
Edward Cowie
RUTHERFORD'S LIGHTS
Richard Casey • piano

RUTHERFORD'S LIGHTS

24 studies in light and colour
by Edward Cowie (b.1943)

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RUTHERFORD'S LIGHTS

a note by the Composer

This epic cycle of 24 studies for solo piano, explores the wonders of light in many states and forms from *Simple Wave Motion* to *Dispersion* and *Radiation of Electromagnetic Waves.* Himself an ex-student of physics, I collaborated with Light Physicist, Sir Michael Berry FRS, in *'an adventure in illuminations, colours and photons!'* The work was commissioned by The Institute of Physics in London, England and premiered and then recorded in 2010. This is music inspired by science inspired by music! Pianist, Richard Casey gives a stunning and richly virtuosic performance of this work, which after its premiere in The National Portrait Gallery in London, earned huge praise and plaudits for its originality and creative power. This is a re-release of the original recording, released at that time on UHR label.

But let me explain the 'odd' title and then talk about my approach to composing a major work inspired by the theories of light!

Ernest Rutherford, is famous for three things especially. He was the first to describe **the nuclear structure of the atom**; to discover **alpha and beta rays**; and to propose **laws of radioactive decay**. He is certainly **not** remembered for any significant contribution to **theories of light**! He was, however, one of the undisputed major figures in the history of science when I was a student of physics (alongside music and fine art) in the early 1960s. Rutherford died only 6 years before I was born though he seemed to me (and indeed was) very much an Edwardian figure, rather like Edward Elgar, (there is even a physical resemblance between the two, and they were born and died in more or less the same period).

Imagine my surprise, then, when whilst browsing in a second-hand bookshop in Townsville, North Queensland (about as far away from Cumbria where I currently live as possible!), I discovered a book with a dark green cover and emblazoned with the gold crest of the University of Manchester on the cover. The book was called *The Theory of Light* by Thomas Preston: this being a third edition published in 1901. It was

awarded as a 2nd year Physics Prize to one Henry (Harry) Cotton for the session 1908-09. And who was the Professor at Manchester who awarded the prize and signed the award notice? *E Rutherford!* I certainly remembered this book in the library at Imperial College and even reading some of its contents at that time in the early 1960s.

Thomas Preston was Irish by birth and died at the tragically young age of 40 years in 1900. His specialisms were in the fields of **heat, magnetism and spectroscopy.** The latter was and is a science especially **focussing on the absorption and emission of light.** These phenomena are measured by **the splitting of light into its constituent wavelengths (spectra)** in much the same way as a prism is used to split light into the colours of a rainbow. Instantly, I was intrigued as to why Rutherford might have chosen a book on **Light** to award to the young Harry Cotton. A little research into Preston revealed his discoveries and research into something known as *The Zelman Effect* concerned with spectral lines in the presence or absence of magnetic fields. Preston's results of examining these effects was far more complex and anomalous than those of Zelman and Preston published two major papers towards the end of the 19th century, outlining his *'astounding and surprising'* findings.

It was the inconsistency of the observable results that puzzled him though he was not to realise that it was not until the 1915 publication of Einstein's *Law of Relativity* that these strange results could be explained. The question – for me – was: did Rutherford already guess that something that Preston had discovered was connected with and toward Einstein's discoveries? He evidently believed and knew that **Light** was an area of research and mathematics that would one day shake classical science to its foundations.

I began to read the Preston book from cover to cover and made careful notes (as well as my own idiosyncratic studio drawings and notations), of the entire body of work. But in the twenty-one Chapters, I also realised that there were certain **super-important descriptions** of the properties of light. I soon found myself clustering these special descriptions into integrated and related **sets** and by Chapter twenty-one, had arranged a total of **eight sets** of descriptions by taking anything from one to six expressions in a set. At this time I was seriously considering writing a major set of piano pieces that would number thirty or thirty-three in total: like the

Goldberg Variations of JS Bach or the Diabelli Variations of Beethoven. Indeed Richard Casey, the first performer of the Rutherford Cycle, did give the world premiere at The National Portrait Gallery in 2009 of the entire thirty-three movements.

But the effect on me (and even more surely on the audience I suspect), was like listening to a musical analogue with Tolstoy's *War and Peace* or James Joyce's *Finnegan's Wake*! It was simply too much to take-in in one concert and I immediately removed nine movements to leave twenty-four short pieces. The number **24** has featured in quite a number of my works including the 24 *Birdsong Bagatelles* in my 5th String Quartet: the 24 Preludes for Piano (released on Métier), and all four of my *Bird Portraits cycles,* (three already out on Métier and the remaining one to be out in 2024).

Thus, I admit that the connection between **Rutherford** and **Lights** is perhaps a little confusing until you read what I've just written...that it was the name of Rutherford in a book on Light that directly inspired my musical mind in this special way. But now I'd like to describe (as best and as honestly as I can without getting unnecessarily complicated), how I approached making this cycle in particular, and how it fits into what I identify as one of the **two main modalities and paradigms for and in the use of scientific thinking and method in the composition of new music.**

A major clue in the understanding of these two music/science/music approaches is in my use of the words **thinking** and **method**. In the case of other works of mine that are inspired directly by empirical science, (science that has already been tested by theories and experiments to offer varying degrees of proof and verifiability), namely **The Colours of Dark Light**; **Particle Partita**; and this cycle, **Rutherford's Lights,** I'm seeking to make musical responses to **something that has already happened.** The contemplation and organisation of music like this is based on pre-existent **information**. Such information in the form of mathematical equations; theories, experiments and learned publications is best approached by **study-learning-researching- measuring-understanding** and then **translation or relocation** into musical languages and forms. Given that these sources are not often of an emotional kind and certainly not often dictated by what we could call *sensuality* with an emotional root, I find myself **thinking** towards the music.

My second approach or mode of composition in the utilisation of science in music is to use **method-in-the-moment** as a means of (perhaps) finding 'new' musical forms and modes of expression in the creation of music. These are works that are instigated and initiated by **field work** and are seldom dictated-to by pre-existent bodies of knowledge and information. These kinds of works (and which in fact constitute more than 70% of my musical output to date), are much more likely to be emotional and intuitive. The scientific methods, however, are very frequently like those used by a Rutherford or an Einstein. But my place and method of work is not (in the initial stages), in a laboratory full of machines- nor on blackboards covered with equations. My place-of-scientific investigation (I should say **sensing** much more than **thinking** at this point), is the **great outdoors**. By means of varying forms of mnemonic notation; drawings; paintings; musical notations; verbal descriptions and visual symbols, I am able to catalogue a panoply of experiences that are quickly changed (in my studio) to 'shards of information' which can soon be put back together (often by **thinking** at this stage) into a musically and emotionally coherent progression and succession of musical ideas.

Because Rutherford's Lights is inspired by knowledge, thinking and experimental outcomes that already exist, music like this is going to want to stimulate the listener to reflect on not what the music is **describing and evoking**, as it might in my nature-inspired pieces, but on perhaps more **abstract** forms of listening where an innate sense (which all humans have) of **pattern, form, dynamic activity** and even **properties of energy** comes into play as you, the listener take a musical journey on a pathway that has been well-trodden and shaped by the history of science. In writing like this, I rejoice in scientific thinking and discoveries, and remind myself how beautiful the sometimes chaos of clouds and streams can interest, move and inspire me even when I don't know the mathematical and scientific principles and knowledge that might be before and behind these phenomena.

I invite you to **travel-imagine-conjure-remember-discover-realise** just how delicious it is to be surrounded by the many shapes, forms and behaviours of things in the cosmos. The light **on** your eyes is also the light **in** your eyes, and the sounds in this music are the sounds in your very own musical mind and imagination. That's how

nature makes us natural when we allow it to, and which allows us to listen- even for a first time- and realise that many ‘first times’ are places, sensations and experiences **where we have been before**....

Edward Cowie
Cumbria. April, 2023

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Assistant Producer: Lisa Hart
Chief Engineer: Daniel Halford
Engineer: Adrian Walker
Engineer’s Assistants: Tristan Bruce & Rhys Hanry
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THE COMPOSER

'Considered by many to be the greatest living composer directly inspired by the Natural World'

Edward Cowie's first Prom commission was Leviathan; a large scale orchestral work premiered by the BBC Symphony Orchestra in 1975. It marked the first major event in a career that was to gain him national and international recognition for a new kind of 'voice' in the music world. Its title, arising from a conjunction between the mighty whale and a book by Hobbes with the same name can be seen as a signal of a composer whose imagination is deeply embedded in and inspired by the forces of nature. Throughout the 1970s and beyond, a stream of works inspired by wild places on this planet flowed into being, works like his sumptuous *Gesangbuch* (1975/6), (just released on Signum Classics), the *American Symphony* (1984), *Mount Keira Duets* (1985), and his powerful *Choral Symphony, 'Symphonies of Rain, Steam and Speed'*. This immersion in the study of nature was born of a childhood spent in rural Suffolk and the Cotswolds and continues to form the core of his fertile imagination today.

But two further strands underpin and inspire Cowie's musical practice and ideas. His undergraduate studies in Physics and practical studies in Painting have been integrated into a kind of 'fusion-world' of ideas where science, the visual arts and music coalesce in a kind of creative continuum. In recent years, he has increasingly worked towards his music by means of 'field studies', theoretical research and painting-drawing. Studies and collaborations with leading physicists, for example, have not only seen exhibitions of his pre-compositional drawings, but have added a body of new music that directly translates scientific theory and experiment into music. His monumental solo piano series *Rutherford's Lights* was inspired by a study of the relationships between theories of light and colour, and his more recent *Particle Partita* for two violins – with a sonic time-line of the history of particle physics.

These 'fusions' of disciplines, the bridges between study and practice are an essential part of the composer's quest for new ways of forming. Parallels can be found between the linear and pointillist textures, forms, and motifs in his music with the writings and

paintings of Klee and Kandinsky. During his period as first Composer in Association with the BBC Singers (2002-5), Cowie produced a string of large and small-scale pieces that moved through landscapes and natural habitats all over the world. *Gaia*, *INhabitAT*, *Lyre Bird Motet*, *Bell Bird Motet* are classic examples of a music that engages with all of the senses in a profound respect for the power that nature has to move us.

Cowie was the first Granada Composer/Conductor with the Royal Liverpool Philharmonic Orchestra between 1982/4. This led to many conducting dates with other orchestras including the BBC Northern Symphony Orchestra; the BBC Singers, ABC symphony orchestras of Sydney, Adelaide, Queensland and Tasmania and the Seymour Group and the Australia Ensemble. He was the first Composer in Association with the BBC Singers between 2003/5 and first Artist in Residence with The Royal Society for the Protection of Birds (RSPB) for the same period. His work for television has included a major film on Edward Lear for Granada TV and his acclaimed BBCTV2 film *Leonardo* of 1986. He has also written and presented major radio series commissioned by ABC FM Australia as well as for BBC Radio 3 and 4.

Major public lectures include the Gertrude Langer Memorial Lectures in Australia, and the Kate Springett Memorial Lecture in London as well as a Ruskin Lecture at Oxford. He has been invited to give keynote lectures and recitals all over the world. As a visual artist he has had over 40 one-man shows in important galleries in the UK, Germany, USA, Australia and New Zealand and his paintings and drawings are in public and private collections in 19 countries.

Other musical honours have included a Gulbenkian Award to study at The Royal Ballet; The Radcliffe International Composer's Prize and a Chopin Fellowship to study with Lutosławski in Poland. Cowie acknowledges Alexander Goehr as a major influence (as Cowie's professor and teacher) on his life and work- an acknowledgement that continues in a warm and ongoing friendship.

As an academic, Cowie has held major professorships in two Australian and one British University as well as Visiting Professorships in Germany and the USA. He has two doctorates- a PhD which includes studies in physics, mathematics, music and fine arts and was awarded the first Doctorate in Music (DMus) from the University of

Southampton for his work as a composer. He was awarded a Leverhulme Emeritus Fellowship for inspirational visits to Africa and California, both leading to major compositional outcomes concerned with bringing music to the world that 'warns of the dangers to the wild and living world through the continuing destruction of it at the hands of humanity'.

Cowie's reputation continues to grow world-wide, and new recordings emerge with high praise and appreciation. His collaborations with major soloists and chamber groups are also enlarging and deepening. He still regards the human voice and the chamber-music mediums as the 'the most fabulously rich and varied palette of possibility in the expression of emotion and sensation'.

Edward Cowie returned to Australia with his visual artist wife Heather to live there permanently in November 2023. They intend to continue their exploration of the natural world as vigorously and comprehensively as ever!

> "The process of composition, for me, is always connected with processes of visualisation. The drawings for the work were made just before the final process of composition began. They are a kind of mental bridge between the materials that inspire (In this case a great quantity of scientific notations and mathematics as well as observations of light and colour), and the sifting and refining of musical forms and sounds."

Illustrations for Rutherford's Lights are contained later in this booklet

Edward Cowie

THE PIANIST

Richard Casey was born in Manchester in 1966 and started playing the piano at the age of seven. After graduating in Music and Modern Languages at St John's College, Cambridge, he studied piano at the Royal Northern College of Music with Marjorie Clementi and Martin Roscoe, and later with Ronan O'Hora. In 1997 Richard won first prize in the British Contemporary Piano Competition, an achievement which attracted a series of solo engagements in the UK and abroad.

Based in Manchester, Richard complements his solo career with a strong commitment to chamber music. He frequently gives 2-piano concerts with his duo partner, Ian Buckle, specialising in repertoire from the twentieth and twenty-first centuries. Since 1994 he has been pianist with the New Music Players and has performed frequently as a guest with the London Sinfonietta, Lontano and Ensemble 10:10. Richard has recorded the piano works of Camden Reeves, Anthony Gilbert (with Ian Buckle), Peter Maxwell Davies, Anthony Powers, Paul Newland, Ed Hughes and Anthony Burgess. Richard also teaches at Manchester University.

Richard Casey on Métier recordings:

Ed Hughes: Dark Formations
CD/digital
MSV 28530

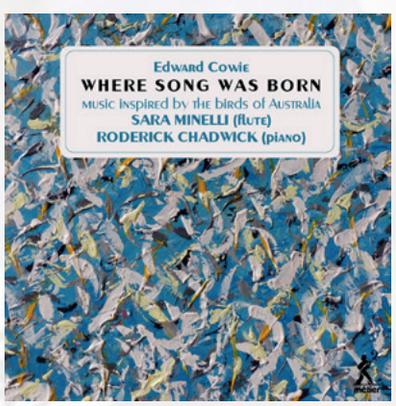
Ed Hughes: Symphonic Visions
DVD: MSVDX 99103
Audio digital: ZME 50801

Three Quartets and a Solo
Peter Sheppard Skærved
Kreutzer Quartet
Métier MSV 28603
"Strong recommendation … simply outstanding."
– *Musical Opinion*
"Played with verve and true musical understanding"
– *New Classics*

Concerto for Orchestra / Clarinet Concerto No. 2
Alan Hacker
Royal Liverpool Philharmonic/ Howard Williams
MSV 92108
"Superb disc of two exhilarating concertos… magnificent, thrilling, hypnotic." – *MusicWeb*
"An exciting whirlwind of a listen." – *BBC Music Magazine*

Bird Portraits 1: Birds of the United Kingdom
Peter Sheppard Skærved / Roderick Chadwick
MSV 28619
"A major composition that will take its place amongst the significant works for this duo medium. The playing by both partners of this violin/piano duo is revelatory." – *MusicWeb*
"Highly original vivid evocations." – *New Classics*

Bird Portraits 2: "Where Song was Born"
Birds of Australia
Sara Minelli / Roderick Chadwick
MSV 28620
"Fascinating and creative music. Intersting and Innovative"
– *Art Music Lounge*
"Stunning, beautiful, revelatory, often moving and thoroughly committed." – *MusicWeb International*

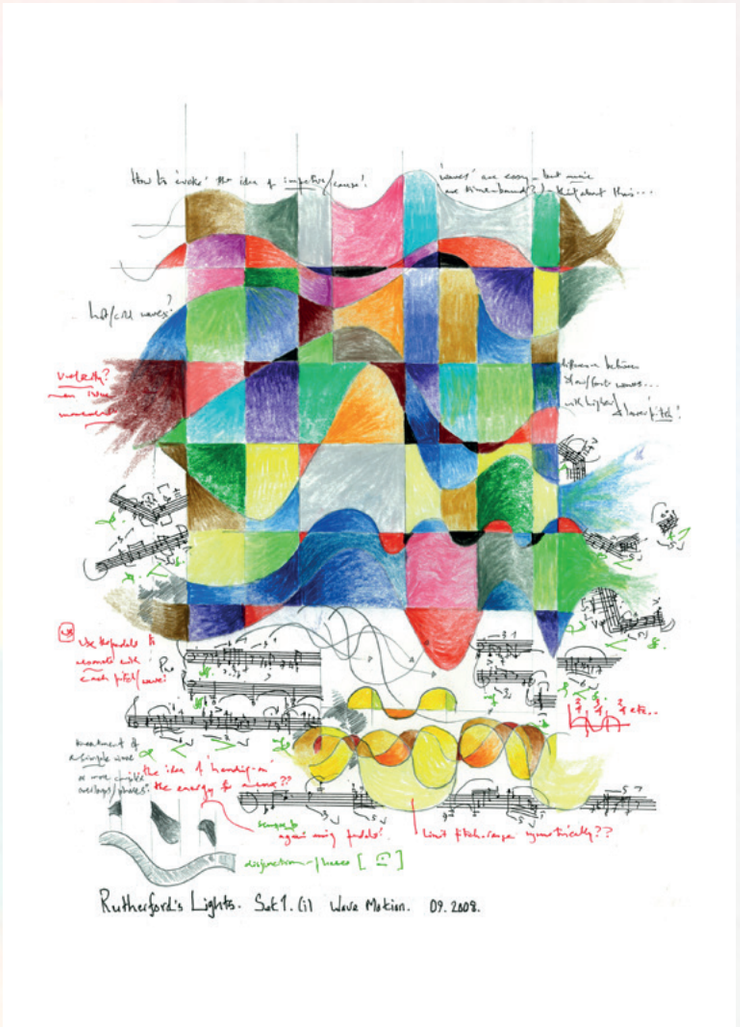


Bird Portraits 3: "Where the Wood Thrush Forever Sings"
Birds of America
Anna Hashimoto / Roderick Chadwick
MEX 77104
"A tour-de-force… I highly recommend it"– *Art Music Lounge*
"Subtle, nuanced and always creative and revelatory" – *MusicWeb International*

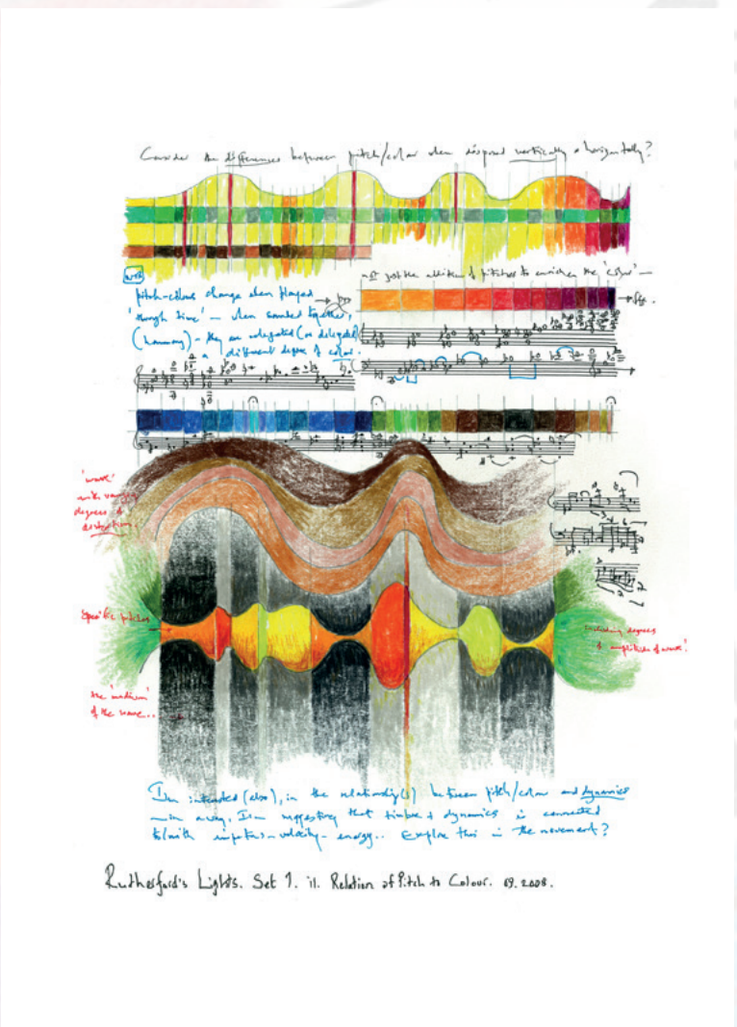
Streams and Particles
Spectrum Guitar Quartet/ Christopher Redgate / Miyabi Duo / Peter Sheppard Skærved / Mihailo Trandafilovski
MSV 28612
"Cowie has a fine ear for color and texture. I found an almost hypnotic attraction had set in." – *Fanfare*
"Very highly recommended!" – *Art Music Lounge*

24 Preludes for Piano
Philip Mead **MSV 28625**
"An outstanding recording. [Cowie] regards himself as a pictorial 'composer of evocations', a description fully justified by these wonderful Preludes." – *International Piano*
"Quite lovely piano pieces. Warmly Recommended" – *Fanfare*

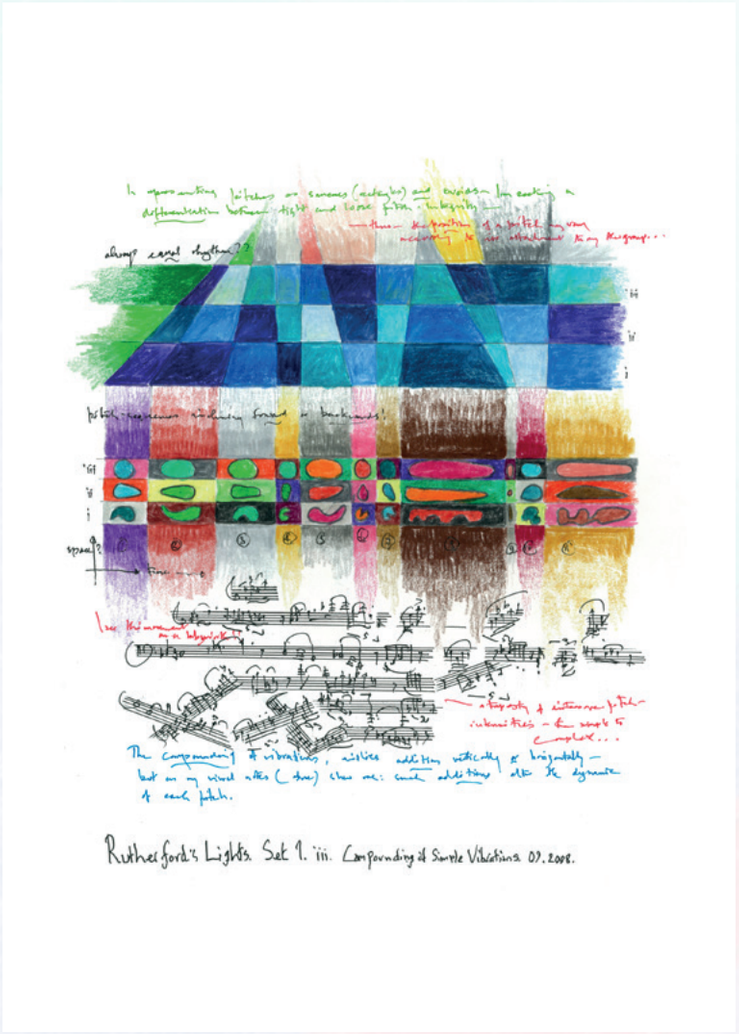
In Two Minds
Improvisations for flutes and piano
Duo Menurida: Laura Chislett / Edward Cowie
MEX 77121
(new release February 2024)



1)
Wave Motion

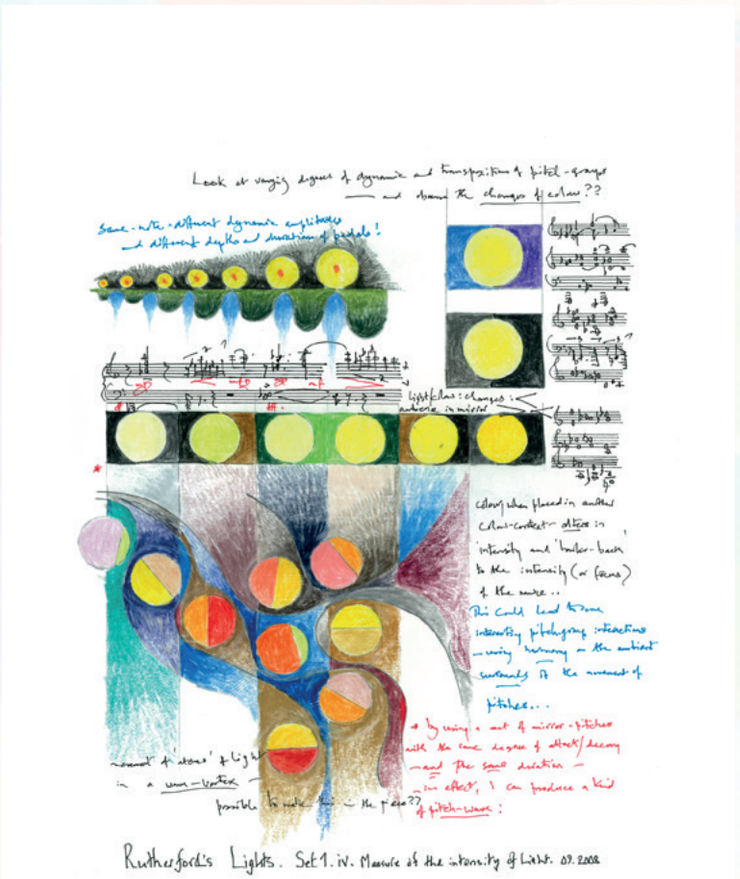


2)
Relation of Pitch to Colour



Rutherford's Lights. Set 1. iii. Compounding of Simple Vibrations. 07.2008.

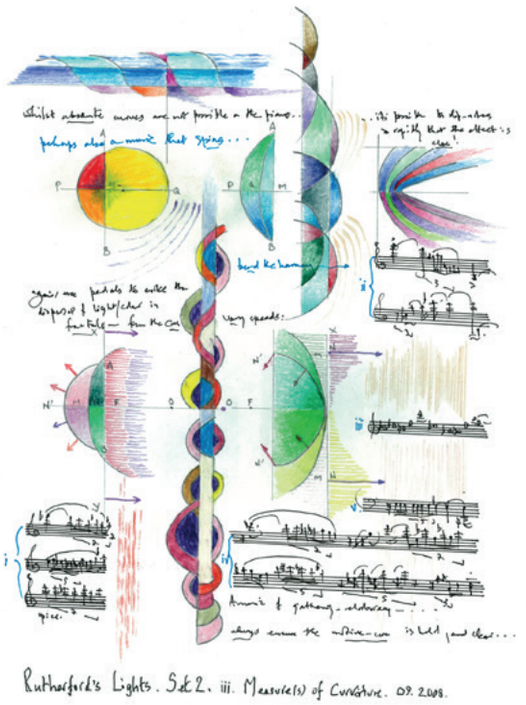
3)
Compounding of Simple Vibrations



Rutherford's Lights. Set 1. iv. Measure of the Intensity of Light. 07.2008

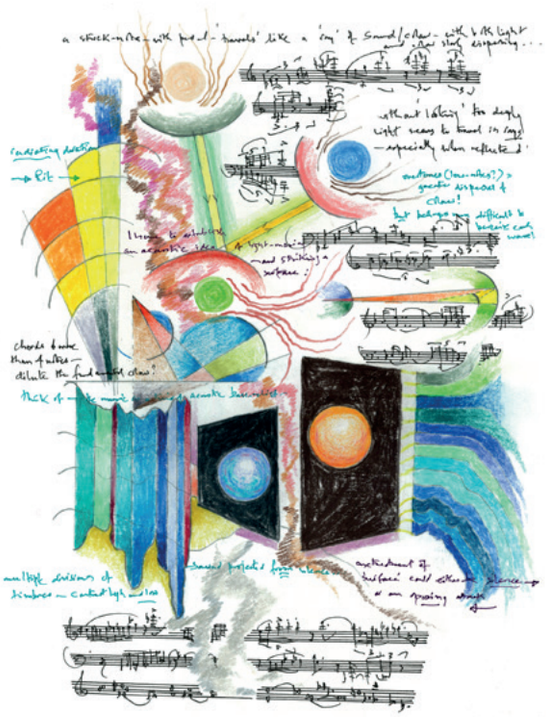
4)
Measure of the Intensity of Light

5)
Measure of Curvature



Rutherford's Lights. Set 2. iii. Measure(s) of Curvature. 07.2008.

6)
Reflection of Any Wave on Any Surface

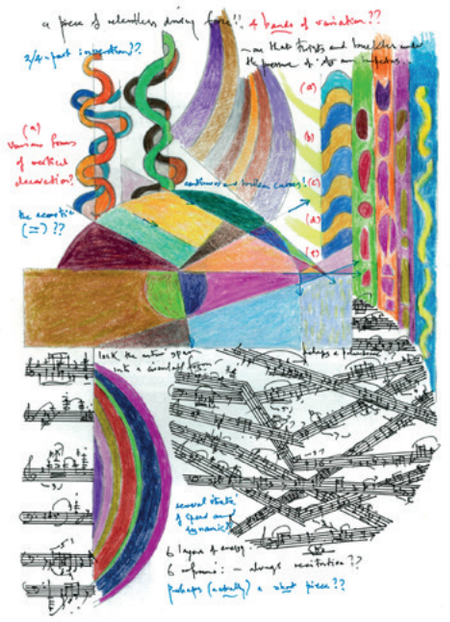


Rutherford's Lights. Set 2. iv. Reflection of any wave at any surface. 07.2008.

7)
The Principle of Least Time

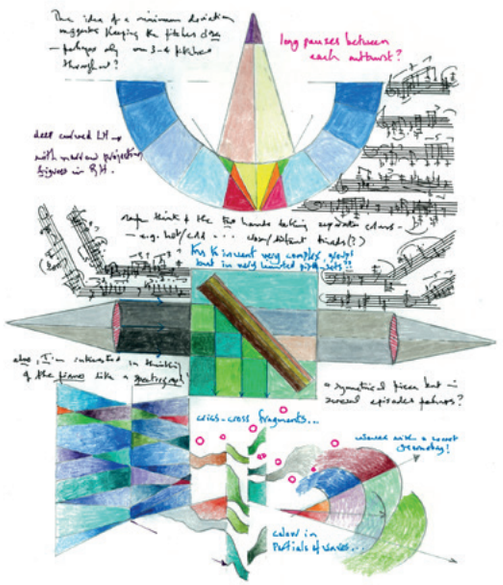
Rutherford's Lights. Set 3.i The Principal of Least Time. 09.2008.

8)
The Energy Equation



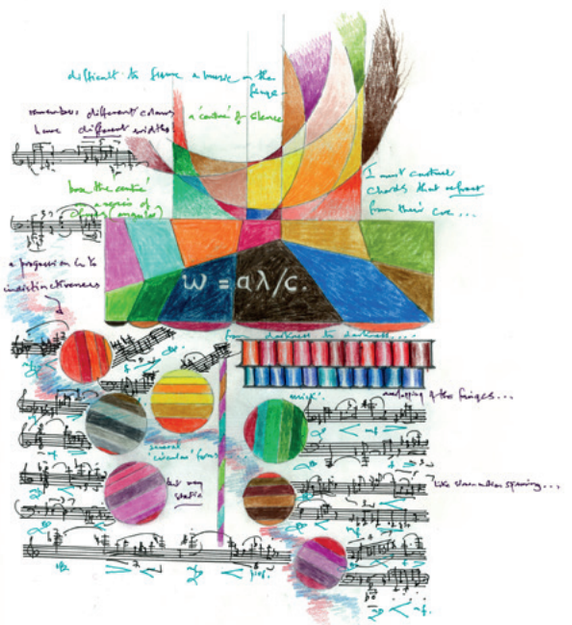
Rutherford's Lights. Set 3.ii. The Energy Equation. 09. 2009.

9)
Minimum Deviation



Rutherford's Lights. Set 3. iii. Minimum deviation. 09.2008.

10)
Limit to the Number of Fringes

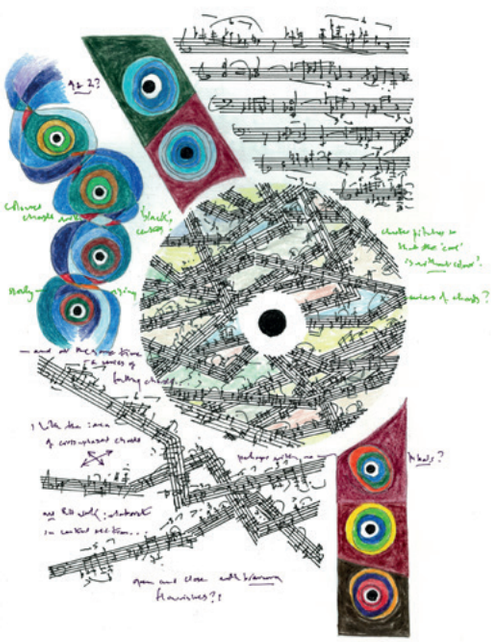


Rutherford's Lights. Set 4. i. Limit to the number of fringes. 09.2008.

11)
Multiple Reflections

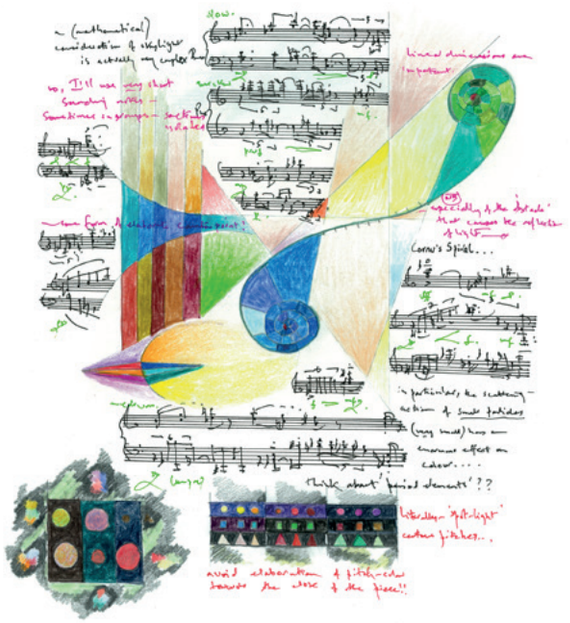
Rutherford's Lights. Set 4. ii. Multiple Reflections. 09.2008.

12)
Rings with a White Centre



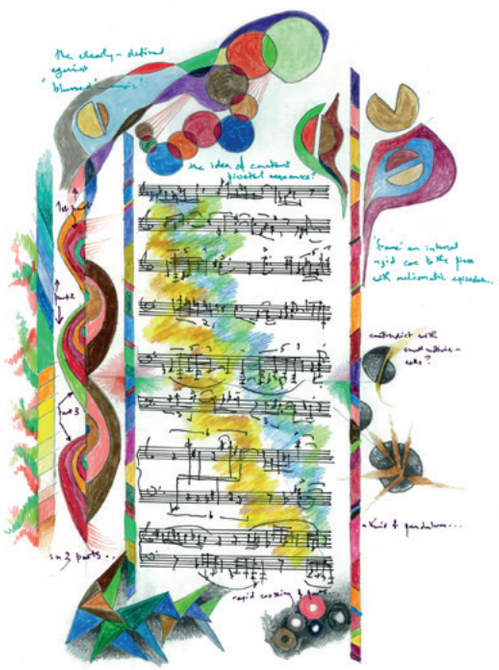
Rutherford's Lights. Set 4. iv. Rings with White Centres. 09. 2008.

13)
The Colour of Skylight



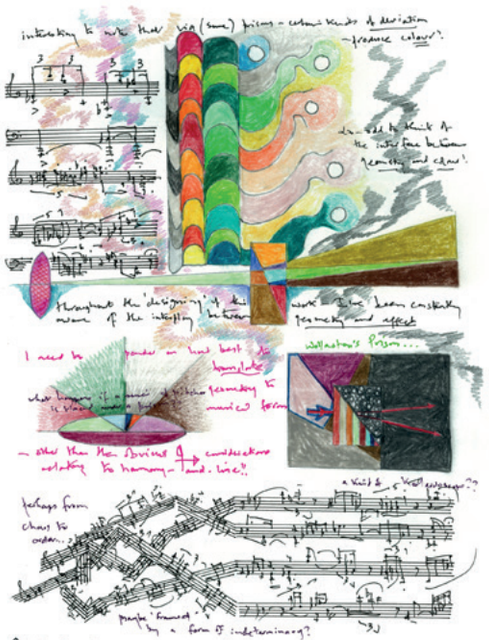
Rutherford's Lights. Set 5. i. The Colour of Skylight. 09.2008

14)
Foucault's Prism



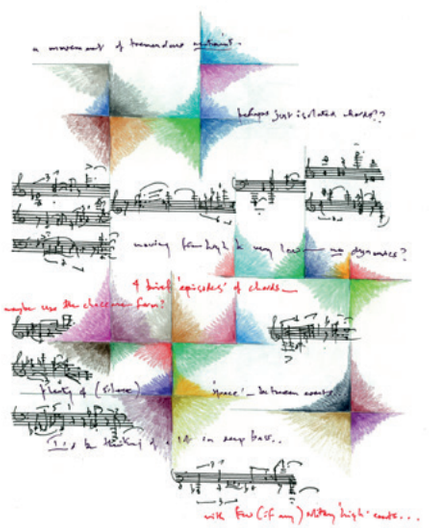
Rutherford's Lights. Set 5. iii Foucault's Prism. 09.2008.

15)
Wollaston's Prism



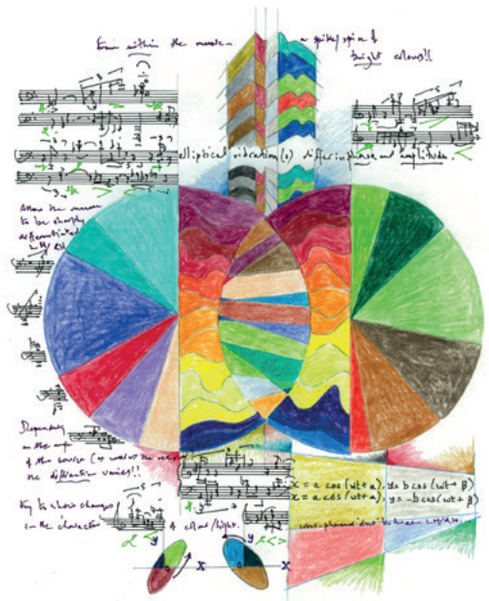
Rutherford's Lights. Set 5.iv. Wollaston's Prism. 09.2008.

16)
Plane Polarisation



Rutherford's Lights. Set 6.i. Plane Polarisation. 09.2008.

17)
Elliptical Polarisation

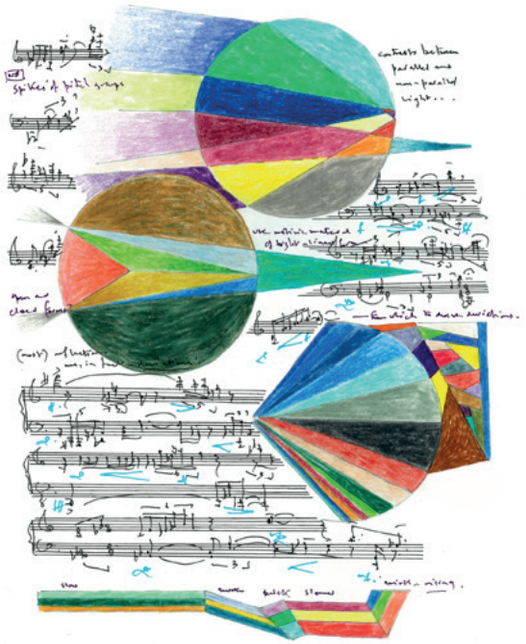


Rutherford's Lights. Set b. iii Elliptical Polarisation. 09.2008.

18)
Natural Light

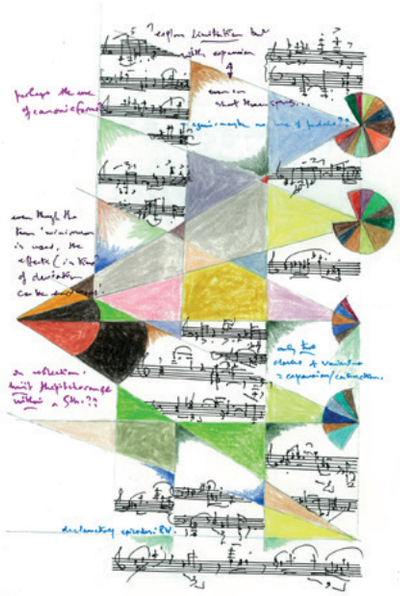
Rutherford's Lights. Set b. iv. Natural Light. 09.2008.

19)
General Expression for the Deviation



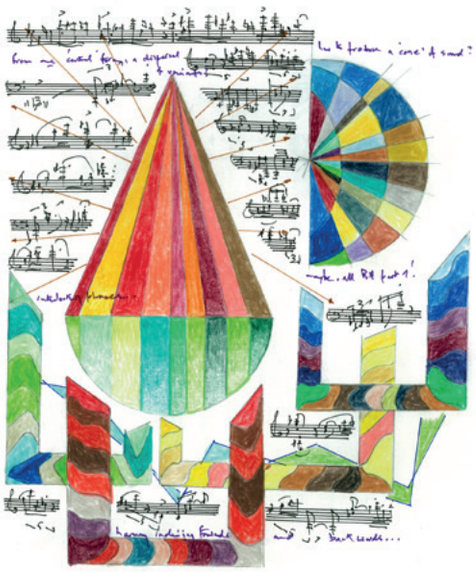
Rutherford's Lights. Set 7.i. Deviation of Light. 09.2008.

20)
Minimum Deviation 2



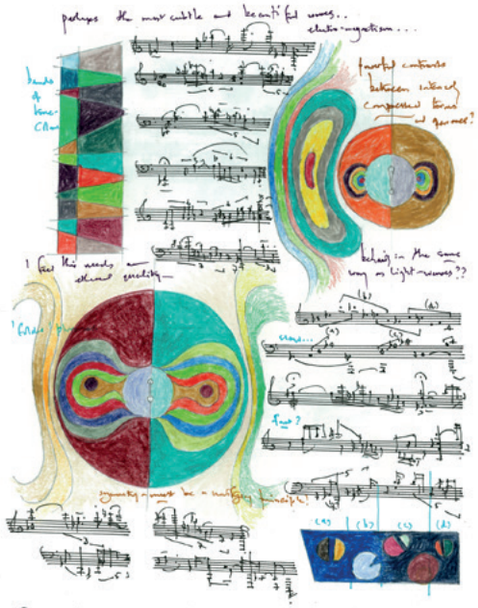
Rutherford's Lights. Set 7.ii Minimum Deviation. 09.2008.

21)
Dispersion



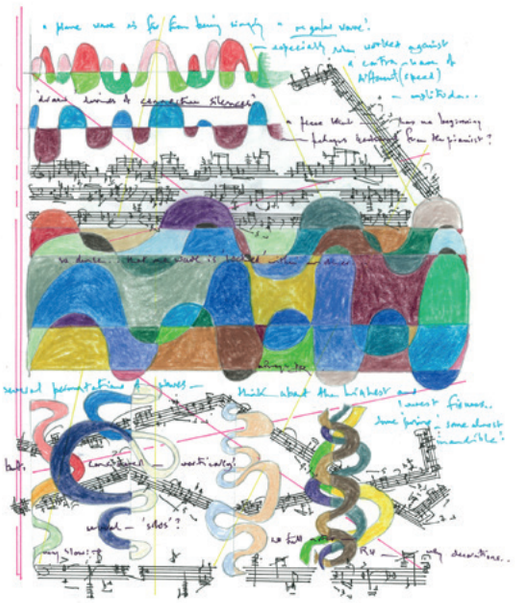
Rutherford's Lights. Set 7. iii. Dispersion. 09. 2008.

22)
Radiation of Electromagnetic Waves



Rutherford's Lights. Set 8. i. Radiation of Electromagnetic Waves. 09. 2008

23)
Plane Waves
(in an Isotropic Non-Conductor



Rutherford's Lights. Set 8.ii. Plane Wave. 09.2008.

24)
Particular Solution

Rutherford's Lights. Set 8.iv. Particular Solution. 09.2008.

The Edward Cowie Collection continues with these new albums to be released in 2024

MEX 77103 ‘The Kreutzer Effect’
MEX 77122 ‘Because they have Songs’ (Bird Portraits 4)
MEX 77123 ‘Rock Music’: Piano Sonatas 1-3

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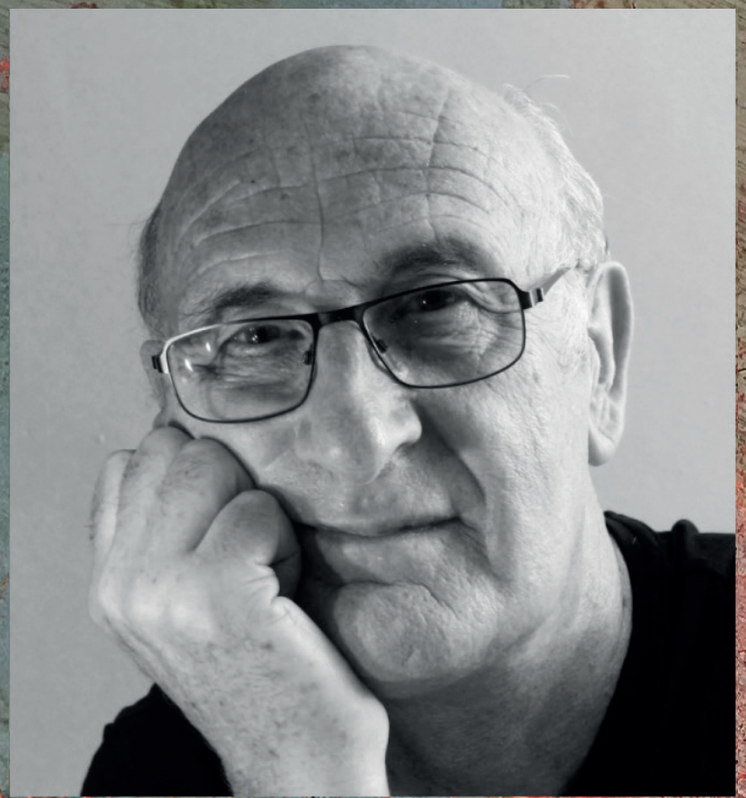

Edward Cowie

Richard Casey

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