
TOCCATA
CLASSICS
Douglas MUNN
COMPLETE MUSIC FOR SOLO PIANO
Arta Arnicane
FIRST RECORDINGS

DOUGLAS MUNN, MATHEMATICIAN AND MUSICIAN

by Lesley Duncan

Professor Douglas Munn (he never used his first name Walter) was a distinguished Scottish mathematician with an international reputation. He was also a fine pianist and a composer of piano music – and my elder brother.

The link between music and mathematics is not in itself unusual. Mathematicians are often fond of classical music, but predominantly, perhaps, they look to Bach and the intellectualism and intricate structures of his compositions for their pleasure. Douglas was different. As a young child, he was drawn to Chopin, Debussy and Brahms, as well as to Beethoven; and by his early teens he was a proficient pianist, particularly in Chopin's music. This involvement with the great Romantic was mirrored in his early compositions, which, as you'll hear, eloquently reflect Chopin's influence.

The Scotland of his childhood and teens was a place of austerity in the aftermath of the Great Depression and the Second World War. But it was not impoverished culturally. Since 1707 the Scottish parliament had been subsumed in the larger assembly of Great Britain. But England's smaller northern neighbour kept its own institutions: its laws, its Calvinist brand of religion and, perhaps especially, its education system. In the eighteenth century it was for a while the centre of the European Enlightenment, with such figures as Adam Smith, the great economist, and David Hume, the philosopher. It is significant that until the nineteenth century, Scotland boasted of three universities as opposed to England's two. The internationally admired Scottish education system was also more open socially than its English equivalent, a concept articulated as 'The Democratic Intellect'.

This is the background to Douglas' upbringing, which took place in the seaside Ayrshire town of Troon – although he was born, on 24 April 1929, in Kilbarchan,

in Renfrewshire, to the west of Glasgow. Our parents, Elizabeth and Robert Munn, were a teacher and railway official respectively. They were both also amateur artists of professional standard: Elizabeth painted portraits and flowers in oils; Robert produced fleeting, lyrical landscapes in watercolour. Their home brimmed with paintings and books, from English classics, contemporary poets and writers such as Aldous Huxley to encyclopaedias and the visionary fiction of H. G. Wells. Though it was not a well-off household, it was a cultured one.

Douglas' childhood talent showed itself early, in the composition of music. The family French piano was succeeded by a heavy Blüthner upright, piled up not only with volumes of Beethoven and Mozart sonatas and the nineteenth-century Romantics but also a collection of modest manuscript books with Douglas' first childhood attempts at composition, written in pencil to allow endless revision. He mastered the technical language of composition quickly, with little or no guidance from his piano teachers. Some of the compositions on this album date from his early and mid-teens.

From the family home in Troon, he could walk in a few minutes to the beach, with its dramatic view west over the Firth of Clyde to the blue mountain peaks of Arran; or, in the reverse direction, to his domed secondary school. Living on the north-western fringe of Europe probably helped to mould the austere element of his character, and inflected his later fondness for the music of Sibelius.

That secondary school, Marr College, had been founded by a philanthropist who believed that the millionaire's daughter and the dustman's son should be educated together. It was a handsome building, with every modern amenity of its time. It functioned as the state school of the area. Co-educational (that is, boys and girls in the same classes), with a high-powered teaching staff, it offered its pupils a generous curriculum, taking in mathematics and science, Latin, Greek and modern languages and the arts, as well as vocational subjects. It launched many young people from economically humble backgrounds into successful professional life. (Curiously, music was a rather neglected subject, and Douglas had to tutor himself for the national exam in music. It proved no problem.)

He excelled in this liberal environment. While his contemporaries were playing football or rugby, he was re-thinking Einstein's theory of relativity or practising Beethoven sonatas or Chopin études. In spite of his precocity, he was popular with his classmates, for whom he was simply 'Dougie'.

In 1947 he went on to Glasgow University (founded in 1451). There, in an unusual move, he enrolled in the Arts Faculty, rather than the Science one. Thus, as well as studying mathematics and natural philosophy (as physics was still called in Glasgow) as his major subjects, he took classes also in music and English. After winning the prize for the outstanding arts graduate of his year in 1951, he went on, as was the custom of the brilliant Glasgow graduates of the time, to Cambridge University, to embark on a Ph.D. in pure mathematics.

Music remained a staple part of his Cambridge years. He was surely well aware of the contrast between the solitary intellectual ponderings of his mathematics research – a closed book to his family and most of his contemporaries – and the emotional charge of classical music, felt by both performers and audiences.

At St John's College he shared rooms with the musicologist Kenneth Elliott, whose ground-breaking series of publications for Musica Scotica re-established Renaissance and post-Renaissance Scottish music in its European context. Douglas and Kenneth, who was a skilled harpsichordist as well as a pianist, played Mozart duets and piano transcriptions of orchestral music at social gatherings. And on his university holidays in Scotland, Douglas would drive his mother and sister almost to distraction with his assault on Beethoven's 'Hammerklavier' Sonata.

Douglas used to say, with a smile, that his kind of pure mathematics – algebraic semigroups – was the paper-and-pencil kind, with absolutely no practical relevance or application, but with a strong aesthetic appeal. Certainly, highly educated societies seem to produce men and women who gravitate to this refined intellectual world, and have formed a global fraternity.

The dichotomy between his mathematical and his musical instincts was probably not consciously resolved – and his mathematical career made increasing demands on him. With his Ph.D. completed in 1955 (it still earns praise), he went on to serve his

National Service in GCHQ, the then-secretive institution which dealt with government intelligence when the Cold War was at its height. He never spoke of his work there but, when he returned to academia in 1956, he remained for some years a consultant, forbidden to travel to eastern Europe – although decades later he was able to give an address on his research work to a major maths conference in Ekaterinburg, in the shadow of the Urals.

After the rather James Bond-ish interlude at GCHQ, Douglas chose to return to academic life at Glasgow University. The next years were productive mathematically. He gained a higher doctorate and was elected to the prestigious Royal Society of Edinburgh while still in his thirties. Then came two professorships: the first in 1966 at the new University of Stirling (where he chose the Steinway grand piano for the University); and the second at Glasgow University, where he held the newly created Thomas Muir Chair of mathematics with distinction from 1973 until his retirement in 1994.

Music flourished in Scotland in the post-war years and it remained a leitmotif of Douglas' two decades in his Glasgow chair. The Edinburgh International Festival, founded in 1948, had brought glamour and world-class music and performers to the Scottish capital in his student days; and now, in later decades, there was a rich variety of classical music to enjoy, through concerts by the long-established Scottish National Orchestra (from 1991 the Royal Scottish National Orchestra) and BBC Scottish Symphony Orchestra (both based in Glasgow), as well as the Scottish Chamber Orchestra and Scottish Baroque Ensemble. His operatic education was enhanced by the acclaimed Scottish Opera productions of *The Trojans* and the Ring Cycle under Alexander Gibson. And in the 1990s, after the collapse of the Soviet Union, major Russian orchestras, conductors and soloists brought a sparkling new dimension to his concert-going.

Douglas was also the Glasgow University representative at the Royal Scottish Conservatoire in Glasgow and a director for many years of St Mary's Music School in Edinburgh. At one of the International Scottish Piano Competitions at the Royal Scottish Conservatoire in 2001, he and his musician wife, Clare, met the Latvian pianist Arta Arnicane, and a firm friendship was formed.

Pure mathematics is supposed to be a 'young man's game', but Douglas continued to produce research papers of high quality into his seventies – there are almost 100 of them. And in these years he returned to the piano compositions of his teens and twenties, revising many of them. As a player he maintained his allegiance to Chopin, Brahms and Beethoven. His favourite pieces for performance were the late Beethoven Sonatas, Chopin's *Berceuse* and *Barcarolle* and the Brahms *Intermezzi*.

When he died, on 26 October 2008, after a five-year battle with cancer, his status within the global world of mathematics was such that a volume of the German-based Semigroup Forum was published in his honour, with contributions from his worldwide company of admirers and fellow researchers. A few months later, at a memorial concert in his honour at Glasgow University, Arta played some of the compositions on this album.

In his youth Douglas was a tall, handsome figure, and he retained his impressive presence in old age. In spite of his achievements and professional success, he remained the most unconceited of men, as modest in manner as in self-esteem. Although he had no children, he was devoted to his family and to Clare, whom he first met in Salzburg. And music remained his guiding star.

Lesley Duncan is a Scottish journalist, poet and book-editor. As the young sister of Douglas Munn, and his only sibling, she remembers as a child hearing him develop some of his early compositions. After studies at Glasgow University and Pennsylvania State University, she has worked for many years for The Glasgow Herald. *Now a freelance, she presides over the daily poem feature in the paper, with occasional contributions of her own. A collection of her poetry,* Images Not Icons, *was published by Kennedy & Boyd, Edinburgh, in 2010. She has also edited, or co-edited, various poetry books, the most important being* The Edinburgh Book of Twentieth-Century Scottish Poetry, *published by Edinburgh University Press in 2005.*

MUNN'S MATHEMATICS

by David Easdown

Douglas Munn was a gifted, admired and highly influential mathematician, regarded as one of the founding fathers, in the west, of a branch of modern algebra known as semigroup theory. It is difficult to outline his achievements in mathematics without using technical language and it is hoped that the reader will forgive unexplained terminology in what follows.

His early work took place in the 1950s, leading into the cold-war era of the 1960s, when parallel or complementary discoveries were also being made or disseminated in the field on the other side of the Iron Curtain. Douglas wrote over eighty scholarly papers in mathematics, in nearly six decades of prolific activity, many of his works being seminal or ground-breaking, spawning cascades of research projects and publications by several generations of mathematicians. His writings are of the highest standard, carefully crafted, conceived always from the point of view of the reader who can access and appreciate the subtleties of his mathematical reasoning and the originality of his ideas. Douglas has many important theorems and several concepts named after him, such as Munn rings, Munn algebras, Munn inverse semigroups and Munn trees, the last of which are clever devices in combinatorial algebra (an area of mathematics that provides useful tools in developing the theory of formal languages), closely related to finite-state automata (forming one of the important paradigms in the hierarchy of abstract computation in theoretical computer science), which Douglas invented in the 1960s and which transformed the theory of inverse semigroups.

Although it appears to be abstract pure mathematics, semigroup theory is directly related to symmetries of mathematical structures and composition of functions or transformations. Its origins can be traced back to the ground-breaking discoveries

of the youthful Évariste Galois (1811–32) in the first half of the nineteenth century: he found a link between the solvability of polynomial equations and decompositions of permutation groups, which, in a sense that can be made precise, measure the complexity of the symmetries that occur in the solutions of the equations. Group theory developed axiomatically in the second half of the nineteenth century, through the work and insight of Arthur Cayley (1821–95), who sowed the seeds of representation theory (essentially converting the abstract mathematics to concrete manipulations of arrays of numbers, known as matrices), after which there was an explosion of activity, leading to generalisations, from about the middle of the twentieth century, to inverse semigroups, which model partial symmetries. Semigroup theory relies on one axiom, associativity of a single binary operation (that allows arbitrary rebracketing of expressions without altering the final outcome), relaxing the invertibility axioms of a group, which then opens up a myriad of possibilities and subtle variations. Because of its vast generality, and connections with functional composition and theories of formal languages, semigroup theory is ubiquitous throughout mathematics and theoretical computer science.

Douglas' first main contributions were in the area of representation theory of semigroups, arising from his doctoral thesis, completed in Cambridge in the early to mid-1950s. His work galvanised the field from the early 1960s. His contributions to the theory of inverse semigroups over the following decades influenced directly or indirectly nearly all of the main contributors to the discipline and provide the foundations for hundreds of articles and chapters of monographs. Even after retirement, Douglas produced work of outstanding quality, and returned to one of his early interests, the theory of semigroup rings and algebras, but now in the context of mathematical analysis. His natural curiosity, conviviality, modesty, and disarmingly innocent delight in discovery and communication of ideas, made Douglas a wonderful and inspiring collaborator. He touched the hearts and minds of all who came into contact with him and he is sorely missed by the mathematical community that continues to explore themes and ideas propagated by him, even stemming from the final years of his productive mathematical life.

David Easdown is an Associate Professor, working in the School of Mathematics and Statistics at the University of Sydney since 1990. He was a postgraduate student when he met Douglas Munn, visiting Monash University in Melbourne in 1982, and subsequently collaborated with him on research in semigroup theory. He has published widely in pure mathematics and mathematics education, including a textbook on linear algebra. He most recently developed a Massive Open Online Course (MOOC) Introduction to Calculus, on the Coursera platform, found particularly useful by students from all over the world during the recent pandemic.

MUNN'S MUSIC

by Arta Arnicane

This recording has been inspired by an extraordinary story of friendship that started through music. I studied in Glasgow, at the Royal Scottish Academy of Music and Drama (it is now the Royal Conservatoire of Scotland), and Douglas and Clare Munn supported me during my time as a student and after my graduation. Working on this programme has been a beautiful way to discover many unexpected aspects of Douglas Munn's personality and to gain a much deeper understanding of this extraordinary man – and to repay a long-standing debt of gratitude.

The dates on the scores reveal that Douglas composed most of these works in his youth, and started to revise them in the mid-1980s – motivated, I am sure, by his humble self-criticism and his desire to achieve the highest standards he could. By 2006 he had revised most of his piano works and, during one of my concert tours in Scotland, he gave me the scores of the eight pieces he had revised. There and then, I made myself – and him – a promise to record them one day, a goal now achieved, fifteen years later. The discovery after his death of two more Nocturnes (in A major 8 and E flat major 10) and especially the Preludes Nos. 2 and 3, in

F sharp major [14] and D major [15]), was an even more pleasant surprise, followed by the decision to have the scores typeset and published.[1]

Douglas' music possesses clear and balanced structures, but his love for accidentals, as well as the use of such tonalities as F sharp major and E flat minor, can make the manuscripts tricky to read. That was part of the reason for my deciding to memorise the music very early in my work on it – and, of course, playing this music by heart almost at once stimulated a very personal approach towards the interpretation, as well as a deeper understanding of the emotional context.

There are many styles in this music, which consists mainly of miniatures but also embraces slightly larger forms, such as the sonatina and the scherzo. Munn has a particular approach to harmony, as can be heard, although he maintains a sincere flow of emotion. The music mainly represents his favourite epochs of Romanticism and French Impressionism – clearly with Chopin as the deepest well of inspiration: the single Mazurka [2] and many Nocturnes obviously follow in those footsteps. The richness of feeling is remarkable in all five Nocturnes, particularly in the most dramatic ones, the B minor [9] and E flat minor [11].

Even though Douglas seems to have made no explicit connection between his music and Scottish nature and folk-music, those influences have affected my interpretation of some of these pieces. Such a vision is most clearly apparent in the two larger pieces. When I play the middle section of the Scherzo [3], I see a mediaeval castle through mist and hear the distant sound of bagpipes – although, since Douglas was no enthusiast for the pipes, he might raise an eyebrow at this association. The Sonatina is probably the most individual work in its musical language, and took longest to compose: the first two movements [4] [5] were composed in 1950, but the finale [6] had to wait until 1985, when Douglas started to revise his compositions, and its jaunty tune was born only then – indeed, Clare remembers him singing it during one of their many walks in the Galloway hills. Its joyful character reminds me of ceilidh dance-rhythms.

[1] Plans for the publications of Munn's piano music are under discussion; details will be announced on www.artaarnicane.com in due course.

The Neo-Classical character and formality of the Minuet and Trio 1 set this piece apart from the rest of Munn's compositions – even so, its elegant movement and tender harmony make it one of my favourites and a perfect beginning to this musical journey through Douglas' music.

The rhythmically interesting Intermezzo 12, one of the shortest compositions, is a little jewel, with an individual pianistic language that could have served as a musical postcard. It has an unusually charming time-signature, $\frac{5}{8}$, more often found in folk-music and therefore surprisingly refreshing here.

The Preludes have been a true discovery, both technically and musically. The compact, unified structure and melodic simplicity of No. 1 in E minor 13 does indeed give this piece a preludial feeling, but Nos. 2 and 3 are much more extended in comparison. Pianistically, the most demanding is No. 2 in F sharp major 14: the melody is intricately woven into a shimmering texture, which, especially in a key that uses six sharps, requires a degree of virtuosity not often encountered in Munn's other piano pieces – this one, indeed, has the technical demands of a Chopin étude. No. 3 15 is a very different work altogether: its expansive ternary structure (ABA + coda) makes it more of a miniature tone-poem – a thought reinforced by the Debussyan delicacy of the central passage, which is sandwiched between the passionate outer sections, remarkable for the richness of their late-Romantic harmony – before it finally melts into an ethereal, dream-like ending.

Music Holds the Key
(for Douglas)

Debussy's Jardins sous la pluie,
Played by my teenage brother,
Falls into earliest memory in a
Downpour of enchanted notes
That have reverberated a lifetime.

Later, that household god, Beethoven,
Glowers down on his Scots disciple
From a suitably Teutonic Blüthner piano,
As the Hammerklavier drives to distraction,
With its vast elemental energies, those
Who overhear the relentless practising.

Then the ultimate peak, Opus 111,
Sonata beyond nickname, harnessing the
Heroic masculinity of the opening movement
To the Arietta, sublime timelessness
Jolted into syncopation and final trilled resolution.

Chopin's Ballades, Berceuse, Barcarolle (so many Bs)
Cascade through childhood recollections
Of weekend visitors, Scotch high teas,
And walks by the Firth of Clyde.
Waves of music; waves of memory.

Lesley Duncan

A ready communication with audiences and a talent for creating a special concert atmosphere have taken the young Latvian pianist **Arta Arnicane** to a large variety of performance venues across the world, among them the Rudolfinum in Prague and the Zurich Tonhalle.

Born into a family with a long-standing musical tradition, she started playing the piano and composing at the age of four. Supported by numerous scholarships and by such eminent artists as John Lill and Homero Francesch, she has studied in several countries, graduating with distinction from the Royal Scottish Academy of Music and Drama (now the Royal Conservatoire of Scotland) (2004), the Latvian Academy of Music (2008) and Zurich University of the Arts (2010 and 2012).

Her professors – Sergejs Osokins, Norma Fisher and Homero Francesch – influenced the artistic development of her personality and guided her into the international music scene. She has won many prizes at international music competitions, including the Vianna da Motta (2001), Premio Iturbi (2010) and Prague Spring (2011).

Arta Arnicane has an extensive solo repertoire and her interpretations of the Mozart piano concertos and of Impressionist music have won special appreciation. She works regularly with the conductors John Gibbons and Martin Lebel, and is in demand as a soloist with youth orchestras for her temperament and ability to inspire. She is also an enthusiastic chamber musician and frequently performs in a duo with her husband, the cellist Florian Arnicans. The first 'Duo Arnicans' album was released by Solo Musica in 2015, with sonatas by Chopin and Dohnányi.

She is especially devoted to creating thematic and narrative programmes, as well as to the discovery and performance of rare repertoire. Her creative collaboration with John Gibbons has included performances of both piano concertos by William Alwyn and, most recently, the discovery and the recording of the powerful and expressive piano concerto by William Wordsworth, recorded on Toccata Classics TOCC 0526.

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DOUGLAS MUNN Complete Music for Solo Piano

1	**Minuet and Trio in G minor** (1947, rev. 2004)	**5:24**
2	**Mazurka in D minor** (1947, rev. 2006)	**3:20**
3	**Scherzo in F sharp minor** (1948, rev. 1989)	**5:47**
	Sonatina in F minor (1950, rev. 1985/2001)	**11:22**
4	I *Lento – Allegro*	4:50
5	II *Andante*	4:06
6	III *Allegro giocoso*	2:26
7	**Nocturne in D flat major** (1944)	**3:27**
8	**Nocturne in A major** (1943)	**3:01**
9	**Nocturne in B minor** (1945, rev. 1988/2003)	**3:33**
10	**Nocturne in E flat major** (1943)	**2:32**
11	**Nocturne in E flat minor** (1946, rev. 1991/2004)	**5:59**
12	**Intermezzo in A minor** (1947, rev. 2005)	**1:31**
13	**Prelude No. 1 in E minor** (1944, rev. 2003)	**2:28**
14	**Prelude No. 2 in F sharp major** (1946)	**3:24**
15	**Prelude No. 3 in D major** (1947)	**5:53**

Arta Arnicane, piano

TT **57:44**

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