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The bug-eyed monster program

By GWYNNE DYER

?There is absolutely no procedure enshrined in international law to respond to a signal from an alien civilisation,? said Martin Dominik, an astronomer at the University of St. Andrews. ?It makes sense to create a legally binding framework that is properly rooted in international law.?

Well, yes, it would make sense. But if the Bug-Eyed Monsters do send a message, would we really want to reply at all?

Bug-Eyed Monsters (BEMs), generally portrayed carrying off half-naked Earth maidens with evil intent, were a standard feature of pulp science fiction in the 1950s. We are all more sophisticated now, of course, but fear of alien contact is not necessarily irrational.

The specific reason for Prof. Dominik's remarks is a survey of public attitudes towards alien contact that was launched this month by London's Royal Society and the UK SETI Research Network, but in broader terms it is a response to two important developments in the Search for Extra-Terrestrial Intelligence (SETI) that occurred in 2015.

One was a debate at the American Association for the Advancement of Science convention in 2015 about whether ?Active SETI' was a good idea. Should we advertise our existence and publish our address to the cosmos, or is that just asking for trouble? Many of the scientists present backed a declaration that a ?worldwide scientific, political and humanitarian discussion must occur before any message is sent.?

The other major event of 2015 was the launch of Russian-Israeli tech billionaire Yuri Milner's 10-year Breakthrough Listen project, which is buying thousands of hours of time on the world's most powerful radio telescopes to search over a million stars for artificial radio or laser signals.

This is ?Passive SETI', and there's certainly no harm in just looking for signs of the existence of other civilisations elsewhere in the galaxy. There is ?no bigger question in science,? said the late Prof. Stephen Hawking, who was an adviser to the project. But if you find such a civilisation, an enormous debate will immediately erupt over whether we should reply or not. Hawking thought not.

The Breakthrough Listen project has been up and running for several years now, and last month it announced that it has so far examined 1,000 star systems within 160 light years of Earth but detected no transmissions from alien civilisations.

However, even if there were ten thousand civilisations in the galaxy, the probability that one of them would be within 160 light years of us is very low. Moreover, they would have to be using a very powerful signal aimed specifically at us to be detected at that range. Old television programs do not travel across the galaxy intact. (Sorry, Galaxy Quest.)

In fact, it is remarkably quiet out there, but that doesn't necessarily mean that there are no other civilisations in our corner of the galaxy. There is a rival hypothesis which suggests that there may indeed be one or more civilisations in our galactic neighbourhood, but that they are observing radio silence.

Why? Because they know or at least suspect that there is something big and bad and dangerous lurking out there in the dark, and they do not want to attract its attention.

This hypothesis is increasingly being called the ?Dark Forest Problem', after the extraordinary success of Chinese science-fiction writer Liu Cixin's ?Three-Body Problem' trilogy. It traces the calamitous consequences over 400 years of an alien contact scenario, initiated by well-meaning human beings, that goes desperately wrong.

Nothing in the science we know makes this hypothesis plausible. Interstellar travel is virtually impossible, and neither trade nor

conquest would be profitable at interstellar distances even if it did somehow became possible. The energy required and the time taken would simply be too great.

Or so we assume, but our current level of scientific knowledge is probably not the last word on the subject. We still have much to learn even about the basic physics of the universe ? the nature and role of ?dark matter' and ?dark energy', for example ? and distance alone might not be enough to protect us from any ill-intentioned BEMs with a sufficiently high level of technology.

So Dominik is right: we do need to have an international discussion about whether we should make our existence known, should the intensified SETI research yield a positive result. And it would be wise to have it before the media circus that would erupt if we actually found a message.

Another of Milner's programs, Breakthrough Message, is working on what kind of answer we might send, but its remit is clear. It has pledged ?not to transmit any message until there has been a global debate at high levels of science and politics on the risks and rewards of contacting advanced civilizations.?