

THE TURING TEST

An opera by Julian Wagstaff



Edinburgh Festival Fringe
15 - 19 August 2007

Edinburgh Studio Opera

Welcome

Dear Guests,

Edinburgh Studio Opera is concluding its 2006/2007 Season with one of its most ambitious projects to date. With the world première of Julian Wagstaff's opera *The Turing Test*, ESO is delving deep into the realms of contemporary opera writing.

The production has been made possible by our principal supporters, the University of Edinburgh School of Informatics in association with Scottish Enterprise Edinburgh and Lothian. We are immensely grateful to them for their vision and trust. We would also like to thank our commercial sponsors and the charitable trusts and organisations listed opposite who have enabled this project to proceed.

Julian Wagstaff's opera poses unique challenges to listeners and performers alike. Its structure combines elements of musical theatre and chamber opera, never quite following expectations, and often surprising the listener with eccentric chromaticisms and poignant moments of mind-blowing beauty. Through its experimental structure, Julian Wagstaff has created an extremely difficult but equally accessible work of art, of which we will doubtless hear more in the future.

Following the success of ESO's acclaimed production of *Albert Herring*, the production of *The Turing Test* has equalled and surpassed all expectations in terms of its professionalism and boundless optimism and enthusiasm.

I would like to thank Julian Wagstaff for giving Edinburgh Studio Opera the privilege and trust to be the platform for this world première production. Our collaboration has been extremely satisfying, and we look forward to further joint ventures in the future.

I would also like to extend my warmest thanks to the entire production team who have created such a professional result by sharing their vision and expertise. It has been a pleasure to be part of this process.

Finally I would like to thank the members of the Committee of Edinburgh Studio Opera for all their hard work and support.

I hope you enjoy tonight's performance and I look forward to welcoming you all again during Edinburgh Studio Opera's 2007/2008 season.

Maximilian Fuhrig
President
Edinburgh Studio Opera
<http://opera.eusa.ed.ac.uk>

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Edinburgh Studio Opera
presents

THE TURING TEST

a new chamber opera in one act -
words and music by Julian Wagstaff

This world première production of The Turing Test has been made possible by the generous support of the following organisations:

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The Turing Test

A chamber opera in one act

Words and music by Julian Wagstaff

The Turing Test – a means of determining whether or not a computer is capable of intelligent thought. If a machine, when responding to questioning on any subject by human interlocutor, is indistinguishable from a human being, then it is deemed to have passed the test and to possess intelligence. At the time of writing, no machine has passed the Turing test...

Professor Anton Milotovic

A naturalised American mathematician

Maximilian Fuhrig

Professor Colin Trevelyan

An English cyberneticist

Julian Guidera

Miss Stephanie Williams

Trevelyan's PhD student

Georgia Knowler¹

Linda Robertson²

Mrs Clarissa Milotovic

Wife of Anton Milotovic

Laura Smith

Mr Ferdinand Grosz

Trevelyan's laboratory assistant

Barry McAleer

The Computer (LUCIE)

Live Unmediated Conversationally Interactive Entity

Héloïse Plumley

Musical Director

Tom Butler

Director

Christopher Neil

Set Designer

Moley Campbell

Technical Manager

David Pammenter

Stage Manager

Jody Bicknell

Costumes

Laura Wallace

Props

Natasha Dare

Repetiteurs

Andrew Johnston
Fiona Macleod

Produced by Julian Wagstaff and David Pammenter for
Edinburgh Studio Opera

www.turingtestopera.com

¹ Wednesday, Thursday, Saturday and Sunday

² Friday

Synopsis

Time: the near future

Scene 1 – A lecture hall at a prestigious English university

Milotovic is delivering a lecture in which he claims that he will have developed a machine that can pass the Turing test – a test for human-level intelligence in a computer - within three years. He is interrupted by Trevelyan who takes issue with his scientific approach, condemning Milotovic as superficial. Stephanie teases Trevelyan, suggesting there are more personal reasons for this dislike. Trevelyan angrily denies this, and storms out in a temper. Stephanie is left alone with Milotovic, who invites Stephanie to join him for a drink. They are interrupted by Clarissa, who drags her husband away before Stephanie can give her reply.

Scene 2 – Trevelyan's lab at the same institution

Ferdinand is alone in the lab, waiting for Stephanie to arrive and speculating on the reasons for her tardy appearance. When she does arrive we learn of her dire financial situation, and Ferdinand's lack of professional fulfilment. Trevelyan appears and despatches Ferdinand on a time-consuming errand. Trevelyan confides to Stephanie that he is about to be sacked from the University because of his abysmal publication record, fuelled by his drink problem. He offers to pay Stephanie a regular stipend in return for the right to publish her research on the Turing test as his own. After a brief internal debate, Stephanie agrees.

Scene 3 – Trevelyan's lab

Trevelyan asks to see how far Stephanie is progressing with her work. She introduces a computerised chat program called LUCIE – Live Unmediated Conversationally Interactive Entity. The computer gives an impressive performance, and Ferdinand and Trevelyan each respond in their own way to this encouraging result. Trevelyan pays Stephanie her first instalment of money, and declares that they are certain to beat Milotovic in the race to pass the Turing test. We learn that Trevelyan, Milotovic and Clarissa studied together at MIT, and that Clarissa was Trevelyan's girlfriend until she abandoned him to marry Milotovic. Stephanie receives a call on her mobile telephone and leaves hurriedly. She has received an invitation to meet someone.

Scene 4 – The Hummingbird (a local wine bar)

Stephanie meets Milotovic who greets her enthusiastically. He is drinking champagne, which he shares with her. Stephanie tries to elicit information from Milotovic regarding his work on the Turing test. He cleverly deflects her questioning and instead attempts to seduce the young student – pleading that he is not as black as he is sometimes painted. Stephanie begins to succumb to his charms, but then thinks better of it, making her excuses and leaving. However, she leaves the possibility of a future rendezvous open.

Scene 5 – Trevelyan's lab

A year has passed, and Trevelyan is becoming impatient at Stephanie's lack of further progress. He demands another demonstration of the LUCIE program, and Stephanie reluctantly agrees. The demonstration is a failure and Trevelyan angrily threatens to cancel Stephanie's stipend. Distraught, Stephanie turns to Ferdinand for advice. He tells her there is only way to make the machine pass the Turing test. He demonstrates how by connecting a headset and microphone to the LUCIE computer, so that he can supply the answers to Stephanie's questions himself. Ferdinand hides out of sight, and Stephanie demonstrates the new "machine" to Trevelyan. Trevelyan is ecstatic, and proclaims that the Turing test has been passed, and must be shown to the world at the earliest opportunity.

Scene 6 – The Hummingbird wine bar

Stephanie again meets Milotovic, who has arrived in Britain to attend the much-awaited demonstration of the LUCIE machine, planned for the following day. Stephanie confides in him that the computer is a fraud. Milotovic comforts her, assuring her that her secret is safe with him. Holding Stephanie in his arms he kisses her, and this time she reciprocates. The two are amorously intertwined when Clarissa Milotovic enters. She flies into a rage, and orders Stephanie to leave immediately, which she does. Clarissa announces that her marriage to Milotovic is over. He is utterly devastated and offers to do anything to make her stay. We learn that Trevelyan plagiarised Clarissa's work when they were students together, and that this was the true reason for the break-up of their relationship. Clarissa has never forgiven Trevelyan for this betrayal. Milotovic spots an opportunity to rescue his marriage, and tells Clarissa the secret of the LUCIE machine. He offers to help use the information to ruin Trevelyan (and, by implication, Stephanie too) if Clarissa will give him one more chance. Clarissa is interested, and asks to know more.

Scene 7 – Trevelyan's lab

Stephanie confesses her and Ferdinand's deception to Trevelyan. He reacts with uncharacteristic calm, and simply tells her to make sure that Ferdinand is at the symposium the following day, with all of the necessary equipment to guarantee that the fraudulent LUCIE program will operate convincingly.

Scene 8 – Trevelyan's lab / The lecture hall

In the lab, Stephanie receives a telephone call from Milotovic, informing her that the presentation has been delayed. Ferdinand is sceptical, but Stephanie assures him that Milotovic is a man who can be trusted.

In the lecture hall, Trevelyan is becoming agitated at Stephanie and Ferdinand's non-appearance. Milotovic and Clarissa arrive, with Clarissa eagerly anticipating Trevelyan's final humiliation. Trevelyan requests that the LUCIE demonstration be delayed, but his request is rejected by the symposium organisers. Stephanie and Ferdinand arrive, viewing the developing scene in horror. With all eyes upon him, Trevelyan begins to ask the computer some questions...

N.B. The libretto of this opera is an original work of fiction. The characters which feature in it are also fictional, and any resemblance to actual persons living or dead is entirely co-incidental.



Members of the Turing Test cast and orchestra (May 2007)



Julian Wagstaff

What exactly is the Turing test?

The Turing test is the popular name now given to what the English mathematician and cryptographer Alan Turing called the "imitation game". In it, a computer tries to imitate a human being responding to typed questions via a computer keyboard. It was first expressed in a paper by Turing entitled "Computing Machinery and Intelligence", published in 1950 in the journal *Mind*.

To put it simply, Turing suggested that if you are having an "online chat" via two separate computer terminals, one of which is linked to a human correspondent and the other to a computerised chat program, and if you cannot tell the difference between the computer and the human after chatting for an extended period of time, then the computer has passed the test and can legitimately be said to be intelligent.

At the time of writing, no machine has ever succeeded in passing the Turing test. However, an annual competition called the Loebner Prize offers the sum of \$100,000 for the inventor of the first machine which can successfully pass it.

The technological visionaries Mitch Kapor and Ray Kurzweil have an outstanding bet worth \$10,000 on whether or not the Turing test will be passed by 2029.

A slightly modified version of the Turing test features in the cult sci-fi film *Blade Runner*, where Harrison Ford's character Deckard attempts to unmask a robot by testing its responses to human questioning.

Further information is available from the following websites:

www.loebner.net/prizetf/loebner-prize.html

www.theturingtest.com

www.longbets.org/1

Who Was Alan Turing?

Alan Turing (1912-1954) was one of the most important British mathematicians of the last one hundred years. The founder of modern computer science, co-inventor of the computer and wartime Enigma codebreaker, his discoveries and insights have had a profound influence on the emergence of today's computer-dependent age.

Born in London, he studied mathematics at Cambridge University and, in 1936, published his groundbreaking and revolutionary paper "On Computable Numbers", widely regarded as the first published article in the field of modern computer science.

During World War II, he worked at the government codebreaking station at Bletchley Park in Buckinghamshire. As head of "Hut 8", which dealt with naval cryptography, he was instrumental in devising the techniques which led to the cracking of the German Enigma codes, thus making a huge contribution to the Allied war effort, arguably shortening the duration of the war.

After the defeat of fascism, Turing was involved in the design and construction of some of the world's first electronic computers, including the Manchester Mark 1 machine at Manchester University.

A more or less openly gay man at a time when male homosexuality was a criminal offence, Turing was convicted of gross indecency in 1952 after admitting to a relationship with a younger man. Given the choice between imprisonment and state-administered hormone therapy he chose the latter, suffering horrible physical and mental side-effects as a result.

He committed suicide at the age of 42 by eating an apple laced with cyanide in an apparent reference to his favourite film, *Snow White and the Seven Dwarfs*. The Apple computer logo is said to be a coded tribute to Alan Turing's work.

Further information on Alan Turing is available on the Internet at www.turing.org.uk

The Orchestra

Conducted by Tom Butler

Violin I *	-	Alexa Butterworth
Violin II	-	Jonathan Law
Viola	-	Rosemary Burke
Cello I	-	Joanna Woolley
Cello II	-	Pete Harvey
Double Bass / Bass Guitar	-	May Halyburton
Flute / Piccolo	-	Fiona Ferguson
Clarinet / Alto Saxophone	-	Neil Hamilton
Bassoon / Contrabassoon	-	Simon Rennard
Horn	-	Marian Kirton
Percussion	-	Calum McIntyre
Keyboard	-	Andrew Johnston

* Denotes orchestra leader

Stage Crew

Andrew Doig
Angus Robertson
Calum MacGregor
Dougie Robertson
Phillipp Hehrmann
Roland Wagstaff
Roy Carter
Piotr Cieslak

Composer's Note

Necessity, they say, is the mother of invention. And so it was with the genesis of *The Turing Test*.

It was April 2006, and I had just secured an agreement in principal from Edinburgh Studio Opera (formerly the Edinburgh University Opera Club) to stage the première of my new opera. The only problem was that there *was* no opera. There was not even an *idea* for an opera. I had been wrestling since the New Year with the most improbable plan for a piece about the British general election of 1926. Entitled *The Zinoviev Letter*; it was to be a hard-hitting critique of the dangerous power of the media to subtly transform conjecture into established fact in the minds of the reading or viewing public.

Fortunately, my PhD supervisor Nigel Osborne (ever the voice of reason) spotted the flaw in my plan. He demanded to know where the "love interest" would come from. Without it, he said, there was no opera. I could not produce said love interest, and so three months of diligent research duly hit the bricks.

The following week I flew out to Boston, Massachusetts (in my "other life" as a computer programmer) to write an equally improbable control application for a pair of robotic incubator units for the pharmaceutical industry. While there, I visited the Massachusetts Institute of Technology and its famous MIT Museum. The museum had a section devoted to the Turing test, Alan Turing's test for human-level intelligence in a machine. Almost immediately those three words became, in my mind, the title of a piece of theatre. Then, over the next hour or so, characters began to materialise within my imagination – with names, desires, character traits and looks. Several dramatic ideas which had been with me for a while, looking for a home, began to attach themselves to those characters. By the time I left the museum the workings of a libretto had formed in my head. I wrote a detailed scenario on the plane home the following day and the libretto, piano and orchestral score followed sequentially from that point onwards.

The Turing Test is not, perhaps, what many people might expect from a contemporary opera. Firstly, it is set in the future; secondly, its libretto is not based on any pre-existing text, and thirdly its music resists straightforward binary categorisations based upon distinctions such as tonal/atonal, "popular"/"serious", opera/musical etc. My hope is that these peculiarities will be viewed as strengths rather than weaknesses.

My further hope is that the opera will function on a number of different levels, and appeal to a range of different audiences. In short, I will be pleased if there is enough opera to satisfy opera fans, enough musical theatre to retain the ear of musical go-ers, and enough science to keep the interest of our friends in the Edinburgh University School of Informatics, whose generous sponsorship has made this production possible.

The overarching idea that informs this work is that true intelligence goes beyond the ability to simply give the "right" answers to a given set of questions, and that it is only when machines are capable of appreciating art and music that they will have begun to stake a claim to human-level intelligence. Thus this "opera about whether computers can appreciate opera" goes to the heart of what it is to be human and what, in the end, differentiates us humans from mere machines.

Director's Note

Alan Turing was clearly one of the most intelligent, inventive and forward-thinking people of the 20th Century. His enigma code-breaking work undoubtedly cut the length of World War II by some considerable time, and his involvement in the development of the modern computer transformed the channels of human communication forever. But this man's focused ambition to achieve, to open new possibilities for mankind in how we communicate, while he himself led a focused, troubled, almost solitary life - which he took by committing suicide - makes for an interesting study of human behaviour and the inner conflict which potentially exists in all of us. Paradoxically, the ideas behind the Turing test which he developed are surely about us finding new and interesting ways to develop communication between human beings as much as it is about machines passing themselves off as human, and yet we seem to be heading more and more towards a world where we exist in solitary confinement, with only the computer to talk to.

The characters within this opera live in their own solitary confinement, battling their own inner conflicts. This opera is not about technology, it is about human beings - it is about us. Society demands that we succeed, that we battle to be the best, and the characters in the opera demonstrate what happens when we wrestle with such inner conflicts: ambition versus the need to not fail, the possession of knowledge versus a lack of confidence to succeed, the need to win versus regret of action, a driven, insular existence against the need to be protected by others, the need to present oneself as all-knowing as opposed to having no substance.

I hope you enjoy this new opera in the first week of its life. Welcome to the lab of human behaviour!

Christopher Neil

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Biographies

Julian Wagstaff (Composer/Librettist/Producer)

Julian lives in Edinburgh where he was born in 1970, and is active as a composer, arranger and musician. He graduated with 1st class honours in German and Politics from Reading University in 1993, and has worked variously as a translator, television researcher and computer programmer.

Julian's full-length stage musical *John Paul Jones* was staged in Edinburgh in July 2001. A studio recording of the soundtrack was released in April 2002. On the basis of the score for the musical he was accepted to study music at Edinburgh University and awarded a Masters degree in 2002. His first major work of concert music, the Piano Quintet, received its premiere in 2003. The work has subsequently been recorded by the Edinburgh Quartet, with Alina Kolonitskaya on piano.

Julian's other work includes an orchestral medley and symphonic overture from *John Paul Jones*, the musical play *What Goes Around* (to a libretto by Mike Gibb), a saxophone sonata, and a work for string orchestra entitled *Treptow*, inspired by the Soviet war memorial in east Berlin. His most recent major work is the *Symphony for Chamber Orchestra*, which received its first performance in November 2005.

He is an associate tutor of composition in the Music department at Edinburgh University, a post he has held since 2004, and co-author of the Guitarmaster music transcription software application. He has recently completed a PhD in Composition at Edinburgh, the principal component of which was the score for *The Turing Test*.

More information and sound clips are available at www.julianwagstaff.com.

Tom Butler (Musical Director)

Tom Butler (b.1983) graduated from the University of Edinburgh in 2005 with a First-Class Honours degree in Music, winning the Tovey Memorial Prize for composition and the Cameron Prize for his contribution to the musical life of the university and the wider community. Whilst at university, Tom studied conducting with James Lowe and worked with several student orchestras including the Edinburgh University Chamber Orchestra and Music Society. He also co-founded and conducted Little Boot, an ensemble that specialises in contemporary music.

In 2006, Tom received a Donald Dewar Arts Award which enabled him to further his studies of conducting with David Jones at the Royal Welsh College of Music and Drama. Additionally, he participated in a masterclass led by Jac van Steen with the BBC National Orchestra of Wales.

As a composer, Tom has had work commissioned by the Edinburgh Contemporary Arts Trust (2005) which was performed by Roham de Saram and Ananda Sukerlan.

The Turing Test is his second production as Musical Director with Edinburgh Studio Opera, the first being *The Bartered Bride* (2006).

Christopher Neil (Director)

Christopher graduated from Queen Margaret University College, Edinburgh in 2000 and has since directed a wide variety of different productions from Shakespeare to New Writing, Opera to Musicals, in Scotland, London and the North West of England where he is now based.

Recent productions include *Under the Dirt* by Claire Berry, *Closer* by Patrick Marber, and a multi-media production of *Othello* (Best production at Studio Salford). Opera productions include *Dido and Aeneas*, *Così fan Tutte*, and *Il Tabarro*. Operetta and musicals directed range from *The Merry Widow* and *HMS Pinafore* to *Call Me Madam* and a number of new musicals including the première of Julian Wagstaff's *John Paul Jones*. Christopher has also shadowed/assisted at Glyndebourne, the Royal Opera House and Dundee Rep.

Future productions include *Karry Owky* by Michael Stewart, a new opening at Studio Salford in October followed by an English tour.

Georgia Knowler (Soprano)

Georgia Knowler graduated this year with a BMus from the University of Edinburgh where she studied singing with Margaret Aronson. She has performed in renowned London venues including The Coliseum, where she worked with Mary King. In Edinburgh, she has performed with Dr John Kitchen in the Usher Hall, sung the roles of Susanna, Mænenka and Miss Wordsworth with Edinburgh Studio Opera, performed with the Edinburgh University Singers and as a soloist with the Edinburgh University Sinfonia conducted by Tom Butler. Elsewhere, Georgia has undertaken masterclasses with Eugene Asti, Hans Peter Blochwitz, Christopher Underwood and Robin Bowman amongst others. Georgia has covered oratorio solos in repertoire by Vivaldi, Mozart and Haydn. In September, she will begin the PG Vocal Diploma course at the RAM, having gained a scholarship to study with Elizabeth Ritchie and Iain Ledingham.

Linda Robertson (Soprano)

Linda Robertson recently graduated from the University of Edinburgh with honours in music. She has been a keen singer from a young age and has subsequently taken part in productions with a number of companies including Ayrshire Voices, Opera West, Edinburgh University Savoy Opera Group and Edinburgh Studio Opera. *The Turing Test* will be her debut principal performance with ESO. Linda trained for three years at the RSAMD under Alan Watt, and now studies with Margaret Izatt. She performs with several choirs including the National Youth Choir of Scotland, and gives regularly recitals around the city. She is about to take up her studies in Education at Moray House, but plans to continue performing - time permitting!

Héloïse Plumley (Mezzo)

Héloïse made her singing début aged 5 as Pinocchio! Since then, her operatic roles have followed an alternative trend: Cherubino (*Marriage of Figaro*, 2005), Siebel (Gonoud's *Faust* in this year's Edinburgh Festival Competition Opera class) and most recently, LUCIE the singing computer (*The Turing Test*, 2007). She has been studying singing under Sheila McNab since September 2005 and has not ruled out the possibility of studying opera performance after the completion of her present undergraduate Philosophy and English Literature degree.

Laura Smith (Alto)

Laura Smith is currently entering her final year of music at the University of Edinburgh. She studies singing with Margaret Izatt. Laura is specialising in recital next year and sings with the National Youth Choir of Scotland (NYCoS) under the direction of Christopher Bell. She performed with NYCoS at the London Proms in The Albert Hall and recorded an episode of 'Songs of Praise' and a documentary last year. She is travelling to Hungary with NYCoS at the end of August. Laura is also part of the NYCoS music staff, accompanying their Falkirk choirs. She also sings with the Edinburgh University Singers under the direction of John Kitchen. Laura was a finalist in the University of Edinburgh performance competition, The Tovey Memorial Prize, this year. As well as performing, Laura teaches both singing and piano through the Youth Music Initiative. Laura has sung with Edinburgh Studio Opera previously in Smetana's *The Bartered Bride*.

Barry McAleer (Tenor)

24 year-old Barry hails from Omagh in Northern Ireland. He recently graduated from the RSAMD and remains under the tutelage of Stephen Robertson, having made the transition from baritone to tenor a short while ago. Barry has been singing since the age of 16 and has performed both chorus and principal roles with Youth Opera Northern Ireland, WNO Max, Fife Opera and at the RSAMD, including Masetto in *Le Nozze di Figaro*, Guccio in *Gianni Schicchi* and Monostatos in *Die Zauberflöte*. Barry is delighted to be joining Edinburgh Studio Opera to further his interest in new music by debuting the role of Ferdinand in *The Turing Test*.

Julian Guidera (Baritone)

Julian grew up in Liverpool and studies at the RSAMD with Alan Watt. A former child prodigy euphonium player, he turned to singing after a chance encounter with the renowned tenor, Stewie Griffin. Recent roles include Pinellino in *Gianni Schicchi* (RSAMD/Orchestra of Scottish Opera), Achilles in *Julius Caesar* (Fife Opera) and the title role in *Don Giovanni* (scene with Liverpool Italian Opera). This summer he sang in the chorus of Rossini's *La donna del lago* (Garsington Opera) and covered the role of Ping in *Turandot* (Dorset Opera). In concert he has sung Bach's St. John Passion and Fauré's Requiem, as well as Mozart's Coronation Mass in Stuttgart and Handel's *Messiah* in Berlin. With the National Youth Choir of Great Britain he sang at the BBC Proms and across Europe. Julian writes music in his spare time and his compositions have appeared in two short films to date.

Maximilian Fuhrig (Bass)

Maximilian Fuhrig was born in Belgium in 1987. He began singing at the age of six with the acclaimed Tölzer Knabenchor in Germany. He sang with the Brompton Oratory Choir and the Ealing Abbey Choir. He was also part of English National Opera's children's chorus singing roles in *La Bohème*, *Carmen*, *Boris Godunov* and *The Cunning Little Vixen*. In 2000 he performed as soloist in the Barbican Hall London, alongside Richard Hickox and Robert Tear. Maximilian resumed his studies as a bass in 2001 under the acclaimed voice expert Gerhard Schmidt-Gaden. Work has included Verdi's *Nabucco* and Donizetti's *Anna Bolena* with the Ulmer Theater Opern Chor. He has been a Choral Scholar at Worth Abbey and St Mary's Episcopal Cathedral Edinburgh. In 2006 he gave his solo debut with Edinburgh Studio Opera as Kecal in Smetana's *The Bartered Bride*. Since then he has given performances of Schubert's *Die Schöne Müllerin* in Bucharest and as Superintendent Budd in Britten's *Albert Herring*. Maximilian Fuhrig was appointed President of Edinburgh Studio Opera in 2006.

Credits and Acknowledgements

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