



THE ROYAL
SOCIETY
OF EDINBURGH

Science, Politics and Drama



“**May you now guard science’s light.
Kindle it and use it right
Lest it be a flame to fall.
Downward to consume us all.**”
Yes, us all.

From *The Life of Galileo*, by Bertolt Brecht





in collaboration with



Timetable

Thursday April 23

3.00-4.30pm	<i>The Strangest Dream</i>	Film about Sir Joseph Rotblat	RSE, 22 – 26 George Street
6.00-7.00pm	<i>Copenhagen</i>	Michael Frayn in conversation with Janice Forsyth <i>BBC Radio Café</i>	Royal Lyceum Theatre, Grindlay Street
7.00-7.45pm	<i>Copenhagen</i>	Reception <i>(ticket holders only)</i>	Royal Lyceum Theatre
7.45-10.00pm	<i>Copenhagen</i>	By Michael Frayn	Royal Lyceum Theatre

Friday April 24

5.00-5.30pm	<i>Aftereffects of Copenhagen</i>	Talk by Michael Frayn	RSE
5.30-6.00pm	Refreshment break		RSE
6.00-7.00pm	<i>Operation Epsilon: the Farm Hall transcripts</i>	Reading	RSE
7.00-7.30pm	Refreshment break		RSE
7.30-8.30pm	<i>The Drama of Nuclear Weapons</i>	Panel discussion <i>Panel members:</i> Sir Michael Atiyah, Chair Prof. John Finney Michael Frayn Richard Holloway Rev. Dr. John Polkinghorne	RSE

Science, Politics and Drama

Introduction

SIR MICHAEL ATIYAH OM,PPRS,PPRSE



This year is the 70th anniversary of the discovery of nuclear fission by Hahn and Strassmann, a discovery that had momentous consequences in 1945 and in the arms race that followed it. The threat of nuclear annihilation is still with us.

The Royal Society of Edinburgh which, since its foundation in 1783, has encompassed both the Sciences and the Arts, is very pleased to be collaborating with the Royal Lyceum Theatre in a two-day event on *Science, Politics and Drama*. The centre-piece is a new production of the brilliant play *Copenhagen* by Michael Frayn, based on the visit

by Werner Heisenberg, Germany's top nuclear physicist, to see his old mentor Niels Bohr in German-occupied Denmark in 1941. The possibility of nuclear weapons being developed provides the sombre back-cloth to their conversations. Michael Frayn will also lead a discussion on his play.

At the end of the war in Europe in April 1945 ten leading German scientists, including Heisenberg and Hahn, were secretly brought to England and interned at Farm Hall near Cambridge. Their conversations were recorded, without their knowledge, and provide a vivid and candid commentary on their predicament and on their work in Germany on nuclear energy. It was only several decades later, in 1992, that the recordings (translated into English) were made publicly available and were published in book form as *The Farm Hall Transcripts*.

The RSE decided to complement *Copenhagen* by a dramatic reading of the transcripts, using the code-name *Operation Epsilon*, in an edited version made by Jan McDonald FRSE and myself. This will be produced at the RSE by the well-known theatrical director Muriel Romanes. The German scientists, reduced in number to the four most important ones, will have their parts read by mathematicians and physicists, both British and German.

These two performances, based on specific but important events, will be set in a larger context with the first showing in Scotland of a new Canadian film *The Strangest Dream*, made by Eric Bednarski. This is based on the life of Joseph Rotblat, the only nuclear physicist to leave Los Alamos in 1944 when it became clear that the Germans had given up any plans to develop an atomic bomb. He went on to devote himself to the application of nuclear physics for medical purposes. Rotblat also campaigned actively against nuclear weapons and founded the Pugwash Conferences on Science and World Affairs, which played a key part in defusing the nuclear threat. For this Rotblat and Pugwash shared the Nobel Peace Prize in 1995.

Our final event will be a panel discussion on *The Drama of Nuclear Weapons*, involving physicists and theologians, including the Reverend Dr. John Polkinghorne FRS and Richard Holloway FRSE, former Bishop of Edinburgh, as well as Michael Frayn. I will chair the session, which will focus on the ethical problems faced by all the physicists who worked to develop the atom bomb, and the way they reacted to these problems.

I hope that the discussion will not only look back over fifty years of history but will also consider the future. Fortunately world leaders have finally decided that serious efforts should be made to reach a world free of the threat of nuclear annihilation. The quotation at the end of this brochure from Barack Obama's Inaugural Address is a hopeful sign.

Sir Joseph Rotblat



Sir Joseph Rotblat (1908 – 2005) was a nuclear physicist and a tireless worker for peace. When he and his creation, the Pugwash Conferences on Science and World Affairs were jointly awarded the 1995 Nobel peace prize, some newspapers identified him only as a “little known” physicist. But scientists in many disciplines, and officialdom in many countries, knew him well.

Rotblat was born to a Jewish family in Warsaw, Poland. He studied nuclear physics in Warsaw, obtaining his doctorate in 1938.

An invitation to spend a year as Oliver Lodge fellow at Liverpool University saved his life. He worked there with Professor James Chadwick, who had been awarded the Nobel prize for physics for discovering the existence of neutrons. Rotblat left Poland two days before Hitler invaded his country. Otherwise one of the most extraordinary scientific careers of the 20th century would have been lost. Tragically, his wife Tola could not join him and perished in the Holocaust.

In the year 1939 came the discovery of nuclear fission in uranium and Rotblat himself subsequently worked on fission, briefly in Warsaw and later in Liverpool, where certain basic experiments were carried out into the feasibility of an atomic bomb. Inevitably, with the entry of the United States into the second world war in 1941, and the subsequent move to develop the A-bomb, he soon found himself at the centre of the Manhattan Project at Los Alamos, New Mexico.

Like a minority of the scientists involved, he was concerned then about the morality of working on a weapon of mass destruction, but convinced himself that the apparent danger of a German bomb justified it. However, unlike those other scientists, as soon as this danger had clearly disappeared he left the project and returned to Liverpool University to resume his post as a lecturer, and then senior lecturer, in the physics department and director of research into nuclear physics.

In 1950 he became professor of physics at London University’s St Bartholomew’s Hospital Medical College. He remained in the post until 1976 – then becoming emeritus professor. During those years his professional career was devoted to the application of nuclear physics to medicine.

But Rotblat’s real life’s work was summed up by Bertrand Russell in his autobiography: “He can have few rivals in the courage and integrity and complete self-abnegation with which he has given up his own career (in which, however, he still remains eminent) to devote himself to combating the nuclear peril as well as other, allied evils.”

Adapted from the Guardian obituary, 2 September 2005



“

Joseph Rotblat was a truly visionary leader... who did not succumb to panic or despair, and worked persistently to make people and politicians understand the pernicious futility of the arms race”

Mikhail Gorbachev

THE STRANGEST DREAM

**He walked away from the Bomb –
but lived in its shadow the rest of his life.**

The Strangest Dream

THE LIFE OF SIR JOSEPH ROTBLAT, NUCLEAR PHYSICIST AND PEACE CAMPAIGNER

When the U.S. government brought the world's greatest scientists together to build the first atomic bomb, nuclear physicist Joseph Rotblat was among them. But his conscience would not allow him to continue, and he became the only member of the Manhattan Project to leave on moral grounds.

Branded a traitor and spy, Rotblat went from designing atomic bombs to researching the medical uses of radiation. Together with Bertrand Russell he helped create the modern peace movement and eventually won the Nobel Peace Prize.

The Strangest Dream tells the story of Joseph Rotblat, the history of nuclear weapons and the efforts of the Pugwash Conferences on Science and World Affairs – an international movement Rotblat co-founded – to halt nuclear proliferation.

With the end of the Cold War, the fear of imminent nuclear catastrophe faded, but about 27,000 warheads remain, and more nations are racing to join the nuclear club.

The first Pugwash conference took place in the small Nova Scotia fishing village from which it draws its name. This film brings to light the group's behind-the-scenes role in defusing some of the tensest moments of the Cold War.

The story takes us from the site of the first nuclear test, in New Mexico, to Cairo, where contemporary Pugwash scientists meet under the cloud of nuclear proliferation, and to Hiroshima, where we see survivors of the first atomic attack. Featuring interviews with contemporaries of Rotblat, members of the Pugwash movement and passionate public figures including Senator Romeo Dallaire, *The Strangest Dream* demonstrates the renewed threat.



ABOUT THE FILMMAKER

Eric Bednarski is a Halifax-based filmmaker who has studied in Europe and North America. His films have screened on Danish and Polish television, internationally at festivals, and at the State Museum of Auschwitz-Birkenau and the Museum of Polish Jewish History in Warsaw. Like *The Strangest Dream*, his earlier films display a passion for history. *Postcard from Auschwitz* (2003) tells the wartime story of a relative sent to the notorious concentration camp, while *MDM* (2005)

explores how ideology and architecture came together to create a controversial Warsaw neighbourhood in post-war Communist Poland. *The Strangest Dream* is his first project with the Canadian National Film Board.

Copenhagen

COPENHAGEN IS AT THE ROYAL LYCEUM THEATRE UNTIL 9 MAY 2009. www.lyceum.org.uk



Royal Lyceum Theatre

Copenhagen is Michael Frayn's gripping drama in which the mysterious actions of German physicist Werner Heisenberg in 1941 are intensely analysed and questioned. Michael Frayn's play is a fictional exploration of a real-life meeting between Heisenberg and his old friend and mentor Nils Bohr and the enormous significance their discussion may have held for the world. Years after the event, their ghosts debate the true meaning of the encounter and try to understand exactly what happened that night.

Having collaborated in laying down the guiding principles of quantum physics in the 1920s, the two men found themselves on opposite sides of the Second World War. Led by Heisenberg, Germany rushed to create a bomb. But did Heisenberg really want to put the atom bomb in Hitler's grasp? If so, why did he come to Copenhagen and consult freely with Bohr, his half-Jewish colleague?

Thus emerges a fascinating portrait of the lives and work of these two men. Driven to explore the boundaries of science, they were also placed by history in a time when their work could (and would) cause suffering and horror. With Bohr's perceptive wife Margarethe alongside them, the scientists try to decipher what Heisenberg hoped to achieve and the implications of their meeting in Copenhagen.

Michael Frayn's play is by no means the first dramatic response to nuclear weapons. Brecht's play *Life of Galileo* (1945, with many subsequent revisions) was informed by the development of the atom bomb, using Galileo's conflict with the Catholic Church regarding Copernicus' heliocentric model of the solar system as a paradigm for scientists' responsibility.

Friedrich Dürrenmatt's 1962 satirical play *The Physicists* is set in a Swiss sanatorium, where three nuclear physicists (called Einstein, Möbius and Newton) are inmates. They are closely monitored by the staff : a setting not so different from Farm Hall!

"A drama about physicists has to be paradoxical. It cannot have physics as its goal, only its effects. The content of physics concerns the physicists, its effects concerns all people. What concerns all, only all can solve." (from the epilogue of *The Physicists*)

Michael Frayn's 1998 play *Copenhagen* was influenced by the Farm Hall reports:

Heisenberg's strangest dream (from *Copenhagen*):

"But, Bohr, we're not ski-ing now! We're not playing table-tennis! We're not juggling with cap-pistols and non-existent cards! I refused to believe it, when I first heard the news of Hiroshima. I thought that it was just one of the strange dreams we were living in at the time. They'd got stranger and stranger, God knows, as Germany fell into ruins in those last months of the war. But by then we were living in the strangest of them all.

Copenhagen

The ruins had suddenly vanished – just the way things do in dreams – and all at once we're in a stately home in the middle of the English countryside. We've been rounded up by the British – the whole team, everyone who worked on atomic research – and we've been spirited away. To Farm Hall, in Huntingdonshire, in the water-meadows of the River Ouse. Our families in Germany are starving, and there are we sitting down each evening to an excellent formal dinner with our charming host, the British officer in charge of us. It's like a pre-war house-party – one of those house-parties in a play, that's cut off from any contact with the outside world, where you know the guests have all been invited for some secret sinister purpose. No one knows we're there – no one in England, no one in Germany, not even our families. But the war's over. What's happening? Perhaps, as in a play, we're going to be quietly murdered, one by one. In the meanwhile it's all delightfully civilised. I entertain the party with Beethoven piano sonatas. Major Rittner, our hospitable gaoler, reads Dickens to us, to improve our English... Did these things really happen to me...? We wait for the point of it all to be revealed to us. Then one evening it is. And it's even more grotesque than the one we were fearing. It's on the radio: you have actually done the deed that we were tormenting ourselves about. That's why we're there, dining with our gracious host, listening to our Dickens. We've been kept locked up to stop us discussing the subject with anyone until it's too late. When Major Rittner tells us I simply refuse to believe it until I hear it with my own ears on the nine o'clock news. We'd no idea how far ahead you'd got. I can't describe the effect it has on us. You play happily with your toy cap pistol. Then someone else picks it up and pulls the trigger... and all at once there's blood everywhere and people screaming, because it wasn't a toy at all... We sit up half the night, talking about it, trying to take it in. We're all literally in shock."

From the *Copenhagen* Postscript:

"In the end, though, I believe that the crucial piece of evidence lies elsewhere, in a source that was denied to everyone who wrote about Heisenberg until recently – the transcripts of the Farm Hall recordings.

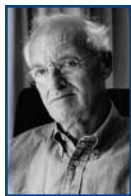
The story of Farm Hall is another complete play in itself. Sir Charles Frank, the British atomic physicist, in his admirably fair and clear introduction to the text of the transcripts that was published in Britain, regrets that they were not released in time for Dürrenmatt to make use of.

At the end of the war troops of the Alsos mission, to which Goudsmit was attached, made their way through what was left of the German front line and located the remains of the German reactor at Haigerloch, with the intention of finally reassuring themselves that Germany would not be able to spring some terrible nuclear surprise at the last moment. They also seized the team of scientists themselves, making a special armed sortie to Urfeld, in Bavaria, to collect Heisenberg from his home. Hechingen, the nearby town where the team was based, and Haigerloch itself were in the French sector. The scientists were abstracted secretly, from under the noses of the French, and brought back to Britain, where they were held, under wartime laws and without anyone's knowledge, in a former Intelligence safe house – Farm Hall, near Cambridge.

The intention seems to have been partly to prevent their passing on any atomic secrets to either of our other two allies, the Russians and the French; partly to forestall any discussion of the possibility of nuclear weapons until we had completed and used our own; and partly, perhaps, to save Heisenberg and the others from the alternative solution to these problems proposed by one American general, which was simply to shoot them out of hand.

They were detained at Farm Hall for six months, during which time they were treated not as prisoners but as guests. Hidden microphones, however, had been installed and everything they said to each other was secretly recorded. The existence of the transcripts from these recordings was kept as secret as that of the prisoners. General Groves, the head of the Allied bomb programme, quoted from them in his memoirs (1962), and Goudsmit plainly had access to them, which he drew upon in his book on Alsos, but the British Government, perhaps to protect the feelings of the former detainees, some of them now prominent in post-war German science, perhaps merely out of its usual pathological addiction to secrecy, continued to block the release of the papers themselves. Even Margaret Gowing was refused access when she wrote her official history of British atomic policy in 1964, and David Irving was refused again, in spite of strenuous efforts, for *The Virus House* in 1967. The ban was maintained until 1992, when the Government finally gave way to a combined appeal from leading scientists and historians.

The German originals are lost, and the translation was plainly done under pressure, with little feeling for colloquial nuance, but the transcripts are direct evidence of what Heisenberg and the others thought when they were talking, as they believed, amongst themselves. The ten detainees represented a wide range of different attitudes. They ranged from Walter Gerlach, the Nazi Government's administrator of nuclear research, and Kurt Diebner, who had been a member of the Nazi party, to Max von Laue, who had been openly hostile to the regime, who had never worked on the atomic programme, and whose inclusion in the party seems on the face of it mysterious. Their conversations over the six month period reflect a similarly wide range of attitudes and feelings. The general tone is pretty much what one might expect from any group of academics deprived of their liberty without explanation and cooped up together. There is, as one might suppose, quite a lot of complaining, scheming, and mutual friction."



Photograph courtesy of Eamonn McCabe

Michael Frayn was born in London in 1933. He began his career as a journalist – first as a reporter on the Guardian, then as a columnist for the Guardian and the Observer. He has written 16 plays, including *Noises Off*, *Copenhagen*, *Democracy*, and most recently *Afterlife*. He has also translated for the theatre, mostly from the Russian, and written a number of screenplays, including *Clockwise*, starring John Cleese. He has published ten novels, including *The Tin Men*, *Towards the End of the Morning*, *Headlong*, and *Spies*, and two works of philosophy, *Constructions* and *The Human Touch*. *Copenhagen* was first produced at the National Theatre, in 1998, directed by Michael Blakemore, who subsequently directed the New York and Paris productions. The play won numerous awards, including the Evening Standard Best Play Award in London, the Tony in New York, and the Prix Moliere in Paris. The film version, produced in 2002 by the BBC and KCET, Los Angeles, was directed by Howard Davies.

Operation Epsilon

Character	Reader
Narrator	Ida Thompson
Patrick Blackett	Michael Atiyah
Walter Gerlach	Max Ruffert
Otto Hahn	Friedrich Hirzebruch
Werner Heisenberg	John Finney
Carl Friedrich von Weizsäcker	John Polkinghorne

The text of the reading is an adaptation by Michael Atiyah and Jan McDonald from the original Farm Hall reports. The words ascribed to the characters are essentially their own, with the exception that Gerlach is also given some of the words of the other German scientists at Farm Hall. The reading is directed by Muriel Romanes.



Die Farmhall der Familie Towgood in Godmanchester bei Huntingdon - Okt. 1945.
Aufenthalts: 3. Juli 45 bis 2/3 Jan. 46. Gezeichnet von Erich Bagge

The Farm Hall of the Towgood family in Godmanchester near Huntingdon – October 1945.
Residence: 3 July 1945 – 2/3 January 1946. Drawn by Erich Bagge.

Biographies



Sir Michael Atiyah OM PPRS PPRE (1929 –) British mathematician. Lecturer, Cambridge 1957-1961. Savilian Professor of Geometry, Oxford, 1963 – 1969. Permanent member, Institute for Advanced Study, Princeton, 1969-1972. Royal Society Professor, Oxford, 1973-1990, Cambridge, 1990 – 1997. Master of Trinity College, Cambridge, 1990 – 1997. Since 1997 Honorary Professor at the University of Edinburgh. Fields Medal 1966, Abel Prize (with I. Singer) 2004. Many other mathematical prizes, honorary doctorates, memberships of learned societies etc. President of Pugwash, 1997 – 2002.



Patrick Blackett OM CH PPRS (1897 – 1974) British experimental physicist, who worked on cloud chambers, cosmic rays and paleomagnetism. Pioneer of operational research. Worked at Cambridge, Birkbeck College, London, Manchester and Imperial College, London. Awarded 1948 Nobel Prize in Physics. Advised the Government on the development of the nuclear bomb during the war. His 1948 book “Military and political consequences of atomic energy” was a very sceptical account of Western nuclear policy. Life peer 1969.



John Finney (1943 –) Emeritus Professor of Physics at University College London, with scientific research interests in disordered condensed matter, particularly water. He began working with Pugwash and Joseph Rotblat in the late 1990s and is currently Chairman of the British Pugwash Group and a member of both the Council and Executive Committee of International Pugwash. In addition to ‘straight’ science, he has written on the social responsibility of scientists, nuclear waste problems and Rotblat’s work in nuclear physics. He has been Chairman of the WMD Awareness Programme since its inception in 2002.



Werner Heisenberg ForMemRS (1901 – 1976) German physicist. Pioneer of quantum mechanics, formulated the “Heisenberg uncertainty principle”. Göttingen 1923 – 1924, Copenhagen 1924 – 1932, Professor at Leipzig University 1927 – 1941. Nobel Prize in Physics 1932. In 1941 appointed Professor of Physics at the University of Berlin and Director of the Kaiser Wilhelm Institute for Physics. Director of the Max Planck Institute of Physics and Astrophysics Göttingen 1946 – 1958, Munich 1958 – 1970. Many honours and distinctions.



Friedrich Hirzebruch ForMemRS (1927–) German mathematician. Institute for Advanced Study Princeton 1952 – 1954. Dozent in Munster 1954-1955. Professor in Bonn 1956 – 1993. Founding Director of the Max Planck Institute for Mathematics in Bonn 1980. President of the European Mathematical Society 1990 – 1994. Member of many academies, including the US National Academy of Sciences, the French Academy of Sciences and the Russian Academy of Sciences. Major national and international awards, including the Pour le Merite , the Wolf Prize and the Cantor Medal of the German Mathematical Society.



Otto Hahn ForMemRS (1879 – 1968) German chemist, a pioneer of radioactivity and radiochemistry. Professor at Berlin University 1910 – 1934. At the Kaiser Wilhelm Institute for Chemistry in Berlin 1912 – 1948, Director 1928 – 1946. The collaboration with Lise Meitner 1907 – 1938 included the discovery of element 91, called protactinium. (Element 107 is called hahnium, and element 109 is called meitnerium). The 1939 Hahn-Strassmann paper on the splitting of uranium was interpreted by Frisch and Meitner as nuclear fission. Awarded the 1944 Nobel Prize for Chemistry in 1945. Founding President of the Max Planck Society 1948 – 1960.



Rev. Dr. John Polkinghorne KBE FRS (1930 –) was Professor of Mathematical Physics at Cambridge 1968 – 79, working in theoretical elementary particle physics. He then resigned to train for priesthood in the Church of England. After five years in the parochial ministry, he returned to Cambridge, first as Dean of Trinity Hall and then as President of Queens' College, retiring in 1996. He gave the Gifford Lectures at Edinburgh in 1993 and is the author of many books on science and theology.



Carl Friedrich von Weizsäcker HonFRSE (1912 – 2007) German nuclear physicist and philosopher. From 1929 to 1933, Weizsäcker studied with Heisenberg and Niels Bohr. In the 1930's, worked with Hans Bethe on nuclear processes and fusion in stars. Director of the department for theoretical physics in the Max Planck Institute for Physics in Göttingen 1946 – 1957. Professor of philosophy at the University of Hamburg 1957 – 1969. From 1970 to 1980, he was head of the "Max Planck Institute for the Research of Living Conditions in the Modern World" in Starnberg. He researched and published on the danger of nuclear war. After his retirement in 1980 he became a Christian pacifist.



Richard von Weizsäcker (1920–), the President of the Federal Republic of Germany 1984 – 1994, is a brother of Carl von Weizsäcker. In fact, a quote from President von Weizsäcker's celebrated 1985 speech commemorating the 40th anniversary of the end of the war was used in the 1991 letter to the British Government seeking the release of the Farm Hall transcripts. The letter is reproduced later in this booklet.



Max Ruffert (1964 –) German applied mathematician, specializing in numerical simulations of collisions of neutron stars and black holes. Worked at the Max Planck Institute for Astrophysics in Munich, the Stewart Observatory at the University of Arizona, Tucson, and the Institute of Astronomy, Cambridge.



Walter Gerlach (1889 – 1979) German physicist who codiscovered space quantization in a magnetic field, the Stern-Gerlach effect (for which Stern was awarded a Nobel Prize in 1943). Professor at the Goethe University Frankfurt, Tübingen and the Ludwig Maximilian University in Munich (of which he was rector 1948-1951). In 1944 Gerlach was head of the physics section of the Reichsforschungsrat (Reich Research Council) and Bevollmächtigter (plenipotentiary) of nuclear physics.



Muriel Romanes is one of the most well-known and respected artists in Scottish theatre, having worked for over 30 years as an actress and director. She is the Artistic Director of Stellar Quines Theatre Company. She has also been an Associate Director at Edinburgh's Royal Lyceum Theatre and has directed several acclaimed productions for the company including *A Streetcar Named Desire*, *Lavender Blue*, *If Only*, *The Prime of Miss Jean Brodie* and *Anna Karenina*.



Jan McDonald FRSE FRSAMD, Honorary Professorial Research Fellow and Dean of Faculties, University of Glasgow. Vice President (Arts and Humanities) of the Royal Society of Edinburgh, 2005-8. During her tenure of the Arnott Chair of Drama (1979-2005) in the Department of Theatre, Film and Television Studies at Glasgow University, she served as Senate Assessor on the University Court, Governor of the Royal Scottish Academy of Music and Drama, and chaired the Drama Committee of the Scottish Arts Council and the Panel for Music and the Performing Arts of the Arts and Humanities Research Board. Her principal research interests lie in nineteenth- and early twentieth-century British theatre history.



Richard Holloway FRSE (1933–) Between 1959 and 1986, he was curate, vicar and rector at various parishes in England, Scotland and the USA. He was Bishop of Edinburgh from 1986, and was elected Primus of the Scottish Episcopal Church in 1992. He resigned from these positions in 2000, and is now regarded as one of the most outspoken and controversial figures in the Church, commenting widely on issues concerning religious belief in the modern world. He is well-known for his support of liberal causes, including campaigning on human rights for gay and lesbian people in both Church and State. From 1990 to 1997, he was a member of the Human Fertilisation and Embryology Authority, and held the position of chair of the BMA Steering Group on Ethics and Genetics. Currently chair of the Scottish Arts Council and Sistema Scotland.

EPSILON

1st May to 30th December, 1945

This document is of historical interest
and must not be destroyed.

TOP SECRET

Farm Hall, 1945

From the introduction to "Operation Epsilon: The Farm Hall Transcripts" (ed. Sir Charles Frank FRS, Institute of Physics, 1993)

"Ten German scientists (Bagge, Diebner, Gerlach, Hahn, Harteck, Heisenberg, Korsching, von Laue, von Weizsacker and Wirtz), variously connected with Atomic Energy research, were detained, incommunicado, in Farm Hall, Godmanchester, fifteen miles from Cambridge, through July to December, 1945: a period covering the nuclear bombing of Hiroshima on August 6th, 1945. The 24 weekly Farm Hall reports, here reproduced for the first time in their entirety, contain the translations of their clandestinely recorded conversations. These are generally known as the Farm Hall Transcripts, though they only include one transcript in the strict sense, material transcribed from the recordings, in the original language, namely the Appendix to FH.5.

How their detention came about has been described in Samuel A Goudsmit's book ALSOS and in R V Jones' introduction to its second edition (New York: Tomash/American Institute of Physics co-publication 1983). Throughout the work on the Manhattan Project directed by Major General Leslie R Groves, leading to the production of 'atomic' bombs in America, those engaged saw themselves as in a race with the Germans who had a head-start since nuclear fission had been discovered by Hahn in Germany at the end of 1938. The ALSOS mission (Greek "ΑΛΣΟΣ: a sacred grove) under the scientific leadership of Goudsmit was charged with following closely behind the Western Allied invading forces in 1944 to locate and seize personnel, documents and material concerned with the German Atomic Bomb programme. Though the evidence collected by November 1944 was enough to convince Goudsmit that there was no German Atom Bomb in the making, there continued to be many, particularly in America, who would not believe it, and the mission continued with much the same target, at least for Intelligence purposes. These ten individuals were selected by Goudsmit from among those picked up, mostly at Hechingen, by an Anglo-American raiding party which had made its way through a gap in the crumbling German front, under the leadership of Colonel Boris T Pash, the principal military officer of ALSOS. Hechingen is on the Eastern edge of the Black Forest, and it was there that the greater part of the Kaiser Wilhelm Institut für Physik, in particular with its uncompleted nuclear reactor 'pile', had been relocated after being bombed out from Berlin.

Once they had been taken, what was to be done with them must have been the subject of much high-level transatlantic discussion. Any action, whether to release any of them, or to arrest more, or even to admit their existence, could focus attention on atom bombs at a time when two kinds were almost ready for test in America. Holding them in France was slightly embarrassing: they had been taken from a part of the front overrun by the French forces and France itself had interests in atomic energy. One American general even suggested that the simplest solution was to shoot them. It was R V Jones who pointed out that Farm Hall, Godmanchester, in England, which belonged to the British Secret Service, was now free, and would be a suitable place to house them.



Farm Hall, 1945 *(continued)*

He also suggested that microphones should be installed there before they arrived. This had become standard practice with senior prisoners-of-war. Experience had shown that their private conversations could be more revealing than interrogation. Any ethical doubts about this had faded during five years of war. These people, all civilians of course, were distinguishable from prisoners-of-war but they were formally employed in an organization classified as 'important for war' (kriegswichtig) under the overall authority of Reichsmarschall Göring.

The greatest fascination in these conversations lies in the insight they give into the minds of ten individuals, each weighing for himself a variety of competing loyalties, to humanity, to science, to his country and duty, to his group, to his family, to his amour propre and to his career: with knowledge of a truly terrible weapon to give importance to their thoughts. One must regret that this material was not released while Duerrenmatt was available to make it into a play. One may wonder whether in the hands of sufficiently skilful actors these conversations could be successfully enacted on the stage: and the answer must presumably be 'only to an audience of physicists'; with its main dramatic climax lying concealed in Heisenberg's seminar – and he not always the plainest of – even von Laue found some difficulty in following him (FH5). The reader, at least, may be able to find the sympathy to follow the drama in his own mind, recognizing that thoughts unspoken were no less important than what was said.

As a coda to the Farm Hall story and some relief to the growing tedium of detention, came the news on 16 November 1945 of the award to Hahn, the discoverer of nuclear fission, of a Nobel prize: which was duly celebrated that evening with a dinner (FH18 and its Appendix). Captain Brodie calls von Laue's speech on this occasion 'unfortunate'. In fact it was virtually the same speech as he would have made at short notice for this ceremonious occasion in any other circumstances, and naturally it mentioned Hahn's wife. This reminded them all of the families from which they were separated, and evoked some tears. This embarrassed Captain Brodie, whose efforts to maintain communications between them and their families had been less successful than could have been wished. (I am sorry that AD1 (Science), Air Ministry, had not been asked to help in this: I think we could have done better.) However, sentimental sadness was presently submerged in the kind of light-hearted intellectual humour characteristic of German academics. It is a pity von Weizsacker did not produce a Schüttelreim for the occasion (or if he did, it escaped the record). He used to be able to compose one at the drop of a hat."

In his memoirs Otto Hahn wrote:

"Without exaggeration one could consider our life in England as luxurious. Breakfast consisted of cornflakes or porridge, bacon and eggs, marmalade, toast and butter. For lunch or dinner we had rumpsteaks or other meat and quite often chips. No wonder that we all rapidly gained weight ... Entertainment and education were served by a rather good library. Apart from the radio we often listened to Heisenberg playing Beethoven sonatas on the piano. Major Rittner would sometimes read Dickens to us in the afternoon, to improve our English."



*The listening team.
From left to right: Lehmann, Pulay, unknown, unknown, Ganz, Rittner, Heilbronn, Brodie.*

The listening team from the Combined Forces Detailed Interrogation Centre in a 1945 photo, which was reproduced in both "The Farm Hall Transcripts" (IOP, 1993) and "Hitler's Uranium Club" (by Jeremy Bernstein, 2nd edition, Copernicus 2001) with the caption in reverse order (sic). Major Rittner is the senior figure 3rd from right. 'Heilbronn' (2nd from right) is Hans Heilbronn FRS (1908-1975) who subsequently became Professor of Mathematics at Bristol and Toronto. The joint Bristol University-GCHQ Heilbronn Institute for Mathematical Research (Director: Professor Elmer Rees FRSE) is named after him. 'Ganz' (4th from right) is Peter Ganz (1920-2006) who subsequently became Professor of German Languages and Literature at Oxford.

Both Ganz and Heilbronn were German Jewish refugees. The Independent obituary (15 September, 2006) of Ganz states that "In 1945 he was one of the young Germans employed at Farm Hall, near Cambridge, recording the conversations of the German scientists who were interned there."

Major Rittner's Report from Farm Hall

The operation has been successful to date in that,

- (1) The professors have been detained for over ten weeks without any unauthorised person becoming aware of their identity or place of detention, and.
- (2) They have, with considerable difficulty, been kept in a good frame of mind.

The following are brief character sketches of the professors

VON LAUE A shy mild mannered man. He cannot understand the reason for his detention. He has been extremely friendly and is very well disposed to England and America.

HAHN A man of the world. He has been the most helpful of the professors and his sense of humour and common sense has saved the day on many occasions. He is definitely friendly disposed to England and America.

HEISENBERG He has been very friendly and helpful and is, I believe, genuinely anxious to cooperate with British and American Scientists although he has spoken of going over to the Russians.

GERLACH Has a very cheerful disposition and is easy to handle. He appears to be genuinely cooperative.

HARTECK A charming personality and has never caused any trouble. His one wish is to get on with his work. As he is a bachelor, he is less worried than the others about the conditions in Germany.

DIEBNER Outwardly very friendly but has an unpleasant personality and is not to be trusted. He is disliked by all the others except BAGGE.

VON WEIZSÄCKER A diplomat. He has always been very friendly and cooperative and I believe he is genuinely prepared to work with England and America but he is a good German.

WIRTZ An egoist. Very friendly on the surface but cannot be trusted. I doubt whether he will cooperate unless it is made worth his while.

BAGGE A serious and very hardworking young man. He is completely German and is unlikely to cooperate. His friendship with DIEBNER lays him open to suspicion.

KORSCHING A complete enigma. He appears to be morose and surly. He very rarely opens his mouth. He has, however become more human since his arrival in England

14 July 1945

The release of the Farm Hall reports, 1992



The Royal Society

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From the President
to Michael Stiguh, F.R.S.

20 December 1991

Dear Lord Mackay

We are writing, as historians and scientists, to ask you to approve the release to the Public Record Office of a 46 year-old document of great historical importance.

At the end of the war, the leading German scientists who had been concerned with plans for atomic weapons were captured and interned at Farm Hall, near Cambridge. They included W Heisenberg (now dead) and C F von Weizsacker (the brother of the German President). The house was "bugged", and their conversations were recorded. The transcripts include, in particular their reaction to the news of the dropping of the first atom bomb on Japan.

These "Farm Hall transcripts" have so far been withheld from public access, though their existence has been acknowledged. Their historical interest arises, in part, because there still is controversy about the role of the scientists in the German atomic-energy project. Some historians and some journalists claim that moral scruples prevented the German scientists from completing a nuclear weapon. A few extracts from the transcripts have appeared (in translation) in books, e.g. by General Leslie Groves and Professor S A Goudsmit, but they are out of context, and it is impossible to check their accuracy. It is desirable to release the transcripts while four of the members of the German group, as well as some who knew the German scientists personally, are still alive. They could make useful comments, but they are all of advanced age.

We note that, in correspondence with one of us, none of the four surviving Farm Hall scientists objected to the release of the transcripts. We also remember the words of the German President, Richard von Weizsacker, in a speech on 8 May 1985: "We need, and we have the strength to look truth straight in the eye without embellishment and without distortion... anyone who closes his eyes to the past is blind to the present."

We therefore urge you to reconsider your ban, under the Public Records Act, on the release of the German transcripts and their English translation, and if still in existence, of the original recordings.

Yours sincerely

President of the Royal Society

President of the British Academy

Lord Blake, FBA

Lord Bullock, FBA

Lord Dacre of Glinton, FBA

Sir Sam Edwards, FRS

Lord Flowers, FRS

Sir Charles Frank, FRS

Professor Margaret Gowing, FBA, FRS

Professor R.V. Jones, FRS

Lord Kearton, FRS

Professor N. Kurti, FRS

Sir Ronald Mason, FRS

Professor Robert O'Neill, FASSA

Sir Rudolf Peierls, FRS

Professor A. Roberts, FBA

Lord Zuckerman, FRS

The Rt Hon. Lord Mackay
Lord Chancellor's Department
House of Lords
London SW1A 0PW

FROM THE RIGHT HONOURABLE THE LORD MACKAY OF CLASHFERN



HOUSE OF LORDS.
LONDON SW1A 0PW

13 February 1992

Dear Michael,

You and a number of interested colleagues wrote to me in December last year asking the Government to consider again the question of the release of the Farm Hall transcripts. I am sorry that it has taken so long to let you have a substantive reply.

I am informed that the tapes themselves no longer exist but the transcripts and their English translation have certainly survived. I know that there has been a deep continuing academic interest in these transcripts over the years and I am pleased to be able to tell you that, following one of the regular re-reviews of such intelligence-related material, arrangements have now been made for their release. This will be announced in a brief press statement by the Public Record Office this Friday, 14 February. You may be interested to note that the transcripts have been assigned to class WP 208, piece number 5019, and that they will be available from tomorrow for public inspection at the Public Record Office at Kew.

Once again, I am sorry you have had to wait so long for an answer, but I hope you will agree with me that this news is worth the wait.

I am copying this letter to the President of the British Academy.

*Yours ever,
John.*

Sir Michael Atiyah
President
The Royal Society
6 Carlton House terrace
LONDON
SW1Y 5AG

Lord Mackay FRSE was Lord Chancellor in 1992.

The nuclear threat today



Henry Kissinger, Former US Secretary of State

Nuclear weapons today present tremendous dangers, but also an historic opportunity. U.S. leadership will be required to take the world to the next stage – to a solid consensus for reversing reliance on nuclear weapons globally as a vital contribution to preventing their proliferation into potentially dangerous hands, and ultimately ending them as a threat to the world.

Letter to the Wall Street Journal January 4, 2007 by GEORGE P. SHULTZ, WILLIAM J. PERRY, HENRY A. KISSINGER and SAM NUNN and others



David Miliband, UK Foreign Secretary

The huge and complex challenges posed by the global economic crisis are producing a concerted, international response. Yet, at the same time, we cannot afford to lose sight of other pressing strategic challenges facing the world, including the question of nuclear weapons.

Today, we face new risks within a new nuclear context. Nuclear power is one of the energy sources more countries are likely to turn to in order to reduce carbon emissions while meeting rising energy demand. As a result, the technologies and materials for making nuclear weapons may become more widely dispersed, potentially raising the dangers of them falling into the wrong hands.

A world without nuclear weapons, Guardian, 8 December, 2008



John Holdren, Assistant to the US President for Science and Technology

We all live under one atmosphere, on the shores of one global ocean, our countries linked by flows of people, money, goods, weapons, drugs, diseases, and ideas. Either we will achieve an environmentally sustainable prosperity for all, in a world where weapons of mass destruction have disappeared or become irrelevant, or we will all suffer from the chaos, conflict, and destruction resulting from the failure to achieve this.

From the Nobel Peace Prize acceptance speech on behalf of Pugwash, 10 December, 1995



Barack Obama, President of the United States

With old friends and former foes, we'll work tirelessly to lessen the nuclear threat and roll back the specter of a warming planet.

From the Inaugural Address, 20 January, 2009

Acknowledgements



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