

Fear of Living

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Abstract: Currently, immersive environments have shown considerable promise in being used in mental health treatment. The holodeck is a space where the physical and virtual become indistinguishable and could be seen as the ultimate extension of these systems. This holonovel looks at some of the possibilities that holodeck technology could provide in dealing with mental health and psychological issues in the future. With this potential comes ethical and other challenges which the holonovel also considers.

Keywords: Holonovel, Holodeck, Virtual Reality, Mixed Reality, Immersive Environments, Transhumanism, Mental Health, Psychology, Science Fiction, Science Fiction Prototyping, SFP, Brain Computer Interface, Artificial Intelligence, Interdisciplinary Research, Ethics

1 Introduction

Although the last few hundred years have seen dramatic changes generally, it is only over a very recent period that traditional conceptions about the boundaries between technology and ourselves and the nature of external and internal reality have begun to be challenged. This is reflected in discussions about transhumanism and concepts like the holodeck. These emerging areas hold out possibilities, as well as challenges for the future, which even our most vivid imaginations at the moment only have a glimpse of, and which the holonovel is intended to explore.

This holonovel particularly focuses on our mental and physical selves and the external world, and the way the boundaries between them will blur and morph. It is both intended to look at the practical possibilities of how new immersive technologies could be used in the area of mental health, but also to raise the complex ethical and other questions that will inevitably come with this in the future.

2 Background

Many technological developments, some of which only exist currently in very rudimentary form, would be necessary to achieve the vision of the holodeck as envisaged by Gene Dolgoff, and originally expressed within the Star Trek context [1]. Immersive technologies would be one of the key components of this and Virtual Reality and game-based systems have been used in different ways in the area of mental health. Many of these applications have been in the treatment of anxiety, but other examples include dealing with conditions such as schizophrenia, substance-related problems, eating disorders, and depression [2][3].

One particular VR method has shown particular effectiveness in a number of different application areas. This is based around the concept of embodiment, whereby the behaviour of an avatar in a virtual space closely mirrors that of the subject in the experiment, who wears a motion capture suit and a virtual reality headset, so that they see things as if through the avatar's eyes. In a number of cases this has been shown to produce significant changes in attitude and mental state. A particularly interesting example was where embodiment was used to recreate a traumatic event where the actions of an individual could have saved lives, and the application simulated travelling back in time so as to be able to influence what took place. This had complex outcomes, including reducing regret, with potential for use in real trauma situations [4].

In these examples, the physical behaviour of the avatar is controlled by physical movements of the subject. Complementary to this would be considering how the mental state of the subject could influence the avatar or other aspects of the virtual environment. An example of work in this area was the development of a system to allow the thoughts of a subject to influence a scenario in a game like environment, in this case a narrative that was part of a soap opera set in a hospital. The subject's degree of empathy for the main character was used to determine how different variants of the narrative were chosen and developed, leading to positive or negative outcomes [5].

Brain interfaces are an area of rapid development. For instance, a system that enabled a human subject, without any previous training, to manipulate the movement of a rat in a maze, has been demonstrated [6]. Although still at an early stage, interfaces to the human brain that can incorporate additional processing capability are increasing in sophistication from the relatively primitive systems that form the basis for prosthetic devices such as cochlear implants. Developments in biologically based computing hold out the prospect of much more sophisticated interfaces and human brain augmentation. The concept of this has been demonstrated in neuron based processing devices that have been constructed. An example is the Koniku Kore system currently being rolled out for use in detecting explosives, based on rat neurons. This has an interface of 640 electrodes connecting to 128 active and over 50 thousand hidden neurons [7]. Although the vision of a holodeck as originally envisaged still lies considerably in the future, the elements that would go towards its fulfilment can be clearly discerned in current technology.

Beyond the scope of this paper is the key underlying issue of the causes of mental health problems, which any interventions must presuppose. This question is problematic and contentious. As an article in the journal 'Nature' states, "Despite decades of work, the genetic, metabolic and cellular signatures of almost all mental syndromes remain largely a mystery" [8]. However, the wider context of mental problems, which goes beyond individual biological factors, can be critical and has been highlighted by important research in this field [9]. This is an important issue in its own right and comes up in the course of this holonovel.

3 The Story

3.1 The Mission

Captain Brady walked rapidly along the narrow path in the dense forest. He could feel the weight of the pack on his back from the supplies and equipment he was carrying. He had to reach the bridge which was many miles away before dark. The intelligent surface of his combat suit continually adjusted to blend in with his surroundings, but he doubted that there would be any enemy soldiers in this remote area anyway. It was great to feel the adrenaline again of being in action. It had been a while since he had even felt he had anything to live for. It was a year now after the Delta incident, a year of bitterness and frustration. Of course he took responsibility as commander of the unit. It had been particularly hard as the only survivor of the six. Publicly they were all heroes, but within the service it was very clear whose fault they thought it was. But who was really to blame? They knew who they were, and he did. But who could he tell and who would believe him? As if it wasn't bad enough losing some of his closest comrades and friends, he then had to undergo interminable analyses and tests. PTSD, survivor syndrome, depression, even paranoia, were just some of the conditions that had been attributed to him. But he had to focus on his current objective now. It was his chance of redemption, both with respect to others and to himself. He had been surprised to get the mission, but as they had said, he was uniquely suited to it. He also spoke the language - his mother had originally come from here, although he hadn't visited since childhood. He tried to put to the back of his mind the fact that maybe they also thought he was expendable.

He remembered the mysterious set of cards he had been given after his military briefing. Pick a card each day and read it, he had been told. The card he took out looked like it had come from an old-fashioned board game. On it was printed the words "Trust no one, except yourself". The word "except" had been crossed out and the word "especially" written above it. Brady shook his head. Why this was supposed to be helpful was certainly beyond him. When he neared the bridge, he found a spot where he could view it without being seen. He was fitted with augmented vision as was standard with combat operatives, so he could magnify what he looked at and display added information, controlled through his thought interface. It was a narrow rope bridge with planks for its footing, in dilapidated condition and about 60 metres across and 25 metres from the water below, which was just downstream of some

rapids and flowed very quickly. His inspection revealed nothing untoward and he proceeded cautiously to the bridge and started his crossing. He was about 20 metres across when he noticed it. Near the other end was a proximity mine, he was surprised he hadn't detected in his earlier inspection. From his experience, Brady recognised it as a type that would explode when anything moving got within about 10 metres. He looked backwards to start to retrace his steps. The sun was just disappearing below the mountains, but caught in its low angled twilight rays was something he recognised only too well. It was the reflections from several gunsights trained on him from relatively close in the forest behind.

Brady was sure he hadn't been followed. So they must have known he was going to be here. But how? Had he been betrayed? Yet deciding to use the bridge here had been his decision. He instantly made up his mind about what he had to do. He continued crossing slowly, but using his thought interface he directed the sensors built into his combat suit to scan the water below. The point of maximum depth they picked out near the centre of the bridge was inadequate, but he had no choice. He continued moving forward normally till he reached that point and then in one quick movement slung himself over the side rope. He braced himself as he hit the bottom of the river. His ankle caught on the edge of a rock. He kept underwater and swam with the river flow. In less than a minute he knew he would be at a safe distance and could activate the buoyancy aids in his suit to float downstream. A little later he found a suitable place on the bank he wanted to reach and clambered ashore. He used his emergency medical kit to dress his leg injury and continued on along the riverside till dark, when he found a concealed location to stay overnight. As he lay looking at the night sky, his thoughts went back to how the mission had come about.

3.2 Preparations

When Brady was told to report for duty to headquarters, he wasn't sure what to expect. Without explanation he was directed to a military vehicle with blacked out windows and was driven for several hours. When he got out he was in some kind of military complex which seemed to be underground. He was shown into an operations room, where he was surprised to see his commanding officer, Major Lockwood, together with someone he didn't recognise.

"Sorry for all the cloak and dagger stuff, Brady, but this is a top-secret facility, from which some of our most sensitive missions are launched", Lockwood said. "Major Malik will brief you about this shortly, but I would like to welcome you back to operational service first. We know you've been having a difficult time lately, but we see this as a way of hopefully getting back to the way we were".

"Yes, sir", Brady nodded. He couldn't help thinking that something was going on. Lockwood had seemed strangely unemotional about what he was saying, as if he was reading from a prepared script. Now he returned to the manner Brady was more familiar with.

"Please remember some of the things I have raised in our debriefings. The scope of your mission is limited and it is imperative that you stick to the objectives you are given. You are perhaps also prone to suspicion, mistrust even. Sometimes we have to accept that luck is just against us. We must also always strike a balance between our

fear of dying and our fear of living. Choose this wisely. A lot depends on the success of this mission. I look forward to a favourable report back".

To Brady's surprise, Lockwood then got up and left the room, as if he was washing his hands of the situation. Brady had heard the adage about dying and living many times over the past year. It was as if they thought he had a death wish and didn't want to live. And that tied in with the issue of mistrust. If he had done what he had wanted to do, no one would have died. He was ordered to do what he did, and then betrayed. Bad luck had nothing to do with it. But Brady knew it wasn't Lockwood's fault. He had been kept in the dark about what was going on. No, the finger pointed to someone much higher up the ladder.

Major Malik went to the electronic board behind him and a map appeared.

"As you may know, there is a nuclear fusion plant in this area now. According to the agreement there has been for some time, development of any weapons there is strictly forbidden and enforceable by international weapons inspectors. We have had our suspicions about this for some time, but the official investigations have turned up nothing. Two operatives belonging to a different agency to yours were dispatched to carry out an undercover operation to see what they could find. We think they uncovered something, but they were captured before they could return to report. Of course the government there denies all knowledge of them. We believe they are being held in the Eagle's Castle in the mountains nearby. We need that confirmed or otherwise. No more. If they are there, a major operation, which could include diplomatic and military initiatives as necessary, will be organised to get them back".

"How will I get into the castle?", Brady asked.

"It's now considerably extended from what you might remember from the past, and a very heavily defended fortress", Malik replied. "Getting past the exterior defences is the biggest problem. There is very strict security for anyone who goes in through the single entrance. The barriers and fences against anyone climbing up to the castle and trying to bypass the entrance would be also very difficult to breach. In addition, according to our intelligence they have very thorough defences against any aerial assault. But we think there is a way, which is where you come in".

Brady laughed. The castle was not quite at the summit of the mountain, the rear face of which was topped by a vertical rock face half a kilometre high. In his younger days Brady had held the records for the fastest climb of similar sheer faces without ropes, such as the one at Yosemite Park in California called El Capitan.

"So I guess I climb up the back way and drop inside the perimeter defences from above?"

"That's what we figured", said Malik. "You would have to do it at night. Once you were inside, the internal security is relatively lax. We thought up a way to make it easier for you to get around as well. We can set the intelligent material of your suit to change so it looks like the hazmat uniform people there will be familiar with from the fusion plant. What I will do shortly is to take you through to the medical and technical facility here. We will give you some of the latest gadgets and enhancements and upgrade your thought interfaces. You will be dropped off at a particular location and there are designated places which you will be told about where you can be picked up at the end. One key thing you need to know is this. To prevent them detecting your

location, there will be strictly no communication between our command centre and you over the course of the operation. There is only one circumstance under which this can be overridden. If you have confirmed the location of the operatives but are captured or otherwise cannot return, your suit is equipped with an emergency button that you can activate to send a signal that we will receive and be able to locate".

Malik answered a number of Brady's questions and then took him to meet a member of the medical staff, Sophia. At one point he sensed Sophia wanted to tell him something, but without the others knowing about it. In the end she slipped him a small cardholder.

"Have a look at one of these each day during the operation", Sophia said, "they may be helpful".

The following day was taken up with further procedures. That evening it was explained to him that he would be transported and dropped off before morning. Because of the problem of hiding him when getting through the border, it was suggested that he would be safer and more comfortable if he was sedated overnight. When he woke he was on a forest floor on an impromptu bed that had been fashioned out of leaves and branches, ready to start his mission.

3.3 The Eagle's Castle

Brady woke as the sun rose over his riverside hideout. He felt a sharpness of his senses he hadn't felt for a long while. The mountain on which the castle was located, was visible in the distance. The closest route to it would be to leave the riverside and go towards it directly. On the way it would be necessary to cross a major highway that ran parallel to the river and gave access to the fusion plant further downstream. But if the enemy had been alerted by his presence and had surmised his destination, around here would be where they would be looking for him to cross the road. So instead he planned to go further down river and cross the road there before doubling back. He had travelled about two kilometres when blocking his path both on land and across the river was a fence. He checked his map through his thought and vision interface, but there was no fence of any kind marked. He thought of cutting through, but decided not to, in case it set off some alarm. Anyway, he was far enough away from the route they might expect him to take.

Brady walked towards the road. He was surprised when he got there that there were large numbers of military vehicles travelling along it. They were clearly not looking for him as they were moving fast down the highway, but it took some time before there was a sufficient gap for him to get across the road without being noticed. He doubled back and then continued towards the mountain. On the way he remembered the cards. He picked the next one from the pack. On it was printed the words, "Life is not a game". The word "not" had a line through it with a question mark above it. Whatever Sophia was trying to tell him was rather too subtle, Brady decided. He reached the mountain and walked round it, climbing till he had reached the vertical face on the far side, where he rested.

Brady started his ascent at midnight. The climb would be difficult he knew, but the intelligent sensors he had were set up to calculate the optimum path at any point and feed it back through his thought interface. He reached the summit and was able to climb down and find a suitable hidden location within the security perimeter well before the first light of morning. He felt completely exhilarated now. This was exactly what he had needed to dispel all the shadows that had dominated his life over the past year. No more "fear of living", if that's what they want to call it, he thought. He activated the system to change the appearance of his suit and was about to set off when he remembered the cards. He took the last card out of the packet and read it. It said, "A coward dies a thousand deaths, a hero only once". A curved arrow had been drawn connecting "coward" and "hero" with a question mark on it, which he presumed implied that they could be interchanged. Brady smiled. Whatever this was supposed to mean, he certainly wasn't thinking about death at the moment.

The main internal entrance to the castle complex had a counter with a woman in uniform behind it. He flashed the forged pass he had been provided with. As he had hoped, the hazmat apparel commanded instant respect and there was no attempt to check his credentials. Brady decided that boldness was the best approach.

"The two prisoners?", he said. He figured that if she didn't respond he could always bluff and change the subject. Her response was immediate though. She raised her hands to her mouth as if to stop herself speaking.

"Of course, we're not supposed to talk about it, but I presume you must be here to see them". Brady couldn't believe his luck. He had accomplished his mission. He now just had to take his leave and get out of the castle.

"I'll buzz you through to the secure unit", she said, pressing a button on a panel in front of her, "the guard on the door will know you're coming".

Brady thought quickly. If he tried to back out now she might be suspicious. She showed him a map of the complex and indicated the route he should take and then gave him an access card. Brady smiled and asked her whether it had been busy that morning.

"Well you know the big exercise is on, so there's hardly anyone in. Even the secure unit has only two staff on duty inside today", she said.

Brady nodded as if he knew what she was talking about. He remembered the military traffic on the highway. Perhaps the exercise was in preparation to counter a possible military operation to rescue the prisoners. They would be ready and there would be many difficulties and complications. A thought began to cross his mind. But the last thing they would have allowed for would be someone like himself actually inside the castle complex now. And only a skeleton security contingent in the prison area. Was this an unexpected opportunity he should try to exploit? Brady thanked the woman and followed the route he had been shown.

The secure unit was at the end of a corridor. The entrance to it was a massive reinforced metal construction with transparent panels that could be seen through, revealing a further corridor behind it. The guard sitting at a desk in front of it, looked up and greeted Brady as he walked up to the desk.

"We've had no notification of anyone from the hazmat team coming here today", he said.

"It's for the exercise", Brady said, "we're thinking about the possibilities of an attack including chemical weapons. I'm just supposed to take some token readings inside".

"I'll still have to confirm with Central Command. You know, rules and regulations", the guard said.

"Of course", Brady replied, "but if you'll just let me through to take my measurements while you do it. Where getting late on our schedule for the exercise, and Central Command certainly wouldn't like that".

The guard nodded and then started to key in a sequence on a keyboard in front of him. Abruptly he stopped and paused, as if he was listening to something. Suddenly he stood up facing Brady and pulled out a handgun from a holster he was wearing. His other hand reached down till it was over a red button on the desk

"Put your hands in the air", he said. "I know who you are and what you're here for. Be aware that I can press this emergency button at any time. If I do this and my colleagues inside think that the security of the unit has been breached in any way, they are under orders to kill the prisoners immediately".

Brady thought quickly. How had the guard found out? The woman at the entrance clearly had no suspicions. But someone must have betrayed him. He had to try to retrieve the situation. If he could overpower the guard, hopefully one of the gadgets he was carrying could find the code to get past the door. If he got in, the guards inside would not be expecting any intrusion and could be surprised. Perhaps he could then improvise something to hide the prisoners in and smuggle them out of the complex under the guise of removing hazardous materials. First he had to deal with the guard, who appeared very jumpy. There was unfortunately only one way to do this. Brady adjusted the position of his body very slightly. He now had to go through a complicated thought sequence. What he was about to do couldn't be allowed to happen by accident. There was a flash from what appeared to be an ordinary pocket on Brady's suit. He dived to the floor, but the guard had been taken by surprise and didn't pull the trigger of his gun. But as he crumpled forward on the desk his hand touched the emergency button and the muffled sounds of the alarm could be heard through the secure unit door.

Brady's options raced through his mind in an instant. He had 20 seconds at the most before one of the internal guards would get to the door. Brady would need to get inside and conceal himself within that time. But even if he managed that, anyone looking through the door would see the dead guard's body there. There was nowhere he could hide the body in the corridor, and just seeing the body would indicate that security had been breached. There was only one thing to be done he decided. He shifted the guard's body so it was sitting on the chair. The gun was still clasped in his hand, so Brady extended his arm forward with the gun in it. Brady then stood facing the guard by the desk and held the gun to his chest with one hand. The other hand he put on his own emergency button which would tell HQ where the prisoners were. When someone looked through the door, they would see an intruder and the guard, who had both died in a shootout. There would have been no security breach. Brady braced himself as he got in position. "No fear of living, or dying", he said to himself.

His final thought turned to the cards he had been given. A smile of understanding came to his lips just as he pulled the trigger.

3.4 Aftermath

Brady's body lay on a bed in a dimly illuminated room. He sat up suddenly feeling drowsy and very disoriented. Where was he? He looked around. Sophia was sitting by the bed and smiled at him.

"I guess you're figuring some things out, but you're certainly owed a lot of explanations. Let's go through to the debriefing room", she said.

They sat down and were joined by someone now dressed casually.

"Professor Omar Malik", he said, shaking Brady's hand. "I've been a military psychologist for many years, but this is a special facility I'm in charge of, the most advanced of its type in the world. There's some apologising we need to do and I'm sure you've got a lot of questions. But let me give you some background first. Nearly everyone, over 80% of the population as a whole in most analyses, will suffer from some mental disorder in their lifetime. The work we do here and some of our facilities deal with this in general, but there are obviously problems that will be particularly associated with military conditions that we specialise in. For this, technology has created the possibility to enhance and extend what we do. With the development of immersive simulated environments it was found that particular techniques could have significant effects in changing behaviour, attitudes and psychological states very generally. This has been taken to a new level by what you may have seen referred to as holodeck technology, that can create complex simulated experiences that blend the physical and the virtual seamlessly".

"So what I experienced didn't actually take place?", said Brady incredulously.

"It did in one sense, but not necessarily where and how you may have imagined", replied Malik. "Think of it like making a film. Some of what you see is done on a film set, some on location, some through computer graphics, mechatronics, robotics and AI. You can't tell the difference. Of course it takes it to another degree to experience things physically. That injury to your leg is real enough, I'm sure you'll agree. In this underground complex and the area around we have the equivalent of an extremely large studio, with a very wide selection of natural features as well as constructed facilities. To make things realistic requires a complex combination of things taking place around you and things happening closer to home. We had equipped you with a suit that was based on your military one but could also simulate many types of physical sensation. But it was what was internal to yourself that was crucial. Nearly everyone now is fitted with some form of bodily and mental enhancement. Because of your military role you had this to a wider and more sophisticated extent. The procedures you underwent before your "mission" took this to a new level again. We could tap into your vision and all your senses. I have to confess that you were a guinea pig to try out some techniques we've never used before".

"Let's get down to some basic considerations to do with ethics", Brady said in an annoyed tone. "What about my agreement and consent to this?"

"Here's where we have to start with the apologies", Malik replied. "In nearly all cases subjects have to give their consent and know what's happening. The technique is usually still effective, although it works differently sometimes. Some people here don't believe in doing it any other way". At this point Malik looked towards Sophia, who looked back at Brady knowingly. He knew what that look meant, but he wasn't going to let on to Malik.

"We already had you earmarked for some interventions using these techniques, but these would have been voluntary", Malik continued. "But to the military you are a very valuable asset that they have made a lot of investment in and don't want to lose. They had their own issues they wanted resolved as well, so they were looking for an experience that would also act as a way of evaluating your suitability for returning to active service. Major Lockwood is a bit of a traditionalist and wasn't sold on the idea".

"You better tell me how you put your blockbuster together", said Brady, a wry smile on his lips.

"Well it was certainly a major operation", said Malik, "with not quite a cast of thousands, but still extensive work involved in design, planning and operational control. Of course we have already built up a library of resources that we could reuse and what we had to create specially will be added to that. The mountain wall you climbed, for instance, originated in a development for recreational and training purposes. You broke the course record by the way. We had a number of objectives and parameters to work to, both from a medical and military standpoint. We wanted to give you back the experience of combat operations and having a challenging objective, which we knew would be psychologically beneficial. If you had regrets for not saving the others and felt guilty as a survivor, we hoped the scenario would give you the chance to show yourself that you could change this in another situation. But we were also told to check out how you would react to feeling you had been betrayed and whether you could limit your objectives. One requirement that took some thought was testing how you would balance the fear of living and the fear of dying".

"You certainly seemed to know how to frustrate me", said Brady.

"This is where we were able to use some of our latest thought interface features", said Malik, with obvious pride in his voice. "We couldn't read your mind exactly, but we were basically tapping in to your fears of what could happen in the worst case, interleaving it with what you hoped would happen. So, for instance, everything was fine until you got onto the rope bridge, but then things started to go wrong. For example, the mine actually wasn't there when you inspected the bridge from a distance. But when you got near, it was one of the possible problems you feared and so appeared there".

"Well I have to give it to you that you certainly seemed to choreograph the performance very well", said Brady grudgingly.

"Not quite", said Malik, "you caught us out a few times. We didn't expect you to continue along the river after your first night's sleep, rather than going straight towards the mountain. That's why we had to put a fence up on the fly to stop you. We hadn't created the area beyond that. And you almost convinced the AI system controlling the guard at the secure unit at the castle to let you in temporarily. That

would never have done. Who knows, you might have managed to rescue the prisoners, which would have defeated the object of our exercise. One of our controllers had to intervene manually to stop you by changing the behaviour of the guard".

Malik answered Brady's questions for some time and then someone came to collect Malik for another appointment.

"There will be a full military evaluation of the exercise and Major Lockwood will get back to you", said Malik. "This has been a big success for us in validating our new developments. Within security constraints, the powers that be are keen to get as much public relations benefit from this as possible, to help justify the substantial expenditure when it comes to budget time, if nothing else. So if you are willing, there are some people from the media and the press who would like to speak to you when you return to your base. Of course the story will be suitably refashioned. Military hero collaborates on groundbreaking development with momentous health potential, that kind of thing".

"That's made me think", said Brady, "I'm in a young man's game and I'm not going to be able to continue in what I'm doing for very long. Maybe working as part of your group is something you would consider me for in the future".

"With your experience, you would be a most welcome addition to our team", Malik said as he left.

Brady continued his chat with Sophia.

"I hope the cards were of some use", Sophia said, "I wanted to at least put something in your subconscious that things may not be quite what they seemed. We did pick up high levels of anxiety around the issues of mistrust and betrayal at certain times. Could we help with this?"

Brady paused. Then he decided. Maybe now was when he needed to trust someone.

"The problem is not just something in my mind. It's what really happened. You would undoubtedly have done your research about my background and the Delta incident. It was a period of dangerous international tension, as you may recall, in a disputed area. I was leading a unit of 6 and there was a confrontation situation with a much larger enemy force. My judgement was that we should retreat, which we could have done safely, and this was endorsed by my immediate commander, Major Lockwood, who was at our staging base, a long way away. Because of the situation, there were other forces elsewhere in the area under a much higher level of command. I was sent an order directly from their HQ, which said that we should stand our ground because airborne forces would be imminently arriving to reinforce our position. My men held their position heroically, but no airborne forces turned up. I was very lucky to survive. But then I found that no one would accept responsibility for the order. Even Lockwood I think believed I had made it all up to justify some kind of futile heroic gesture, motivated by a death wish - my personal Charge of the Light Brigade".

"I thought at the time that someone was just trying to cover up a mistake in not getting forces there", Brady continued. "I wasn't in much of a position to do anything about it anyway because I was in a military hospital recovering from injuries. But it

was there that I found out what had really happened. By chance there was someone also there from the airborne unit that was supposed to relieve us, that I never would have come across in normal circumstances. He knew nothing about the operation. In fact they were involved somewhere else at the time. I figured out the truth. At some very high political and military level, a decision had been made that our side couldn't be seen to back down. We were all to be sacrificed as pawns in their game, with no one to know about the order and the blood on their hands. I was the inconvenient truth that survived to tell the tale".

Brady received notice the next day to report back for active service to his base. He met up with Sophia to say goodbye.

"You've got your reinstatement out of this and that's the main thing", Sophia said. "But an attempted cure has to rely on a correct diagnosis and we clearly were given the wrong idea about your supposed death wish and paranoia. Maybe there's something I can do that will try to deal with the real issues and give you at least some redress about your betrayal. When you return to base, you will get a lot of press and media attention and be in the public eye. So if I tipped off a certain investigative journalist I know, who without involving you at all could ask some awkward questions about what really happened during the Delta incident, who knows what might come up. Consider it part of my therapeutic duties".

"I've just got one final question", Brady said as he was about to leave. "How do I know that I'm not still in a holodeck experience and you are just a simulation?"

"You've got no guarantee", Sophia replied, "but do you really think the technology is up to producing someone as nice as me?"

"I'd need to be convinced of that", Brady replied, "I wonder whether you'd be free to meet up sometime to help me decide - just in the line of duty of course?"

Sophia had to accept that this was a difficult request to refuse.

Brady couldn't help smiling to himself later as he looked forward to them meeting up. The fear of living seemed a long way away now.

4 Conclusion

Constructing scenarios and narratives as part of existing mental health interventions using VR formed part of the background that was reflected in the psychological intervention of Malik's group in this holonovel. As systems like this become a reality in the future, these techniques will become more important, for use in mental health and more generally. The skills to do this are of course the same ones generically that are required for creating holonovels and for the related genre of SFP, to help determine development strategies now in different areas that could lead to favourable outcomes in the future. Thus one conclusion that should be drawn is that these skills should be taught and promoted as part of a general pedagogical approach that sees the importance of combining scientific and technological expertise with skills related to fictional writing and creative thinking, and values an interdisciplinary and holistic approach to knowledge in a wide sense.

The other key aspect that this holonovel touches on is that irrespective of the development of technology in the future, familiar ethical and moral issues will still be

there, as will be the need for the correct analysis of the causes of problems - exemplified here by Brady's supposed paranoia. Of course issues will arise in new forms, as with regard to Brady's consent or otherwise to what he experienced. In the same way that at the present time technological developments have highlighted issues of data protection and ownership, even more complex problems will arise in the future when the nature of who we are becomes increasingly less easy to define. It can be expected that the genre of the holonovel will play a significant role in both the process of facilitating the exciting developments that lie ahead, as well as in helping to resolve the wider questions and issues that these will raise.

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