:50,000 --> 01:27:54,000

socially, technically, and culturally.

812

01:27:54,000 --> 01:28:01,000

It could lead either to our rapidly attaining a superior status ourselves, or it could lead to our extinction.

813

01:28:01,000 --> 01:28:09,000

And it probably depends upon how well we can conceal or overcome our great failings as social beings.

