L'Entente Cordiale

A hundred years of the British Section of La Société des Ingénieurs et Scientifiques de France

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By
La Société des Ingénieurs et Scientifiques de France
(British Section)

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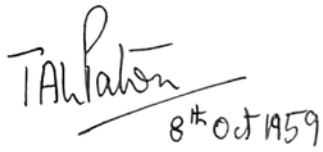
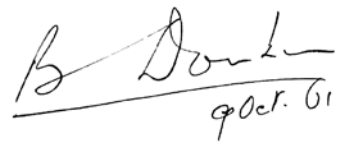
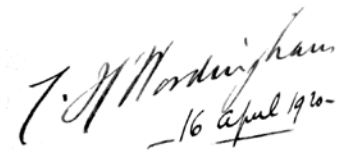
A Apostol – President 1958



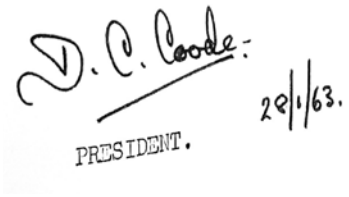
A Paton– President 1959



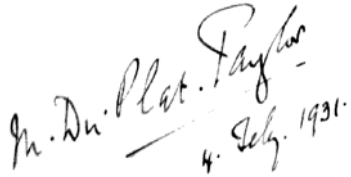
B Donkin – President 1961



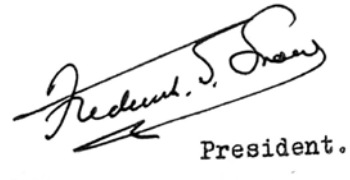
CH Wordingham – President 1919-1920



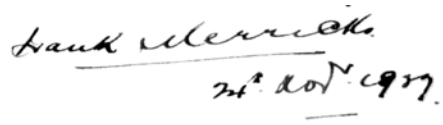
D C Coode – President 1962



F M G Du-Platt-Taylor – President 1931-1933

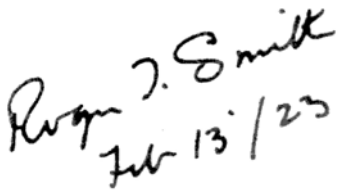


F Snow – President 1955



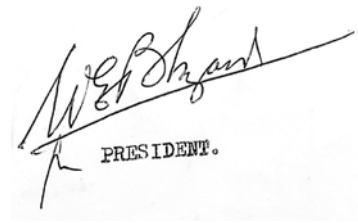
Frank Merricks – President 1928-1929

L A Legros– President 1924-1925

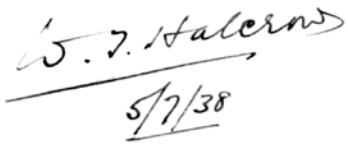


R T Smith – President 1923

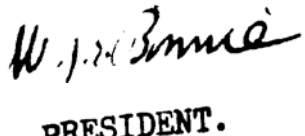
T J Gueritte – President 1921



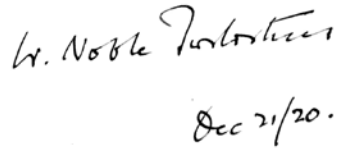
W E Blizard – President 1954



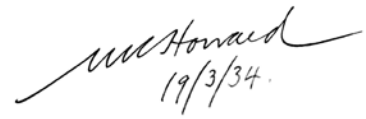
W Halcrow – President 1938-1939



W J E Binnie– President 1940-1945



W Noble Twelvetrees – President 1922



W R Howard – President 1934

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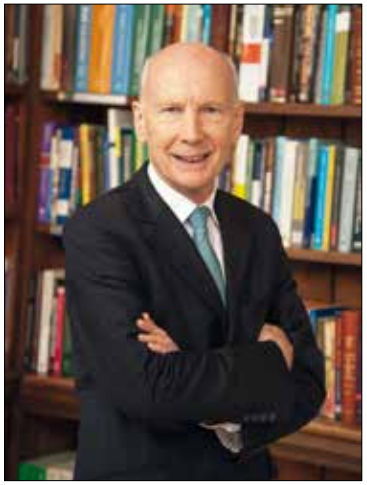
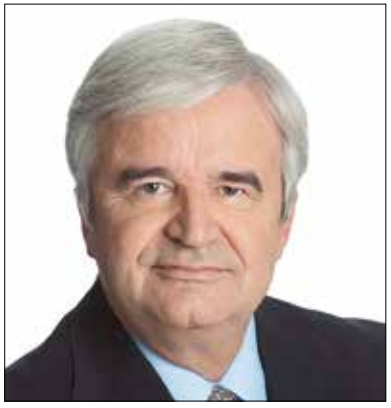


It is a huge privilege and honour to be the Patron of the British Section of the Ingénieurs et Scientifiques de France (IESF). I have been very struck by the way in which the Société always has interesting and broadly based meetings and lectures, and by its friendly and distinguished membership drawn from the top echelons of engineering. It is especially good that these occasions are attended by spouses and partners to share in the camaraderie and enjoyment. A special feature of the Société is its annual Voyage d'Etude to a place of interest in France.

It is remarkable to reflect that the British Section of the National Council of Engineers and Scientists of France was founded 100 years ago in June 1919 by members of the British Army returning from the Great War who wished to maintain links with their wartime colleagues in France. The Société has continued with this original ambition to establish a close relationship professionally and socially between its members and their French colleagues.

Britain and France have enjoyed close engineering and scientific dialogue since Napoleon's time. The first President, Eugéne Flachat, of the Société Centrale des Ingénieurs Civils (created in 1848, the forerunner to the IESF) was a student of George Stephenson and was responsible for the first French railway lines. And there have been numerous examples of French/British collaboration ever since. When I visit engineering projects throughout the world I often encounter outstanding French and British engineers working together. The activities of the British Section of the IESF celebrate and encapsulate this. Long may this close cooperation and major influence on the world's science and engineering continue to thrive.

FOREWORD BY MARC VENTRE – PRĒSIDENT, IESF



One hundred years is a very special milestone in the life of an association, so I wanted to wish a happy anniversary to all our British colleagues. The British Section of IESF is one of the most ancient and probably the most active of our sister associations from around the world. Be sure that we will be, in our heart, close to you, if not physically, on the 1st of July. Whatever happens on the political arena, we will stay close to each other and continue to promote the importance of scientists and engineers to shape the world!

INTRODUCTION BY RICHARD COACKLEY CBE – PRESIDENT OF THE BRITISH SECTION, 2019

Professional engineers and scientists are involved in some of the most amazing and important projects. Little did they know what life had in store for them when they studied their chosen subjects. Their life partners knew even less of what they were getting involved with and some of the major, in some cases fundamental, contributions they would play in the success of the delivery of those projects.

Life's wonderful patina, the interests and connections between people, lead to unexpected discoveries, and to challenges to the views and the different paths which we follow. This is especially so when people from different countries are involved, where different backgrounds, geography, schooling, and government structure, lead to different thinking, decisions and outcomes.

The British Section of the French Society of Engineers and Scientists encompasses and reflects many of these aspects in its own history and development.

As we celebrate our first one hundred years and consider and challenge our "raison d'etre" and what IESF might mean for future engineers and scientists it is worthwhile to reflect, to capture and record some key activities of our Society, our members, their projects and their thinking.

Our parent body, the French Society of Civil Engineers was created on 4th March 1848. Our British Section was created just after the First World War in 1919 by three Ingenieurs des Arts et Manufactures, the Marquis de Chasseloup-Laubat, Mr T.J.Guéritte and Mr Herman Sloog, and formally approved at a Council meeting in Paris on 27 June 1919 in the presence of Herman Sloog, our first Honorary Secretary.

At that time financial and moral support was being provided by British people through their home towns and villages towards the reconstruction of towns and villages in France.

Our founder members were very much involved in support of this ethos and commitment between our two nations. There was considerable effort in cultural and technical exchange. French orchestras and chamber groups would tour the UK providing French music concerts. Our French civil engineer colleagues would be invited to tour the UK to inspect engineering works and new factories. Our British civil engineers would visit reconstruction work in France, and thereby create the birth of our Voyages d'Etude.

Membership rose gradually to over 200 between the wars and technical meetings increased from one to two a year at that time to four a year some time after the Second World War.

Many technical meetings were joint meetings with other Institutions and Societies in London with lectures being held at their premises and given by senior professionals in their field. Many French engineers of repute travelled from France to deliver papers at such meetings. The field of topics covered was vast, including matters of moment such as the latest developments and understanding of reinforced concrete, in which members of our Society played a key part.

Our French parent body expanded its horizons in 1978 to include professional scientists and become the formal registration body for French engineers and scientists.

Our British Section followed suit in broadening its professional membership and now comprises a diverse group with a special interest in our relationship with France and our French colleagues.

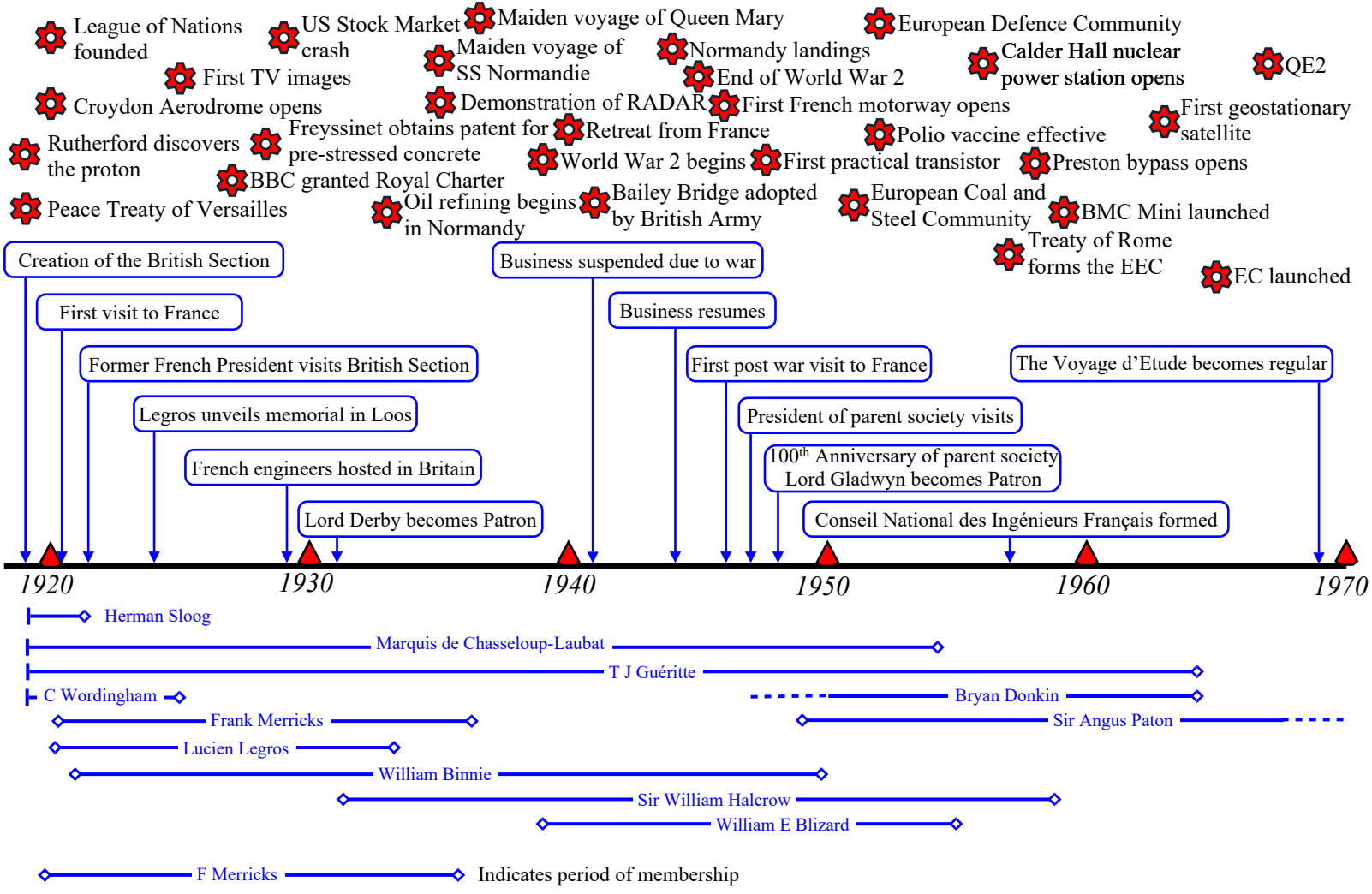
Partners of our members have long been an integral part of our Society, with social and dining events being considered an important occasion for information exchange. More recently a mini Voyage has been added to our annual events around the May Bank holiday to join the President's technical visit and the Autumn Voyage D'Etude. Alongside these the creation of the Amis class of membership and a "partners and amis" event has broadened our annual events and outlook.

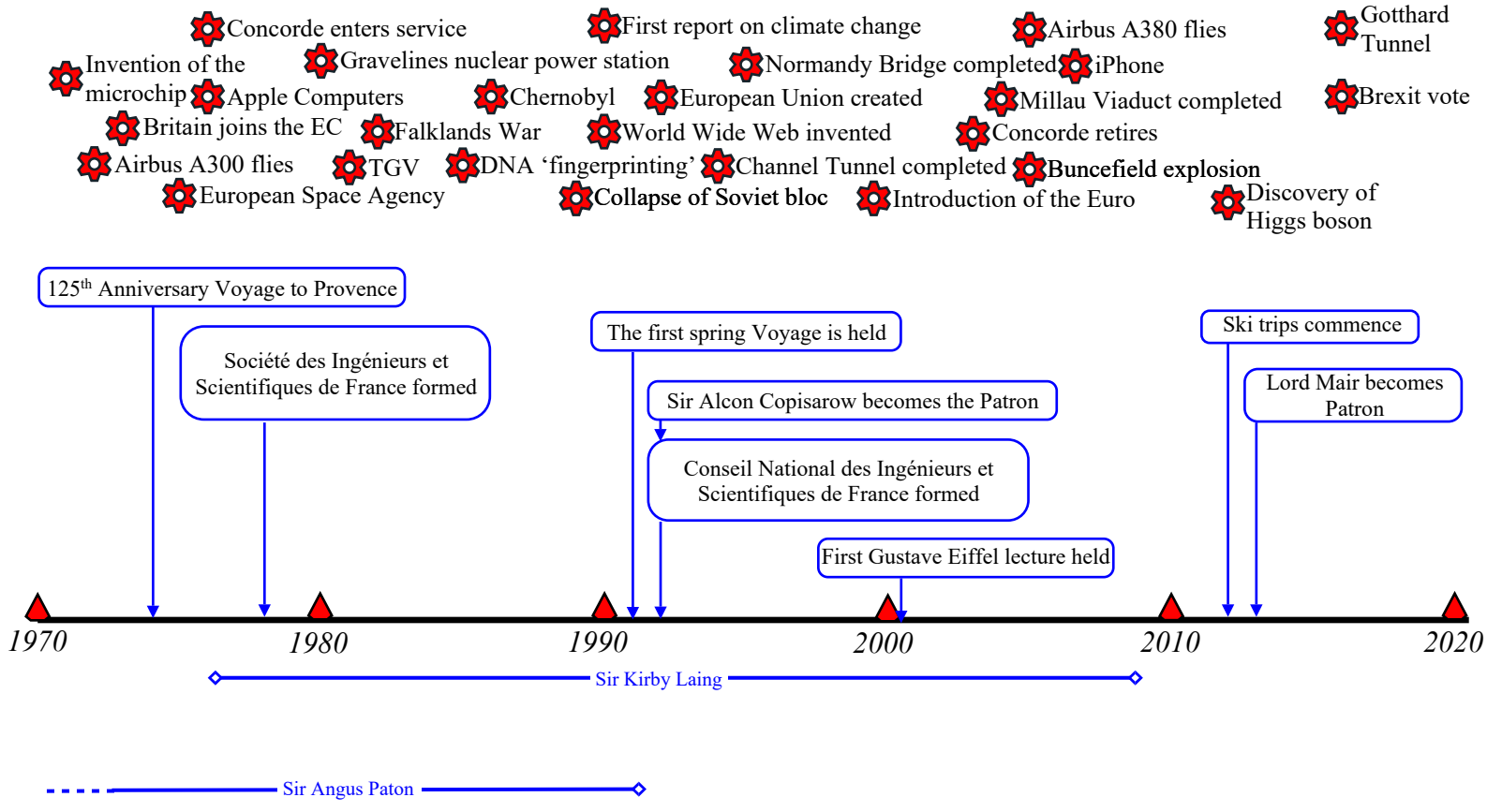
There have been many members who have made time at the top of their careers and professional fields to be involved with and hold Presidential and senior positions in the Society. It is instructive and humbling to begin to understand the world in which they lived and delivered spectacular outcomes for the major projects, programmes and tasks that they masterminded or in which they have been key players.

Our aim is to shed light on the creation of our Society and on the past achievements of our members, and, with the knowledge of the past, help to make us better engineers and scientists, at the same time fostering international relations into the future.

I would like to thank all those who have contributed to the book, including fellow members of the editorial team, John Beck and Liz and Ray Jefferson. By far the main contribution in archive research, collection of material and writing, is down to the efforts of Liz and Ray. Thank you also to the Institution of Civil Engineers (ICE) Library and Archives team, Carol Morgan and Annette Ruehlmann, for their help in retrieving and assisting with information gathering.

It's instructive to note that during the first hundred years of our Society, when relationships between the UK, Europe and France have naturally ebbed and flowed our professional relationship between countries has remained strong. Long may this continue. Vive l'entente cordiale!


League of Nations founded
US Stock Market crash
Maiden voyage of Queen Mary
European Defence Community
First TV images
Maiden voyage of SS Normandie
Normandy landings
Calder Hall nuclear power station opens
QE2
End of World War 2
Croydon Aerodrome opens
Demonstration of RADAR
First French motorway opens
First geostationary satellite
Rutherford discovers the proton
Freyssinet obtains patent for pre-stressed concrete
Retreat from France
Polio vaccine effective
World War 2 begins
First practical transistor
Preston bypass opens
BBC granted Royal Charter
Peace Treaty of Versailles
Oil refining begins in Normandy
Bailey Bridge adopted by British Army
European Coal and Steel Community
BMC Mini launched
Treaty of Rome forms the EEC
EC launched
Creation of the British Section
Business suspended due to war
First visit to France
Business resumes
Former French President visits British Section
First post war visit to France
The Voyage d'Etude becomes regular
Legros unveils memorial in Loos
President of parent society visits
French engineers hosted in Britain
100th Anniversary of parent society
Lord Gladwyn becomes Patron
Lord Derby becomes Patron
Conseil National des Ingénieurs Français formed
1920
1930
1940
1950
1960
1970
Herman Sloog
Marquis de Chasseloup-Laubat
T J Guéritte
C Wordingham
Bryan Donkin
Frank Merricks
Sir Angus Paton
Lucien Legros
William Binnie
Sir William Halcrow
William E Blizard
F Merricks
Indicates period of membership



A TIMELINE OF THE BRITISH SECTION

1. THE ORIGINS OF THE BRITISH SECTION

"... we must not forget the heroism of our allies and associates in helping France to secure this peace. The committee was interested in the possibility of strengthening the already friendly ties that bind our society with our colleagues in allied countries. On the suggestion of one of our English colleagues, Mr. Sloog, and after agreement with him, the creation of a section in England was decided upon. The proposal received the firm approval of the Ministry of Foreign Affairs."

In reflecting on the origins of the French and, subsequently, the British forbears of what became the Société des Ingénieurs et Scientifiques de France (IESF), there is little doubt that the establishment of both manifestations of the Société followed periods of great trauma and upheaval in the history of Europe. In studying its origin, it is instructive to examine the societal background and seminal moments of the time.

The 1848 Revolution in France saw the removal of the Orléans monarchy and the proclamation of the French Second Republic. This was one of numerous popular uprisings across Europe in that year. The Second Republic lasted until the declaration of the Second Empire in 1851 and saw the official adoption of the motto *Liberté, Égalité, Fraternité.*

This was an era of widespread political and social turmoil in France with tension between *La République démocratique et sociale* and a radical progressive liberal form of republicanism. But across continental Europe, it also heralded the gradual emergence of more democratic systems of government. The earlier French Revolution of 1830 had seen the end of absolute monarchy under the Bourbons and, consistent with the zeitgeist, had established a more liberal constitutional monarchy under the Orleans dynasty, one of many similar regime changes of the period.

These were at once exciting and potentially dangerous times, but it was in this febrile climate of liberalisation that clubs sprang up in all professions. French engineers created the Société Centrale des Ingénieurs Civils on 4th March 1848. The first Président was Eugène Flachat, who with his half-brother, Stéphane Mony, was responsible for the first French railway line from Paris to St Germain constructed between 1833 and 1835. They also built the Paris-Versailles Right Bank railway. Flachat went on to build the first railway station in Paris, Gare Saint-Lazare, in 1851. It is interesting to note that he had been a student of George Stephenson, underlining at an early stage the shared technical heritage and two-way exchange of knowledge between Britain and France.

Over the succeeding decades, the French organisation grew and flourished, attracting engineers dedicated to the advancement of the art and science of engineering and the development and sharing of knowledge.

The outbreak of the First World War was directly triggered by the assassination in June 1914 in Sarajevo of Archduke Franz Ferdinand of Austria by a Bosnian-Serb nationalist. It was the culmination of a complex web of contributing factors that made war almost inevitable. Analysts, looking back, struggle to explain why two loose alliances of rival powers, Russia, France and Britain on

the one hand and Austria-Hungary and Germany on the other, came into such ultimately devastating conflict but all cite militarism, imperialism, nationalism and the power vacuum created by the breakdown of the Ottoman Empire, upsetting the balance of power. The tangled web of alliances and suspicions, coupled with the fact that the Kaiser's Germany was militaristic and expansionist, complete the picture.

The war was a brutal affair, accounting for some 37 million civil and military casualties, killed or wounded, across Europe over the four years to 1918. It changed the face of society. Half a million British men under thirty died, leading to coining of the phrase the 'lost generation'. The gaps in the old school photographs or the church pews, the presence in communities of thousands of widows or single women who never married, were a constant reminder of those who had never returned.

To digress for a moment, the loss of life in Britain was disproportionate and focussed on particular parts of the country, for example from the 'Pals' battalions of Bradford and Liverpool, men joining up alongside their friends and neighbours, as well as in the Scottish regiments. It is noteworthy that the 17th Earl of Derby, as Director General of Recruiting, had organised one of the most successful recruitment campaigns to Kitchener's army in Liverpool, with over 1500 joining up in just two days. Over the next three days three more 'Pals' battalions were raised in Liverpool. (The ancestral home of Lord Derby was and remains to this day Knowsley Hall, Lancashire just a few miles north of Liverpool)

Lord Derby became the first Patron of CNISF British Section sometime between 1931 and 1941.

The cost in lives, property and infrastructure damage in France was far greater, with whole villages, entire communities obliterated from the map. Whilst Britain had seen 750,000 soldiers killed, France had lost some 1,400,000.

Although the Armistice was signed on 11 November 1918, bringing the hostilities to an end, it took six months of Allied negotiations at the Paris Peace Conference to conclude the peace treaty. The **Treaty of Versailles** was the most important of the various treaties and ended the state of war between the Allied powers and Germany. It was signed on 28 June 1919.

On 27 June 1919, the eve of the signing of the Treaty of Versailles, a meeting of the ***Société Civils de France*** took place in 19 rue Blanche, Paris. An extract from the notes of that meeting, suitably abridged, is set out below:

'We are on the eve of a major event that is shortly before an important date, among the most important in the history of mankind.

It is indeed tomorrow that will be signed at the Palace of Versailles, the peace that the victorious allies have imposed on the people responsible for the most terrible catastrophe that has ever overwhelmed the world.

What will this peace be? What will it be worth to what extent will it meet our expectations? Let's hope first, and this will be the first of the blessings of peace, that it renders to the spirits disorientated by five years of war, by effort, worry and anguish, an interlude of balance, tranquillity and calm. The second benefit of peace is that we can now enter a period of industrial and economic renaissance and future prosperity.

However, we must not forget the heroism of our allies and associates in helping France to secure this peace. The committee was interested in the possibility of strengthening the already friendly ties that bind our society with our colleagues in allied countries. On the suggestion of one of our English colleagues, Mr. Sloog, and after agreement with him, the creation of a section in England was decided upon.

The proposal received the firm approval of the Ministry of Foreign Affairs.

Accordingly, at the initiative and upon the proposal of three engineers, the Marquis de Chasseloup-Laubat, TJ Gueritte and Herman Sloog, the British section of the French Society of Civil Engineers was approved by the Committee. Herman Sloog became the first Honorary Secretary of the British section.

Thus, out of tragedy and conflict emerged something valuable, forged in the heat of battle, of allies working together.

In the establishment of the British section there was clear recognition of the contribution of the allies during the war. There was a shared determination and a recognition that there was an urgent need to re-build shattered economies and infrastructure. Equally, there was huge desire amongst British engineers to offer as much assistance to their French counterparts in this endeavour as possible. In this respect, by the efforts of Herman Sloog and later his colleagues, great success was achieved initially by visits to devastated districts of France.

There were several developments in France over the succeeding years, with the creation in 1929 of the Fédérations des Associations et Sociétés Françaises d'Ingénieurs Diplômés (FASFID), an association of past engineering students. 1948 saw the arrival of the Union des Associations et Sociétés Industrielles Françaises (UASIF), bringing together French learned societies, until in 1957 the Conseil Nationale des Ingénieurs Françaises represented French engineers as a whole.

In 1978, UASIF amalgamated with ICF to become the Société des Ingénieurs et Scientifiques de France (ISF). In 1992, FASFIC, CNIF and ISF, now the three major engineering organisations in France amalgamated to form Conseil National des Ingénieurs et Scientifiques de France (CNISF), becoming Ingénieurs et Scientifiques de France (IESF), apparently viewed as a more 'commercial' title, by decree of the Ministry.

Overall membership in France is estimated currently at around one million, across a very broad range of scientific and engineering disciplines.

IESF in France is the French member of FEANI (Fédération European des Associations Nationales d'Ingénieurs) and WFEO (World Federation of Engineering Organisations). It publishes a directory of Professional Engineers to act as a reference guide, but also as protection against misuse of the term 'Engineer'.

The British Section has sought in recent years with some success, to diversify its membership, mirroring the parent body, to embrace the scientific professions, departing from the original dominance of civil engineers but at the same time, mirroring the methods by which modern projects are delivered – and indeed the way today's industry and commerce are conducted – by multi-disciplinary teams.

Thirteen other *sections* étrangères were created in Europe, Africa and the Americas over the succeeding decades, for example, in Belgium, Denmark, Argentina (amazingly) and quite recently, South Africa, but are not regarded currently as fully functioning entities of IESF.

The British Section is limited to a maximum membership of 300 but has operated for many years with around 150-160. Links between the British Section and IESF in Paris have ebbed and flowed over the years but the centenary of the British Section presents an opportunity to re-affirm the value of working together to achieve common goals in society.

List of Foundation Members

The following list, whilst not definitive, is the best approximation to the names of those active or elected to the British Section of the Société des Ingénieurs Civils de France in its first year.

Surname	Forename(s)/ Initial(s)	Notes
Barnhill	J	Londonderry
Bergmann	H E	Gloucester
Bernon	M	London
Bewsher	J Nixon	Yorkshire
Bilbie	J	London
Bion	M J	London
Brotherhood	S	Peterborough
Bunny	J M	London
Champin	P	London
Charlet	M	London
Chasseloup-Laubat	Marquis Louis de	Representative of the Parent Society
Codet	L	London
Delano	William H	London
Dieny	P	Membre Sociétaire
Doig	W	London
Duittoz	E	London
Fell	G Noble	London
Fiander-Etchells	I	London
Garde	L de la	London
Gérard	M E	London
Gornick	R	London
Griffiths	A	London
Gros	F	London
Guéritte	Alfred Tony Jules	London
Hadfield	Sir Robert	London. Membre d'Honneur
Harrap	G T	London
Hoover	H	London
Hopper	J Russell	Epsom
Howard	Walker Robert	London
Hunt	E F	London
Husband	J	Sheffield
Imbault	G C	Darlington
Jarny	M de	London
Jouve	A	London
Kamm	L	London

Surname	Forename(s)/ Initial(s)	Notes
Kaylor	E	Manchester
King	Charles R	Bristol
Knap	C	London
Lachlan	W	London
Lange	F	London
Legros	L A	London
Lisle	A	Redcar
Lynde	G C	Ashton-upon-Mersey
Martin	N	Wolverhampton
Matthews	E	London
Mérindol	F	Bath
Mosman	M C G	London
Neilson	R M	Glasgow
Norton	A	London
Oates	R	London
Parsons	H B C	London
Parsons	H	Wallsend on Tyne
Picard	A	London
Pierres	G de	London
Pierret	C	London
Poliakoff	V de	London
Queneau	A	Newcastle on Tyne
Reincke	L	London
Revy	J	London
Robinson	M	London
Roch	C	London
Routkowsky	M de	London
Sampaïo	C	London
Sauvée	A	London
Savill	E	Caterham Valley
Sloog	H	London
Smith	R T	London
Stanger	R Harry	London
Stonebridge	A	Membre Sociétaire
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Twelvetrees	R	Wellington
Tyrwhite	S	Monmouth
Vallenet	E	
Vésian	J S E de	London
Waite	S	London
Westcott	J T	Bournemouth
Wooley	W E	London
Wordingham	C H	London

2. A BRIEF HISTORY OF ENGINEERING IN BRITAIN AND FRANCE

"The practical application of the electric telegraph began life in Britain in 1837, and by 1851 a submarine telegraph was successfully laid between Dover and Cap Griz Nez by John and Jacob Brett (even though a French fisherman thought it was a kind of seaweed and had severed the link! – armour plating of the cable soon followed). John Brett was subsequently asked by the French Emperor to install a link between Corsica and Algiers, which he did successfully."

Introduction

It is now 100 years since the British Section of what became the Ingénieurs et Scientifiques de France was proposed in 1919. A century of shared interests and involvement has achieved much in the way of fellowship and understanding during that period. However the French and the English have been getting along together (or not) over a much longer period, and it is interesting to view the events of the last century in their longer context.

In a recent book about engineering, David Blockley defined the activity as 'the art, science, and craft of changing a dream into a reality through conception, feasibility, design, manufacture or construction to operation and eventual decommissioning of something that fulfils a human need'. Since the beginnings of mankind there have always been human needs of course and, although not specifically named as such, engineering and its associated processes therefore have a very long history indeed. In ancient times, gold, copper and tin were smelted and the wedge, the lever and the wheel were developed. The structures and buildings of ancient Egypt, Greece and Rome also required considerable engineering skill.

However, this chapter aims to give an outline of Anglo-French relationships in engineering over a somewhat shorter timescale, exploring how each country has influenced the other in the period up to the Second World War. Of course there have been many other international influences on the development of engineering over the years, but those influences are largely outside the scope of this work.

The Norman Conquest and After

The circumstances of European geography have made it inevitable perhaps that there should be a continuing mutual interest or antagonism between Great Britain and its near neighbours on the continent. This includes the case of France, where an on-off relationship has coloured history for a millennium.

The Norman conquest of England in 1066 was the result of William of Normandy claiming what he considered to be his rightful throne. As a consequence England became an integral part of an Atlantic seaboard kingdom which, by the thirteenth century, extended from the Scottish borders in the north to Gascony and the Pyrenees in the south.

The migration of ideas which inevitably followed is well illustrated by the spread of Gothic architecture from the continent. Gothic structures involved considerable engineering experiment and experience, particularly with the building methods needed to support tall structures and vaulting. Perhaps the first fully Gothic structure was the Abbey Church of St Denis near Paris, constructed from 1137, which led to eighty cathedrals and 500 churches

being built in that style in France during the twelfth and thirteenth centuries. In England the approach was first taken up in the choir of Canterbury Cathedral, which was begun in the year 1175 under the guidance of the French master builder, William of Sens. The French Gothic influence was important across the whole of northern Europe of course, although the English adaptations of the style were particularly fruitful, leading to the innovations of the decorated and perpendicular periods. Nevertheless, French influence was critical in the creation of England's legacy of great religious buildings from the middle ages.

The very names of those involved in construction (and what we would now call engineering) during this period reflects the union between England and France and the fact that French was then the language of the upper classes. Ailnolth, who worked on the Tower of London at the end of the twelfth century was described as an *ingeniator*, and one of the prime movers in the construction of the Welsh castles under Edward I was called Richard Lenginour. Edward was himself active in founding new towns in France and brought that expertise to England, for example in the creation of Winchelsea after 1280, where the *bastide* and harbour there owed much to Itier of Angouleme, an experienced Gascon planner.

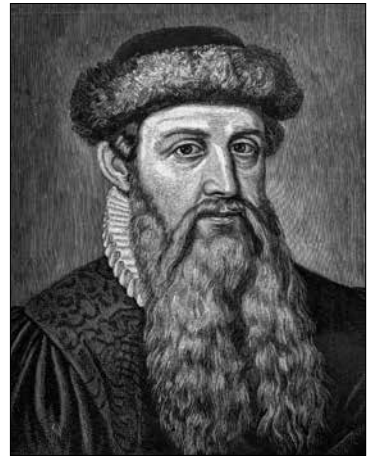
2.01 The nave of Canterbury Cathedral

The Hundred Years War

As with subsequent conflicts, the so called 100 Years War of the 14th century stimulated engineering innovation as the English and French royal families disputed over territory. Cannons were first used by Edward III at the siege of Calais in 1345, and their increased use inevitably led to a greater demand for gunpowder. This in turn led to new developments in chemistry, metallurgy, mechanical engineering and surveying. Also during this time the guild system was developing which took responsibility for the training and regulation of craft skills, and which can be seen as a forerunner of the modern professional institutions.

15th and 16th Century German Influences

In 1454, in the free city of Mainz, Johannes Gutenberg perfected the printing process using movable type. The consequent publication of books (hundreds in England alone in the first quarter of the sixteenth century) undoubtedly led to a major increase in the spread of ideas between countries. Many of the texts had a religious intention, although scientific subjects were also included. For example, by 1540 Biringuccio in Venice had published the first comprehensive book on metallurgy which was published in both English and French editions.



2.02 Johannes Gutenberg

This was a period of German influence in engineering matters. Burchard Kranich was granted a patent in 1563 to drain British mines and was the first person to use water power to crush tin and copper ore in Cornwall. Also around that time Joachim Hochstetter came to England with six other German industrialists to develop other mines. In 1564 German capitalists were active in exploiting English copper ores, and rich deposits near Keswick were worked from 1571 by Daniel Hochstetter. Other Germans established the Mineral and Battery Works which exploited zinc bearing deposits in Somerset, setting up a brass foundry in 1568. German miners were also employed in the lead mines of Yorkshire and the silver mines of Durham.

Restoration Developments

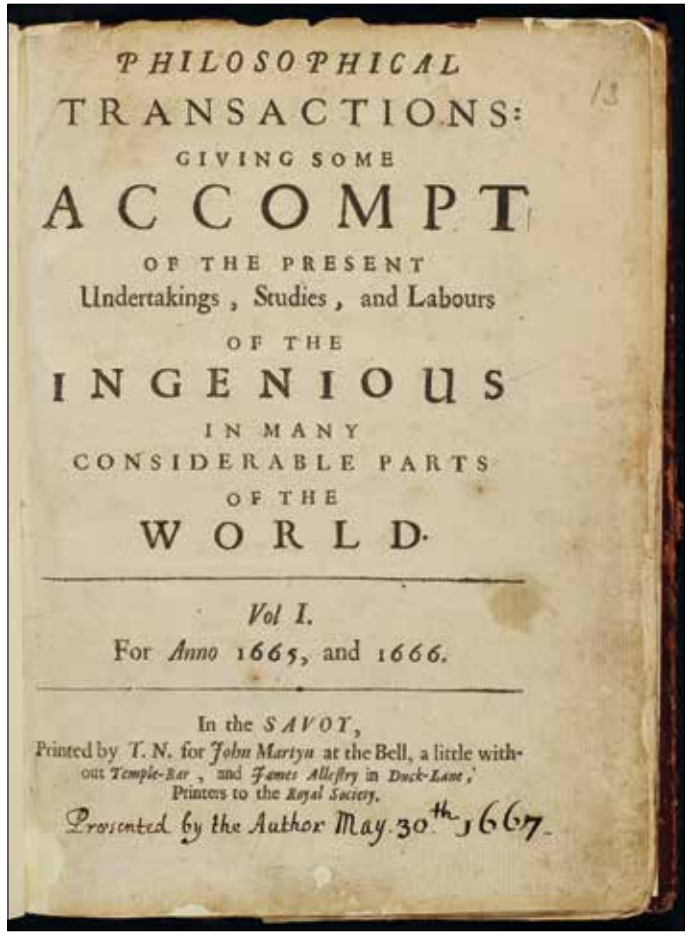
Following the English Civil Wars and the restrictions of the Cromwell era, Charles II took an interest in the promotion

of scientific knowledge and granted a charter to the Royal Society in 1662. As early as 1670 a deputation from the Society visited France and was treated to an account of how considerable obstacles had been overcome to allow the Canal du Midi to make a connection between the Atlantic and the Mediterranean. The Society published the first scientific journal in the English-speaking world – its Philosophical Transactions. This launched an effective way of spreading information and knowledge that became the norm in the modern era.

Another Hundred Years of War

From the end of the seventeenth century France and England entered into a period of recurring conflict interspersed with uncertain periods of peace which lasted for more than a century. This led the French to develop engineering skills linked to military defence. Sébastien Vauban was responsible for star shaped fortifications, as well as harbours and canals, and created the Corps des Ingénieurs Militaire. This was followed in 1716 by the Corps des Ingénieurs des Ponts et Chaussées. These military organisations were to have a profound effect on civilian arrangements later.

The eminent administrator and civil engineer Daniel-Charles Trudaine set up what became the École des Ponts et Chaussées in 1747 while Pierre Tresaguet invented


PHILOSOPHICAL
TRANSACTIONS:
GIVING SOME
ACCOMPT
OF THE PRESENT
Undertakings, Studies, and Labours
OF THE
INGENIOUS
IN MANY
CONSIDERABLE PARTS
OF THE
WORLD.

Vol I.
For Anno 1665, and 1666.

In the SAVOY,
Printed by T. N. for John Martyn at the Bell, a little without Temple-Bar, and James Allestry in Duck-Lane, Printers to the Royal Society.
Presented by the Author May 30th 1667

2.03 Title page of the Philosophical Transactions

2.04 Sebastien Vauban

new methods of road building while working in the Limousin district of France. Jean-Rodolph Perronet, the first director of the nascent Ēcole des Ponts et Chaussées built many stone arch bridges including the Pont-Sainte-Maxence over the Oise in northern France, where he used a water wheel to power the 2,000 lb rammer of his pile driver. One of his pupils, Emiland Gauthey, became Inspecteur-General des Ponts et Chaussées and pioneered many experimental structural methods. It was his nephew, Claude-Louis Navier who went on to become the founder of modern structural analysis and developed the Navier-Stokes equations with George Stokes which became important in the advance of fluid mechanics.

French achievements in civil engineering were meanwhile having an impact in Britain. In 1753 the Duke of Bridgewater had viewed the Canal du Midi for himself. It encouraged him to engage the services of James Brindley to build a canal from the coal mines on the Duke's estate in Worsley to Manchester which, when it opened in 1761, halved the cost of coal in that city. This helped trigger the extensive canal building era in England which was such an important stimulus to the industrial revolution.

During the Seven Years War (1756-1763) between Britain, France and others, a soldier and industrialist named John Holker (who had escaped from prison in Newgate, incarcerated there because of his Jacobite

2.05 James Brindley with the Barton Aquaduct in the background. Painted by Francis Parsons 1770

sentiments) slipped away to France and persuaded Daniel-Charles Trudaine that he could bring the textile industry in Rouen up to British standards. He not only succeeded in this but also established a works for the production of

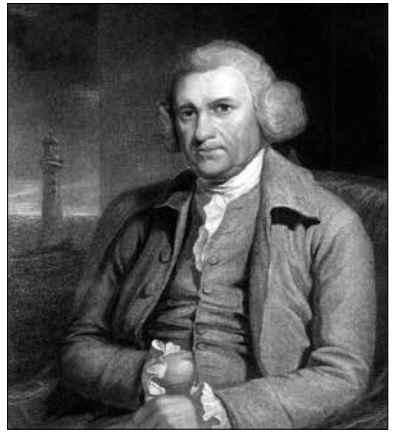
2.06 The Bridgewater canal at Worsley

sulphuric acid, a key ingredient in the bleaching process. Holker was in effect one of the world's first industrial espionage agents.

Meanwhile, engineering innovation really began to accelerate in Britain in the second half of the eighteenth century as the industrial revolution got underway. Abraham Darby had already succeeded in using coke to smelt iron ore at Coalbrookdale giving a boost to the ironworking trades. Then John Smeaton and James Watt made improvements to Newcomen's engine and steam power began to replace many water driven wheels in mills. Matthew Boulton opened his Soho Manufactory in 1765

2.07 Coalbrookdale.
Painting by Philip de Loutherbourg 1801.

where the mass production of metal goods was pioneered. Richard Arkwright established his textile mill at Cromford in 1776 which proved the value of the factory system. In about 1779 Samuel Crompton perfected his cotton spinning mule which revolutionised the production of textiles, with the result that cotton eventually became the basis of the Britain's largest export industry. In the same year Abraham Darby III completed his cast iron bridge across the River Severn near Coalbrookdale, and although this did not fully exploit the tensile capability of the material, it eventually led to other examples, such as the iron lattice

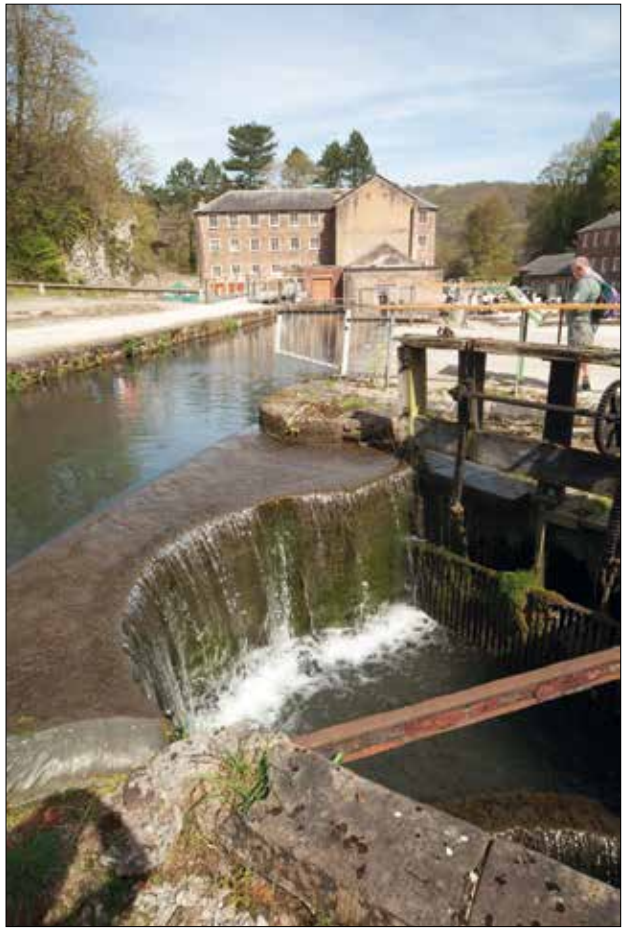


2.08 John Smeaton

2.09 Matthew Boulton

2.10 The Soho Manufactory in about 1800

2.11 Sir Richard Arkwright



2.12 Cromford Mill

2.13 Samuel Crompton painted by Charles Allingham circa 1800

structure of the elegant Pont des Arts in Paris by Alexandre de Cessart and Jacques Lavroise Dillon (1804).

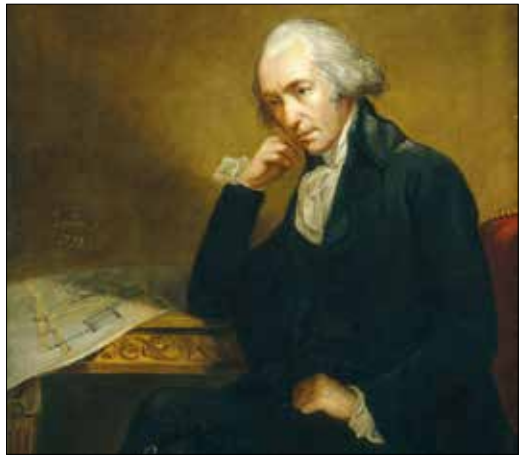
The rapidly growing wealth of Britain after the Seven Years War further encouraged the country's ruling elite to make the Grand Tour, journeying through the continent to learn about classical antiquity and the renaissance. Although primarily aimed at exploring Venice and Rome, France was often on the itinerary and many friendships were forged. British architects such as William Kent and the Adam brothers had acquired international reputations, and the English idea of redesigning (and even re-engineering) the landscape setting of country houses swept the continent, starting with France.

In the eighteenth century French engineering was mainly organised from above, often for military purposes.

2.14 Hall i'th'Wood, Bolton, where Samuel Crompton perfected his spinning mule

In Britain, engineering inventions were more likely to arise spontaneously from below. John Smeaton (who was perhaps the first Englishman to describe himself as a civil engineer) recognised the dispersed nature of engineering progress in Britain and sought to bring like-minded men together to pool their knowledge. In 1771 this led to the creation of the Society of Civil Engineers (or Smeatonian Society, still in existence). Other professional groups were also becoming organised during this period, laying the foundations for many of the institutions and organisations which uphold the standards for engineers and others today.

Smeaton was of course the engineer who successfully solved the previously intractable problem of building a lighthouse on the Eddystone reef outside Plymouth harbour, and which was followed by many commissions for him as a bridge engineer. He was also a member of the Lunar Society of Birmingham – a small group established in the 1760s interested in discussing scientific progress. There he met Joseph Priestley, Matthew Boulton and James Watt, each of whom had a son fluent in French and German able to correspond with their continental counterparts. Small scientific subscription libraries were also established across England at that time and many took French journals and proceedings to keep their readers abreast of developments.



2.15 James Watt painted by Carl Frederik von Breda

2.16 The Soho House Handsworth where the Lunar Society met

In 1775 the American War of Independence broke out between Britain and its thirteen colonies in America. France sympathised with the colonies and declared war in 1778. Britain and France were once again at loggerheads. Nevertheless, William Wilkinson (the brother of John 'Iron-Mad' Wilkinson) was invited to France by Marchant de la Houlière in 1777 to plan a large iron works to manufacture cannons at Indret, near the mouth of the Loire and linked by canal to four blast furnaces at Le Creusot. He was continuing to give similar advice in Liège some four years later despite the war.

Also while the war was in progress, Jacques-Constantin Périer (who, with his brother, had won the right to establish the first water works in Paris in 1778) visited Britain on at least two occasions to procure steam pumping engines and went to the Soho Foundry of James Watt in 1779 for that purpose. The success of these engines encouraged the brothers to set up their own manufacturing plant at Chaillot to produce copies of the Watt engine – but without paying any royalties.

The American War of Independence was settled by the Treaty of Paris in September 1783. The following month César François Cassini de Thury, the director of the Paris Observatory, wrote to the English politician Charles Fox suggesting a joint survey to determine the exact longitudinal distance between Greenwich and Paris as an aid to map making and navigation. This idea was well received by Joseph Banks, President of the Royal Society, who set about making arrangements for what was to be the start of the most comprehensive and accurate survey, leading eventually to the foundation of the British Ordnance Survey. Banks arranged for William Roy, the renowned maker of Scottish military maps, to lay out and measure a base line with great precision across Hounslow Heath. This formed the base for a triangulation exercise that ultimately crossed the Channel to link up with French observations. The whole affair took four years to complete and involved considerable liaison between English and French surveyors, particularly in the task of making observations across the Channel utilising reverberatory lamps or flares to aid the sightings required.

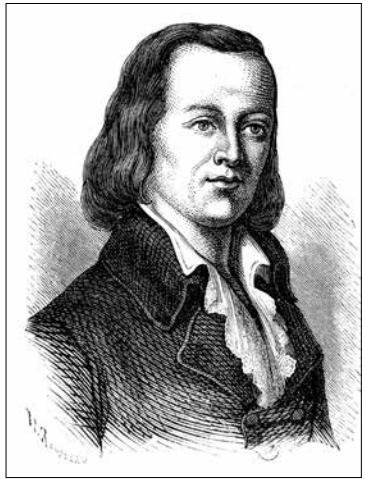
2.17 César François Cassini de Thury

After the French Revolution of 1789, France became embroiled in wars across the continent which lasted a

quarter of a century. These conflicts gave a major boost to engineering and other technologies. Being cut off from their usual suppliers, the French were forced to develop war materials from domestic sources. For example, Jean-Antoine Chaptal established a successful gunpowder factory in Grenelle. Nicolas Leblanc also showed how alkali could be produced from commonly available raw materials. His process was so successful that it found its way to England before the end of hostilities and, by 1823, was incorporated in a major plant in Liverpool by James Muspratt.

2.18 Jean-Antoine Chaptal painted by Anicet Lemonnier

In an era when the horse was the fastest means of travel Napoleon's military successes were in part made easier by an innovative communication system which eventually spread from France to England. From 1794 the brothers Claude and Ignace Chappe placed semaphore levers on towers spaced about ten miles apart which allowed messages to be sent with great speed. A similar system was copied and implemented in England to connect London to the Channel ports.



2.19 Claude Chappe

In 1794 Gaspard Monge founded the Ēcole des Travaux Publiques (later Ēcole Polytechnique) and collected men of talent about him. One of these was Charles Dupin who assisted in the construction of ports in Holland and elsewhere. After the hostilities with France ended, Dupin visited Britain on a tour of inspection between 1816 and 1819 which he wrote up in a work which became popular on both sides of the Channel called *Voyages dans la Grande-Bretagne.* He was particularly impressed with the benefits

2.20 The Chappe semaphore system being demonstrated

2.21 Statue of Claude Chappe on Boulevard Saint-Germain, Paris. (Melted down in 1941).

2.22 Charles Dupin

of educating industrial workers and the establishment of savings banks for the working man. Another product of the Polytechnique was the 'positivist' philosopher Auguste Comte, who also had an impact on Britain by influencing English thinkers such as John Stuart Mill and Herbert Spencer.

Other French initiatives of this period included a practical way of preserving food for the army and navy using heat sterilisation of bottles, developed in 1809 by a Parisian confectioner called Nicolas Appert. This was taken up in England by Bryan Donkin who went on to develop the canning process which became the ubiquitous method of long term food storage for the next 150 years. Donkin was an ancestor of the President of the British Section of the Société des Ingénieurs Civils de France in 1962.

2.23 Bryan Donkin

Reactions to War

The British response to the Napoleonic Wars included the establishment of the School of Military Engineering at Chatham, primarily to educate soldiers in siege warfare. However, the school went on to pioneer ballooning, mechanical traction, telegraphs and camouflage. Its first director, Charles Pasley, is credited with the invention of Portland cement contemporaneously with Joseph Aspdin.

Problems with the mass production of naval equipment for the war also brought an exiled Frenchman to Britain. Marc Isambard Brunel had fled France for the United States after the revolution. However, he heard about the problems of producing pulley blocks for the Royal Navy while in New York and sailed to Britain in 1799 with a practical solution. He eventually persuaded the admiralty to adopt a machine of his design which improved productivity tenfold. The Frenchman went on to develop the tunnelling shield in 1818 (subsequently improved by James Greathead and later to become so important in building the London underground railway system). With his wife Sophia, Marc also produced the famous son, Isambard Kingdom Brunel, who made so many innovations in the railway age.

Towards the end of the Napoleonic wars, John Fox Burgoyne and William Reid cut their teeth in the Spanish Peninsula campaign devising solutions to the problem of

crossing Spanish rivers with armed forces. Both achieved prominence later in the nineteenth century – Burgoyne as Inspector General of Fortifications and Reid as Chairman of the Executive Committee of the Great Exhibition of 1851.

2.24 Sir Marc Isambard Brunel painted by James Northcote circa 1812

Bridges, Canals, Roads and Railways

Even before the Napoleonic Wars the Scot, Thomas Telford, had progressed in his career to become the surveyor of public works for Shropshire. In this capacity he oversaw the construction of some forty bridges, but his first major commission was the detailed design and construction of the Ellesmere Canal in 1793 to serve the collieries and ironworks of Wrexham. He went on to transform the Scottish Highlands with hundreds of miles of new road, hundreds of bridges and numerous harbour improvements. Between 1815 and 1820 his design was used to construct a suspension bridge across the Menai Strait to Anglesey, fully exploiting the tensile properties of iron. In the latter year he was also invited to become the first president of the newly established Institution of Civil Engineers, a position to which he gave gravitas and which led to its Royal charter in 1828. He particularly stressed that the organisation should progress by the voluntary efforts of its members and not be subject to government control, unlike the situation which prevailed in France and Germany. Through his pupil Joseph Mitchell he also encouraged the habit of recording the substance of the various papers presented to the Institution.

Telford's techniques were adapted for the 'permanent way' by engineers involved in the rapid development of the railways after 1830. One of Telford's assistants, John

2.25 Thomas Telford

Benjamin Macneill, became a consulting engineer on railway construction and, as an admirer of the French engineer Claude-Louis Navier, translated his *Means of Comparing the Advantages of Different Lines of Railway* in 1836. Macneill went on to take up the first chair of civil engineering at Trinity College, Dublin in 1842.

2.26 Sir John Benjamin Macneill

2.27 Thomas Brassey in 1850

The first public railway wholly to use steam locomotives was the Liverpool and Manchester Railway of 1830, engineered by George Stephenson. This was the start of the rapid expansion of railways in Great Britain which soon spread to the continent, and worldwide. While constructing his permanent way between Liverpool and Manchester, George Stephenson was seeking a suitable source of stone for the Sankey Viaduct. This brought him into contact with Thomas Brassey who owned several quarries on the Wirral and, once the deal was done, Stephenson advised Brassey to become involved in railway construction. This was the start of a successful career as a civil engineering contractor which led Brassey to become one of the wealthiest self-made Victorians.

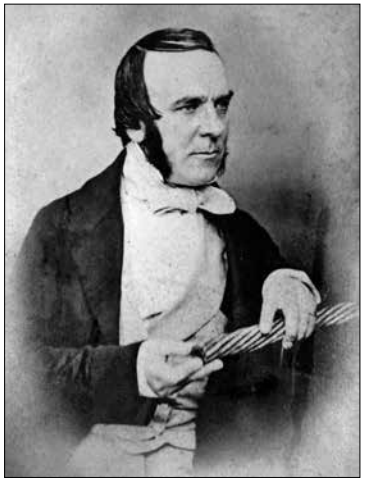
During the 1830s and 1840s Brassey won important contracts in England (e.g. the Penkridge viaduct and the Chester and Crewe Railway). Meanwhile Stephenson's pupil Joseph Locke had been appointed as the engineer on the Paris to Rouen railway. He recommended that the contracting work should be opened up to international competition and the job was awarded in 1841 to Brassey, in partnership with another contractor, William Mackenzie. Many other contracts in France followed (and indeed in many other countries in Europe, North and South America, Australia, and Asia) and he is reputed to have built three-quarters of the railway lines in France at the time of his death in 1870.

One of the few disasters in Brassey's career occurred in January 1846 when the Barentin viaduct on the Rouen to Le Havre railway line collapsed. This was built of brick to a height of 30m and the collapse occurred after a few days of heavy rain. Although uncertain, it is possible this happened because of defective lime used in the mortar, which was sourced locally, as specified in the contract. Brassey rebuilt the viaduct at his own expense using lime of his own choice.

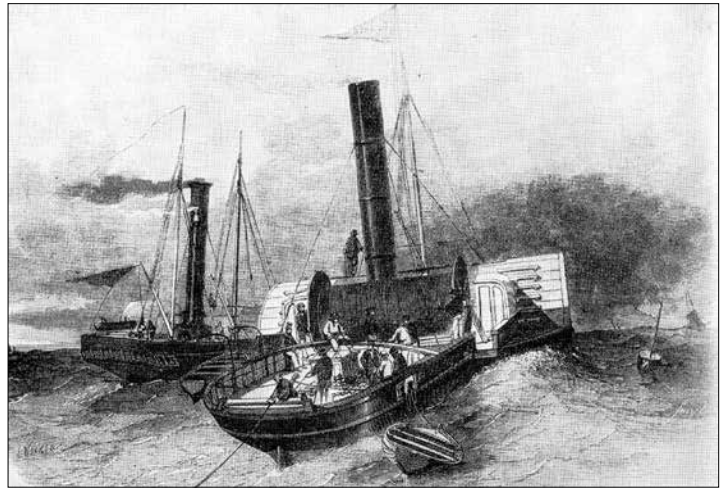
Brassey was concerned to achieve high standards of workmanship throughout his career and chose his projects with care. His example helped drive out some of the bad practices which had hitherto blighted some engineering work. Thomas Brassey was involved in activities away

from the railways, including sewerage systems and ships. He also advocated the construction of a Channel Tunnel, although that obviously came to nothing at the time.

Steam power became an essential ingredient in many engineering innovations during the nineteenth century. Railway engines are an obvious example, although steam pumps became vital in land and mine drainage, traction engines increased agricultural productivity, steam ships shrank the seas and stationary engines made factories the normal location for manufacturing tasks. However, electrical innovations were also developing. The practical application of the electric telegraph began life in Britain in 1837, and by 1851 a submarine telegraph was successfully laid between Dover and Cap Griz Nez by John and Jacob Brett (even though a French fisherman thought it was a kind of seaweed and had severed the link! – armour plating of the cable soon followed). John Brett was subsequently asked by the French Emperor to install a link between Corsica and Algiers, which he did successfully. The Channel link was in some ways a symbol of the peaceful connections which had developed between Britain and France following many years of conflict and held out the promise of continued mutual cooperation.



2.28 John Watkins Brett



2.29 The tug Goliath laying the cable to France in 1850

Education, Training and the Founding of Professional Bodies

The rapid expansion of engineering activity and the need for better education and training ultimately led to the establishment of college courses in England, although

2.30 Charles Blacker Vignoles

these were slower off the mark than in France. It wasn't until 1826 that University College London added a course in "mechanical philosophy" to its classics curriculum. In 1832 Professor William Ritchie of the University of London said he was prepared to give courses in civil engineering. The first prospectus for a course in civil and mechanical engineering was issued by Kings College in 1838. University College followed suit in 1841, appointing the bridge and railway engineer Charles Vignoles as its first chair of civil engineering. By 1859 the chair was taken by William Pole, a somewhat legendary character. He was a Fellow of the Royal Society, a doctor of music and secretary to the Institution of Civil Engineers. He wrote with authority on engineering, music and whist. Private schools were also established in this period with the College for Civil Engineers being one example, opening in 1834. This college eventually spawned the Society of Engineers in 1857.

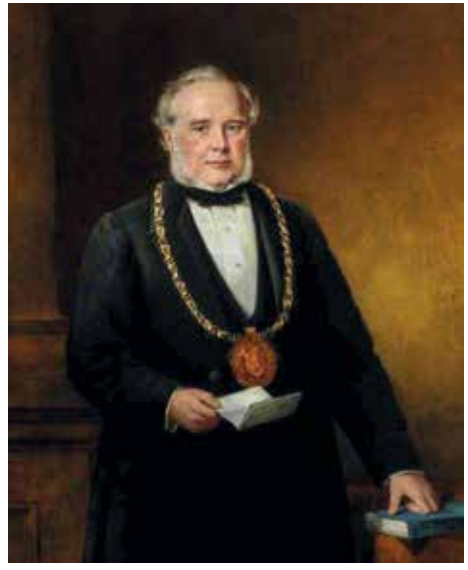
The Institution of Mechanical Engineers was founded in this period, initially stimulated by progress within the railway industry. After watching some locomotive trials on the Lickey incline, south west of Birmingham, Charles Beyer, Richard Peacock, George Selby and others launched the Institution on 27th January 1847 with George Stephenson as its first president. Samuel Smiles, an early biographer of Stephenson, alleged that the founding of the IMechE came about in part because Stephenson had been refused entry into the Institution of Civil Engineers unless he supplied a 'probationary essay as proof of his capacity as an engineer'. Needless to say there is little evidence to support this.

During the 1840s, although the French King, Louis-Philippe I, promoted friendship with Britain, the protectionist policies of his government involved high tariffs and trade barriers which resulted in shortages and high prices for imports such as textiles, machines, tools and ores. Economic links between France and Britain were curtailed and the French economy suffered. The very restricted franchise in France at the time resulted in discontent among the middle classes and ultimately to the revolution of 1848. Like his predecessor, Louis-Philippe went into exile in Britain. The incoming provisional government in France agreed to universal male suffrage and the creation of national workshops

to relieve unemployment. During this period there was a proliferation of political clubs engendered by the new freedoms of assembly, and it was against this background that French engineers founded the Société Centrale des Ingénieurs Civils (the forerunner of the IESF) in March 1848. Their first president was the railway engineer, Eugène Flachat, who, among other things had visited the Stephensons in Britain and made a study of the first Thames tunnel being constructed by the Brunels.

The Stimulus of Conflict Again

War came again in the Crimea between 1854 and 1857. This time the British and the French were allies. During the fighting the French originated the idea of armour plating for wooden ships, a tactic which worked well and which led to both British and French navies acquiring ships with iron hulls. Heavy industry was called into play to supply boilers, springs and other forgings. John Brown visited a French naval base in 1860 and returned with the idea of rolling armour plate rather than forging it. Before long he had sheathed three-quarters of the ships in the British navy. Meanwhile, concerns about the British capability to design warships led in 1864 to the foundation of the Royal School of Naval Architecture and Marine Engineering in South Kensington.



2.31 Sir John Brown when he was Mayor of Sheffield

The Crimean war also gave impetus to the work of Henry Bessemer. He was commissioned and funded by Napoleon III to work on ways to give rotation to shells to improve their accuracy. This he successfully achieved, although the projectiles he developed were unsafe to fire from the guns available at the time. As a consequence he experimented further with a reverberatory furnace to produce steel of the required quality. Pleased with the progress,

2.32 Henry Bessemer

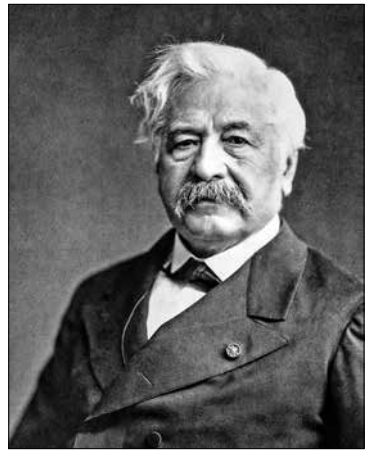
announced in Sheffield in February 1856 and led to the cheap production of steel and its general substitution for cast iron.

William Armstrong also got a stimulus from the hostilities. He had already established himself as a hydraulic engineer and was asked to design submerged mines to blow up Russian ships in the harbour of Sevastopol. This worked well and, after an incident at the Battle of Inkerman in 1854, Armstrong also proposed the development breech-loading guns to replace the muzzle loaders which were then in use. His career as an armaments manufacturer was thereby confirmed and led to the massive expansion of his company.

Napoleon ordered that such a furnace should be installed at the cannon factory at Ruelle, near Angoulême. Meanwhile, Bessemer took the work forward and devised the method of forcing air into a closed cupola to remove impurities from molten iron. The resultant 'Bessemer process' was

2.33 William George Armstrong

Immediately after the Crimean war the Indian mutiny raised the need for better communication between Britain and the Indian sub-continent. The major project likely to achieve this was a proposal to cut a canal across the Isthmus of Suez. The Frenchman Ferdinand de Lesseps obtained a concession from Egypt to construct the canal but his attempts to gather support for his idea in Britain failed because of fears that it would mean French control of the route. In the end it was mainly constructed with French money. It was said that Robert Stephenson, by then a British MP, spoke so forthrightly



2.34 Ferdinand de Lesseps photographed by Nadar

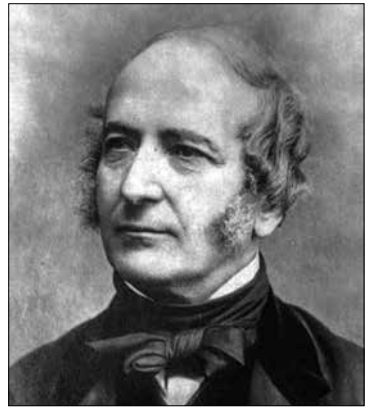
2.35 Robert Stephenson, 1856

against the canal that de Lesseps challenged him to a duel which was only avoided by the secretary of the Institution of Civil Engineers obtaining an apology. The canal finally opened in 1869 and it wasn't long before Britain managed to acquire a majority shareholding in the canal which eventually led to it becoming a neutral zone for shipping. Its creation caused a revolution in world trade and confirmed the supremacy of steam ships over sail.

Improved Education and Yet More Warfare

An International Exhibition was held in Paris in 1867 showcasing technical developments from around the world. British participants in the exhibition were disconcerted to find that scientific education in Britain had fallen behind its international rivals, particularly in Germany and France. Britain was still reliant upon empirical and observational techniques rather than those grounded in science. Cross fertilisation between disciplines was depressingly slow.

2.36 Bird's eye view of the Paris Exposition of 1867



2.37 John Scott Russell in 1847

In 1869 John Scott Russell pointed to the virtues of the French system whereby the elite of the nation were selected for the corps du génie militaire or the corps du génie civil. He advocated the establishment of fifteen technical colleges in British industrial towns. In a parallel move James Dredge, the editor of *Engineering*, collected data on the education and status of civil engineers in the United Kingdom and foreign countries for the Institution of Civil Engineers. The consequence was the growth in university colleges, often grown out of local mechanics' institutes and philosophical institutes. Foundations were made in Newcastle, Leeds, Liverpool, Manchester and Sheffield during the 1870s.

Towards the end of the nineteenth century the methods of creating large engineering structures reached maturity, exploiting the riveting techniques developed earlier by William Fairbairn and Eaton Hodgkinson. This resulted in enormous constructions such as the Forth Railway Bridge of Baker and Fowler and the Garabit Viaduct in the Massif Central by Gustave Eiffel.

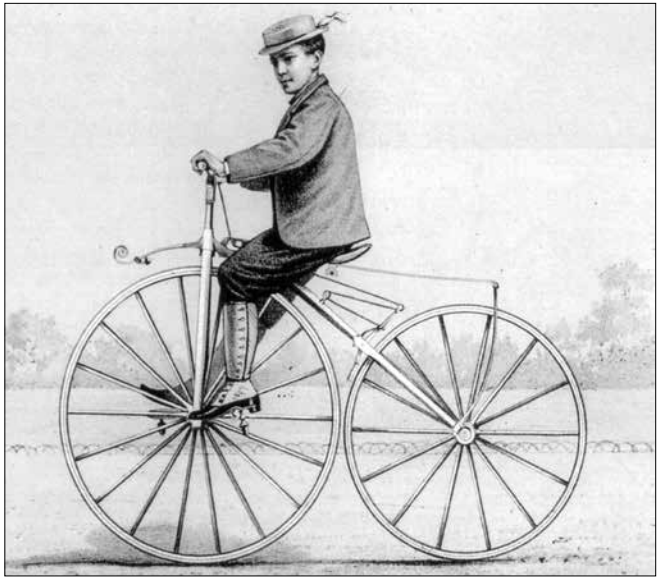
Meanwhile the new uses of electricity were catching on with the consequence that the Society of Telegraph Engineers was formed in 1871, which led directly to the Institution of Electrical Engineers in 1889 (incorporated by a Royal Charter in 1921).

The French found themselves at war again in 1870, this time with the Prussians, who were successful in the overthrow of Napoleon III. Britain cautiously welcomed the subsequent creation of the new unified Germany, and British-based companies benefitted from the demand for war materials. The Siemens Brothers factory in Charlton, which had been established by the German, William Siemens in 1858, expanded particularly rapidly. This reflected the strides being made in research facilities in the new Germany, their progress in chemical engineering and progress with the internal combustion engine in particular. Rudolf Diesel went on to develop a marketable version of his eponymous engine by 1897 and one of his first successes was to sell such motors to the French navy for use in their submarine fleet.

Automobiles and Aeroplanes

Progress with the internal combustion engine soon supported the development of the automobile. Interestingly, that word, together with chauffeur and garage, is of French derivation, although the main developments were taken forward by the Germans, the British and the Americans. A great deal of experimental work on engines was undertaken in France and Germany in the second half of the nineteenth century, but the real work on developing the automobile concept was in the

hands of British cycle engineers. To begin with, Rowley Turner was excited by the success of the Michaux family in Paris who used their velocipedes in races. Turner brought one of the French machines back to England in 1868. His intention was that the Coventry Sewing Machine Company would manufacture the velocipedes and sell them in France. The Franco-Prussian war prevented this however and so they were launched onto the home market. This was so successful that a new U.K. industry was born.



2.38 A Michaux velocipede of 1868

The wire spoked wheels, chain drives, ball bearings and pneumatic tyres of cycles were important in the development of the motor car. Coventry quickly became the seat of the car industry with cycle manufacturers such as Humber and Rover turning to car manufacturing. The progressive lifting of restrictions on the use of motor cars in Britain from 1896 stimulated the industry further, giving rise to names such as Daimler, Leyland, Wolseley and Rolls-Royce. The Automobile and Cycle Engineers Institute came into being in 1904, evolving into the Institution of Automobile Engineers in 1906.

The move towards lightweight engines also made aviation a practical proposition. Although the first successful powered flight was made by Orville Wright at Kill Devil Hills, North Carolina, at the end of 1903, considerable progress was made in Europe by the Farman brothers and Louis Bleriot in France, and Samuel Cody (an American) and Geoffrey de Havilland in Britain. The Wright brothers had excited considerable interest in aviation in Europe, and after Wilbur Wright's demonstration flights near Le Mans in 1908 the race was on to develop successful aircraft on this side of the Atlantic. Bleriot's successful flight across the Channel in 1909, landing near Dover Castle, was the first flight between the two countries and confirmed aviation's potential.

2.39 Louis Bleriot arrives at Dover

Meanwhile, the condition of Britain's roads (like those overseas) was unsuited to the new automobile, and various lobby groups arose demanding improvements and, in particular, the suppression of dust. (Dust laying competitions were organised by the Road Improvement Association and there were even suggestions that a pipe should be laid between Brighton and London to dampen the roads with sea water.) Eventually the French government took a lead by organising the first World Road Congress in Paris in 1909, which has been active and influential ever since, only lapsing during the two World Wars.

In Britain, the government responded by establishing the Road Board, the first national authority for roads in England and Wales since Roman times. This had the power to make grants and loans to local authorities to improve roads. It also established an advisory engineering committee led by the electrical engineer, Rookes Crompton. He was succeeded by Henry Maybury in 1913 who oversaw considerable work on the standardisation of road construction and tar spraying. The use of bitumen from Mexico was also introduced.

The Impact of World War I

With the outbreak of the Great War in 1914 the Road Board found itself involved in a wide range of projects establishing military camps and airfields. By 1916 Maybury

2.40 Rookes Crompton as caricatured in Vanity Fair, 1911

and his engineers were fully involved in infrastructure projects in France and over £5 million was spent on such work. Unsurprisingly, the mechanised nature of the new warfare on land and in the air led to concerns about the supply of petroleum products and a shortage of the necessary engineering expertise. The Institution of Petroleum Technologists was established by the Royal Society of Arts in 1914 to help improve professional standards. Later on, this step nourished the development of the chemical engineering profession.

From the engineering point of view, it could be argued that the First World War was a technologists' war. Tanks, machine guns, massed artillery, aircraft, explosives, poison gas, ships and drugs were all required in great quantities. Ironically, the production of uniforms required khaki dyes which were obtained from Germany, as were aspirins and the glass for range finders and cameras. The demands for British war production and scientific innovation were so great that they led to the establishment of the Department of Scientific and Industrial Research in 1916.

The war soon became a stalemate which wasn't broken until 1918. Meanwhile the destruction wreaked around the front line in Belgium and France was colossal. At Passchendaele alone, four and a quarter million shells were used in a barrage which totally destroyed that part of Belgium (and probably caused half a million allied and German casualties). At the Battle of the Somme in 1916 there were nearly 60,000 British Army casualties on the first day alone, and more than one million casualties altogether over the course of the battle. This devastation was one of the reasons for the foundation of the British Section of the Société des Ingénieurs Civils de France once the hostilities were over.

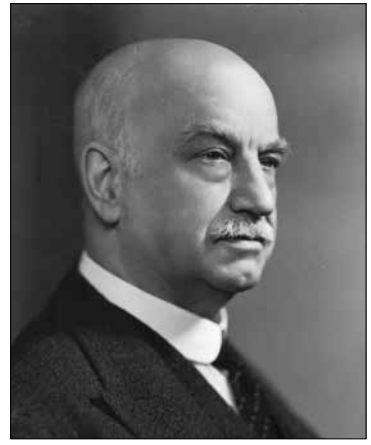
Engineering between the Wars

Back in the 1890s in the United States Fred Winslow Taylor had emerged as a strong advocate of 'job analysis' and 'efficiency' studies leading to 'scientific management'. This, and time and motion study, was the foundation of engineering production as a discipline. Although applied with some considerable success in the USA, opposition by trade unions slowed its progress. Nevertheless, during and after the First World War mass production techniques accelerated on this side of the Atlantic. In France, Georges Clemenceau argued that all plants under the French Ministry of War should investigate the minimum use of labour and the best production methods through scientific research. Planning departments were set up in every French works to investigate and apply Taylor's techniques. In England the Institution of Production Engineers was set up in February 1921.

Britain's total preoccupation with the war and the need to bend its productive efforts onto war materials meant that nations that had previously relied on Britain for their manufactures were obliged to find their goods elsewhere, or to produce them themselves. India and Japan in particular developed their own textile industries which initiated the long decline of the Lancashire textile industry. In general, former customers concentrated their investments on the basic industrial activities, so that the typical impact of the war on Britain was to threaten its heavy industry but to stimulate the more modern light industries. The rise of the automobile and electrical industries became important.

Ninety six British firms were in the motorcar business after the war, although rationalisation reduced this to about 33 by 1939. Morris in particular was able to out-distance his competitors by lowering his costs. He had originally sourced his engines in America, but with the disruption of supplies during the war Morris turned to the French Hotchkiss Company who had previously manufactured machine-guns in England. By 1923 the French company had been bought out and Morris Motors Ltd was formed in 1926.

Sir Herbert Austin was another successful entrepreneur in the business who made his name with the Austin Seven. Eventually also manufactured in France, Germany and the United States, some 352,000 vehicles of that mark were sold up to 1934. By 1938 Britain was the second most prolific car



2.41 Herbert Austin

manufacturer after the United States. Germany was third. Car production was also associated with the growing use of plastics. By 1933 about thirty firms in the Birmingham area alone were making plastics of one kind or another.

The growth of car ownership had a transforming impact on Britain. Together with the bus and lorry, the car supported the growth of suburbia, the growth of peripheral housing estates and the establishment of new towns like Welwyn Garden City, which was founded in 1920. This was a trend which was destined to accelerate after the Second World War as rising living standards embedded the car in the national psyche. Even between the wars it called forth considerable investment in highway improvements, bypasses, bridges and tunnels.

The meetings of the World Road Congress after World War I revealed major advances had taken place in highway construction in Italy, Germany and the United States. The Italian autostrada and the German autobahnen were indicators of what the future would bring with traffic segregation, safety with speed and aesthetics in mind. Increased investment in Britain meant more engineers were needed and in 1930 the Institution of Highway Engineers was established.

The coming together of companies in the motor industry between the wars was emulated in other manufacturing activities. In Britain this was particularly the case with steel and chemicals manufacture. Imperial Chemical Industries was formed in 1926 and the English Steel Corporation followed in 1927. Another great combine, Lever Brothers, was formed in 1929 exploiting soap and food processing.

The drive for administrative coherence and standardisation also led to the creation of large corporations, often in public ownership. The BBC had been set up after the war as a private company and was reorganised as a public corporation in 1926. The Central Electricity Board was also set up in 1926 to ensure common standards of frequencies, voltages and equipment.

Professional institutions now started to organise in a significant way, reflecting the growing, diverse nature of engineering and the need to ensure the maintenance of standards. The inter war years saw the beginnings of many new organisations, including Fire Engineers (1918), Engineering Inspection (1919), Production Engineers (1921), Chemical Engineers (1922), Highways and Transportation (1930), and the Engineers' Guild (1938).

John Maynard Keynes published his *General Theory of Employment, Interest and Money* in 1936. This suggested that state action was needed to keep investment and consumption stimulated. The government could use low interest rates, public works or action to equalise incomes as policies to keep the economy moving and to tackle economic depressions. Such activity, combined with the

rise of new industries helped things along in Britain, although growing acceptance of the need to rearm after 1935 also contributed to an increase in industrial and engineering activity.

The Path to War Again

State expenditure on armaments in Britain increased from £23 million in 1935 to £273 million per annum in 1939. Developments encompassed major investment in the aircraft industry, including shadow factories and airfields, and also stimulated specific innovations such as the development of radar under Robert Watson-Watt at the National Physical Laboratory. In France there was a good deal of political confusion during the 1930s and economic measures were more traditional than Keynesian. However, a continued concern over the need to strengthen French defences resulted, from 1929, in the major engineering works of the Maginot line on their eastern frontier.

The failure to achieve a lasting settlement after the Great War which was fair to all those involved aided the inexorable drift towards further conflict. Efforts were made to delay, if not avoid, all-out hostilities, a delay which allowed Britain and France to collect their resources together. The outbreak of war in September 1939 would eventually lead to an explosion of activity on the scientific and engineering fronts as Britain's military machine built up its capabilities. However, after the failed allied campaign in Belgium and northern France in 1940, the French suffered occupation and alignment with Germany. Any further cooperation between the French and British engineering professions would have to wait until hostilities had ended.

3. THE SOCIĒTĒ BEFORE THE SECOND WORLD WAR

The Marquis de Chasseloup-Laubat (joint founder and treasurer of the British Section) gave an illustrated lecture on the efforts being made in France towards the reconstruction of their devastated regions. He stated that to remedy the situation a "close, effective, sincere and real Entente Cordiale must be established." Britain and France "could not afford to drift into squabbles or fight each other by customs duties and tariffs."

In the early years of the British Section of the Société des Ingénieurs Civils de France there was a strong desire to extend a helping hand to a neighbouring country in distress and a wish to share engineering knowledge and expertise between French and British counterparts. Many eminent French engineers visited the British Section over the years to give lectures, and study tours were made for mutual benefit. A great number of the engineers involved in the British Section were prominent in their field and brought substantial weight and authority to the proceedings. It was always going to be right to share knowledge and information between countries for mutual benefit, promoting the public good.

The northern areas of France and much of Belgium suffered gravely during the hostilities of World War I. Some five million acres of land in northern France alone had been transformed into a desert and abandoned. Whole villages were obliterated by the fighting and considerable economic damage was also done during the German occupation. The areas directly affected by the conflict

3.01 War damage at Amiens after World War I

3.02 Destruction at Vailly sur Aisne

were among those which had previously made the greatest contribution to French industrial output. As an example, the textile industry was badly hit, with one third of the total French textile spinning capacity being lost. Factories in Rheims were destroyed by gunfire, and machinery in the Roubaix area was damaged beyond repair during the search for copper. Textile machines were destroyed or removed to Germany from areas which had competed with German plants before the war.

It is difficult today to appreciate the task of rebuilding faced by France. The population of the invaded and devastated areas was some four million in 1914 and had reduced to half of this by 1918. 290,000 homes were completely destroyed and 423,000 severely damaged. 33,000 miles of road, 1,600 miles of railway and 1,200 bridges were also destroyed.

After the massive destruction wrought by the war on both Belgium and France there was a strong feeling among many in Britain that efforts should be made to assist their allies with the reconstruction of their countries. This would extend to physical, economic and social reconstruction. A Groupe Inter-Universitaire Franco-Britannique was formed in 1918 to promote friendly intercourse between British and French universities. By 1921 fifty towns in Great Britain had adopted some eighty seven towns and villages in the devastated areas of France.

For their part, a group of engineers in France and Britain decided that the fraternal relations and mutual cooperation which had been established during the hostilities could usefully be continued into the peace. The prime movers in this initiative were the Marquis Louis de Chasseloup-Laubat, Tony Jules Guéritte and Herman Sloog. Thus the British Section of the Société des Ingénieurs Civils de France was proposed in 1919 with the aim of periodic reunions, and the shared study of professional practice, education and law. The first President was Charles Wordingham (he was also President of the Institution of Electrical Engineers), with Acting

President T J Guéritte, and Secretary Herman Sloog. The Marquis de Chasseloup-Laubat was asked to be the representative of the parent society. The clearly stated intention was to further strengthen the links between the engineers of the two nations. However, some concern was expressed on the British side at the outset that the French parent society seemed to expect the British Section to be the point of contact for them throughout the British Empire – a challenging prospect and one which did not feature prominently afterwards.

The Marquis was an eminent French engineer who had served as an expert on explosives with the French government and with the French ambassador and Lord Kitchener on the Committee for Inter-Allied Ammunition throughout the Great War. He also continued to take an interest in Anglo-French relations afterwards. His family had a long and illustrious history of support for the French military. For example, his father, the Marquis Prosper, had been the French Minister of Marine under the second French empire and had greatly aided the rebuilding of the French army after the conflict with Prussia in 1871.

Tony Jules Guéritte was a French engineer who had joined Mouchel and Partners before the Great War, having previously been employed in the offices of François Hennebique in Paris where he had worked on the Hennebique system for ferro-concrete. He eventually became the head of Mouchell, a position he held for nearly forty years. On the founding of the British Section he soon became its second president and then the long standing treasurer. He was also the permanent delegate of the mother society in the British Empire.

Herman Sloog was a Dutchman who was educated as an engineer in Paris. Since 1913 he had acted as a consulting engineer for a number of French firms active in Britain and had shown considerable interest in supporting former fellow pupils of the Ēcole Centrale where he had himself qualified. This interest grew into the Franco-British Inter-University Group, of which he was the first Honorary Secretary. Unbowed by heavy work, he also became the Honorary Secretary of the Board of Control of the British Bureau of the National Office of French Universities. Unsurprisingly perhaps, he also acted as Honorary Secretary to the British Section until his early death in 1921.

The need to assist the rebuilding efforts of the French after the destruction of the war became a regular theme. The first visit to France by the British Section in June 1920 inspected the destruction in mining areas around Amiens, Arras, Lens, Loos and Lille. (Gustave Eiffel also invited the party to visit the Eiffel Tower while they were in Paris.) Such visits were organised at the outset as suitable for a mixed party. On this occasion 27 engineers travelled with

3.03 Raymond Poincaré

15 ladies. In November 1920 Ēdouard Gruner, the President of the parent society, read a paper entitled 'The Destruction of the Mining Districts of Northern France and the Work of Reconstruction'.

During the following year another summer visit to France was organised to include the battlefields of Verdun. Then, in November 1921 the former French president, Raymond Poincaré, visited London to receive a cheque for £15,000 at the Mansion House from the British League of Help to support the city of Verdun, London's adopted city. That same evening he presided at a meeting of the British Section of the Société des Ingénieurs Civils to hear the Marquis de Chasseloup-Laubat (joint founder and treasurer of the British Section) give an illustrated lecture on the efforts being made in France towards the reconstruction of their devastated regions. He stated that to remedy the situation a "close, effective, sincere and real Entente Cordiale must be established." Britain and France "could not afford to drift into squabbles or fight each other by customs duties and tariffs." In response, Monsieur Poincaré said he was profoundly grateful to the British Section for their generous efforts. They had contributed to the work which had already resulted in many factories being restored, although in towns and villages the reconstruction of private houses, peasants' dwellings and agricultural buildings had scarcely begun.

In March 1922 the Marquis de Chasseloup-Laubat and Tony Jules Guéritte continued to promote the reconstruction of the devastated regions of France by giving an illustrated lecture in the Gloucester Guildhall. Tony Jules Guéritte was there in his capacity as the President of the French Chamber of Commerce in London and was accompanied by another member of the British Section, W Noble Twelvetrees. All the proceeds were given to the fund to reconstruct Gloucester's adopted French village, Ovillers-la-Boisselle, near to the River Somme. The village had been completely destroyed by the war, although the residents were determined, and eventually succeeded, in rebuilding the village largely as it had been before the war.

However, ideas to reinstate France were not limited to merely regaining its pre-war situation. In June 1922 the French engineer Monsieur Antoine explained to the members of the British Section that there were plans afoot to improve the Rhine by the construction of a lateral canal

3.04 Ovillers-la-Boisselle after World War I

3.05 The Rhine and parallel canal at Breisach

between Basel and Strasbourg (the Grand Canal d'Alsace). The canal would parallel the left bank of the river through the plain of Alsace and would allow Rhine barges to serve the industrial region of Mulhouse as well as give Switzerland an access to the sea by an inland waterway. It would also have hydro-electric potential. The initial cost was estimated at one million francs and would take twenty years to construct. Some parts of the scheme were indeed completed in the 1930s and further (modified) works were completed after World War 2.

Following the first visit to France in June 1920 the adoption of the village of Loos-en-Gohelle, near Lens in the Pas-de-Calais was proposed and agreed. Subscriptions were collected not only from members, but also from other British engineers and colliery owners and managers. Like many others, the village had been totally destroyed during the war, especially in the Battle of Loos towards the end of 1915. Not a single building or tree survived the pounding by artillery. In September 1924, the automotive engineer Lucien Alphonse Legros (incoming president of the British Section) whilst taking part in a visit organised

3.06 Loos-en-Gohelle

by the French parent body to the north of France took the opportunity to visit the village to present a cheque and speak at the unveiling of a monument to the soldiers and other non-combatants who had perished in the war.

The response to the war was not the only theme however. Back in 1919 the British Section had almost immediately become involved in the arrangements for the celebration in Birmingham of the centenary of the death of James Watt. Messrs Guéritte and Sloog joined with representatives from the American Society of Engineers, the Engineering Institute of Canada and Monsieur Rateau of the Société d'Encouragement pour l'Industrie Nationale to give support. £250,000 was being sought to give an endowment to the University of Birmingham for a James Watt Chair to promote research into the production of power, and to encourage the study of the conservation of natural sources of energy. Also intended was a museum to collect together examples of James Watt's work, as well as work by Matthew Boulton and William Murdock. Things did not quite work out as planned it would seem, since today there are two James Watt Chairs, although both are at the University of Glasgow.

As the British Section's acting president, Tony Jules Guéritte was soon spreading knowledge about French advances in engineering. In addition to his engineering work he was also a Councillor of the French Board of Trade. In November 1919 he was in Sheffield giving a lecture on the application of ferro-concrete in mines to the Midland Institute of Mining Engineers.

An article in the Sheffield Daily Telegraph in July 1920 celebrated the success which had already been achieved by bringing the engineers of the two countries into closer touch:-

> *"Differences of training and temperament tend to give a special character to French and British engineering methods, and although the engineers of the two countries*

usually work along separate lines they both attain the same ends. Frequently the more positive character of British engineering gives more direct and practical results, while the French engineer works out problems with such precision of detail that he sometimes finds himself involved in intricacies, but his method leads him to startlingly novel solutions. Engineers of both countries would obviously gain by a closer interchange of ideas, and would each benefit by adopting some of the other's methods. It is therefore gratifying to see that the creation of a British section of the I.C.F. is likely to be followed by more frequent visits of engineers of the two countries."

Also during the summer of 1920 the British Section organised for about 28 engineering students to attend electro-technical courses at the University of Grenoble, no doubt under the influence of the president, Charles Wordingham. It was hoped that this initiative could continue. In 1922 the idea of students going to France was promoted further when engineering firms in the Lorraine area involved in the railway industry offered to take British students for periods of two or three months during their summer holidays. No salaries or expenses were to be covered however. Some knowledge of the French language was thought advisable.

Members of the British Section were also striving to organise the engineering profession in the same way as the medical or legal professions to achieve statutory registration for engineers for the protection of their interests. In November 1921 Tony Jules Guéritte and Walter Noble Twelvetrees were prominent at the third annual dinner of the Gloucestershire Engineering Society where over one hundred people were present. Twelvetrees, who was there as the past president of the Society of Engineers, spoke of his desire to get all the members of engineering societies into one association with a central committee that could lobby parliament on their behalf. Others at the dinner were there representing the Chamber of Commerce, the Technical Schools Committee, the Gloucester and District Association of Science and Arts Societies, and the Engineering Faculty of Bristol University. Herman Sloog was also present wearing his hat as the Honorary Secretary of the Groupe Inter-Universitaire Franco-Britannique.

The Ingénieurs Civil de France were active with other British organisations at this time. For example, in July 1923 a delegation from the Society of Glass Technology went to Paris for a joint meeting which included a visit to the Royal Sèvres porcelain factory as well as the glass factories of St Gobain and Chantereine. For its part, the British Section was also cooperating with other Institutions and engineering societies, organising for their

members to attend British Section lectures, particularly when using their premises for British Section meetings. This spirit of mutual interest became a continuing feature of the Section's activities.

By 1924 Tony Jules Guéritte, as president of the Society of Engineers, had begun to advocate the establishment of an Association of British Engineering Societies. Once again he was supported by W Noble Twelvetrees who argued that the proposal was not intended to compete with the larger Institutions (Civil, Electrical, Mechanical and Naval, who had formed a Joint Engineering Council) but was intended for the two to three hundred smaller engineering institutions and societies to combine to act in the interests of their members by participating in the joint arrangements.

Tony Jules Guéritte continued as an active member of the British Section until the early 1950s. During that time he gave seven lectures to the British Section. For example, in 1927 he lectured on the design of cooling towers and in April 1931 he gave a talk to a joint meeting of the British Section and the Institution of Structural Engineers on the views of Eugène Freyssinet on reinforced concrete bridges, arguing that such bridges were superior to wire suspension bridges from the point of view of breaking stress. Later that year he addressed the South Wales section of the Institution of Civil Engineers in Cardiff about the construction of the reinforced concrete bridge over the mouth of the River Ēlorn in Brittany.

In 1924 Lucien Alphonse Legros was very active in delivering lectures, having been to Paris, Sheffield, Leeds, Aldershot and London to lecture. By 1925, when he was the president, he delivered a lecture to the British Section on the problems of British trade caused by the "slowing down of work" (as reported in the British press). The issues he reportedly outlined then have been reflected in many of the debates which continued into the 1980s. He supported the use of time studies to identify ways to speed production but criticised trade unions for using such studies to argue for processes to proceed at the speed of the slowest, a practise which he claimed had spread to entire industries. He felt this was particularly the case within the metal manufactures and the construction of buildings. He disliked the use of sympathetic strikes (which he said was un-British) and restrictive practices. In his opinion some trades had been sheltered from international competition and, during the Great War, had managed to enforce higher wages in ways that had upset the balance which had previously been recognised between skilled and unskilled men. The overall consequence was one of low productivity and lower quality in British industry compared to many continental manufacturers.

An insight into the costs of running the British Section can be obtained from a report made by the treasurer about the finances for 1925. Expenditure for the year was reported as:-

Printing	£21.15s.1d
Postage	£7.6s.3d
Cost of meetings	£19.11s.1d
Total	£48.12s.5d

Subscriptions for membership were subsequently raised in 1927 to become 100 Francs per annum (about 17/6d at the then rate of exchange) with a special supplementary levy of 7/6d, making 25/- in total (about £55 in today's money). In the absence of a significant growth in membership, it was found necessary to increase the total subscription again to 30/- in 1928.

In spite of the horrors of the Great War, the need to discuss armaments continued. As early as 1921 Lucien Legros was lecturing on 'Tank and Chain Track Artillery' and Sir Robert Hadfield gave a lecture on the history of armour plating to the British Section in November 1926. Sir Robert described how he had been engaged for more than thirty years in the production of armour piercing projectiles. He had witnessed rounds fired from small, medium and large guns, including a monster 18 inch projectile weighing 3,300 lbs against armour plates up to 16 inches in thickness. He predicted that armour plating had reached its limit – advances in plating would always be immediately followed by improvements in projectiles. Other lectures had been given to the British Section on tanks and explosives during this period.

French engineers certainly came across to England in the early years. In July 1929 about sixty members of the Société des Ingénieurs Civils de France and their wives and daughters enjoyed the following itinerary:-

Sunday – arrival in London, staying at the Russell Hotel. A visit to Kew and Richmond in the afternoon, with dinner in the evening.

Monday – a sight-seeing drive by motor coach in London City. An afternoon trip on the Thames. In the evening, the express train to Birmingham.

Tuesday – visiting Birmingham and Derby.

Wednesday – at Sheffield. Divide up to visit the works of the silverware manufacturers, Mappin and Webb; the East Hecla steel works of Hadfield's Ltd at Tinsley; the works of Walker and Hall; the premises of John Brown and Co. Ltd; and Hodkin and Jones Ltd. the manufacturer of architectural mouldings. Catch the afternoon express to Glasgow.

Thursday – at Glasgow. A trip on the Clyde and a visit to the Fairfield Engineering Shipyard or similar.

Friday – take the railway to Edinburgh via Loch Lomond, Loch Katrine and the Trossachs for Edinburgh.

Saturday – a morning visit to the Forth Bridge. Catch the noon express to London for the Dunkerque service.

The arrangements were made with Thomas Cook & Son at an estimated cost for the British elements of £20 per head.

In November 1929 the president of the British Section, Noel Hackney, gave a talk about the international aspect of engineering. In it he celebrated the wide scope of the studies undertaken by members and suggested that the organisation should open its doors to every aspect of engineering, attracting papers from a wide spread of disciplines, together with joint meetings. In reality this is exactly how the British Section has developed over the years.

The US stock market crashed in 1929 and the great depression began. By the end of 1930 the value of British exports had halved and unemployment doubled to more than 20%. The industrial areas of the north and Wales were particularly badly affected and engineering projects were delayed or curtailed. Some parts of the economy thrived however. For example, the low interest rates helped to sustain a building boom in the suburbs of London. It is perhaps not surprising however that Major F M Du-Platt Taylor devoted his presidential address to the British Section in October 1931 to the subject 'The Industrial Situation in Great Britain'. Although the government took a variety of steps to tackle the problem, things did not improve greatly until after 1935 when the country started to rearm against the possibility of another war.

The great depression had begun to hit at about the same time as a Royal Commission set up by Prime Minister Baldwin was reporting to the British government about the economic factors surrounding the building of a Channel Tunnel. As a matter of interest, between 1802 and 1986 over 130 different proposals had been put forward in Britain or in France promoting the idea of a tunnel. Indeed, significant tunnelling operations were even begun in 1881 when Edwin Watkin's South Eastern Railway engineered at least 1,000 yards of pilot tunnel; sufficient to entertain the Prime Minister, William Gladstone, to an electric light champagne lunch as a promotional stunt. That proposal fell away however as a result of opposition on the grounds of endangering national security. The same fate befell a 1930 proposition with the Committee of Imperial Defence being amongst the most vocal opponents. In another analysis, the British Section received a lecture in March 1930 from its member Gilbert Szlumper, Assistant Manager of the Southern Railway, giving figures that

3.07 Gilbert Szlumper in 1915

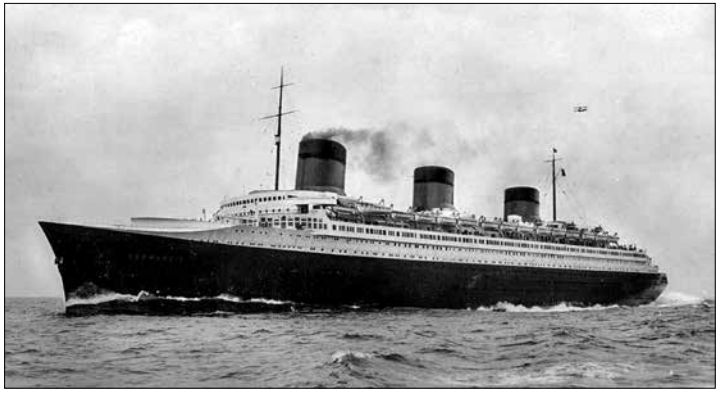
showed that a Channel tunnel was unlikely to be a successful financial venture and that some fault in construction could well give rise to an uncontrollable amount of water entering the works which could not be remedied. In an interesting aside, the Daily Mail of the time argued that, given the emphasis on the difficulties contained in the report to government, a new inquiry should be held and an endeavour should be made to find someone to lead it who did not confine themselves to facts.

On a brighter note, in May 1931 Frank Merricks, mining engineer and president of the British Section in 1928/29, G G Lynde and N C Hackney were each created Officiers de l'Instruction Publique in the Ordre des Palmes Académiques by Gaston Doumergue, the President of the French Republic. This was in recognition of their services in developing friendly relations between the engineering communities of Great Britain and France through the medium of the Société des Ingénieurs Civils de France. Mr W R Howard, the Honorary General Secretary, was given a distinction as an Officier de l'Académie.

Study visits continued for the members. For example, in 1932 Mr C Helsby invited members to pay a visit to the work which his company – Messrs West's Rotinoff Piling and Construction Co. Ltd – was carrying out at Paddington. In the years that followed the British Section collaborated with the Alliance Française to arrange other study visits for British engineers to France, and vice versa. Mlle Y Salmon of the Federation des Comités Britanniques de l'Alliance Française conducted the tours with Tony Jules Guéritte for parties ranging in size from thirty to sixty persons, and much was learned about engineering in the two countries.

The prohibition era in USA during the 1920s and early thirties was a good time for the trans-Atlantic passenger ships bringing American tourists to Europe for vacations stimulated in part by easy access to alcohol. The major shipping companies such as the White Star Line and Cunard responded to the opportunity by laying down the keels of new superliners, and the French were equally determined

to join in with the *Ile de France* and the *Normandie*. A dry dock was built in Saint-Nazaire specifically to build the latter. The *Normandie* was a revolutionary vessel with a clipper-like bow and bulbous forefoot below the waterline which guaranteed a good performance.



3.08 SS Normandie

However, there were the inevitable teething troubles, and the British Section was appraised of some of these in a lecture given in November 1935 by Jean Marie, the director of the operating company, Compagnie Générale Transatlantique. Vibration during running had proved to be a problem, although this was said to be a common issue with all fast ships, and work was afoot to determine a solution. Monsieur Marie also outlined the research which had been carried out to determine the best configuration of the hull. He explained that ten different hull types had been modelled and subjected to tank trials at Grenelle which resulted in a 4,000 ton improvement in displacement together with a reduced power requirement to cruise at 28 knots.

Although a splendid liner, the *Normandie* was never a commercial success and had to rely in part on subsidies from the French government. She vied for the Blue Riband with the Queen Mary but had an ignominious ending when she caught fire and sank in New York harbour in 1942, having been seized for the war effort by the US authorities.

As the Second World War approached, the British Section could look back on a successful twenty years of activity. About eighty lectures on a great diversity of subjects had been given, many of which were by French engineers of standing. The membership of the British Section was approaching two hundred and many of these were at the top of their professional careers having also been presidents of their various engineering institutions. The interest in the work undertaken by members of the British Section is confirmed by the fact that three British authors (Lucien Alphonse Legros, Roger Smith and William T Halcrow) had Premiums awarded for their papers in Paris, and Tony Jules Guéritte had three Premiums awarded in Britain

by the Institution of Civil Engineers, the Institution of Structural Engineers and the Society of Engineers.

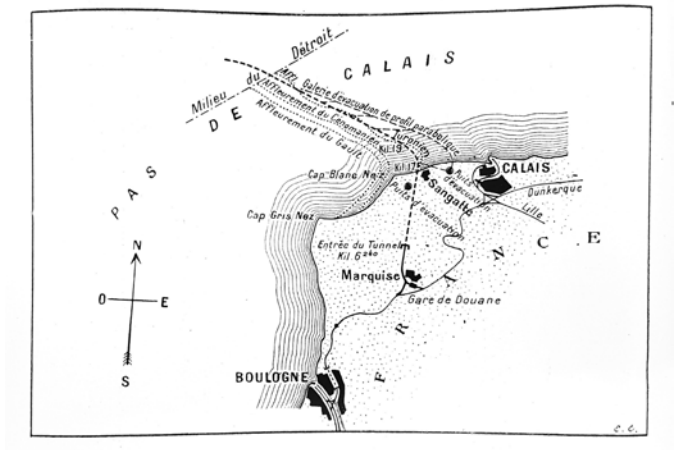
The Second World War was to introduce something of a hiatus however, but that is another story.

4. A SELECTION OF LECTURES GIVEN BEFORE WORLD WAR TWO

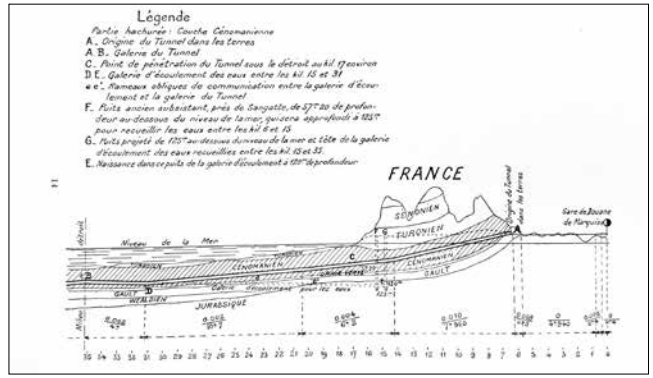
Before World War Two the lectures received by the British Section were overwhelmingly given by French engineers. Papers were written in French or English, although arrangements were usually made to obtain English translations of the former. A flavour of the interests can be obtained from the following sample of titles, with dates where known.

Year	Title	Author
	German Destruction of the Mining Districts of Northern France	E Gruner
1921	Reconstruction in France (delivered at a meeting chaired by President Raymond Poincaré of France)	Marquis de Chasseloup-Laubat
	Improvement of the Rhine Between Basle and Strasbourg	A Antoine
	Traction Across Rough and Roadless Country	L Legros
	Enlargement of Le Havre Harbour	M Michel-Schmidt
1924	Repairing and Strengthening Cast Iron Railway Bridges over the Rhone at La Voulte	M De Boulongne
1926	Restoration Due to Damp of the Palaces of Versailles and Trianon	A Knapen
1926	Economy of Human Effort in Relation to Industrial Fatigue	L Legros
1927	Engineering Features of the Channel Tunnel	Yves Le Trocquer
1927	The Port of Casablanca	C Laroche
1927	The Design and Working of Cooling Towers	T J Guéritte
1928	The Schneider-Fieux Gyroscopic Anti-rolling Gear	J Fieux

Year	Title	Author
1930	Cross Channel Transit	G S Szlumper
	Electrification of the Paris – Orléans Railway	T Parodi
	The Views of Freyssinet on Plougastel Bridge and Ferro-Concrete Bridges of very great Span	T J Guéritte
	Explosions in Coal Mines due to Coal Dust. Preventive Measures	Sir Henry Walker
	Testing of Bridges by the Measuring Vans of the German State Railways	Dr. R Bernhard
	The Utilization of Solar Energy in Palestine	P Candillon
1933	Reinforced Concrete Grain Silos	T J Guéritte
	The Solar Illumination of the Interior of Large Buildings	J Atthuys
	Standardisation of Frequency in the Electrical District of Paris	P Rieunier



4.01. Monsieur Le Trocquer's map of the proposed Channel Tunnel route, 1927



4.02. Monsieur Le Trocquer's cross section

Year	Title	Author
	Future Prospects for Reinforced Concrete and Steel for Bridges of very great Span	H Lossier
	Some Large French Water Dams	R Miche
	The Mineral Resources of Jugoslavia	H K Scott
1935	The Atlantic Liner "Normandie"	J Marie
1936	A Revolution in the Technique of the Utilisation of Concrete	E Freyssinet and T J Guéritte
	A Study of the Underground Road Crossings in Paris	G Bardet
	The New Westminster Hospital	R T Morgan
	The Dunkirque Harbour Works	M Brice
	British Long Distance Fast Trains	O V Bulleid
	Tapping a Lake 32m Below Surface	Sir W T Halcrow
1940	Pre-Stressed Concrete and Resulting Saving in Steel	T J Guéritte
	Distribution of Electric Energy in the London Area Since its Origin	E H Jesty

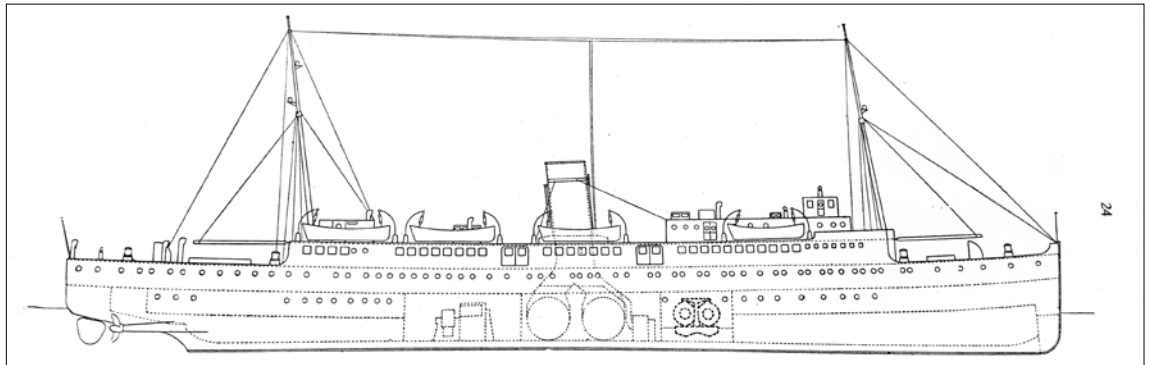


FIG. 26.—RELATIVE MAGNITUDE OF THE ANTI-ROLLING GEAR ON A PASSENGER STEAMER.

4.03. The Schneider-Fieux Anti-Rolling Gear, 1928

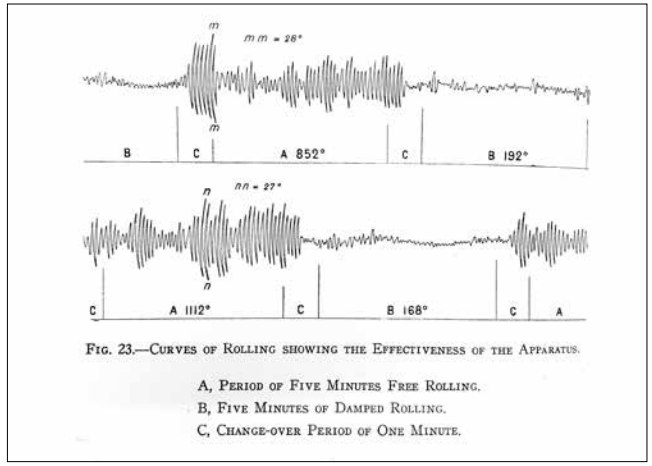


FIG. 23.—CURVES OF ROLLING SHOWING THE EFFECTIVENESS OF THE APPARATUS.

A, PERIOD OF FIVE MINUTES FREE ROLLING.
B, FIVE MINUTES OF DAMPED ROLLING.
C, CHANGE-OVER PERIOD OF ONE MINUTE.

4.04. Proof that the Anti-Rolling Gear worked

5. SOME EMINENT MEMBERS BEFORE WORLD WAR TWO

"Legros seems to have been a man somewhat ahead of his time with regard to the role of women. He promoted the idea that women should be admitted to membership. Dorothée Pullinger, who was employed as a draftsperson at the Arrol-Johnson automobile firm in Scotland, applied to be an Associate as the by-laws stated a "person" could apply. On advice from the Royal Society, the Institution was told that a "person" meant a man! Legros and Pullinger's request was refused."

Introduction

Over the years the British Section has been fortunate to have many members who are eminent leaders in their field who have not only contributed to the science and practice of engineering but have often contributed generously to other aspects of life. Many of them have used their skills at time of war, and many have travelled extensively to help bring major projects to fruition around the world. This chapter gives a flavour of the lives and contributions of some of them.

Armand Eugene Louis Napoleon Prosper De Chasseloup-Laubat 1863 – 1954

Louis was a joint founder of the British Section of the Société des Ingénieurs Civils de France. He was the son of the French government minister, Marquis Justin Napoleon Samuel Prosper de Chasseloup-Laubat, who served as the Minister for the French Navy under the second Empire, was instrumental in the expansion of French influence in Southeast Asia and redrafted French military laws after the war with Prussia in 1871. Louis's grandfather, General François de Chasseloup, was a military engineer who had saved Napoleon's army on several occasions.

Louis's younger brother Gaston became a racing car driver and was renowned for having set the first recognised automobile land speed record in 1898 at 39.24 mph. Using electric cars Gaston went on quickly to break the world record twice more in a series of record setting duels against a colleague, the Belgian, Camille Jenatzy. Louis himself, who became the fifth Marquis on his father's death in 1873, was a significant engineer and also an athlete in his own right.

The Marquis was a member of the Société des Ingénieurs Civils de France where he was treasurer. He travelled in India and America in the late nineteenth century, and was interested in the contribution of engineering towards social reform. However, and perhaps surprisingly, he wasn't entirely convinced by the contribution of women to his profession. Following his attendance at the Chicago Convention of 1893 he wrote that "the most unfortunate and vexatious feature of the organisation of the Congresses of Chicago was the exaggerated importance given to women."

Perhaps stimulated by his brother, Louis wrote about the development of the automobile in France in 1899 – maintaining that 'automobilism' had been born there with the invention of the steam carriage by Nicolas-Joseph Cugnot in 1769.

The Marquis was married in 1900 to Marie-Louise Stern whose father was a banker and prominent race horse owner. Louis moved in the grandest circles in France and Britain.

His own sportsmanship was demonstrated when he led the French épée team at the first International Fencing Tournament held in Paris in 1904. Nine years on he led the French fencing team at the equivalent Tournament held at Earl's Court in London. Later that year, as President of the Fédération Nationale d'Escrime of France, he presided at a conference in Paris which founded the International Fencing Federation. The aim was to promote the international development of fencing and to draw closer bonds of friendship uniting amateur fencers of all countries – something reminiscent of the establishment of the British Section of the ICF about six years later.

Interestingly, in March 1913 the Marquis, as President of the Fédération Nationale d'Escrime had expressed his organisation's deep sympathy with the English nation over the heroic death of Captain Scott in Antarctica. He proposed that an 'assault-at-arms' should be held in London to raise funds for the bereaved families. Unsurprisingly perhaps this was declined by the British Amateur Fencing Association.

During World War I the Marquis acted on behalf of the French Government, heading up a special Mission to ensure the supply of explosives. He served with the French Ambassador and Lord Kitchener on the Committee for Inter-Allied Ammunition throughout the war. This brought him into contact with Winston Churchill who was then the Minister of Munitions. He also undertook other formal duties, for example receiving the gift of an ambulance convoy to be used on the French battlefields and donated by members of Lloyds of London in 1916.

In 1919 the Marquis joined with T J Guéritte and Herman Sloog to advocate the creation of the British Section of the Société des Ingénieurs Civils de France. This was a natural extension of his experiences during the war and in keeping with his international outlook. He took a regular interest in the affairs of the British Section for a number of years afterwards.

In July 1921 Louis attended the first birthday celebrations of the League of Help at the Mansion House. The League had been set up to garner help for the devastated areas of France and had raised over £200,000 during its first year. This activity reflected the sympathy for the war damaged areas felt by many in Britain and was certainly in line with the activities of the British Section at the time.

Little is known about the details of his later life, although there is reference in a book ("Vichy France and the Jews" by Michael Marrus and Robert Paxton, 1995) to Marshal Pétain asking in 1942 on behalf of the Marquis's wife for an exemption from wearing the yellow star required of Jews by French law at that time.

Roger Thomas Smith 1863-1940. President of the British Section 1923-1924

Roger Smith was one of the first members of the British Section of the Société des Ingénieurs Civils de France and was elected President in 1923, following on from W Noble Twelvetrees.

He graduated from University College, London and went on to complete his pupilage as a mechanical engineer with Messrs. Hawthorn, Davey and Co. of Leeds. The company then employed him on the erection of pumping plants. In his next period of work, for Messrs Easton, Anderson and Goolden, he went to India where he was given responsibility for the establishment of water pumping plants in six cities. There then followed four years in Antwerp as a technical manager of the Cie. Hydro-electrique Anveroise.

During the next seven years from 1898, Smith began to develop the idea of electrification on tramways and railways.

In 1905 he was appointed as an electrical engineer to the Great Western Railway and he worked for the company until he retired as Chief Electrical Engineer in 1923. On his retirement, the GWR took the decision to merge the electrical department with the mechanical department. This was a setback to railway electrification, as Smith had been seen as an active advocate for its development and spread. Grace's Guide to British Industrial History reported that in electrical circles "the Great Western Company's decision to do without a separate electrical department is bound to meet with disapproval, the idea usually being that mechanical engineers are necessarily antagonistic to electrification". At the time of his retirement, the York to Newcastle scheme had been abandoned, the electrification of suburban lines delayed and there was to be no electric service to Brighton.

Retirement from the GWR was not the end of Roger Smith's career. Smith became a partner in the firm of J S and W E Highfield which then became Highfield and Roger Smith. He worked with Sir Felix Pole to prepare a report on the railways and steamers of Sudan and was engaged as a consultant advising on the electric supply and railway electrification in France and Belgium. In Britain he also advised the Central England Electricity Board.

He maintained his connection to the University of London, serving on the Senate and promoting engineering education. Roger Smith was an athlete; he played lacrosse for England and first class cricket. He enjoyed skating and was an accomplished dancer until he sadly developed arthritis which caused him to become lame, although it is said he always maintained a positive outlook on life.

His membership and Presidency of the British Section was important to the newly formed Société. He spoke excellent French and received the Légion d'honneur.

Charles Henry Wordingham 1866-1925. President of the British Section, 1920

5.01 Charles Wordingham

Charles Wordingham was the first president of the British section of the Société des Ingénieurs Civils de France.

He studied Engineering and Applied Sciences at King's College, London between 1882 and 1885. He graduated, with distinction and served his apprenticeship with Dr. John Hopkinson. Six years after graduating he applied to become an Associate Member of the Institution of Civil Engineers and was accepted into the Institution in 1892. Until 1889 he worked for the United Telephone Company, assisting with the erection of telephone exchanges. His next appointment was to the post of engineer at the Grosvenor Gallery Generating station of the London Electric Supply Company. During this time he worked with Dr.Sebastian Ferranti and Mr George Partridge on pioneering experiments which led to Ferranti's larger scheme for high-voltage distribution from the power station in Deptford. Wordingham's role, as head of meter testing, was to devise methods for testing switches and fuses.

In 1892 Wordingham returned to work as an assistant to Dr Hopkinson and they were employed to supervise the erection of lighting stations in Whitehaven and Manchester. This led to his appointment as Manchester Corporation's first City Electrical Engineer in 1894 and he remained in that role until 1901. His energy and application meant that before he left Manchester his plan for a combined tramway and lighting station with high tension distribution had been accepted and was later implemented.

In 1901Wordingham moved from Manchester and began to work in private practice as a consulting engineer. His next appointment, in 1903, was with the Admiralty, where he worked as head of the Naval Electrical Department. This would have been a relatively new role and Wordingham was employed to help modernise the Royal Navy. He was responsible for all the electrical equipment in all larger naval ships and electric power and light in dockyards and other shore bases. Wordingham remained working for the Admiralty throughout World War I during which time he was also responsible for light and power for the naval air stations. A major innovation which he introduced was the adoption of lead covered paper-insulated cables for the mains supply on larger

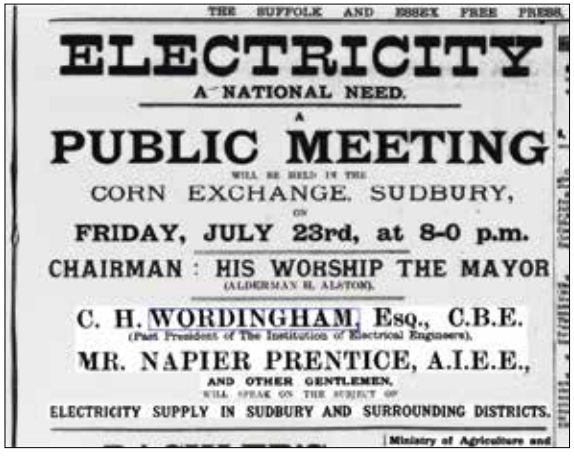
ships. In recognition of his work with the Royal Navy, Wordingham was awarded the CBE in 1918.

Alongside his professional work, Charles Wordingham worked tirelessly on two matters of electrical modernisation. The first was to do with standardisation; this concern may have arisen out of his early work with Ferranti and his subsequent work with the Royal Navy. He used his chairmanship of the Ship Electrical Equipment Committee of the Institution of Electrical Engineers to promote his view about the importance of standardisation of supply and wiring. At the time of his death he was also chairman of the Institution's Wiring Rules Committee.

The second area of Wordingham's interest grew out of his work with Manchester Corporation. He identified a need for a Proving House where appliances and materials could be tested as to their compliance to specified requirements. Although this had not been adopted in 1925 when Wordingham died, the scheme was being actively promoted. His determination to modernise electrical installation and standardisation can be shown by his membership of various committees. He was chairman of the Electrical Sectional Committee of the British Engineering Standards Association and a member of the British section of the International Electrotechnical Commission. He also represented the Institution of Electrical Engineers on the General Board and Executive Committee of the National Physical Laboratory. This list does not represent all the organisations and committees with which Wordingham was associated but one other should be included. He was prominent in the establishment of the Incorporated Municipal Electrical Association and was its second president in 1896-97, during his time working for Manchester Corporation.

Charles Wordingham also promoted the use of domestic electricity which was still not widely available. In February 1920 he addressed a public meeting in Braintree on the topic of the "Electricity Supply for Braintree, Bocking and District" and in July 1920 he spoke in the Corn Exchange, Sudbury on the same topic. It seems that this was a series of talks held under the banner "Electricity, A National Need."

In 1923 Mr Wordingham was the subject of a special meeting of Dover Town Council. Wordingham had been asked to act as consulting engineer in connection with the installation of new electrical machinery. The meeting seems to have focused more on the level of fees (5%) rather than on the recommendations of his report. It was pointed out that any delay in finding and appointing an alternative engineer would be too long but that the council should approach Wordingham with an offer of 4 per cent. This motion was overruled and the council agreed to advertise for an alternative engineer who would be responsible for the entire project.


THE SUFFOLK AND ESSEX FREE PRESS.

ELECTRICITY

A NATIONAL NEED.

A

PUBLIC MEETING

WILL BE HELD IN THE

CORN EXCHANGE, SUDBURY,

ON

FRIDAY, JULY 23rd, at 8-0 p.m.

CHAIRMAN: HIS WORSHIP THE MAYOR

(ALDERMAN H. ALSTON).

C. H. WORDINGHAM, Esq., C.B.E.

(Past President of The Institution of Electrical Engineers),

MR. NAPIER PRENTICE, A.I.E.E.,

AND OTHER GENTLEMEN,

WILL SPEAK ON THE SUBJECT OF

ELECTRICITY SUPPLY IN SUDBURY AND SURROUNDING DISTRICTS.

Ministry of Agriculture and

5.02 Charles Wordingham lectured on the need for domestic electricity supplies

By 1923 his health was being to fail, to be believed through overwork and as a result of the work undertaken during World War I. His obituary described a man who always considered all aspects of any problem in a logical and practical way in order to be able to then work and speak about the matter with purpose and enthusiasm.

Frank Merricks 1866-1936. President of the British Section between 1927 and 1929

An obituary written for Frank Merricks in 1936 gives a brief insight into his globe-trotting career. Although it refers to his travel to many countries, one only has to look at his application for membership of the Institution of Civil Engineers in 1922 to realise the scope of his involvement with worldwide mining projects. It is worth noting that at the time of his application to the Institution of Civil Engineers, Merricks was already a member of British Section of the Société des Ingénieurs Civils de France having been placed for election in 1920.

5.03 Frank Merricks

He had become an Associate member of the ICE in 1898 and in his application he gave a brief résumé of his career to date which included employment in the UK, India and Australasia, actually giving his address as being in New Zealand. He had been employed by Edward Riley and Co., Construction and Mining Engineers since 1891. Riley, himself a metallurgical chemist and minerals analyst needed an employee (subsequently partner) with qualification and experience in mining. The Institute of Mining and Metallurgy lists Merricks as an Associate of

the Royal School of Mines in its journal and Riley took him on initially to manage a newly opened branch of his business in Cordova, Spain.

By the time of his application to become a full member of the Institution of Civil Engineers, his experience encompassed work around the world. His overseas work seems to have started at almost the beginning of his career, and even during the time of his Associate membership Merricks had reported on mines in a large number of European countries as well as Australasia, British Columbia, Siberia and India. One significant report was an investigation for the Bank of New Zealand Estates Company into the iron ore deposits of New Zealand and on the advisability of establishing an iron and steel works there.

He also worked in Venezuela, Newfoundland and the Middle East, the last of which involved producing reports for Messrs. Stern Brothers.

From his application, this is a small sample of his travels! The war stopped much of this overseas work but he was actively engaged on the Home Front. During World War I, he acted as an agent for the War Office in order to organise and erect a large number of "Hutment Camps." The camps were used for both troop training and for housing prisoners of war. He seems to have been involved with those built in Colchester and Ipswich. The camp at Colchester was used for training.

5.04 Training at the Colchester Army Camp

In the 1920 London Gazette he is described as having been in charge of Home Iron Ore and Limestone Development, in the Iron and Steel Production Department, for the Ministry of Munitions, where he became responsible for ensuring an increase in the supply of home sourced iron ore. The war had, of course, increased the demand for iron production for both munitions and infrastructure.

Post war, Merricks continued to work as a mining engineer. One of his assignments was to China to investigate and report on the viability of establishing an iron and steel works for the Chinese Engineering and Mining Co. Ltd.

This period also included his membership of the Mineral Resources Development Committee and from 1920-1926 he sat on the Geological Survey Board. He was a member of the Advisory Committee on metalliferous mining and was a Treasury representative on mining companies in Cornwall – a busy man!

In 1927 it was reported that new goldfields, adjacent to previously known deposits, had been discovered in Venezuela. The Leeds Mercury of 10 January 1927 recorded Frank Merricks as a director of New Goldfields of Venezuela Limited in addition to serving on its Technical Committee. The goldfields involved were held under direct title from the Government of Venezuela and the earlier fields had produced gold to value of over £5million during the late 19th century.

The report to the Technical Committee, prepared by Mr Noel Hackney MIMM, gave details of the estimated profitability of the mines, the availability of labour and the ease of transport to and from the mines. New and improved roads were being constructed through the State of Bolivar. Frank Merricks was familiar with the goldfields and was appointed by the Board to consider this report and to supervise the development and equipment required.

Merricks was president of the British Section of the Société des Ingénieurs Civils de France from 1927 -1929. In March 1929, the British section hosted Mr.C Berthelot at the Institution of Mechanical Engineers. Mr Berthelot and his wife had made a special journey from Paris to deliver his address. The address, given in French, was titled "Evolution and tendencies in the coal industry, coal washeries and modern methods of carbonisation"

During his presidential year he accompanied a party of French engineers on a tour of Great Britain. The visit was reported in the Yorkshire Post and Leeds Intelligencer of 1 July and the Sheffield Daily Telegraph of 3 July 1929. Sixty members of the French society of engineers, accompanied by their wives and daughters (no sons?) came to Britain for a 2000 mile tour of important engineering activities. The group included Mr Albert Moutier "the grand president of the Society". Moutier was the chief engineer of the Nord Railway Company of France. The sites visited included the London Docks, Cadbury's factory in Birmingham, the LMS railway works in Derby, where they were met by the chief mechanical engineer of the works, Sir Henry Fowler, foundries in Sheffield, and the Fairfield shipbuilding company on the Clyde. Over the course of 6 days the party certainly had a whistle-stop tour of Britain, travelling by motor coach and express trains. I think the pace of the visit would tax the current IESF membership even with the benefit of modern transport.

Merricks was clearly interested in growing cooperation and friendship between British and French engineers. It

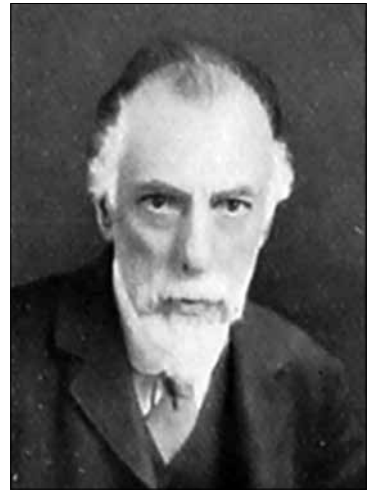
was reported in the Cornishman newspaper of 21 May 1931 that the president of the French Republic had created him Officer de l'Instruction Publique "in recognition of his services in developing friendly relations between the engineering communities of Great Britain and France through the medium of the Société des Ingénieurs Civils de France."

The pace of his life was slowing somewhat although he hadn't stopped travelling altogether. He went to South Africa in 1930, accompanied by Mrs Merricks and to Buenos Aires in 1931 aboard the Blue Star Lines SS Avelona Star.

The Times of 10 June 1936 concluded its obituary by saying "in his quiet way Mr Merricks had the kindliest instincts and the broadest sympathies, and did all he could to encourage younger members of the profession. Within the past year or two he had not been so active in his profession but occupied his time looking after the affairs of charitable institutions. His loss will be felt through a very large circle".

Lucien Alphonse Legros 1866-1933. President of the British Section between 1924 and 1926

Alphonse Legros, the father of Lucien Legros, was an eminent French artist who emigrated from France to England in 1863. He worked as an etcher and engraver but, encouraged by Whistler he became the Slade Professor of Fine Art at University College London where he taught for 17 years. His students included a large number of women who became known as the Slade Girls and who subsequently went on to secure many society commissions mainly for reliefs and sculptures.



5.05 Lucien Legros

Alphonse was an excellent draughtsman and in fact many of his works can be seen in British galleries, including his portrait of Rodin in the Manchester Art Gallery.

Lucien Legros was born in London in 1866, and was the eldest son of Alphonse and his English wife, Frances Hodgson. He attended University College School and went on to work in a variety of engineering companies in his early career. In 1887 he started work at Hick Hargreaves in Bolton, who were manufacturers of stationary steam engines and locomotives. During this short period in the north of England he also served on the Manchester

Association for the Prevention of Smoke, a committee of doctors, scientists and engineers who were attempting to curtail the output of all noxious smoke and fumes from the "Chimney of England" as Manchester was described.

Legros moved on from Bolton to work for the London and South Western Railway at their Nine Elms works. His diverse career continued with Southby and Blyth, refrigerating engineers and as assistant works manager for the London Portland Cement company. He became a member of the Institution of Mechanical Engineers in 1889.

Legros's interest then turned to road traction, working for the Gas Traction Company and the British Traction Company. Having already designed the first petrol driven tram cars in England in around 1895 (not something that seems to have caught on!), in 1899 he was employed by Messrs. Burstall and Monkhouse, a firm of electrical consultants, to make a partial survey of the Croydon tramways. (Part of the Croydon tram line closed in 1927, the remainder being taken over from Croydon Corporation Tramways by the London Passenger Transport Board in 1933. A new tramway system, running partly on disused railway lines, opened in 2000 –the first tram system in London since 1952)

In another change of direction Legros was appointed engineer to the Frederick Wicks company and his experience with rotary type-casting machinery there led, in 1916, to his joint authorship of "Typographical Printing Surfaces." His interest in printing may have been as a result of his father's influence through his skill in engraving.

In 1904 his future career path seemed to have become settled when he became partner to Mr G.J.F. Knowles in the production of motor car chassis and engines. Their model, the Iris, was manufactured from 1904 until 1925. Three models were manufactured with 15, 25 and 35 horse power versions and were sold in 1915 for £ 350, £575 and £700 respectively. It appears, however that Legros himself designed no cars after 1907.

The Institution of Automobile Engineers was established in 1906 and Lucien Legros was one of the founding members, and was their president twice, in 1911 and again during World War I, 1915-1917.

In 1910 Legros read a paper to the Institution entitled "The Development of Road Locomotion in Recent Years" for which he was the first recipient of the Starley Premium award in 1914. The award was given by the Institution of Mechanical Engineers. Other awards for his work included the Thomas Hawksley Gold Medal and a further Starley Premium for his paper "Traction on Bad Roads" awarded in 1918. In addition he was awarded the Alcan medal for his work on military caterpillar traction – date unknown. This award was granted by the Société des Ingénieurs Civil de France.

5.06 An advertisement for the Iris car

Whilst a member of the Council of the Institution of Automobile Engineers, Legros seems to have been a man somewhat ahead of his time with regard to the role of women. He promoted the idea that women should be admitted to membership. Dorothée Pullinger, who was employed as a draftsperson at the Arrol-Johnson automobile firm in Scotland, applied to be an Associate as the by-laws stated a "person" could apply. On advice from the Royal Society, the Institution was told that a "person" meant a man! Legros and Pullinger's request was refused.

In 1910, the British Army had no off-road motor vehicles other than few steam powered "Hornsby Crawlers"- which were primarily for agricultural use. The army relied on good roads for its motor transport. This attitude was condemned by a friend of Lucien Legros, Colonel Crompton. Crompton was a 69 year old steam haulage veteran who had once been fined £3 for exceeding the 12mph speed limit in Surbiton. He was also the first President of the Institution of Automobile Engineers and was determined to improve the state of the roads. His experimental work included spraying the surface of the road with gas tar and with a road dust inhibitor. His work led to the establishment by the Government of the Road Board in 1910, with Crompton appointed to the board.

Through Crompton, Legros was made assistant consulting engineer to the Admiralty Landship Committee in World War I and, later, to the Munitions Inventions Department. Crompton was asked to produce alternative designs for wheeled and tracked vehicles and after establishing a drawing office turned to his friend Lucien Legros to work with him. He described Legros as "a meticulous and distinguished engineer".

Legros and Crompton worked together on the design and production of tracked vehicles, which they promoted over any form of wheeled vehicle. Legros was also tasked to ensure a supply of the right quality hardened steel. This proved difficult as it needed to be relatively thin plate. The steel was procured from many areas of Britain including

Glasgow ship yards and Sheffield rolling mills. Its ultimate purpose was kept secret at the time.

In 1918 he was awarded an OBE. In the commendation he was described as a Chief Technical Assistant, working in the Dilution Section in the Ministry of National Service. The Dilution Section was a branch of the Ministry established to make sure workers were allocated to locations where their skills could be best applied.

Legros was amongst the first members of the British Section, his application had been approved by 1920 and soon afterwards he was invited to join the council. In 1920 he gave a lecture to the British Section entitled "Tank and Chain Track Artillery", illustrated with lantern slides. In 1922 he offered a further lecture, this time the subject was the crossing of the Sahara Desert by Kegrasse Citroen cars. These were half-track vehicles for off road and military uses. (Ultimately these were produced under licence by the US Army Ordnance Department. In World War II the US produced over 41,000 vehicles.) Legros delivered this lecture several times including in Paris and to the Institute of Automobile Engineers.

He maintained his interest in tracked vehicles and he subsequently delivered a talk to the society about a new tractor which had been designed by Mr Pavisy and also invited Colonel Crompton to deliver a paper.

Throughout his career, Legros was a "committee man", which perhaps demonstrates his widespread interests in the field of engineering. He sat on the International Electro-Technical Commission in 1912, the Mechanical Transport Advisory Board of the War Office and the Treasury Committee on Type Faces.

In addition he worked on the Publication committee of the Institution of Automobile Engineers where no doubt his knowledge of printing methods was of great assistance.

Lucien Legros was a Member of the Institution of Automobile Engineers from its formation in 1906 until his death in 1933. He was also a member of the Institution of Civil Engineers, the Institution of Mechanical Engineers and the Institution of Electrical Engineers. He is said to have maintained a keen interest in French engineering and was President of the British Section of the Société des Ingénieurs Civils de France between 1924 and 1926, that is, whilst still in its infancy, which may reinforce this claim.

Legros never married and lived with his sisters, first in Hammersmith then latterly in Mill Hill. The extent to which he travelled is unknown but his first passport application was made in 1896. Just before his death he travelled on the ship "Glengarry" which was sailing to China from London but this seems to have been a round trip. He did not appear to spend any time at any of the

ports at which the ship dropped anchor before docking back in London.

Lucien Legros died at the age of 67. Tragically, and somewhat ironically, he was knocked down by a motor car whilst crossing the road from his home to post some letters.

William James Eames Binnie 1867-1949. President of the British Section 1939-1940 and 1944-1945

William Binnie was born in Londonderry in 1867. His father, Alexander Binnie was developing a notable career in civil engineering and during William's youth was working on projects which would have led him quite an itinerant life. Shortly after William's birth, in 1868, his father moved to India as engineer to the Nagpur water supply system. He was awarded the Telford Medal of the Institution of Civil Engineers for his paper on the Nagpur Waterworks. The family would seem to have been reunited in 1875 when Alexander Binnie was appointed as Chief Engineer for the City of Bradford. William attended Bradford Grammar School before moving on to Rugby School and then to Trinity College, Cambridge.

When William applied to become an Associate of the Institution of Civil Engineers his statement of experience said he had been trained "for the profession of a Civil Engineer from December 1885 to December 1890 under his father". He also spent six months at the Polytechnikum, Karlsruhe, Baden and a further six months experience at the Bradford Water Works. Binnie seems to have taken a similar path as his father, working for a wide range of engineering companies and by the time of his application was contractor engineer working on the building of the Lancashire, Derbyshire and East Coast Railway under Messrs. S Pearson and Son. He was duly admitted as an associate member in 1892.

5.07 William Binnie

In 1896 Binnie joined the workforce of Sir Benjamin Baker as resident engineer during the building of the Central London Railway – the Twopenny Tube – where he stayed until 1900 when the line was opened. The design and construction of this deep level underground railway was initially led by three engineers, Sir James Greathead and Sir John Fowler along with Sir Benjamin Baker. All three had considerable experience in railway engineering. Greathead had developed the tunnelling shield method, Fowler had been an engineer on the Metropolitan railway and Baker had worked on the New York elevated railway. When completed, the tube was all underground and ran for over 5.5 miles between Shepherds Bush and Bank. The cost of travel was 2d. for a journey between any two stations, hence the nickname the Twopenny Tube, which was coined by the Daily Mail. By the end of 1900 the line had carried almost 15 million passengers.

I can't help thinking this must have been an exciting project for a young engineer like Binnie. Tunnels were dug to a depth of 60-110 feet and followed the route of the roads above, which meant that where the roads were narrow the tunnels could not be side by side but had to be one on top of the other. This meant that station platforms were on different levels. Bank station was constructed wholly underground. There were electric lifts to all other stations and of course, the railway used electric locomotives. (Maybe the Crossrail of its day.)

By the time Binnie became a Member of the Institution of Civil Engineers in 1901, he had travelled to Egypt and was the resident engineer for the Khedivial Steam Ship Company based at the Alexandria graving dock. The Company had been established in Egypt in the mid nineteenth century but had been unsuccessful in its aim of creating a modern mercantile fleet for Egypt. From 1898 it sailed under the British flag as part of the P and O line and although the main routes continued to be around the Ottoman Empire, it was able to expand its business to America. In 1936 the company became the Pharonic Mail Line and was eventually nationalised in 1961.

On his return from Egypt in 1902 he went into practice with his father as a consulting engineer. In this capacity, he was involved with his father in the major issue of the water supply for London. The Metropolitan Water Board was formed in 1902 and its 66 members came from each of the local authorities concerned. His first meeting was in 1903. As the Metropolitan Water Board was to take over the control of London's water supply, it was necessary to set up a Court of Arbitration to assess levels of compensation to which the shareholders were entitled. William Binnie and his father provided evidence to this process when the amount of compensation for the East London Waterworks Company was being determined.

5.08 The Khedivial Mail Line

After the death of Sir Alexander Binnie in 1917, his son became the senior partner in the firm of Binnie and Deacon. As his career developed in the field of water engineering, Binnie worked on projects around the world. He was the technical advisor to the British representative on the Central Commission for Navigation on the Rhine in 1922. (The commission was established following the Napoleonic wars and although changes have been made, the Convention of Mannheim, agreed in 1868, is still responsible today for the general management, the administration of social security for ships' crews and is the seat of the Rhine navigation tribunal.)

His domestic responsibilities included membership of river Drainage Commissions.

William Binnie became a member of the British Section in 1922 and was invited to serve on the council, if elected, in 1929 but he chose to decline due to pressure of work.

Back in Egypt, in 1928, he was involved in the heightening of the Aswan Dam and later, in 1937, advised on harnessing the river for the generation of hydro-electric power. As a recognised expert, he was made Chair of the British Sub-Commission on Large Dams from 1933-1946.

The company, which was now Binnie and Partners, was commissioned to lead the construction of the Shing Mun reservoir in Hong Kong with Brigadier Hull as its Chief

Engineer. Hong Kong had suffered from a drought in 1929; the Government had been forced to impose water restrictions and took the decision to construct a reservoir and dam. Work began in 1930 and was completed in 1939, 15 months ahead of schedule and under budget. It is reported that William Binnie took a "hands on" approach to projects and as a consequence travelled extensively. He travelled to Hong Kong to inspect the reservoir and to give advice on further water schemes. Returning from this visit in 1940 Binnie was flying on a French airliner. Unfortunately, as the German forces had invaded and overrun France, it was necessary to divert the flight to Algiers where all passengers were disembarked. As a French colony, Algeria would soon be involved in the war. Binnie was clearly a resourceful man and managed to sign on as a washer-up to a Chinese cook on a ship bound for Gibraltar – a ship which was short-handed due to a mutiny by the Turkish crew!

William Binnie was the President of the Institute of Sanitary Engineers in 1917 and had also been President of the Institution of Water Engineers in 1921 but it was in his capacity as President of the Institution of Civil Engineers that he gave the following address to the Health Congress at Scarborough in 1939 which showed his continuing concern about the issue of providing piped potable water to households.

5.09 The Shing Mun Reservoir, Hong Kong

5.10 The Shing Mun Reservoir commemorative stone which mentions William Binnie

Published in the Journal of The Royal Sanitary Institute in 1939.

Presidential Address by W.J.E. BINNIE, M.A., M.INST.C.E, F.G.S., President, Institution of Civil Engineers.

"It is a much appreciated honour to be asked to preside over this Section of the Annual Health Congress of the Royal Sanitary Institute. On such occasions the President deals with the subjects to which his career has been devoted, and I therefore decided to say a few words with regard to water supply.

About 95 per cent. of the population of England and Wales are now provided with a public water supply. In rural districts, however, the cost of providing it may be so great as to throw a burden on the consumers which could not be met without assistance, and the reliance is placed on local shallow wells and springs, which are not infrequently contaminated or fail in periods of drought.

Recent legislation has, however, conferred powers on the county councils which enable them to render financial assistance, and in a number of cases this assistance has made possible the provision of a piped water supply to rural districts.

The advantages of a piped supply where water of sound potable quality can be brought to a tap within the house are frequently not appreciated by the inhabitants, with the consequence that a considerable period may elapse before a good drought occurs which helps to make up their minds to take the water.

The time is not far distant when a public water supply will be available for the use of everybody in the country, with the exception of farms and houses which are so isolated as to make the cost of providing a piped supply prohibitive."

Binnie was one of the few recipients of the Herbert Lapworth Medal. Lapworth was an authority on the geology of water engineering. In 1939, when Binnie was President of the Institution of Civil Engineers he was invited to a joint meeting with the American Society of Civil Engineers and the Engineering Institute of Canada at the World's Fair in New York to be followed by a visit to Canada. He also became an Honorary member of the American Society of Civil Engineers and the New England Waterworks Association. William Binnie served two terms as President of the British Section of the Société des Ingénieurs Civil de France, 1939-1940 and again 1944-1945. Clearly, the situation in Europe made continuing exchange visits impossible and the proposed visit of French engineers during Binnie's presidency was cancelled.

Shortly before his death he was honoured by the French government who made him a Chevalier de la Légion d'honneur in 1948.

Alfred Tony Jules Guéritte 1875 – 1964. President of the British Section 1921

Throughout his life Alfred Tony Jules Guéritte was referred to as "T J". Not only was he an accomplished engineer, but he was also a prominent spokesperson for France, a lover of music and anxious to find ways to build connections between engineers across international boundaries, including the promotion of a common language.

T J Guéritte was born on 7th March 1875, the son of the Mayor of Blois. He took his degree in Paris at the Ēcole Centrale des Arts. By his early twenties he had found work in the recently opened offices of François Hennebique where he worked on the Hennebique system of reinforced-concrete construction. T J was said to be the most important of the engineers in the Paris office and it wasn't long before he joined Louis Gustav Mouchel in London, where Mouchel was acting as agents for Hennebique. In fact many of the staff in the Mouchel office at this time had come from Paris.

One of his first jobs in England was to instruct D N Brims, the contractors of the CWS quayside warehouse in Newcastle upon Tyne and, for this purpose, took up lodgings on Jesmond Road, Newcastle. By 1904 he had become Mouchel's Northern District Engineer and Manager. Not long after, Louis Mouchel realised he was terminally ill and decided to turn his business into a company, L G Mouchel & Partners Ltd, with T J Guéritte as one of the first directors. Mouchel died at the comparatively early age of 56 in May 1908 and offered his personal holdings in the company to his staff in his will. This was a formative moment for T J Guéritte since he went on to lead the company for nearly forty years.

Mouchel became one of the largest technical consultants in the United Kingdom, being involved in many prestigious projects over the years including the Royal Liver Building in Liverpool (1911 – one of the first buildings in the world to exploit reinforced concrete), Battersea Power Station (began in 1929) and the Earls Court Exhibition Centre (1937).

Sometime before 1912 T J was married to Madeleine who was significant in her own right, becoming the founder and editor of "La Nouvelle Education" and translating several books from English to French. Guéritte seems also to have been something of a music lover taking an interest in the French composer Florent Schmitt and being involved in the Société des Concerts Français in the decade after 1907, which organised chamber music concerts throughout Great Britain.

It is clear that T J wanted to involve himself in advancing engineering knowledge from the outset. In 1912 the Society of Engineers awarded him the Clarke Premium for his paper "The Mechanical Installation and Upkeep of Permanent Way on Railways". Two years later he was advocating the use of Esperanto by engineers to improve the spread of knowledge and international cooperation. He was of the view that English or French would never be accepted as a "world language" on account of irregularities of grammar and pronunciation as well as international jealousies. Maybe today we are getting much nearer to the domination of English than T J thought possible. His interest in Esperanto persisted for many years and he was appointed Fratulo Dumviva (life brotherhood) of the British Esperanto Association in 1931.

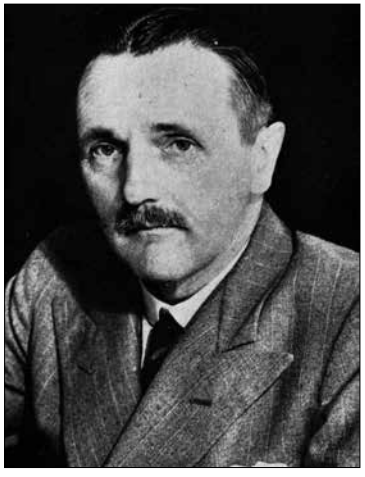
T J Guéritte was a prime mover in the establishment of the British Section of the Société des Ingénieurs Civils de France in 1919 and served both as President and long term treasurer until the 1950s. He regularly contributed papers to the British Section and elsewhere, being awarded at least three premiums for his contributions. However he had other important roles to perform. He was the President of l'Office Commercial Français en Angleterre after World War I. By 1936 he was the vice-president of the Alliance Française, an association of friends of the French language and literature throughout the world, and which had 28 active committees operating in British towns.

During the war, in 1941, while president of Les Français de Grand-Bretagne, T J laid a wreath on Bastille day at the foot of the statue of Marshal Foch in Grosvenor Gardens, London. This was in the name of all French societies and of all French men and women whose home was in Britain and recognised that similar celebrations were curtailed in their home country. The next year, on 11th November Armistice Day, he appeared alongside General Charles de Gaulle on the platform at the Royal Albert Hall at a great rally organised by Les Français de Grand-Bretagne, spreading the news about the allied successes in North Africa and elsewhere.

In 1951 the British Section inaugurated the Guéritte Medal. This had two objectives. First, to give tangible recognition to Mr Guéritte's untiring work on behalf of the British Section, and second, to award authors of papers of outstanding merit. The medal was awarded nine times before his death.

T J Guéritte was clearly a hard worker who promoted the interests of French people living in Britain at every opportunity. This was evident from his support for the British Section to which he gave perhaps the longest service of any of its officers.

Arthur Stanley Angwin 1883 – 1959. A Member of the British Section until 1953



5.11 Arthur Angwin

Although born in Penzance, Stanley Angwin lived for more than thirty years in Welwyn Garden City, being one of the new town's earliest residents. He had worked in Scotland in the run up to World War I from where he was mobilised as the Officer-in-Command of the 52nd Divisional Signal Company. He served in Gallipoli, Egypt, Palestine and France and was awarded the MC and DSO and was mentioned in dispatches five times.

After the war he joined the Post Office Engineering Department and was involved in the design and construction of radio stations at Leafield, Rugby and Cairo and with the inauguration of the transatlantic telephone service. Under his leadership the Post Office went on to develop short wave radio installations which gave Great Britain a predominant position in world telephony.

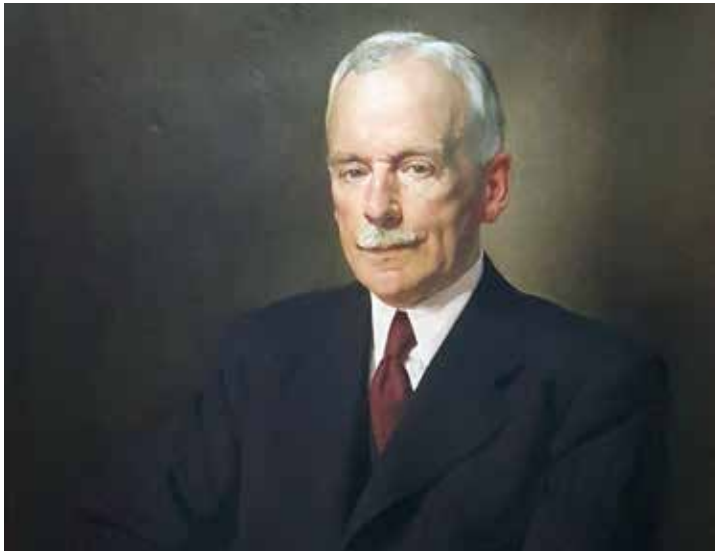
Stanley was one of the three people (including Lord Reith) to appear on screen at the launch of the BBC television service from Alexandra Palace just before the broadcast of the coronation of King George VI. He was knighted in 1941 and rose to be the Engineer-in-Chief of the Post Office from 1939 to 1946.

In 1952 a new cable repair ship built by Swan Hunter in Newcastle upon Tyne was named CS 'Stanley Angwin' and launched by Lady Angwin.

William Thomson Halcrow 1883-1958. President of the British Section in 1938 and 1939

William Halcrow's career spanned an era of great innovation and development in engineering and in particular the use of ferro-concrete. He was involved in many major projects which a potted biography cannot fully encompass. Although he was born in Bishopwearmouth near Sunderland, his family was from Shetland and it was in Scotland that William was educated, graduating from Edinburgh University and where he began his career as an engineer.

He joined the firm of P W and C S Meik and became a pupil to the senior partner, Patrick Meik. He was employed as an assistant resident engineer on the Kinlochleven hydroelectric scheme, the first of such schemes for him which were to become one of the core interests of his



5.12 Sir William Halcrow

working life. His application to become a Member of the Institution of Mechanical Engineers lists assisting on the Lochleven scheme, where a 3000 feet long concrete dam was constructed, working on projects to construct concrete docks and also a ferro-concrete pier in Italy.

In 1910, Halcrow began to work for Topham, Jones and Railton Ltd. He was initially engineer and latterly chief engineer and given responsibility for delivering contracts in Great Britain and overseas.

In the lead up to World War I, Halcrow was appointed to take control of the construction of the defences at the Invergordon Naval base and following that was given charge of the submarine and land defences at Scapa Flow. The Invergordon Naval Base, on the Cromarty Forth, began operations in 1913 and consisted of extensive dockside facilities, fuel storage silos, and accommodation for both naval and civilian personnel.

In Singapore, the trade in tin, rubber and pepper between Singapore and Malaya was leading to the Straits of Johor becoming increasingly congested with ferry traffic. In 1917 the British Government commissioned consulting engineers Coode, Matthews, Fitzmaurice and Wilson to report on the feasibility of a causeway to cross the Straits. The contract was awarded to Topham, Jones and Railton and work began in 1919. William Halcrow was involved in the construction work having presumably returned to civilian work. The causeway was the largest engineering project to have been undertaken in Malaya at the time. There was concern about the cost, an estimated 17million Straits dollars, and work had to be suspended between 1920 and 1922 due to an economic depression. The Straits were eventually closed in July 1923 and the causeway was officially completed and opened in June 1924.

Back in Britain by 1922, Halcrow returned to C S Meik where he became a partner. Following Meik's death

in 1923 the company would eventually became WT Halcrow and partners (1941).

Halcrow was once again engaged in major hydroelectric schemes in Scotland, in particular the Lochaber Water Power works for the British Aluminium Company Limited. In 1930 he delivered a paper on this project to the Institution of Civil Engineers, leaving no doubt that he was an important advocate for hydropower both in the UK and overseas.

In 1927, Halcrow was appointed to the London Passenger Transport Board as joint consulting engineer working under Sir Harley Dalrymple Hay. Hay had worked with the GPO in their construction of an underground railway system to distribute mail to the main sorting offices. This opened in 1927 and soon the fleet of Royal mail vans in London had reduced by 25 per cent.

At the start of World War 2 Halcrow was appointed to a war office advisory committee and was a consultant on safety and defence to the Secretary of State for War. Working with the LPTB had given Halcrow considerable knowledge of the Underground system which was to prove invaluable. His company was involved in the construction of deep tunnels under Whitehall and also worked on making the London Underground system safe from the risk of flooding. In the early days of the war a bomb fell on a disused tunnel which passed under the River Thames south of Charing Cross. Flooding was averted because Halcrow had recommended huge concrete plugs be inserted at either end of the redundant tunnel. (Halcrow was given the nickname "Noah", the man who had saved London from "the Great Flood".) He assisted in the design of deep underground air raid shelters, some attached to existing underground stations. The tunnel under Goodge Street was particularly significant as it became the bunker from which General Eisenhower directed the D-Day landings.

Halcrow worked on the vital Mulberry Harbour scheme, in particular the construction of the Phoenix caissons which were manufactured by several civil engineering contractors and built at various coastal locations around Britain. (One of the contractors involved was Gibb and Partners, largely run by Angus Paton, a fellow member of the British Section.)

As if that was not enough, Halcrow also advised Barnes Wallis on the effect of a bouncing bomb on the Mőhne dam.

Towards the end of the war, he again took up his advocacy of hydropower. It was reported in February 1945 that he, with others including Mr S B Donkin, responded to a report on the topic to the Minister of Fuel and Power. A report which had been produced in 1933 on the feasibility of a Severn barrage was being reconsidered. Originally the cost had been estimated at around £29million. The revised

5.13 Remains of a Mulberry Harbour at Arromanches

cost of the barrage was £47million. The advice from the engineers was that the scheme was both practical and economically justifiable. They calculated that the output from the barrage sub-stations would be 2,190 million kilowatt hours during the first 15 years of operation, rising to 2,207 million subsequently. The consultants believed work could begin in 1947 and take eight years to complete. The saving in coal in the first 15 years was to be almost 1million tons per annum. Halcrow reiterated this position in a lecture to the Royal Institution in May 1945. (We are still waiting!)

In 1944 William Halcrow became Sir William Halcrow, knighted in recognition of service to the Government.

Three years later, W T Halcrow and Partners returned to Scottish hydro schemes. The North of Scotland Hydro-Electric Board wanted to use hydro electric power for public, rather than industrial use. Halcrow's worked on several schemes, including that at Glen Affic. In Wales too, the company built several dams, including, in 1952, the Clywedog dam which helped supply water to the West Midlands.

Major projects overseas included the Kafue Hydro-Electric scheme. The Sphere reported in May 1953 that the engineers found little data available with regard to both topographical surveys and hydrological records. It was decided to map the terrain from the air. "After Sir William Halcrow, the London consulting civil engineer to the Northern Rhodesian Government, presented his report in January, it was decided to go ahead with the Kafue scheme and to give it preference over the Kariba Gorge scheme which will be complementary." (In fact the two dams were constructed in the reverse order.)

Sir William Halcrow maintained his commitment to research and development in the field of hydraulics, giving his support to the development of the Hydraulics Research Station at Wallingford in Oxfordshire which was established in 1947. He was President of the Institution of Civil Engineers in 1946.

Other areas in which Sir William had given support included being Commandant of the Engineer and Railway Staff Corps of the Territorial Army and acting as a member of the Air Safety Board.

So far as his involvement with British Section of the Société des Ingénieurs Civils de France is concerned, he was president of the organisation in 1938 and 1939, having applied for membership in1931. He joined the council in 1933 and became joint Vice-President with W J E Binnie in 1936. In his application to the Institution of Mechanical Engineers in 1933 he listed his membership of other organisations, one of which he described as the French Society of Civil Engineers.

During Halcrow's presidency of the British Section the lecture programme included a joint meeting with the Institution of Electrical Engineers and they continued to include topics and lecturers connected with its French roots. For example there was a lecture entitled "Prevention of Accidents in Industrial Establishments" delivered by Dr. A Salmont, Professeur at the Conservatoire National des Arts et Métiers, Paris.

The parent society visited Britain in June 1938, spending time in London, then travelling to the Engineering Congress in Glasgow via the provinces with a possible visit to the Mersey tunnel.

Halcrow agreed to remain as president for an extra year as Binnie was too busy.

Sir William retired in the 1950's and died in 1958. There were many obituaries written but perhaps this sums him up quite neatly.

"Perusal of Sir William's writings will reveal a style of unusual directness and polish. His interests were not limited to matters of engineering, a fact which was reflected in his appointment as a member of the Royal Fine Art Commission, which is a rather unusual office for a civil engineer. Not all, by any means, of the major civil engineering projects with which he was associated have been mentioned in this appreciation of his career, nor have all the bodies to which he belonged been listed, for the list is very long. But perhaps we have said enough to show that his career was unusually brilliant and energetic, and his death is a sad loss to the civil engineering profession."

Herman Sloog 1884-1921. Secretary of the British Section 1919 – 1921

Herman Sloog was never President of the British Section of the Société des Ingénieurs Civils de France, a position he would undoubtedly have held had it not been for his early death at the age of 37. He nevertheless belongs in any list of significant members of the organisation. His driving aim seems to have been the promotion of cooperation, through

5.14 An advertisement for the Western Electric Company

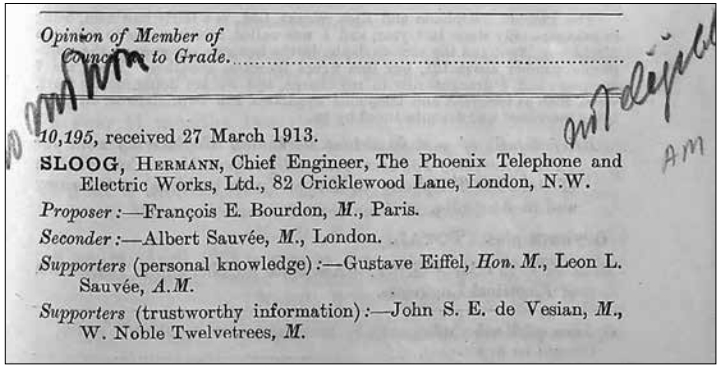
friendship, the sharing of academic ideas and of business links between engineers in France and Great Britain.

Sloog was born in Amsterdam and educated in Paris. In 1906 he left the Centrale des Arts et Manufactures with a diploma in engineering. He was first employed in England by the International Western Electric Co., London. In the late nineteenth century this company made vulcanised electric light wires as agents for the American based company. By the early twentieth century they had acquired a failing cable factory in North Woolwich and having first assembled imported components from Belgium and the United States began complete manufacture. Herman Sloog was employed there between 1906 -1910, leaving as Chief Engineer.

He briefly returned to Paris to become Chief Engineer and manager of the M S Lamp Manufactory and Installation Co.Ltd., a company specialising in the manufacture of metal filament lamps.

On his return to England in 1910 he was employed by the Phoenix Telephone Co., an industry very much in its infancy. In 1913 he applied to become a member of the Institution of Mechanical Engineers which, despite the backing of some famous and eminent engineers seems to have considered him “not eligible”.

In furtherance of his application he says that at Phoenix “I was called over in order to erect a Machinery plant



Opinion of Member of Council as to Grade......

10,195, received 27 March 1913.

SLOOG, HERMANN, Chief Engineer, The Phoenix Telephone and Electric Works, Ltd., 82 Cricklewood Lane, London, N.W.

Proposer:—François E. Bourdon, *M.*, Paris.

Seconder:—Albert Sauvée, *M.*, London.

Supporters (personal knowledge):—Gustave Eiffel, *Hon. M.*, Leon L. Sauvée, *A.M.*

Supporters (trustworthy information):—John S. E. de Vesian, *M.*, W. Noble Twelvetrees, *M.*

5.15 Herman Sloog's application to join the Institution of Mechanical Engineers, with Gustave Eiffel as a supporter

and the various depts. in the factory". His statement of achievements states that he had been personally responsible for "construction of complete Telephone Exchanges (with Building) in Guernsey and in Australia".

In 1913 he had begun to actively promote Anglo French cooperation and was the first Honorary Secretary of a group known as "Camarades", which had been formed from former students of the Ecole Centrale. This group was to develop professional and business relations with Great Britain and grew into the Franco–British Inter-University Group.

By the end of the First World War, Herman Sloog recognised the need for even closer links between British and French engineers. He took a leading role in the establishment of what was to become the British Section of the Société des Ingénieurs Civils de France. As the first Honorary Secretary he was instrumental in establishing the rules, constitution and wording of the British Section to the satisfaction of the French parent body. His vision was of a society which would consist of French, who were working in the UK, and British engineers. Sloog wanted to encourage British engineers to assist their French colleagues with their work, research and investigations. As Honorary Secretary he made arrangements for visits by British engineers to France, first, in 1920 to the devastated mining areas of Northern France then, in 1921 to the metallurgy works in Eastern France.

Continuing to work to assist in the development and formation of closer intellectual and professional links, he became Honorary Secretary of the Board of Control of the British Bureau of the Office of National French Universities, which promoted student exchange visits and summer study schools.

At the time of his death in 1921, the British Section had grown to 85 members and the minutes recorded that the council "greatly deplore the untimely death of our devoted secretary."

A further obituary reported:

"he was greatly liked and held in high esteem by all who had the privilege of coming in touch with this loyal, obliging, helpful and disinterested friend, this admirable organiser and indefatigable worker."

Herman Sloog died aged 37 on 4 November 1921, following an operation.

6. THE CENTENARY OF THE 'FRENCH CIVILS'

"In between each speech during the commemoration event, participants were entertained to classical music pieces played by the Orchestre de la Société des Concerts du Conservatoire under the direction of M. Cluytens."

There was a strong representation of British professional engineering bodies for the Centenary Anniversary of our parent body.

British professional representatives participating in the official delegations comprised:

Institution of Civil Engineers
President - Sir Roger Gaskell Hetherington and Lady
Secretary - Edward Graham Clark and Madame
Institution of Mechanical Engineers
President – Major William Gregson
Vice President – Cough FRS
Institution of Electrical Engineers
President – Percy Good and Madame
Secretary – Brasher and Madame
Iron & Steel Institute
President - Dr Desch FRS
Instiute of Mining and Metallurgy
Vice President – Major Donald Gill and Madame
Secretary – Felton
Institution of Naval Architects
Secretary – Duckworth and Madame
Institution of Structural Engineers
President – Frederick S. Snow
Walter Andrews and Madame
Saint Leger Crowley and Madame
Institution of Water Engineers
President – J Hawksley and Madame
Institution of Chemical Engineers
President – M Cremer
British section - French Society of Civil Engineers
President – G.J. McHaffie and Madame
Hon Secretary and Past President - W.R. Howard

The event started on 29th May 1948, presided over by M. Jacques Fougerolle, the incumbent President of the day. M. Eduard Depraux France's Minister of Education was in attendance with many senior representatives from the engineering profession around the world.

A Séance Solennelle de Commemoration was held at the beginning of the conference. France's President M. Vincent Auriol was in attendance.

In between each speech during the commemoration event, participants were entertained to classical music pieces played by the Orchestre de la Société des Concerts du Conservatoire under the direction of M. Cluytens.

The first speech was given by M. Jacques Fougerolle as President, followed by "Le Carnaval Romain" by Hector Berlioz. Sir Roger Gaskell Hetherington spoke next and replied to the president's speech on behalf of the Society's "Délégations Ētrangers". France's Minister of Education closed the speeches following the piece "Pelleas et Melisand" by Gabriel Fauré.

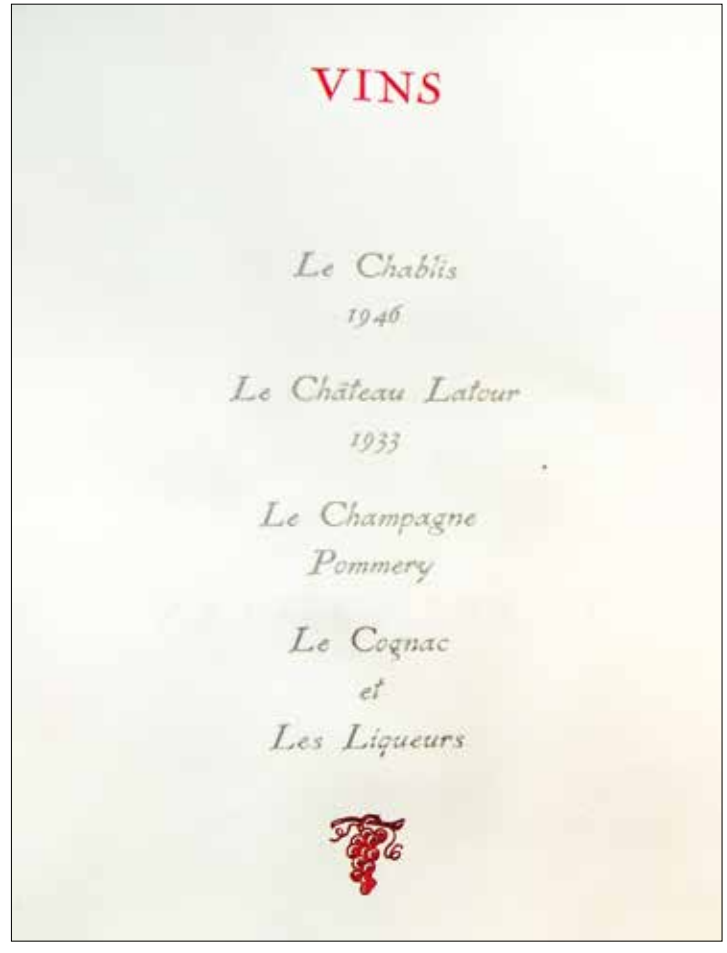
It is interesting to note that President Auriol's great grandmother, Anne Auriol, was a first cousin of the English engineer Isambard Kingdom Brunel, and that Auriol fought with the French resistance during the Second World War before he fled to London in 1943 where he continued with De Gaulle's Free French movement.

Papers were given and professional discussions on the papers were held over a number of days. They included diverse subjects such as the latest developments in trains, permanent ways and roads, lighthouse design and optics, port design and construction, municipal design, strength of materials and chemical engineering. One paper reviewed the differing design philosophies and wind load factors that countries in Europe and around the world used in their standard codes. Possibly the beginning of Eurocode thinking?

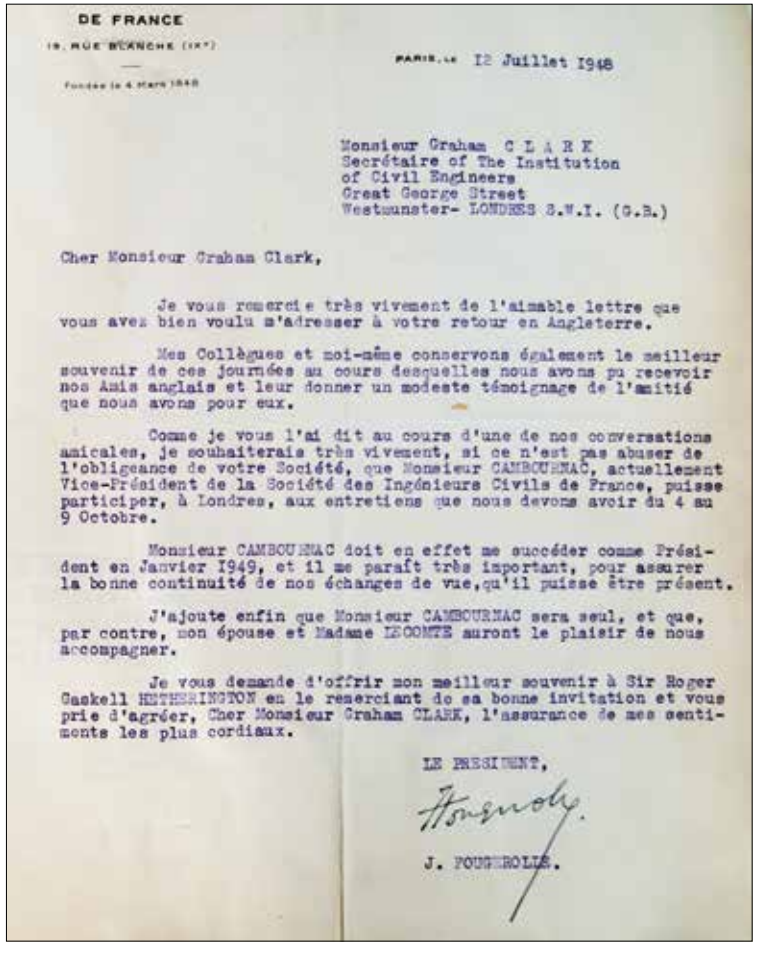
On the evening of 2nd June 1948 a banquet was held at Le Pré Catelan in the Bois de Boulogne. The menu and wines of the day are included in the adjacent extracts from the evening, and must have led to a very special celebratory evening to remember. Celebrations continued over the next week with various receptions for Congress participants, one being held on 7th June as a picnic in the grounds of Ampère's Maison by the Society of Amis.

Later in July, correspondence between the Society and the Institution of Civil Engineers reinforced the success and importance of the event and the increased participation between our two nations as a result.

6.01 The Centenary Menu



6.02 The Wine List



DE FRANCE

19, RUE BLANCHE (IXe)

Fondée le 4 Mars 1848

PARIS, le 12 Juillet 1948

Monsieur Graham C L A R K
Secrétaire of The Institution
of Civil Engineers
Great George Street
Westminster- LONDRES S.W.I. (G.B.)

Cher Monsieur Graham Clark,

Je vous remercie très vivement de l'aimable lettre que vous avez bien voulu m'adresser à votre retour en Angleterre.

Mes Collègues et moi-même conservons également le meilleur souvenir de ces journées au cours desquelles nous avons pu recevoir nos Amis anglais et leur donner un modeste témoignage de l'amitié que nous avons pour eux.

Comme je vous l'ai dit au cours d'une de nos conversations amicales, je souhaiterais très vivement, si ce n'est pas abuser de l'obligeance de votre Société, que Monsieur CAMBOURNAC, actuellement Vice-Président de la Société des Ingénieurs Civils de France, puisse participer, à Londres, aux entretiens que nous devons avoir du 4 au 9 Octobre.

Monsieur CAMBOURNAC doit en effet me succéder comme Président en Janvier 1949, et il me paraît très important, pour assurer la bonne continuité de nos échanges de vue, qu'il puisse être présent.

J'ajoute enfin que Monsieur CAMBOURNAC sera seul, et que, par contre, mon épouse et Madame LECOMTE auront le plaisir de nous accompagner.

Je vous demande d'offrir mon meilleur souvenir à Sir Roger Gaskell HUTHERINGTON en le remerciant de sa bonne invitation et vous prie d'agréer, Cher Monsieur Graham CLARK, l'assurance de mes sentiments les plus cordiaux.

LE PRESIDENT,

Fougerolle

J. FOUGEROLLE.

6.03 The letter from Monsieur Fougerolle in Paris

7. THE POST WAR YEARS

"1965 – The presidential address on "High-Lights In Hydro-Electric Development In Great Britain" contained coloured slides, which Mr Guthrie Brown said "might appeal to the ladies". This was in the infancy of popular colour photography. The dinner afterwards was at the Carlton Tower Hotel since the House of Commons was not a possible venue because that required an MP as sponsor."

INTRODUCTION

The British Section of Société des Ingénieurs Civils de France went into hibernation for most of the Second World War. However, when the allied victory looked certain towards the end of 1944 it came awake again under the continued presidency of W J E Binnie. Roger T Smith, W Noble Twelvetrees and C L Howard Hunphreys had all died during the war years but W R Howard was able to take up the role of Honorary Secretary again and T J Guéritte (an important founder member of 1919) agreed to act as Treasurer even though he was not fully well. Indeed he seems to have suffered poor health regularly over the next fifteen years.

The archives of the British Section held by the Institution of Civil Engineers include a continuous set of minutes running up to 1965 and these reveal a lot about the working and policies of the British Section as the country emerged from the austerity years of the late 1940s and early 1950s.

LEADERSHIP

The British Section was led by a Council consisting of eleven members (President, two Vice Presidents, Honorary Treasurer, Honorary Secretary and six other elected members) although, as the years went on, it was found advantageous to share some of the responsibilities. In some years the secretarial role was undertaken by up to three people, and the treasurer's job was regularly allocated to two members – although the latter arrangement seems mainly to have been to keep T J Guéritte involved in spite of his inability to attend meetings. The minutes reveal the following:-

1949 – T J Guéritte's health was improving, although he was still unable to attend meetings of the Council and had been absent since the war. He was nevertheless acting as treasurer, translating Papers and organising eminent French engineers to visit Britain. The Council decided that Mr Guéritte should receive help from a Joint Treasurer.

1950 – Bryan Donkin was asked to help as Joint Honorary Treasurer.

1951 – In October, Mr Guéritte felt he should relinquish his position as Joint Treasurer due to ill health. The matter was deferred when Bryan Donkin said he was quite agreeable to continue. The Council was obviously very concerned to recognise the special status of Mr Guéritte.

1951 – The French parent society wrote to invite the Secretaries of the various Sections overseas to attend future meetings of the parent Council. It was suggested that this would lead to English engineers being invited to Paris to explain progress with British engineering. This

arrangement does not seem to have worked however, not least because of the inconvenience and expense involved. Rather, delegations were sent across on a regular basis to annual meetings in Paris and the occasional lecture was given in France by an English member.

1953 – T J Guéritte gave the Council an oil painting of the Honorary Secretary W R Howard as an expression of thanks for services rendered over 25 years. This was accepted with grateful thanks. In fact, Mr Howard had a lot more years to give to the British Section.

1954 – A Chevalier de la Legion d'honneur was bestowed on the Honorary Secretary, Mr W R Howard, on 4th December.

1955 – Some tensions were revealed when the Council received representations that officers should be selected not just from consulting engineers. The Council took the point and asked members to submit names for their consideration. The process to form a Council seems to have been that incoming officers were selected by the Council itself from existing Council members and then a long list of other potential Council members was drawn up by the Council and a ballot of members held on that list.

1961 – The offices of the British Section were to be vacated at 82 Victoria Street. A move to the offices of A J Harris (Joint Honorary Secretary) at 127 Victoria Street was proposed. Being a small organisation, the British Section was dependent on premises being made available by its members.

1962 – Despite his representations, Mr Howard was persuaded to stay on as Joint Honorary Secretary for one more year (and in fact that was not his last).

1962 – The French parent society was investigating whether its memoires should be published in English. The President of the French society felt that 'having regard to possible political developments' it would be of interest to explain developments in engineering techniques in both countries in the English language. It is possible that the 'political developments' related to the emergence of the European Economic Community with its common agricultural policy and the European Social Fund. However, no more was heard of this.

1964 – Council meetings became very large. In January, 17 members attended (and 6 apologies were received in addition).

1965 – Mr Howard again accepted office for another year. The Council expressed pleasure at retaining him.

MONEY

The Council was always concerned about money and the need to balance the facilities offered to members against the size of their subscriptions. As is often the case with large organisations, the 'headquarters' (Paris) required the bulk of the subscription to be sent to them to pay their overheads and the British Section was left with a modest income to achieve its objectives. Over the years a number of economies were tried in order to make ends meet.

1944 – The National Savings Certificates held by the Section were transferred to a Post Office Savings Bank Account.

1948 – A special supplementary subscription of one guinea was levied on all members to balance the books. (A guinea then is equivalent to about £35 today) Membership fees for the ensuing years were as follows:-

Year	New members	Continuing members	Supplement (if any)
1948	£1.14.0d	£1.8s.3d	£1.1s.0d
1950	£2.10s.0d	£2.2s.0d	£1.1s.0d
1952	£3.4s.0d	£2.12s.0d	£1.1s.0d
1958		£2.19s.0d	£1.1s.0d

1950 – One thousand copies of the Membership list were printed at a cost of £32.5s.1d. Printing costs proved to be a big consideration in the continued running of the Section – not just membership lists, but, more importantly, the printing of Papers for circulation to members.

1951 – The sum of five guineas was given to the ICE benevolent fund as a small token of kindness for allowing the use of their lecture theatre.

1952 – Because expenditure exceeded income it was proposed to reduce the number of lectures to four a year, including the presidential address.

1953 – The Section's investment income was exempted from income tax after considerable correspondence with H M Inspector of Taxes under Section 447(1)(b) of the Income Tax Act, 1952.

1954 – A loss of £31.1s.10d was recorded on the year. The results for various years were as follows:-

Year	Surplus (Deficit)
1954	(£31.1s.10d.)
1955	£67.1s.1d
1956	£41.2s.5d

Year	Surplus (Deficit)
1957	(£84.13s.5d)*
1958	£68.17s.1d
1959	£112.10s.6d
1960	£176.5s.5d
1961	(£147.15s.10d)

* Partly due to entertaining French visitors

1955 – The Post Office Savings account limit of £500 was reached and a new account was opened with the Westminster Bank and funds transferred there. Securities (Defence Bonds at 4%) were chosen as an appropriate investment.

1956 – The Council agreed to pay the hotel expenses of a visiting French lecturer, but not his travel costs. It seems that most visitors covered their own expenses or obtained them elsewhere.

1961 – A lecture was to be given by Mr Huet on the suspension bridge at Tancarville in May. On his enquiry it was agreed that the French society would pay his travelling costs and the British Section his hotel expenses in London.

1961 – The Inland Revenue accepted that the annual subscriptions paid by members would qualify for tax relief under Section 16 of the Finance Act, 1958.

1961 – A membership list was printed by the Regent Printing Co. – 400 copies for £110 (£2,400 in today's money). The company also offered to sell the standing type for £19.15s.0d. This was bought and achieved an economy since future editions could be edited without resetting all the original entries.

1961 – The loss that year suggested an increase in the one guinea levy charged for British Section membership would have to be considered.

1962 – An increased membership after a presidential appeal had helped the finances, but they were still expected to show a loss that year. 39 new members were accepted. A committee was set up to consider an increase in the membership subscription above one guinea.

1963 – Efforts were to be made to arrange future meetings jointly with other institutions to reduce the cost of presenting Papers. Discussion notes were to be printed with the Papers only when thought to be of importance.

1963 – Membership fees set by the parent society were to increase in 1964 to a total of £5 per annum (equivalent to £100 today). Discussions were held with Paris to negotiate an increase in the size of the portion retained by the British Section. This was needed since the Council was finding it hard to live within the current arrangement.

The French subsequently agreed to the British Section retaining 20 francs of the new 60 franc membership fee and the Council implemented the new membership fee of £5 per annum from 1964 (reduced to £2.16.0d. for members under the age of 30).

1963 – For financial reasons the Council stressed that every effort should be made to publish Papers in the journals of the Engineering Institutions thereby reducing the cost of reprints for their own members.

1963 – The financial situation for 1963 had improved, largely due to the avoidance of heavy printing costs where other Institutions were giving assistance.

1964 – The Institution of Electrical Engineers decided to charge £12 for the hire of their lecture theatre. The British Section had no choice but to pay that for the October 1964 lecture.

1964 – The membership had increased to 312 and there was concern about the cost of printing a membership list (perhaps £200). Advertising in the list was considered as an option. Simple duplication of a list was also considered.

MEMBERSHIP

Like today, there was a continuing interest to retain and expand the membership. The numbers fluctuated, although a couple of membership drives had a significant impact. Eight applications for membership had been received during the war, which was a good start.

1948 – A target to recruit 50 new members was approved. A letter of appeal was sent out to engineers in the major Institutions. Subsequently 56 applications were sent to Paris for approval.

1950 – H K Scott (Past President) died.

1952 – Concern was expressed about the need for more members. This has continued as a theme across the years.

1953 – The Council reiterated its policy that successful applicants for membership should already be members of one of the British Institutions governed by a Royal Charter. Applications for membership were frequently turned down for this reason.

1953 – A suggestion was made that a greater number of suitably qualified French engineers resident in England should be approached for membership. This proved difficult however, with no results from the first set of people approached. This policy was consistent with the original aims of the British Section which was to provide a professional body for French engineers practising in Britain.

1954 – The death was reported of F M G Du-Platt-Taylor (Past President).

1955 – The Council reaffirmed that applications for membership from British nationals would only be accepted from members of one of the Chartered British Institutions.

1955 – 27 applications for membership were considered (three of which were not accepted) – an unusually large number.

1956 – Unsurprisingly, French members of the British Section were resigning on their return to France.

1958 – The deaths of W E Hawthorne (Past President) and Sir Alexander Gibb were recorded.

1958 – Ove Arup joined the British Section.

1959 – The death of Sir William Halcrow (Past President) was announced.

1961 – The Inland Revenue accepted that the annual subscriptions made by members would qualify for tax relief under Section 16 of the Finance Act, 1958.

1961 – The French society was addressed by its 10,000th member, Monsieur René Barut.

1961 – The creation of a retired member category was agreed for those who had been members for approximately 25 years or more. They would pay no further subscriptions, but would receive notification of meetings and publications.

1962 – The death of Conrad Gribble (Past President) was reported.

1962 – 39 new members were accepted.

1963 – In an apparent break with policy, an application for membership was supported from F J White even though he was not a member of one of the four major Chartered Institutions (this may have been the start of greater flexibility about membership qualifications, or perhaps the Council merely wanted to admit a prestigious person).

1963 – Membership of the Société had now reached 15,954 (10,948 Subscribing Members, 223 Life Members, 7 Honorary Members and 4,776 Interns).

1964 – T J Guéritte died on 23rd January 1964. Perhaps the last link to the foundation of the Section was lost.

1964 – In view of his position of importance to the society, Mr A McDonald (Secretary of Institution of Civil Engineers) was granted the full benefits of membership of the Society without payment of a subscription.

1964 – Membership of the British Section had increased to 312.

1964 – The Council decided not to allow an Associate of the ICE into membership – retaining the long term policy. Fourteen other applications from suitably qualified applicants were accepted however.

OTHER ORGANISATIONS

In a wartime initiative, a Union des Ingénieurs et Techniciens de la France Combattante had been formed in 1942 by members of the Société. The British Section may have wished to bring some into its membership but many of them were ineligible to join because of their qualifications. Their future prospects and arrangements, if any, are unknown; although it is likely they would have dispersed after the war. At that time there was also a suggestion that an International Federation of Engineering and Allied Institutions might be formed.

1948 – The Union des Associations et Sociétés Industrielles Françaises was formed.

1957 – The French parent body evolved into the Conseil National des Ingénieurs Français.

1957 – The Treaty of Rome established the European Economic Community (which did not including Great Britain at that time of course)

1958 – A Council member, Mr Walters, said he had been to a reception of the American Section in New York while attending an International Congress on Large Dams. He had been given a very cordial welcome.

1958 – The French Fifth Republic was established under Charles de Gaulle.

1965 – The European Community was launched.

TRAVELLING TO FRANCE

The very nature of the British Section suggests that there should be significant contact between engineers in the two countries. However, the restrictions of time and currency certainly played a part in making trips to France far less likely than today.

1946 – The President and Secretary of the Council visited the parent society in June to attend the annual meeting of representatives from across the world. This continued to be a feature with Council representatives attending annually up to 1964 at the very least. Very often the annual visit was combined with the presentation of the Du-Platt-Taylor and Guéritte Medals from the British Section.

1948 – British Section delegates attended the 100th anniversary celebrations of the parent society. Other invited organisations were the Institution of Civil Engineers,

Institution of Mechanical Engineers, Institution of Electrical Engineers, Institution of Structural Engineers, Institution of Naval Architects, Institution of Mining and Metallurgy, Institution of Municipal Engineers, Institution of Water Engineers, Institution of Chemical Engineers, Institution of Gas Engineers, and the Royal Society. If there was any difficulty in obtaining currency for the trip the parent society was to be approached to see what could be done as regards assistance to support travel facilities.

1955 – In what was perhaps an infrequent move, the President (Mr F Snow) was asked to present a Paper at the French society on "palletization and mechanical equipment". This was well received.

1959 – One of the joint secretaries (Mr Howard) attended the Council meeting of the parent society in Paris in November 1959.

1961 – W J Howard attended an inauguration meeting of the parent society when Monsieur l'Ingénieur Général Salmon was installed as the new president. Mr Howard told him he that he would be very welcome if he decided to come to Britain.

1964 – There was concern that the French society was minded not to take a Paper from J A Broughall on the electrification of the British railway system because it was thought to be too specialist. At a Council meeting Mr Harris pointed out that the "traffic of Papers between Britain and France is supposed to be a two-way one" and, since Mr Broughall could speak French, he felt his Paper would be received appreciatively. Others thought the specialist nature could result in a poor turnout and be a disappointment to the speaker. The President was left to resolve the matter and we don't know if Mr Broughall went or not.

1964 – Mr Harding offered to give a lecture in Paris on either the Channel Tunnel or the London Underground (where he was the consulting engineer) but this had yet to be confirmed.

VISITORS FROM FRANCE

Most of the speakers presenting Papers to the British Section travelled from France for the occasion, although we don't know to what extent their visits coincided with other commitments or just pleasure. However, occasionally there were special arrangements.

1947 – The President of the parent society, Monsieur Veron visited in June to attend the centenary of the Institution of Mechanical Engineers. He was met by the President and Secretary of the British Section.

1948 – The President of the French society, Monsieur Fougerolle, visited in October to meet the Institution of Civil Engineers, Institution of Electrical Engineers and Institution of Mechanical Engineers. A lunch was provided to entertain Monsieur Fougerolle and his wife, to be attended by British Section members "and their ladies".

1949 – A visit by a group from the French society was planned for July.

1949 – Monsieur Freyssinet was said to be prepared to visit Britain after mid-November to lecture on Continental progress with pre-stressed concrete. A proposed triple meeting with the ICE and IStructE was proposed. Monsieur Freyssinet died before this could be fulfilled.

1950 – The President of the French Republic was proposing to visit Britain and the British Section wished to meet him.

1950 – In an interesting question of status, the British Section objected to private firms entertaining eminent French Engineers in lieu of the British Section.

1953 – Monsieur Jean Louis (Past President of the French society), Monsieur Paul Bastien (Vice President) and others visited London to attend a European and United States Conference of Civil Engineers. They were met by British Section representatives but the tight conference timetable made it unlikely that the party was entertained by them.

1957 – A summer visit from France included ladies and took place between 12th and 23rd June 1957. A reception by the French Ambassador was anticipated. The French also intended to visit Scotland. Other British Institutions wished to be involved and visits to the Port of London, the Metropolitan Water Board, the Standard Motor Co. and the Cement and Concrete Association were anticipated. Thomas Cook & Sons were to make the arrangements. The visit was recorded as going well.

PRESIDENTIAL ADDRESSES

At the outset of each year the incoming President gave a Paper on a topic which interested him. As well as the topics themselves, other arrangements can sometimes be interesting.

1948 – The President, M G J McHaffie gave his Presidential address at the ICE Lecture Theatre, Great George Street. This was perhaps the start of a continuing trend.

1951 – The presidential address was to be followed by dinner at the St Stephen's Club with ladies invited.

1961 – The President, Bryan Donkin, organised his presidential address at the Institution of Electrical Engineers, followed by dinner in the Institution's refectory "with the ladies".

1965 – The presidential address on "High-Lights In Hydro-Electric Development In Great Britain" contained coloured slides, which Mr Guthrie Brown said "might appeal to the ladies". This was in the infancy of popular colour photography. The dinner afterwards was at the Carlton Tower Hotel since the House of Commons was not a possible venue because that required an MP as sponsor.

PRESENTATION OF PAPERS AT MEETINGS

The accepted practice throughout this period was for eminent French engineers to give Papers to the British Section (with the exception of the presidential addresses). The French authors often supplied Papers in French which were then translated in Britain before publication.

1948 – M Carpentier's proposed lecture ("The Reconstruction of the French National Railway Bridges") contained 120 lantern slides and a film. The Council were anxious to restrict the lecture to no more than 1 hour 20 minutes, although whether this was achieved seems doubtful.

1948 – A proposed lecture on the "Geology of the Channel" was declined because it was by an English author, although it was felt this might be suitable for a discussion in Paris.

1950 – A Paper on "Tidal Energy" or "Green Energy" was requested from a Monsieur Gibrat – although it was subsequently left in abeyance.

1952 – The meeting on 14th March was given by Monsieur Danel on hydraulic research in France. Because he was accompanied by his wife it was decided to invite ladies to the dinner afterwards at the St Stephen's Club.

1959 – The December meeting took place at the ICE, planning to hear André Coyne (Inspecteur Général des Ponts et Chaussées) speak about "New Dam Techniques", and followed by dinner at the Anglo-Belgian Club. In fact, due to the unavailability of the speaker, Mr Paton stepped in at short notice to talk about the Kariba Dam Project (designed by André Coyne). This turned out to be a particularly tragic cancellation (see Special Causes, below).

1960 – A Paper on the Channel Tunnel was requested from H J B Harding, Vice President of the ICE, in conjunction with the French Engineer M Malcor. This resulted in a lecture at the ICE in March 1961.

1960 – A lecture was given in October concerning "Pre-stressed Concrete Pressure Vessels for Nuclear Reactors at Marcoule" by Jean Bellier and Max Torasse. The reactor had been operational since 1956. Decommissioned in 1984, today it is an important site for the decommissioning of nuclear equipment.

1962 – Papers continued to be given by French Engineers and publication was often undertaken by the organisations which had shared/hosted the various meetings with the British Section (e.g. the Cement and Concrete Association, the Institution of Highway Engineers). Consideration was also given to the printing of the discussion of Papers on an annual basis to achieve economies.

1963 – The president of the parent society, Jean Aubert, proposed to visit in October or November. Although his presentation on the Rhone-Rhine Navigation was to be a joint event, the ICE proposed to treat it as a lecture rather than a Paper. This meant there would be no advance copies or discussion and the lecture would have to be delivered in English. The British Section Council wished to avoid this and, following representations, the ICE offered to print an edited version of Mr Aubert's Paper in British Section covers. (In fact it seems that a report of the Paper was published in the ICE journal and reprints in British Section covers were arranged.)

1964 – The April meeting was joint with the Institution of Structural Engineers, on "Grid and Dome Structures" by Stephane de Chateau. There was some concern about the cost of printing Monsieur Du Chateau's Paper because it needed photographs. He was asked whether "he is keen on having his Paper printed", and would he be prepared to contribute. This state of affairs speaks loudly about the financial position of the British Section.

1964 – The Institution of Electrical Engineers decided to charge £12 for the hire of their lecture theatre. The British Section had no choice but to pay for the October meeting. The presentation was "To See in the Dark; Electronic Solutions to the Problem" by M G Boutry.

SPECIAL CAUSES

Very occasionally the British Section gave some of its scarce resources to others.

1958 – The Council gave ten guineas towards the restoration of the Museum of Polemieux, near Lyon (it is still open today) following a letter from the Society of Friends of André-Marie Ampère. (The founder of the science of electromagnetism.)

1960 – The Council approved £10 be donated to the Frejus Relief Fund. Frejus on the Riviera was devastated on 2nd

December 1959 when the Malpasset Dam burst killing 423 people. It had been designed by André Coyne – hence his absence in December 1959 from his planned lecture to the British Section. He unnecessarily blamed himself for the tragedy and died seven months later. The British Section Council later called for a Paper on the failure but it is unclear whether that did in fact happen.

DINNERS

Although perhaps an incidental to the business of the British Section, the Council nevertheless took a great interest in dining arrangements following meetings.

1947 – The Council planned to have an informal dinner after the March lecture to which ladies would be invited, as well as the President and Secretary of the ICE. The principle of inviting women to dinners was established, although this does not seem to have happened consistently. It is most unlikely that there were any women members of the Section at this time.

1947 – A number of dinner venues were investigated. Over the following years a number of restaurants were considered, including:-

The St Stephen's Club, Westminster

The Normandie Restaurant, Hyde Park Corner

The Trocadero Restaurant, Shaftesbury Avenue

The Maison de France

The Goring Hotel, Belgravia.

The restaurant of the Zoological Society of London

The St Ermin's Hotel

The House of Commons

The refectory of the Institution of Electrical Engineers

The Rubens Hotel

The Anglo-Belgian Club

The Constitutional Club

The Hyde Park Hotel

The Institute of Directors

The Carlton Towers Hotel

The Little Ship Club

1951 – The French Consul Général and the Attaché Commercial were invited to one dinner.

1952 – Four dinners and one lunch were organised during the 1951/52 session.

1963 – It was pointed out that when dinners were organised by the ICE their rules did not allow ladies to be invited. As a consequence it was decided that the dinner after the presentation by the French society President on 22nd October should be organised by the British Section, and that the President and Secretary of the ICE should be invited. The Council wanted it clear that the event was to be led by the British Section. The French ambassador was also to be invited. (In fact he could not attend, so Monsieur and Madame de Vial (the French Consul and his wife) were invited instead.)

MEDALS

A medal had been initiated before the war by Du-Platt-Taylor at his own expense. This was awarded to an author for the best presentation in each season of meetings. It was soon followed by another medal in recognition of T J Guéritte, to be awarded for the best presentation related to reinforced concrete. It was usual for the President of the British Section to present the medals on the annual visit to the parent society in Paris each June.

1947 – The Du-Platt-Taylor medal was held over because no presentation was felt to have achieved the necessary standard.

1948 – The Du-Platt-Taylor medal was awarded to Monsieur André Coyne for the second time. It was cast in bronze.

1949 – The Du-Platt-Taylor medal was awarded to Monsieur Carpentier for his lecture on railway bridges. The British Section decided to take on the cost of future Du-Platt-Taylor medals.

1950 – The Du-Platt-Taylor medal was awarded to Monsieur Eugene Freyssinet.

1950 – The idea of a Guéritte Bursary was canvassed.

1951 – The Guéritte Bursary was proposed to be a silver medal bearing a portrait of T J Guéritte himself, awarded annually on terms to be decided by Mr Guéritte and funded by an appeal to members who were asked to contribute up to one guinea each towards the cost of the award. Subsequently, members contributed a total of £124.4s.0d in response to the appeal. Mr H R Allen ARCA quoted £92.10s.0d to design the medal and, on account of the cost, an alternative quote was proposed by Major Du-Platt-Taylor, to be obtained from Mrs Gillick ARA. The Council also wished to donate a framed copy of the subsequent medal to Mr Guéritte.

1951 – The Du-Platt-Taylor Medal was awarded to Mr J G Walter.

1952 – The design for the Guéritte Medal was submitted by Mr H R Allen ARCA. It was proposed that a bronze version be given to Mr Guéritte and silver version to each awarded candidate. The bronze medal cost £2.12s.6d, plus letters at 4/- per dozen. The silver medal cost £3.5s.0d, plus £2.0s.0d purchase tax and letters at 4/- per dozen. The Council agreed to strike one medal of each.

1952 – Both the Du-Platt-Taylor and Guéritte Medals were awarded (to Mr Dellatre and Dr Alfredo Mazzoni respectively). Mr Mazzoni, the first recipient of the Guéritte Medal, was given his award at an informal lunch at the St Stephen's Club in June 1953. His winning lecture had been given in April 1951 and was entitled "The Tuscan Boracic 'Soffioni' and their Development at Larderello" (these were boracic acid lagoons).

1952 – T J Guéritte was presented with his bronze replica at his home in September.

The further recipients of the medals were as follows:-

Year	Du-Platt-Taylor medal	Guéritte medal
1953	I Léviant	Y Guyon
1954	A Lazard	L P Brice
1955	Professor R Gibrat and F Chenin	Nicolas Esquillan
1956	Raymond Giguet	
1957	Raymond Giguet	René Breffeil
1958	Jean Pimpaneau	
1959	André Blanchard	Nicolas Esquillan
1960		Jean Chaudesaigues
1961	Joseph Elkouby	Jean Bellier and Max Tourasse
1962	Pierre Ailleret	
1963	Paul Bastard	
1964	Jean Muller	

1954 – The death was reported of F M G Du-Platt-Taylor (Past President).

1956 – In addition to the The Du-Platt-Taylor Medal, books (costing no more than three guineas) were awarded to Professor Gibrat and Lucien Carpentier. Professor

Gibrat chose "Partial Differential Equations" by Duff, and Carpentier chose the "Churchill Memoirs". The latter was to be obtained second hand because of the high cost of the six volumes involved. The Duff volume (published 1956) is today, unsurprisingly perhaps, out of print, although one reviewer states "*The tract develops tensor analysis within the body of the text. Only a background in ordinary differential equations is prerequisite (Although, it would be wise to have mastered Sokolnikoff and Redheffer as preliminary). The text is (especially for a technical treatise) wonderfully and lucidly written. One must pay special attention to the notation. Ince and Goursat provide complementary reading to Duff's exposition. Warmly recommended for all with an interest in this topic.*"

1959 – A scientific book costing not more than three guineas was awarded to Pierre Weil. (In fact he asked for and received books illustrating Oxford and Cambridge Universities)

CONCLUSION

Despite having to live within tight financial boundaries the British Section enjoyed a period of considerable professional prestige in this period. A comprehensive set of Papers was read by eminent French engineers and cordial relations were maintained with French colleagues.

It seems unlikely that there was any consistent flow of Papers to France authored by English engineers however. Perhaps that was inevitable given that the British Section's focus was on all things French, whereas the parent body was naturally concerned with its own French affairs, with only a small proportion of its effort devoted to international arrangements.

Although things may have been arranged, there is no evidence of the British Section organising touring parties to France either, partly, no doubt, because of the cost and opportunity compared to today.

It is possible that further digging into the archives will unearth material to give a greater understanding of the Section's history following the Second World War, but of one thing we can be sure; our predecessors benefitted mightily from being exposed to French methods and techniques.

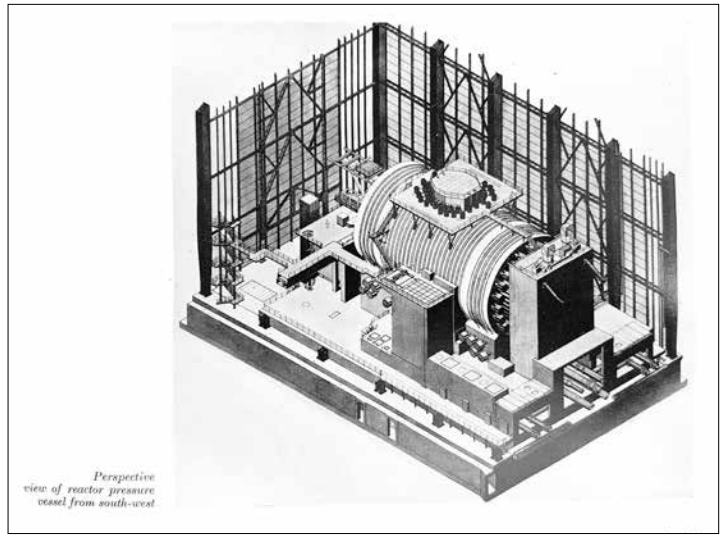
8. A SELECTION OF LECTURES GIVEN OR PLANNED AFTER WORLD WAR TWO

As before the war (Chapter 4), the lecture programme in more recent years has continued to be eclectic. French authors continue to dominate, although perhaps less so after the turn of the present century. In a small number of cases the lectures listed may not have been delivered, although they were all planned by the Council. This is a small sample to provide a flavour. Readers will notice the gap in the records during the 1970s and 1980s. This is a period for which there are currently no known archives for the British Section.

Year	Title	Author
1946	Expanding Cement	Henri Lossier
1947	Latest Developments of Dams and Hydroelectric Power Stations in France	M Coyne
1947	The Port of Marseilles	Jean Couteaud
1948	The Hydroelectric Stations in Switzerland	M Koechlin
1948	The Reconstruction of the French National Railway Bridges	M Carpentier
1951	The Boracic "Soffioni" of Tuscany and the Plant at Larderello	Alfredo Mazzoni
1953	The Development and Use of Railway Stock on Pneumatic Tyres	M Ricroch
1953	Flexural Plasticity in Mild Steel Plate Girders	A Lazard
1954	Fifty Years of Welding in France	M Lebrun
1955	Tidal Energy	Prof. Gibrat
1955	Foundations – Practical Problems in Design and Construction	Sir Frederick Snow
1956	A French Dual Purpose Scheme: the Durance Project and the Serre-Ponçon Dam	Raymond Giguet

Year	Title	Author
1956	The Reconstruction of Bridges in France During and after the 1939/45 War with Particular Reference to Site Organisation and Conditions	Rene Breffeil
1960	The Influence of Development of the Motor Vehicle on the Planning of Large Cities	Joseph S Elkouby
1960	Pre-Stressed Concrete Pressure Vessels at Marcoule Nuclear Centre	Jean Bellier and Max Tourasse
1961	The Pathology of Construction – A Study in the Failures of Structural Engineering	Albert Brenier and Jean Despeyroux
1962	The Installation of Fishing Ports	P Bastard
1963	Concrete Bridges Built in Cantilever	Jean Muller
1964	How to See in the Dark; Electronic Solutions to the Problem	M G Boutry
1966	The Role of Deep Water Ports in Overseas Development	Peter A Scott
1968	Engineering Aspects of the Exploitation of the Ocean Bed	C M Bender and J Delacour
1973	The Case for a Severn Barrage	G F B Scruby
1992	The Ariane Launch Vehicle and Satellite Programme	Mr Bowles
1993	The Future of Pre-Stressed Concrete	Pierre Boitel
1996	Construction of the Channel Tunnel	Michael Lévy
2000	Gustave Eiffel Lecture I. Britain, France and the EU – Integrating Rail	Sir Alastair Morton
2001	The History of the Millau Viaduct Project	Michel Virlogeux

Year	Title	Author
2005	Millau: Building the Highest Viaduct	Michel Virlogeux
2005	Gustave Eiffel Lecture II. The Sir Alan Harris Archive and Diaries	Mike Chrimes
2005	China: Workshop of the 21st Century World	Prof Mike Gregory
2009	CERN and Physical Particle Research	Dr Alan Norton
2009	Les Ponts de Normandie	Michel Virlogeux
2014	Gustave Eiffel Lecture III. Nanotechnology	Sir Michael Pepper
2016	Alpha, Beta, Gamma – a Brief Look at Radioactivity	Edmund Morgan-Warren
2016	Helmet Mounted Vision Systems for Aircraft Pilots	Peter Morgan-Warren
2016	Fracking for Shale Gas	Prof. Lord Robert Mair
2017	Improving Infrastructure Life using Advanced Composite Materials	Sam Luke
2017	The Panama Canal: Gun Boat Politics, Construction, Management and Development	Richard Harris
2018	Antarctica, Oceanographic Research and Climate Change	Hugh Venables



8.01. 1960 - The Marcoule Nuclear Reactor

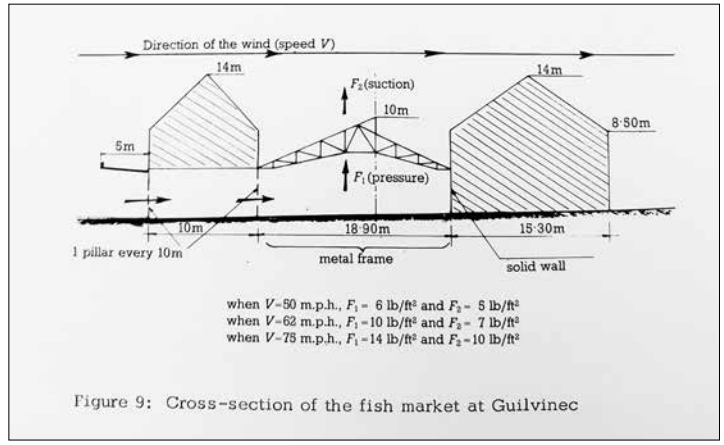


Figure 9: Cross-section of the fish market at Guilvinec

8.02. 1962 – From P Bastard's paper on fishing ports

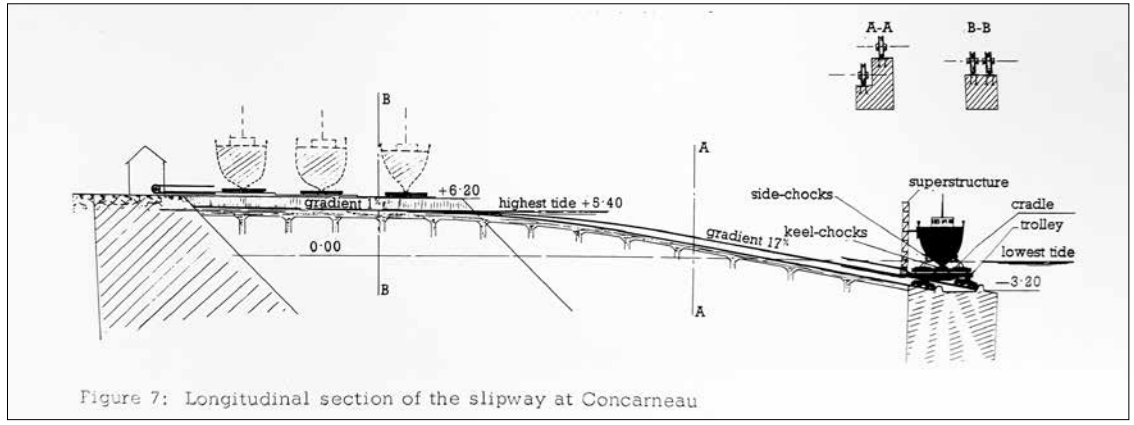


Figure 7: Longitudinal section of the slipway at Concarneau

8.03. 1962 – Another extract from P Bastard's paper

9. SOME EMINENT MEMBERS AFTER WORLD WAR TWO

Sir Alan was continually seeking creative engineering solutions which he was happy to share. In discussions, "his hand would reach into his jacket pocket for his fountain pen and the nearest piece of paper would be covered with clear sketches. The conversation would usually end with 'and it would only need to be a few inches thick.'"

William Ewart Blizard 1889-1956. President of the British Section in 1954

William Blizard was the son of John Blizard, a partner in the firm of Messrs Lemon and Blizard, consulting engineers. After graduation, William worked in his father's firm where he gained experience in both the office and the works. He remained with the company for three years before moving on, in 1910, to G.P. Knowles, followed by a short time working at the Eastleigh works of the London and South Western Railway.

In 1912 when William became an Associate of the Institution of Civil Engineers he had already travelled to Uttar Pradesh in India and was employed by the Indian Service of Engineers. He worked as assistant engineer on major projects including the Gangao dam, the Mirzapore Canal and the Sarda Canal until 1915 when he took a commission in the Indian Army. During the war he served with a field company of the Queen's Own Madras Sappers and Miners in Mesopotamia and Persia. The fighting in this area was largely to protect the Anglo-Persian oil fields. Conditions were brutal, not perhaps the unremitting mud of trench warfare of the western front, but the troops were exposed to extreme temperatures, challenging terrain and the ever present flies.

After the war he returned to the Indian Service of Engineers and was again engaged on the design and construction of bridges, canals and barrages. Passenger manifests show that Blizard travelled to Bombay from Britain during the early 1920s.

The Institution of Civil Engineers accepted Blizard as a Member in 1929, by which time he was a senior partner in the firm of Messrs Lemon and Blizard. He continued his work as a consulting engineer in the United Kingdom, with large and small contracts. There was work on water supply and sewage disposal for local authorities and also jobs such as the repair and construction of the seawall at Totland, on behalf of the Isle of Wight Rural District Council and the Totland Bay Hotel and Pier Company in 1933.

Major William Blizard maintained his involvement with the army over many years. He is recorded as attending the annual dinner of the Engineer and Railway Staff Corps, R.E. (T.A) in 1939 with that rank. He remained an officer in the Territorial Army and at the time of his death he held the rank of Lieutenant-Colonel. During the Second World War, he worked for the Ministry of Health as a Regional Engineer in the South West and latterly became Deputy Chief Engineer with the Ministry of Home Security.

Other societies of which he was a member were the Institution of Water Engineers, the Institution of Sanitary Engineers (including being President), the Royal Sanitary Institute and the Association of Consulting Engineers.

He was President of the British Section of the Société des Ingénieurs Civils de France in 1954.

Frederick Sidney Snow 1899-1976. President of the British Section in 1955

Frederick (Freddie) Snow was born in London in 1899 and in World War I joined the Royal Artillery. He must have enlisted at a very early age as it is reported that he joined at the start of the war. He later transferred to the Royal Engineers, serving in France and Belgium and was twice injured whilst on active service.

Following the war, he started to work as an engineer and was employed by several different companies. By the time he applied to become an Associate of the Institution of Civil Engineers he was employed by the London County Council as an engineer for the Downham Housing Estate in Bromley. His application was passed in1927.

His area of expertise was in the construction of heavy foundations and deep underpinnings, his projects included buildings, for example Unilever House and South Africa House, and infrastructure such as the Kingsway underpass.

In 1943 he established his own consultancy, Frederick S Snow and Partners. The company specialised in projects for the aviation industry and in the early 1950s he was appointed as the overall design consultant for Gatwick Airport.

Snow was the President of the Structural Engineers from 1947 to 1948 and was the first President of the Concrete Society.

He was made a CBE in 1958 and knighted in 1965.

Sir Frederick Snow and Partners continues as a consultancy firm and is involved in a wide range of projects from work on public buildings and environmental issues such as Sustainable Urban Drainage Systems.

Bryan Donkin 1903-1964. President of the British Section in 1961

With his family's long involvement in engineering, it was perhaps inevitable that Bryan Donkin would follow that path. In 1818 his great great grandfather, Bryan Donkin FRS was a driving force in the establishment of the Institution of Civil Engineers. Henry Robinson Palmer, the founder was one of Donkin's pupils. However Donkin will chiefly be remembered as the inventor of the canning process to preserve food.

9.01 Bryan Donkin

The firm of Bryan Donkin Valves Limited, now part of the AVG group, celebrated the 250th Anniversary of the birth of its founder in 2018 with members of the Donkin family present at the unveiling of a painting of his inventions.

Bryan's father, Sydney, although also an engineer, followed a different branch of the profession and joined the firm of Kennedy and Jenkin in 1897. He became a partner in 1908 and the company became Kennedy and Donkin in 1913. His main area of interest involved the design of electricity generating stations and with systems for the transmission and distribution of electric power.

Bryan graduated in engineering from Pembroke College, Cambridge in 1924 and his degree was followed by four years practical training. He spent his three year apprenticeship with the English Electric Co. and the fourth year in America at the General Electric Company (USA). Both point to his intention to continue in the same field of engineering as his father and in fact Bryan became a partner in Kennedy and Donkin in 1933.

Before World War II, Donkin took on responsibility for supervising the construction and working of cables, transformers and switchgear for 132kV and lower voltage sub-stations in Lancashire, Cheshire and Cumberland. This was a time in Britain when a household electricity supply was becoming one of life's essentials in the modern home. However, during the war he was involved in a variety of power station electricity generation schemes and urgent extensions to the Central Electricity Board's grid to ensure bulk supplies of power to wartime factories and other industrial plants. His post-war role, from 1946-1952, saw him take responsibility for the 275kV super-grid lines and sub-stations. He also reported to the Board on the use of power stations as a source of heat as well as lighting.

Following the death of his father in 1952, he became the Senior Partner in Kennedy and Donkin and whilst still taking responsibility for the electric power transmission for the Central Electricity Generating Board he was also employed by the City of Westminster to implement a district electric heat generation scheme. In 1956, Bryan Donkin wrote an article for the Times newspaper, the title of which was "House-Warming in Pimlico, Success of a Prototype Scheme." The article considered the impact of the scheme after five years of operation. The space-heating and hot water was not only supplied to the homes owned by Westminster City Council but also to the Dolphin Square block of flats. The implementation was still not complete and it was anticipated that, when finished, it would cover all 2000 flats on the Council's estates. At the time of the article the scheme had been running with no breakdowns or cuts in the supply of heat. Donkin then paid tribute to the initial designers, which included his father, Sydney Donkin, who had not lived to see the project in operation.

The main advantage of the scheme to the householder was improved cleanliness, no more dirt from solid fuel and ashes and therefore labour saving, with less need to wash clothes and furnishings. It was also a move towards implementing the forthcoming Clean Air Act of 1956, with Westminster City Council setting up a zone with no smoke or other atmospheric pollution.

On the technical points, Donkin wrote that although the cost of fuel to provide the heating and hot water was higher than alternative schemes, it was nevertheless cheaper than using a central boiler-house on the estate. He claimed that the "special advantages of combined heat-electric generation using back-pressure turbines driving alternators, as used at Battersea Power Station for supplying the Pimlico estates, is the great increase in thermal efficiency and the saving of fuel." That is, about 82 per cent., compared with the 30 per cent. achieved by a modern condensing power-station.

In conclusion he wrote that although it is true that there may be cheaper ways of saving fuel, the results of the scheme are: "a highly efficient use of coal as a fuel, producing a valuable by-product of electricity, and a cheap and abundant supply of heat to a community of nearly 10,000 persons who enjoy living in a smokeless zone.... The Pimlico Scheme is a prototype which has proved a success."

A paper, written with two others, "The Pimlico District Heating Undertaking" resulted in Donkin being awarded the Telford Premium of the Institution of Civil Engineers.

In 1956, proposals were put forward for a hydro-electric scheme in Venezuela. In collaboration with H.D. Morgan of Halcrow's, Donkin designed the plant for this project on the Rio Caroni, although construction did not begin until 1963.

The scope of his work can be seen by the number of consulting roles which Donkin undertook. He reported to London Transport on modernising their power stations, he investigated the failure of district heating at the Heath Park Estate and continued his involvement in the design and activation of high-power transmission lines in the United Kingdom. In addition he advised the government of Sudan on the development of the hydro-electric resources of the river Nile.

Bryan Donkin was associated with many professional bodies and advisory committees. He was a member of; the Council of the Institution of Electrical Engineers from 1954-1959, (and vice –president in 1960), the Institution of Civil Engineers, a life member of the American Institute of Electrical Engineers, President of the Association of Supervising Electrical Engineers, President of the Engineers Guild, President of the Junior Institution of Engineers

and a council member of the Association of Consulting Engineers (Chairman 1957-58). He had joined the British Section of the Société des Ingénieurs in the late 1940s and was the joint treasurer with TJ Guéritte in 1950. Donkin became a Vice-President in 1959, before becoming President in 1961. His Presidential year included a lecture on the Channel Tunnel and two lectures on French engineering projects. Reflecting his area of expertise, the society also heard a lecture entitled "Comparisons between Electric Power Problems in England and France" which was delivered by M.Ailleret, le Directeur Général Adjoint, Electricité de France.

He served on various governmental organisations and was frequently a delegate to the meetings of the International Electrotechnical Commission. He went to Ghana in 1959 as a member of the Trade and Industrial Commission.

It was not however all work and no play for Bryan Donkin. He was a member of the Alpine Ski Club and was present at a dinner in November 1953 at which the guests of honour were "Brigadier Sir John Hunt, Sir Edmund Hilary and Mr M.Westmacott." The Times gave little celebrity attention to the recent conquerors of the world's highest mountain, merely noting their attendance; I suspect it might be reported differently today.

When Bryan was young, his father's partner was Sir Alexander Kennedy. Kennedy was a renowned photographer and mountaineer, in particular, he climbed in the Alps. (An early environmentalist, his inaugural presidential address to the Institution of Civil Engineers was used to highlight the impact the profession had on the environment.) It is likely to have been his influence that led Donkin into the sport. It is clear from the obituary written in the Journal of the Alpine Club that he was a highly accomplished mountaineer who gave his time and energy serving the club and helping many members. He was elected to the Alpine Club in 1936, having qualified through ascending mountains from Norway to the Dolomites. He was Honorary Secretary for seven years from 1940, although in the war years the climbs were largely confined to climbing in Britain. After hostilities ceased he worked to build up good relations with climbers abroad and in 1947 took a party to the Tatra Mountains where they joined some Czechoslovak mountaineers. In 1950 he, with John Hunt and others joined a Franco-British expedition to traverse the Meije a peak in the Dauphiné Alps. Weather forced this to be abandoned although "a turbulent crossing of Le Râteau under conditions which should have appealed to any high-voltage engineer" was achieved.

Bryan also had an intellectual grasp of areas outside his professional life, including music and the arts.

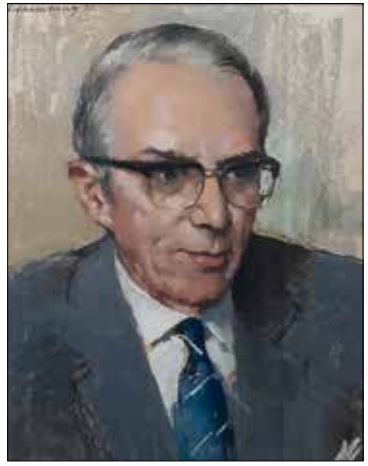
In a letter to a journal written in response to an obituary Dr. C.B.M. Warren wrote:

"For all his efficiency and social charm, Bryan Donkin did not relax easily in company. But when one had him to oneself in the mountains and when he joined the family circle, he could laugh at nonsense with the rest of us. It was then that he could come out with an amusing turn of phrase, as for example, when he referred to a Camembert cheese as having 'an amiable flavour of drains'. I cannot claim that I knew Donkin really well; but who could? He was really something of an enigma. But I think I knew him pretty well, and perhaps rather better than he realised. So for me, and I would guess for a good many people too, life can never be quite the same without him. His fate was a cruel one, for he had cancer. But the courage with which he faced his end was a fine example for all of us."

This seems to have been written with great affection.

Thomas Angus Lyall Paton 1905-1999. President of the British Section in 1959

Angus Paton was born in Jersey in 1905. His mother was the daughter of Easton Gibb, the founder of Easton Gibb and Son, a firm of civil engineering contractors. His uncle Alexander Gibb was also a civil engineer who later renamed the firm Sir Alexander Gibb and Partners. Paton's early education was in France and Switzerland followed by attendance at Cheltenham College. His uncle advised him to read for a degree in civil engineering at University College London. He took this advice and, in 1925, graduated with a first class degree.



9.02 Angus Paton

After graduation he joined Sir Alexander Gibb's firm, the company for which Angus Paton worked his entire professional career. During this time, Paton transformed it from a company with 400 employees, working mostly in the United Kingdom, into a multinational organisation with over 1500 engineers working in over 60 countries. His early practical experiences included assisting in the design of a new jetty for the Barking power station but he soon became involved in what was to become his main area of expertise, the construction of dams and the development of hydropower. In 1927 he worked on a dam at Meantwrog in North Wales. There then followed secondment to the Rangoon Port Trust to

construct a jetty which would facilitate the export of lead from Burma. Whilst being built, the jetty withstood an earthquake in May 1930 and opened in February 1931.

His next assignment was in Canada, where Paton produced a report giving recommendations outlining his ideas for Canada's future major infrastructure requirements. This included developments for ports and other facilities which he thought Canada would need for the next 25-50 years. He delivered his report in January 1932. The recommendations were implemented from 1935 and they continued to be in use until the 1970s. Ralph Freeman, designer of the Sydney Harbour Bridge, worked with Paton on this project.

Back in Great Britain, Paton was appointed as resident engineer on the Glenlee portion of the Galloway hydro-electric power scheme.

In 1934 he managed the building of the new Guinness brewery in Park Royal, northwest London. The designers of the brewery were Sir Alexander Gibb and Sir Giles Gilbert Scott although it is believed that the design was largely developed by Gibb. Gavin Stamp, the architectural historian said; "This is modern industrial architecture of a high order." Pevsner described it as an antidote to "the exuberance of contemporary bypass Art Deco." The brewery, a £2 million project included seven large steel buildings, silos, roads and railway sidings. His management of the construction led to Paton being made a partner in the firm of Sir Alexander Gibb and Partners in 1938.

At the outbreak of World War II, there was a greatly increased need for engineering construction and manufacture. Gibb and Partners were among the companies who secured construction contracts. Amongst war work undertaken was the building of Royal Ordnance Factories. An example was ROF Swynnerton in Staffordshire. The site required 1200 acres and was completed in two years. Swynnerton was a filling factory, involved in the dangerous work of filling shells and bombs with explosive materials.

Paton's war work included travelling to Turkey in March 1940 to supervise the construction of an iron and steel works. Whilst in Turkey he built emplacements designed for the installation of guns recovered from battleships abandoned and mothballed in the Dardenelles since the Gallipoli campaign in 1915. This work was completed but it was impossible to move the guns due to the Axis occupation of Greece in 1941.

On his return to Britain, a journey made via Greece, Italy and France, Paton continued to work on wartime projects. These included a plant for magnesium hydroxide extraction from the sea in Barry, South Wales, a new turbine for the aircraft engine manufacturer British Thomson-Houston company and a £7million underground aircraft engine factory.

Once all that was either underway or completed, by 1943-44 Paton became involved in preparations for the liberation of Europe. He, with many other engineering firms turned to the building of pre-cast concrete caissons, the ultimate use of which was secret, the workforce being under the impression that they were building silos for animal feed. His company worked in the London Docks from where the caissons were towed out to form part of the Mulberry Harbours off the Normandy coast.

This was a time when London was being subjected to attacks from V2 rockets. Paton was involved with the rebuilding of property destroyed or damaged by these raids in the boroughs of Wanstead and Woodford.

Post war saw him involved in a wide range of projects from factory construction in the United Kingdom to completing an economic survey in Syria. This latter produced a report in 1947 and recommended port, water infrastructure improvement and the construction of a hydroelectric power station on the River Euphrates. This last was not implemented until 1968 when the dam was built using money from the USSR. Further surveys included similar work in the Lebanon and the possibility of a railway in (the then) Northern Rhodesia to Dar-es -Salaam and Nyasaland.

He was, by now, becoming regarded as something of a world authority on hydroelectric power. A look at one of the projects in which he was lead engineer adds weight to this claim. In 1955 Paton became a senior partner in Sir Alexander Gibb and Partners and this coincided with him becoming involved in the Kariba dam hydroelectric scheme. In collaboration with the French designer André Coyne he led the overall design and supervision of the construction work which was carried out by the Italian firm Impresit. Paton described the building of the dam as the "highlight of my career" and it led to his company winning big engineering projects around the world.

9.03 The Kariba Dam, between Zambia and Zimbabwe

In The Sphere of May 1964 Angus Paton wrote an article entitled "The Importance of Dams" which he illustrated

with descriptions and photographs of dams from around the world and outlined their impact, with the Kariba dam impounding the largest man made reservoir in the world at the time.

Angus Paton's involvement in the world of engineering is demonstrated by looking at the number of committees and councils to which he was allied. This list is by no means complete, merely a few examples. He was President of the British Section of the Société des Ingénieurs de Civils de France in 1959 after being nominated for the Council in 1954 and serving as a Vice-President in 1958. Whilst President, he delivered an address to the society about the construction of the Kariba Dam as M. Coyne was unable to present his paper on New Dam Techniques following the Fejus disaster.

He was Chair of the Association of Consulting Engineers between 1949-1950, served on the Council of the Institution of Civil Engineers and was elected President in 1970, was a board member of the Hydraulics Research Station, chairman of the Council of Engineering Institutions from 1972 to 1973 and from 1974 to 1979 was chairman of the Ministry of Agriculture, Fisheries and Food flood protection research committee.

Angus Paton was knighted in 1973 for services to the construction profession and was a founding Fellow of the Fellowship of Engineering, which became the Royal Academy of Engineering in June 1976. He continued to actively encourage young engineers and in 1986 established a bursary in his name. The Sir Angus Paton Bursary is an award of £7000 funded from his endowment and is made to a suitably qualified engineer who is enrolled on a full-time Masters course related to the environment.

Oleg Aleksandrovich Kerensky 1905-1984

Oleg Kerensky had a long and prestigious engineering career in the United Kingdom. He was born in St. Petersburg and arrived in England with his mother and brother following the Russian Revolution and subsequent civil war. His father was Alexander Kerensky, a member of the Duma (the Russian parliament) who became the Chairman Minister. In November 1917 the Tsar dismissed the Duma and Kerensky, fearing for his family, left the family home never to live with them again. His wife Olga, with Oleg and Gleb, moved out of St. Petersburg and suffered great privations until they managed to obtain fake papers which enabled them to escape via Estonia and Paris to London in 1920.

Both brothers qualified as engineers, Gleb had a successful career as a mechanical engineer whilst Oleg became a civil engineer, specializing in bridge construction. He joined the newly created Bridge Department of Dorman Long & Co.Ltd. In 1924 the company had won

the 'design and build 'contract for the Sydney Harbour Bridge and this project and the engineers working on it provided good experience to Kerensky. He continued to work for Dorman Long on large projects such as the Bangkok Memorial Bridge and a power station in Egypt which helped build his expertise. In the 1930s during the depression, Kerensky worked in Middlesbrough and supplemented his income by teaching Theory of Structure at evening classes.

Employed by Holloway Brothers throughout the war, Kerensky's work included the building of an emergency oil jetty in Bristol and the fabrication and assembly of buffer pontoons for the Mulberry Harbours and steel pontoons for Bailey Bridges in Conway.

At the end of the war, the firm of Freeman Fox was expanding and was appointed by the Ministry of Transport to design the proposed Severn road bridge and to undertake work for the admiralty. Ralph Freeman took the advice of his son (also Ralph) who knew of Kerensky's work, and appointed Oleg Kerensky as Principal Bridge Designer. Kerensky stayed with the company throughout the rest of his career. The construction of the Severn Bridge did not proceed but the design was later adapted to form the basis of the Forth Road Bridge.

During the 1950s and 60s Kerensky worked on the design and build of bridges and road intersections in Thailand, India and New Zealand in addition to the United Kingdom. Tenders for the Medway Bridge on the M2 were submitted and Kerensky's concrete design was chosen. This elegant bridge was opened in 1963 and it resulted in Kerensky being awarded the CBE in 1964. Many other motorway interchanges and over bridges to his design followed during the 1960s

The reconstruction of the Grosvenor Railway Bridge over the River Thames between 1963 and 1967 was a personal achievement for Oleg Kerensky as well as for his former colleague F A Partridge who acted as a private consultant to the project. The Grosvenor Bridge had been built in 1859, and extended on each side in1865 and 1901. The brief for the reconstruction stipulated that the passage of 1000 trains a day should be maintained throughout the work which was to replace the existing railway tracks and increase the number of lines from nine to ten. The work was arranged so that eight tracks were always open except for when it was necessary to move erection girders on Sundays.

If the reconstruction of the Grosvenor Bridge was a highlight in his career, there followed two tragic bridge failures. The first, in which four construction workers were killed, was a bridge at Milford Haven, but the greater disaster occurred in Melbourne, where the West Gate Bridge collapsed while under construction, killing thirty five men. Following the failures of the two bridges, a committee,

led by Dr. A W Merrison, made recommendations for the checking of the design and erection of box girder bridges. Kerensky gave his full support to these conclusions and led the British Standards Institution Bridge Committee in a reappraisal of its task with respect to steel bridges.

The design of several major bridges, including the Avonmouth and Friarton bridges, had to be modified in order to meet the new standards set out by the Merrison committee. The British Standards Institution produced a code covering the design of structures and the materials and workmanship. It is believed that over time, Kerensky probably contributed more voluntary effort to structural codes than any other engineer. Although he was committed to an established code, which he recognised as an important means of handing down knowledge and experience to the next generation of engineers, he also believed that the code should not be used to stifle new ideas and that engineers should make contributions to the production of new guidelines and improved practise as new materials and designs evolved. He defended this view at the meetings of professional institutions when drafts of new codes, particularly referring to the Bridge Standard were presented.

In the area of education he delivered lectures on steel bridges at the Institute of Welding and a series of lectures to the Engineering Department of the University of Cambridge. The lectures conveyed his conviction that the good engineer required a combination of theoretical knowledge and practical considerations in order to produce successful design.

Oleg Kerensky was a member of many professional institutions including the Institution of Civil Engineers and the Institution of Highway Engineers. He spent a great deal of time serving on many councils and committees of these professional bodies and was held in the highest regard by them. One of many awards made to Kerensky was the Gold Medal of the Institution of Structural Engineers.

It seems apparent that Kerensky was a man with a purposeful outlook on life. When asked if he had set out to make a lasting contribution to engineering, he claimed that he had never been driven by ambition but had sought to achieve the best from himself and from a strong sense of duty 'to myself, my family, my employer, my adopted country and finally to the country of my birth'

Douglas Cecil Coode 1908-2005. President of the British Section in 1962

Douglas Coode was born in London. His father, Arthur, was a consulting engineer who had been born in Jersey and it was in the Channel Islands that Douglas was working at the outbreak of the Second World War. A new harbour was to be built at La Maseline on the island of

9.04 Douglas Coode

Sark. The preparatory work was begun on June 11th 1939 but the German occupation of July 1940 prevented the work being completed until after the war. Coode remained on Sark throughout the war and had to act as an engineer to the occupying forces. He left soon after the Liberation in May 1945.

Douglas then took on a wide range of engineering projects in Britain and overseas. During the 1950s and 1960s he travelled to the Caribbean and West Africa. In Nigeria, his consultancy, Coode and Partners, worked on the Apapa Wharf extension and in Barbados he represented the company at the opening ceremony of the new deep water harbour. The Prime Minister of the West Indies, Sir Grantley Adams, officially opened the Bridgetown Harbour on 6th May 1961.

Douglas Coode was the chair of the Association for Consultancy and Engineering from 1971-2. This association had been established in 1913 as the association of Consulting Engineers and was renamed in 2014. The members provide consultancy and other professional services in the field of engineering. The areas of expertise include building, transport, utilities, environment and construction and the association consists of highly positioned individuals from a wide range of backgrounds representing politics, government, academia, legal and financial institutions.

Douglas Coode was made a C.B.E. in the Silver Jubilee Honours List in 1977. The citation describes him as Colonel Douglas Cecil Coode, late Corps of the Royal Engineers, Territorial and Army Volunteer Reserve.

Ralph Freeman 1911–1998. Elected to the British Section in 1948

Ralph Freeman was responsible for the design of the Humber Suspension Bridge. His father had designed the Sydney Harbour Bridge. During World War II Ralph was a captain in the Royal Engineers and a member of the Experimental Bridging Establishment in Christchurch. There he helped to develop a propped military suspension bridge using Bailey Bridge components. This was used with great success in Burma. Ralph went on to advise on the construction of Bailey Bridges in France, Belgium, Holland and Germany during the liberation of Europe.

As well as the Humber Bridge Freeman tackled the Forth Road Bridge, the Severn and Wye Bridges, the Bosphorus Bridges in Turkey and the Auckland Harbour Bridge. He also managed the construction of the showcase site for the Festival of Britain on the South Bank in 1951. He received a knighthood in 1970, perhaps partly because he had managed the upkeep of Sandringham Park as consulting engineer to the Queen from 1949. Having overseen the overhaul of Sandringham's central heating system he sometimes liked to describe himself as "the Queen's plumber".

9.05 The Forth road bridge

Freeman argued for all branches of engineers to work closely together and to disseminate information, knowledge and training through the ranks. As well as being a member of the British Section he was a Fellow and President of the Institution of Civil Engineers, a Fellow of the American Society of Civil Engineers, President of the Welding Institute, and an Honorary Fellow of both the Institution of Mechanical Engineers and the Zimbabwe Institution of Engineers.

John Couch Adams (Tim) Roseveare 1914–2000. Elected to the British Section in 1951

9.06 Major Tim Roseveare

Seven years before he was elected to the British Section Tim Roseveare had been a parachutist in the Royal Engineers involved in the Normandy campaign to liberate France. Because of his conspicuous gallantry and devotion to duty he was awarded the Distinguished Service Order (DSO). His citation records that "on the night of the 5th/6th June 1944, Major J. C. A. Roseveare was given the task of blowing up an

important bridge at Troarn [just to the east of Caen]. He was dropped some five miles from his covering force, but he immediately gathered together a small force of Royal Engineers and some transport and made for his objective. Troarn was held by the enemy but showing total disregard for his own safety and magnificent leadership he pushed his way through under heavy enemy fire and captured the bridge which he then successfully blew."

After the war Tim was heavily involved with water based projects in Colombo, Coventry, Hong Kong and North Wales, and road, rail and power schemes in South America, Poland, the Middle East and South Korea. He was awarded the Telford Prize in 1955 and the James Watt Medal in 1965.

William Kirby Laing 1916-2009. President of the British Section in 1982

Born in Carlisle, Kirby Laing was the son of John and Beatrice Laing. The family construction business, John Laing and Son, had been established in 1848 and his father encouraged both his sons to learn about the construction industry, introducing them to building sites during their school holidays. Perhaps this early experience and the example shown by his father gave Kirby Laing the empathy with his workforce which he developed as an employer. His parents' strong religious belief was something else which was shared by Laing. He was educated at St Lawrence College, a religious foundation, followed by Emmanuel College, Cambridge from which Kirby graduated in 1937 with an engineering degree. He immediately joined the family firm as a trainee.

9.07 Kirby Laing

As Laing had joined the Territorial Army, he was called up just before the outbreak of war in 1939. He was, however, released almost straight away in order to work on vital construction schemes. Kirby Laing was appointed

as a director of John Laing's and became involved in various projects to which the company contributed. These ranged from barrage balloon stations, components for the Mulberry Harbours and what was the largest programme of airfield building ever undertaken. The whole airfields project was overseen by engineers and technical staff operating under the Directorate General of Works of the Air Ministry. Four major contractors, including John Laing's, were given responsibility for the construction of this massive enterprise. In all, 445 RAF airfields were built. Each one had paved runways, perimeter tracks and hard standing. The lead contractors appointed many smaller companies which could provide different skills and expertise. This grew into a contracting army with over 130 firms working on 800 separate contracts.

In 1943, however, Kirby Laing left the company to join the Royal Engineers with whom he served in France and Italy.

After the war, the company expanded further by taking advantage of the post war housing boom. Both Kirby and his brother Maurice worked for Laing's, with their father's role diminishing although he remained chairman until 1956, encouraging his sons to seek new opportunities in the UK and overseas.

Kirby Laing spent two years in South Africa from 1949 where he worked in partnership with the Roberts


REPÚBLICA DOS ESTADOS UNIDOS DO BRASIL
MODELO S.C. 139
FICHA CONSULAR DE QUALIFICACÃO
Esta ficha, expedida em duas vias, será entregue à Policia Maritima e à Imigração no pôrto de destino
Nome por extenso WILLIAM KIRBY LAING
Admitido em território nacional em caráter TEMPORARIO (temporário ou permanente)
Nos termos do art. 7 letra C do dec. n. 7967 , de 1945
Lugar e data de nascimento Carlisle, 21.7.1916
Nacionalidade britanica Estado civil casado
Filiação (nome do Pai e da Mãe) Sir John Laing e Lady Beatrice Laing
Profissão engenheiro
Residência no país de origem Laing House,Mill Hill,London NW7
NOME IDADE SEXO
FILHOS MENORES DE 18 ANOS
TEMPORÁRIO
Permanência por 180 dias no país
Dec. N. 7.967, de 1945.

9.08 Kirby Laing's identity pass for a visit to Brazil

Construction Group, a South African based construction and engineering company. It is claimed that due to the strict apartheid system in South Africa at the time, this venture was not a success more particularly in view of Laing's strong religious convictions and he returned to London in 1951

Back in London, Laing turned to his strength, the building and building materials side of construction, developing commercial buildings, factories and housing. He was appointed chairman of the Laing Group in 1957 with his brother Maurice as deputy-chairman and their father as life president. The twenty years of his leadership saw the company grow and prosper. John Laing and Sons was responsible for the reconstruction of the Birmingham

Bullring, revolutionary at the time, a section of the M1 motorway, the first nuclear power station at Berkeley in Gloucestershire and the rebuilding of Coventry Cathedral.

Eleven contractors tendered for the scheme to redevelop the Bull Ring in Birmingham. The city council awarded the work to John Laing and Sons and construction began in 1961 on the new open air market. This was opened in June 1962 to be followed in 1964 with the opening of the first city-centre shopping area in the UK.

As mentioned, John Laing and Sons built part of the M1 motorway, the section from junction 10 to junction 18, a distance of approximately 48 miles. The road was officially opened on 2 November 1959, with Laing's section completed on time and budget (£16.5 million). The 5,000 people working on the road had advanced by an average of a mile every eight days.

In 1955, the company signed two contracts on the same day, one was for the Berkeley nuclear power station and the other for the building of the main superstructure of Coventry Cathedral. These two contracts were apparently referred to in the company as "The Power and the Glory".

The work of building Coventry Cathedral gave Kirby Laing great satisfaction and pride. Although his father belonged to a branch of Christianity known as the Christian Brethren, both his sons had been latterly confirmed into the Church of England. Basil Spence's

9.09 Laing's scrapers on the M1 contract

design for the cathedral was not without its critics but the decision to build a new church meant that the Cathedral was seen as a symbol of reconciliation, set as it is, beside the ruins of the old, with its Garden of Remembrance and altar rescued from the bombing. On 13 October 1962 the Bishop of Coventry told the Coventry Evening Telegraph that the Cathedral had become "a source of new hope for the world." He added that in the six months since the cathedral had been consecrated over 2.25 million people had been to see it. The Bishop was speaking after watching a film made by John Laing and Sons which recorded the

construction. Kirby Laing said he experienced a mixture of humility and pride that his company had been involved in the enterprise.

The company seems to have expanded rapidly during the 1960s. In addition to the major projects mentioned, Laings embraced new methods, techniques and materials for construction. They introduced both the French Sectra and the Danish Jespersen systems of concrete manufacture. The Sectra system provided a high speed method of in-situ concrete construction allowing the rapid building of multi storey buildings, in particular, flats. In Manchester this assisted the council to meet the post war need for housing. The flats could be built at the rate of over two floors per week.

The Chairman's report to the Annual General Meeting in 1964 outlined the many other schemes which could be swiftly completed using prefabricated or on site produced concrete, these included two Woolworth's stores in Scotland finished in six months. Civil engineering work included contracts for parts of the M2 and M6 motorways.

In 1968 Kirby Laing was knighted for his services to the construction industry. His company had always had a high reputation in the field of technical training and apprenticeships and this remained their business philosophy.

From 1968 to 1974, Kirby Laing was chairman of the National Joint Council of the Building Industry, a job which involved mediating between different unions and to which Laing could bring his company's reputation for fair dealing. Laing had become known for his somewhat unfashionable view in the construction industry (although probably not exclusively his) that employees were the lifeblood of a company and needed to be treated decently. During his chairmanship, the Building and Civil Engineering Joint Board was formed, leading to better cross industry integration. Laing regarded this as one of his important labour-related achievements.

Laing spoke out against some Government policies. According to the Times in January 1968, he accused the Government of adding about £500 to the average cost of a house. This seems to have been as a result of mortgage rate increases. He appealed to the Chancellor to "keep this in mind when preparing his budget". Laing maintained the extra costs would be an obstacle for first time buyers. He went on to say that a reduced demand from people wanting to buy their own home would impact on the ability of private house builders to contribute to the housing programme that the "Government is now clearly depending on them making". The Government had abandoned its pledge to build 500,000 homes a year by 1970 and had also reduced approvals for council homes

to rent. This placed a greater reliance on the private house builder if the homes programme was to be maintained somewhere in the region of 400,000 new homes a year.

Sir Kirby was allied to various areas of building and engineering. He served as President of the National Federation of Building Trades Employers twice, was on the council of the Institution of Civil Engineers and was president in 1973. He was elected as an honorary member of the American Society of Civil Engineers in 1975 and the Fellowship of Engineering in 1977.

Outside his professional life, Sir Kirby Laing was involved in a host of societies and organisations. In1966 he resumed his military connection, joining the Engineer and Railway Staff Corps, a Territorial Army Unit which advises the British Army on engineering matters. He became the Corps commanding officer in 1978 and did not retire until 1997 at the age of 81. He served as a JP in Middlesex and was Deputy–Lieutenant for Greater London from 1978 to 1991.

The Laing family were all committed to philanthropic work, largely driven by their Christian faith. Sir John Laing had established a charitable foundation in the 1960s and each of his sons also established a foundation in their own names. The Kirby Laing Foundation was started in 1972. One of the five areas of giving is to the promotion of the evangelical Christian faith but the remaining four cover education, particularly in the field of engineering, medical welfare and research, developing talent in the performing arts and helping women and girls in Nepal and Bangladesh.

Alan James Harris 1916-2000. President of the British Section in 1970

Sir Alan Harris: visionary, engineer, professor, soldier, raconteur and pioneer of British prestressed concrete. The life of Sir Alan Harris could be summed up in these few words, but of course there is a man behind those words which led to him being thus described.

Alan Harris was born in Plymouth in 1916, the son of an electrical engineer who worked for the Admiralty. He was determined to become an engineer, and studied for his engineering degree at night school whilst working for local authorities in London.

Possibly the most formative early engineering experiences came as a result of World War II. Some claim that Harris volunteered for the parachute regiment and others say the Royal Navy. He actually joined the Royal Engineers, where he was trained as a diver and led a marine bomb disposal unit. He landed at Port-en-Bessin in Normandy on D-Day+1 and took command of a diving unit on Mulberry B at Arromanche, working with twelve French fishing boats. Alan Harris was subsequently awarded the

Croix de Guerre. He remained with the Royal Engineers, first in Ostend then on the Rhine.

It was whilst in Ostend that Harris met Gustaff Magnel, the Belgian engineer who was an early and zealous advocate of prestressed and reinforced concrete. This meeting seems to have been influential as following the war, Harris volunteered to work in France for Freyssinnet in order to pursue his interest in the new technology of prestressed concrete. He was subsequently employed by Freyssinet and returned to England in 1949 as their chief engineer and managing director of Prestressed Concrete, its licensee. There were plenty of opportunities for Harris, a man with great energy and clarity of thought, to design and promote the use of prestressed concrete for the construction of bridges, jetties, reservoirs and other buildings which would have historically relied on steel, a material in short supply following the war.

In 1955 he set up a consultancy with his brother John and James Sutherland, operating as Harris and Sutherland. James Sutherland knew of Alan Harris's enthusiasm for prestressed concrete and his creative and innovative ideas. When Sutherland joined Harris he believed he would work with him for just six months but they remained partners for many years. The firm developed into an international organisation, with offices in Australia, Hong Kong and Singapore. The company worked on many innovative projects, such as the hanger roof at Gatwick airport and the hyperbolic roof at the Commonwealth Institute in London. The roof of the Commonwealth Institute is listed and when the building was converted to become the home of the Design Museum, the roof was incorporated in the new building.

Sir Alan was continually seeking creative engineering solutions which he was happy to share. In discussions, "his hand would reach into his jacket pocket for his fountain pen and the nearest piece of paper would be covered with clear sketches. The conversation would usually end with 'and it would only need to be a few inches thick'". His ability to visualise the way forces acted on a structure was one of the keys to his success. A former employee remembers being addressed as "old boy" by a very busy man who was always happy to help and share his original and sometimes quirky ideas with 'small potatoes'. He encouraged lateral thinking and multi-disciplinary working and the exchanging of ideas with other specialists outside civil engineering.

One of his designs in the 1970s (which may still be adopted!) was for the construction of a floating airport in the Thames estuary. London City airport is the closest comparison.

He built himself a ferro concrete boat (shades of "Iron Mad" Wilkinson in the eighteenth century) which was thought to be about as responsive as a super tanker.

Sir Alan was well known as an excellent public speaker and raconteur. Chris Burgoyne, writing in the Concrete Matters Newsletter, correctly comments that like all the best speakers his speeches and lectures were always, like his structures, carefully put together and crafted with the minimum of material but to full effect whether speaking to fellow engineers or a non-specialist audience.

His interest in education and Institutions was wide; he was professor of Concrete Structure at Imperial College, a discipline he had been actively involved in establishing after the war. Sir Alan also served as President of the Institution of Structural Engineers in 1978/79 and Vice –President of the Institution of Civil Engineers.

His partner, James Sutherland was a keen historian and convened the history group of the Institution of Structural Engineers and the series of lectures he organised continues today. In 1997 it fell to Sir Alan Harris to deliver the Sutherland History Lecture. His topic was of course, "Freyssinet: the Genius of Prestressing"

The Chairman of the meeting introduced Sir Alan as follows: "James Sutherland will recall a member of our staff who went on holiday in Scotland to the Isle of Skye and seeking no doubt the sublime, he climbed to the top of the Coulins. Disappointment! When looking north, all he could see was Harris and, looking northeast all he could see was Sutherland. These names keep cropping up, not least this evening, but this evening it is Sutherland and Harris. Emeritus Professor Sir Alan Harris."

Kenneth Farish Scott 1918-2007. President of the British Section in 1975

Kenneth Scott served with the Royal Engineers between 1939 and 1946 and was the engineer in charge of demolition during the SOE attack on the Asopos Viaduct in Greece, May-June 1943. The bridge was located across a narrow gorge and was of strategic importance in the allied campaign. The British guerrillas, including Scott, went into the gorge to see if they could take out the arch. After an exhaustive climb down the gorge lasting several days the party had to turn back for lack of equipment. Finally, and with several men doing reconnaissance and others carrying hundreds of feet of rope, grappling equipment and explosives, Scott and the guerrillas made it to the bridge.

9.10 Lieutenant-Colonel Kenneth Scott

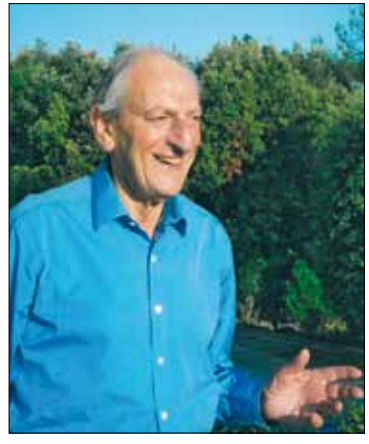
Due to maintenance work that had been underway, the span had scaffolding and ladders on it that would aid their access. On the night of the attack, several German guards were up on the bridge keeping watch with many more nearby. Searchlights were always sweeping the gorge. After two hours, Scott and a colleague had attached the explosives without being seen and the men headed back up the canyon.

The charges were set to go off after an hour and a half but nothing happened. Then after an hour and fifty-five minutes, there was a bright flash. Their distance combined with the noise of the stream made them unsure of what had occurred. The next morning, one of the party who had staked out a position on a cliff above the bridge told them the news – there was an empty space where the bridge used to be.

The demolition of the Asopos viaduct was one of the more successful feats of sabotage in the war. Kenneth Scott was awarded one of his two Military Crosses for his contribution.

After the war Scott went on to design and supervise major water, maritime and airport projects with Sir Alexander Gibb and Partners.

Sir Alcon Copisarow, 1920–2017. Patron of the British Section 1993 – 2013



9.11 Sir Alcon Copisarow

Born in 1920 in Moss Side, Manchester, Alcon Copisarow's parents were Jewish émigrés from the Russian empire. His father became a noted research chemist. Sir Alcon had graduated in geology at Manchester University, but the Second World War pitched him headlong into a world where science, industry and government were mobilised for the common good. After the war, as a scientist and civil servant, Sir Alcon was at the centre of efforts to forge a more productive, innovative nation, when it seemed that business and science had different agendas, never matching their level of wartime co-operation.

In addition to the University of Manchester, he was educated at Imperial College and the Sorbonne.

Alcon Copisarow witnessed many of the key events of the twentieth century and played many important roles in shaping the course of British and international affairs.

He served as a Lieutenant in the Royal Navy between 1943 and 1947 when his aptitude took him from vital war service to engagement in the unfamiliar discipline of radar technology. So far as the Navy was concerned, he had a scientific discipline – and that was that. He adapted quickly – he had to. After leaving the Navy he moved into the world of international diplomacy, successively as Scientific Counsellor at the British Embassy in Paris, as a Department of Scientific & Industrial Research Laboratory Director, in association with Appleton, Cockcroft and Blackett, and as Chief Scientific Officer.

In 1966, bringing his analytical skills to the arena of consultancy work as the first non-American senior partner of McKinsey & Company, he was entrusted with many complex and sensitive assignments – improving the efficiency of the Bank of England, reorganising the Californian aerospace industry and overhauling the administration of Hong Kong, to name but a few. He was the initiator of the Franks Committee which recommended the first British business schools.

His vision and leadership were crucial as co-founder and Chairman of Trustees of the Prince's Youth Business Trust and the Eden Project, orchestrating the work of engineers and technologists with others to help sustain the environment. Subsequently in the UK he was a Board Member of the British National Oil Corporation and British Leyland and held numerous other important positions. He was a Fellow of the IEE (now IET) and a Fellow of Churchill College, Cambridge. He was knighted in 1988.

When considering writing his memoirs, a publisher pointed out to him that it was 'no longer worth their while', except in the case of the famous, particularly young, celebrities. Despite this early setback, Sir Alcon found a publisher prepared to take them on and his memoirs, 'Unplanned Journey – from Moss Side to Eden' were launched in October 2014, subsequently running to several re-prints.

In his memoirs Sir Alcon relates his meetings with a vast range of important figures of the 20th century, from the Duke and Duchess of Windsor, Sir Winston Churchill, to science fiction writer Arthur C Clarke, Roald Dahl and Paul McCartney.

Sir Alcon could also plausibly claim to be the man who made Margaret Thatcher electable when, in 1977, she asked him to restructure the Conservative Central Office. "Our problem is organisation. I will deal with policy," the future prime minister told him.

Sir Alcon regularly expressed surprise that he was approached to take on prominent roles in areas of which he knew little. What his career demonstrated is how many opportunities are open to "T-shaped" people, with deep

knowledge in one area, but the ability to work on a range of broader challenges. "So many top jobs call for a leader who can orchestrate diverse talents a set career strategy would not survive. Young people who "stick to their last" risk missing opportunities. Rather, what I would aim to do is to equip myself not with a single spear, but with a quiver full of arrows and a number of potentially useful disciplines and experiences."

For all his talents, though, Sir Alcon was wise enough to recognise that sometimes even a quiver full of arrows is not enough. "I can think of a number of people, just as capable as me, if not more so, who died as unsung heroes."

In his memoirs, Sir Alcon Copisarow said the four factors that contributed most to his life and work were his upbringing and education, being British, being Jewish and his long and happy marriage. He was married to Diana for 64 years – something he referred to as his 'great good fortune'. He said of marriage, "What is necessary is wider recognition that real effort is needed from the parties themselves, without expectation of instant results. They should think more about what they might contribute to the relationship rather than what they get out of it".

Sir Alcon became the third Patron in the history of the CNISF/IESF British Section, taking up that role in 1992 and relinquishing it in 2013, to be succeeded by Professor (now Lord) Robert Mair. Accompanied by Lady Diana, Sir Alcon was ever-present at AGM's and occasionally other CNISF/IESF gatherings over his term as Patron.

As CNISF Secretary, John Beck first encountered Sir Alcon in 2001 and found his wise counsel over the years invaluable. They corresponded regularly and met from time to time until just before his death, when the sharpness of his intellect and quick wit remained undimmed.

Following an interview upon the publishing of his memoirs in December 2014, the Financial Times dubbed him 'A McKinsey knight with a quiver full of arrows'. An apt title. Sir Alcon died at home on 2 August 2017

Povl Ahm 1926-2005. President of the British Section 1997

Povl Ahm was born and educated in Denmark. After graduation in 1949 he moved to London and soon began to work for Ove Arup and Partners, the company with which he remained throughout his working life. His ability as a civil engineer was quickly recognised, and he was made an associate partner with Arup's in 1956, a full partner in 1965 and a director in 1977. Povl Ahm was the chairman of Arup's from 1989 until his retirement in 1992.

The engineering philosophy at Arup's is best described as "total architecture", that is where engineers and architects work in close collaboration. The environment at Arup's allowed Ahm to combine his expertise in the design of

advanced structures and his interest in architecture. This matched Ahm's thinking in that he worked to demonstrate that good quality engineering depends on good team work. He maintained the view that civil engineering offered the chance for the engineer to be involved in all stages of the project, to be concerned not only with what is to be built and how, but also with why.

An early project which required close cooperation was the rebuilding of Coventry Cathedral where it was necessary to work closely with the architect Basil Spence since Ahm was responsible for the structure. Povl Ahm worked on many other prestigious stand-alone buildings, including the early conceptual design schemes for the Sydney Opera House. He took charge of the building of the new Smithfield Market, the Pompidou Centre, the British Embassy in Rome and the Danish Embassy in London.

9.12 St Catherine's College East Outside Quad, Oxford by Povl Ahm

Ahm secured the contract to construct the Gateshead Viaduct in 1965, and this led to Arup's establishing a specialist transport group within the firm. The company subsequently built the Gateshead Western Bypass and a section of the Tyne and Wear Metro scheme.

From 1981 to 1986 Ahm was the chairman of the Client/Consultant Relationship Committee of the International Federation of Consulting Engineers and started its work on the Guide to the Client-Consultant Model Services Agreement, now the standard reference throughout the world.

In 1993 Ahm won the first Gold Medal awarded by the Institution of Civil Engineers.

An active sportsman, Ahm played in the 1956 Amateur Cup Finals at Wembley. He was the goalkeeper for Corinthian Casuals. (Good quiz question – who was the first Danish footballer to play at Wembley? – thanks to Michael Muller for that.)

10. THE CHANNEL TUNNEL – AN ANGLO-FRENCH PROJECT 'PAR EXCELLENCE'

THE ROLE OF MICHAEL MULLER (PRESIDENT 1996) AND OTHER MEMBERS OF THE BRITISH SECTION

In 1803, when Napoleon Bonaparte explained the first tunnel scheme to the leader of the Whig Party, the Englishman cried enthusiastically: 'It is one of those grand projects we can do together!' Finally it is done.

The Guardian, 6th May 1994

The creation of a connection between Great Britain and France has been long discussed and in fact the idea of a tunnel has featured in several lectures given to the British Section, both before and after World War II. The go ahead for a tunnel was finally given in 1988 and the project completed in 1994. Initially, different proposals to make the link were considered and a tunnel was chosen for the following reasons:-

1. It would be the least disruptive to shipping.
2. It would have the least environmental impact.
3. It would be the easiest to protect against terrorists.
4. It would be the most likely to attract sufficient funds.

In 1980 the British consulting engineers, W S Atkins, were awarded the supervisory contract known as the Maitre d'Oeuvre (MDO), in a joint venture with the French engineering consultancy SETEC. The role of the MDO was to monitor the progress of the project, to ensure compliance with regulations and to ensure delivery of the work according to the client's (Eurotunnel) requirements. Sir William Atkins, the company's founder, was an energetic and persuasive man who, after tendering, successfully secured the contract for his company. By then however, he was beginning to take a less active role, although he was still very interested in this major project. Alan Parish had become the new Atkins chairman but sadly died within about 6-8 months of his appointment. Atkins approached an engineer, Terrel Wyatt, who was about to retire from Costain's, and persuaded him to become their new chairman. He and Michael Muller (both members of the British Section) were the two men appointed to lead for Atkins, becoming directors of Atkins-SETEC on the British side of the MDO.

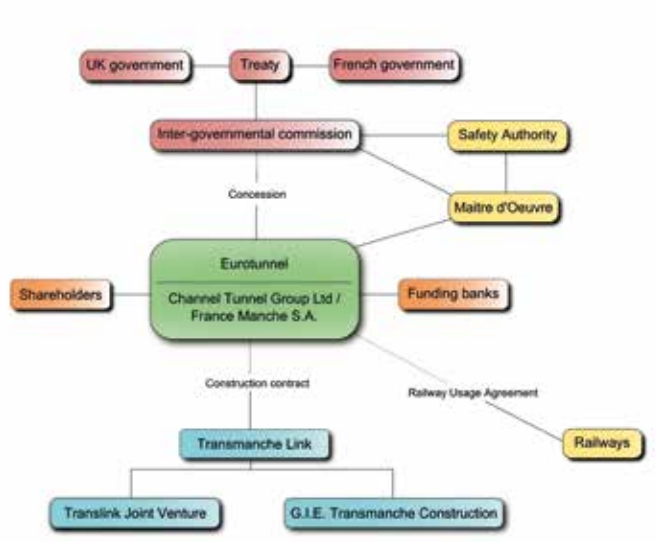
The way chosen to deliver the project was based on the French 'Design and Construct' method. This meant that the contract was let against a general outline of what was needed, provided by the client and his consulting engineers, and the chosen contractors then worked up the detailed design. In the case of the Channel Tunnel the MDO role was vested in a Board of four people, two British and two French. Terrel Wyatt and Michael Muller were the two British Board members responsible for the British half of the work. The

10.01 Michael Muller

French members held equivalent roles of responsibility, which were to ensure that the contractors had made the appropriate preparations, that they had the right machinery, people, a coherent work programme and most importantly followed agreed codes of practice. Terrel Wyatt, as chair, made considerable contributions to the 'ideas' and wider concepts to further the development whilst Michael Muller was more actively involved in the implementation. In addition to the civil engineering work the MDO was also responsible for monitoring all the non-civil engineering aspects of the work. For example, Michael Muller visited Bari in Italy as well as Belgium to view the progress and testing of new railway rolling stock.

In the course of delivering the project up to 15,000 people were employed, all of whom needed to be managed to ensure maintenance of quality and compliance with the agreed design. Atkins-SETEC placed engineers and inspectors with the various contractors to give this oversight.

Michael spent a considerable amount of time in the MDO offices with his French counterpart. The client, Eurotunnel, and the tunnel's backers had senior members of their staffs permanently seconded to the MDO and these were the people Michael worked with to keep up to date on any issues with the work force, any political involvement and of course, any engineering matters. Eurotunnel's chief



10.02 The way the Channel Tunnel work was organised

civil engineer was John Tabener (another British Section member) and he worked closely with the MDO.

Michael was seen as a reliable reporter who was not a direct representative of the client. He remained in post six months beyond his official retirement date in order to fulfil his role within the MDO and to see through the completion of the civil engineering aspect of the tunnel. As he spoke excellent French he maintained a good and cooperative working relationship with his French colleagues.

Ten contractors were appointed to take on the construction work, five to work in France and five on the English side. These contractors were known collectively as Transmanche Link (TML) and on the British side consisted of Balfour Beatty, Costain, Tarmac Construction, Taylor Woodrow and Wimpey International. As the project progressed it became clear that Eurotunnel and TML required greater project management input and Bechtel was called on to help them manage the project to its successful completion.

The design of the tunnel itself is deceptively simple, with two running tunnels and a service tunnel down the middle; but at just over 50km in length, of which nearly 40km is underwater, it was (and remains) the longest undersea tunnel in the world. The tunnel has two crossovers allowing lines to be isolated and trains to switch tracks to allow maintenance and in case of problems in either direction. Cross passages are placed every 375 metres to give access for maintenance and emergency services and for passenger evacuation. The travelling public was concerned about the possibility of flooding in the tunnel but in fact fires poses a far greater risk, so very stringent systems for detection and extinguishing fire and for evacuation were built in to the design. The complete project required a considerable amount of 'above ground' infrastructure. This includes areas to marshal cars and lorries, motorway improvements and new junctions and upgraded railways. W S Atkins's role extended beyond the civil engineering aspect to include this section of the scheme. Although SETEC used a sub contractor on the French side, Atkins procured specialist railway assistance as required.

When the two parts of the tunnel were connected in 1990 an historic handshake was photographed as a French tunneller and a British tunneller met. This was 22km from the British side and 15.6km from the French. The meeting was far from the end of the construction of course, and the railway infrastructure was the next phase of the work. The driving force behind this part of the project was Sir Alastair Morton, who, with a French colleague, was joint chairman of Eurotunnel. It was Morton's energy and determination which led to the tightening up of expenditure, and making sure that finance, particularly from the bankers, was not withdrawn.

When the civil engineering part of the tunnel was completed, a celebratory dinner was held in the middle. This was a nod to the historic dinner which Brunel had held under the Thames on completion of the Wapping to Rotherhithe tunnel in London. The Channel Tunnel guests arrived by train at the central crossover, the lunch having been delivered by an earlier train. The guest list included Michael Muller, bankers and other financial backers, contractors' representatives and many workers from both sides.

Preparing the tunnel for regular passenger and freight services was delayed following concerns raised by the serious Clapham Junction railway accident in 1988. The accident did lead to some backers and politicians losing confidence in the safety of the tunnel and they were concerned that major accidents were a possibility, either during construction or when trains were running. British Rail brought in a replacement team of health and safety experts and the delay caused by bringing the new team up to speed with the complexities of the railway led to a cost and time overrun. However the Queen and the President of France, M. François Mitterand performed the official opening ceremony on 6th May 1994. Freight services began on 1st June 1994 and passenger services in November 1994.

When Eurotunnel was originally appointed to construct the tunnel they agreed to bring forward proposals for a second tunnel when the traffic required it. This has not yet happened although different suggestions have often been put forward, including a bridge. A car tunnel might seem an obvious answer but ventilation would be a major problem. For example, it would be impossible to put ventilation shafts in the busy shipping lanes of the English Channel. Perhaps when electric cars have an increased range that could be a solution. However the current arrangement seems to fulfil the need for the time being.

British Section members have had an important part to play in the Channel Tunnel project, and Michael Muller is rightly proud of the role he played in its construction, believing it to be the most significant project he worked on in his career, and something which has, and will continue to have, a major impact on the lives of millions of people.

> *"The Channel Tunnel project was perhaps the most ambitious engineering project of its time, not only in the rail sector, but from the perspective of all engineering disciplines. In working on the project, Atkins-SETEC helped both the UK and France achieve what had only been dreamt of by engineers of the past". Michael Muller, quoted in Angles, WS Atkins's house magazine.*

Many thanks to Michael Muller for his time and patience in helping to prepare this account. He wishes it to be made clear that he did not dig the tunnel single-handedly!

11. THE SOCIĒTĒ IN RECENT YEARS

"As the professional and networking role of the British Section has reduced in significance, there has been a rise in the social content of its activities. The link to French engineering and France remains a foundation feature for the British Section, although more as a 'love and curiosity of things French' than out of professional necessity."

Introduction

The character of the British Section has undergone gradual evolution in recent years. The strong feeling for 'things French' persists, but, with some notable exceptions, papers from French engineers no longer predominate at meetings, with many lectures being generated by the Presidents drawing on their personal contacts. In addition, there are now very few members coming from French nationals working as engineers in Great Britain.

Changing technologies, particularly the rise of the internet and digital publication and communication have perhaps reduced the significance of the technical content in British Section meetings aimed at advancing knowledge and spreading information, although meeting together to listen to an expert in any given field imparting knowledge is always valuable and sometimes exhilarating. Much of this information and knowledge, which was originally made available through printed papers with limited circulation and discussion at meetings, can now be accessed with relative ease through a computer screen but there is no substitute for face-to-face contact and ability to ask questions.

In addition, the value of concentrating attention on any one country has diminished. The improving and reducing real cost of international communication of all kinds and the development of global markets has led to the rise of multinational, multi-disciplinary organisations and a rise in international cooperation on major projects. British engineers are no longer as dominant across the world with their expertise and organisation as they once were, in the face of stiff and talented competition from others – rather they are valuable potential partners. In a similar vein, there is no specific need to have a body dedicated to the exploration of the engineering technologies of any one country. International conferences and meetings are often 'footloose' and organised to address particular themes. They can be organised in many parts of the world and are not tied to a particular geographical remit.

Membership of the European Union has also meant that links to any one country have become less relevant in professional work. The freedom of personal movement, the elimination of barriers and the harmonising of standards have driven a greater pan-European outlook, although differences in professional structures and methodologies have not been eliminated. (It remains to be seen how Britain's exit from the European Union will affect all this, if and when it goes ahead.)

As the professional and networking role of the British Section has reduced in significance, there has been a rise in the social content of its activities. The link to French engineering and France remains a foundation feature for the British Section, although more as a 'love and curiosity

of things French' than out of professional necessity. As the social side of the organisation has developed, the impetus to meet with other professional bodies has also decreased. Fewer meetings are now held jointly. These were previously valued to share costs (e.g. speakers' expenses, printing, room hire) as well as knowledge. In keeping with rising disposable incomes and the increased leisure time available to members, the Voyages organised by the British Section have become a significant feature for the membership. It is true that visits between Britain and France featured in the more distant past, and often involved partners, but the last few decades have witnessed a growing frequency of visits, the introduction in 1991 of a Mini-voyage each year (sometimes not to France), the involvement of members and their partners in informal activities (e.g. skiing trips) and the development of other social events (e.g. lunches and the joint ICE/RICS annual carol concert).

Membership

Many members have remained loyal to the British Section although younger engineers are nowadays even more likely to find their knowledge base and professional development elsewhere. The result has been an increase in the average age of members beyond retirement age and a tendency to draw new members from professionals in mid/late career or approaching retirement. Because there is no requirement to join the British Section to support career advancement or practise engineering, involvement comes mainly from a general desire to learn about engineering projects, particularly though not always French in origin and to see them first-hand on the ground.

However, it is worth repeating the phrase employed by Robert Mair in his foreword, that the members of the British section are 'drawn from the top echelons of science and engineering'. Many have held top jobs at the highest level in their particular discipline. At the time of writing, there are ten Past-Presidents of the senior institutions within the membership. Thus, the opportunity afforded at IESF gatherings to network with such a remarkable group of individuals remains of immense value. The British section might be small numerically but, as Sir Alcon Copisarow said, it 'punches well above its weight'.

Membership is limited to 300 and stood at 182 in 2006 after a sharp, inexplicable decline in one year. Since then it has stabilised, standing at around 150, including our Patron and nine 'Amis', the number lost through retirement or death being roughly balanced by new recruits.

As early as 1997 major companies were written to, seeking new recruits, and this had some small success. Subsequently most Presidents have expressed the need to maintain (and build) the membership. In 2008, informed

by a review led by David Cawthra, the Council debated how this might be achieved and concluded that:

- it saw no need to change the qualifications for membership
- new members should still be introduced by personal invitation
- there was no need to change the format of events
- there should be no targeting of particular professional disciplines or employment areas.

However, a programme of five actions was formulated:

1. Publish a small leaflet to be used as a hand-out for recruitment,
2. Introduce a newsletter (twice a year) covering recent and future events,
3. Enhance the website which had been launched in 2007,
4. Seek closer relationships with other professional institutions, and
5. Encourage the participation of French engineers and scientists who live and work in the UK.

Since then new members have largely continued to be recruited through the personal contacts of existing members (and are therefore mainly from similar backgrounds and age groups) and from people looking for enjoyable experiences as other professional demands on their time fall away with age.

A further study was commissioned by Peter Blair-Fish, President in 2015. Following extensive discussions with Council, revisiting future recruitment strategy, a report was produced by Norman Train, extracts from which appear at the end of this book in Appendix 1.

Developments in France in recent years have seen our French parent body developing a much wider members' professional base, to encompass numerous broadly scientific endeavours. These range from agriculture and biotechnology on one hand to the traditional engineering and scientific disciplines on the other. At the same time, various general committees were established, considering matters from defence, to economic affairs, to ethics, social and legal issues relating to science and engineering. The British section has mirrored its French parent, adopting a broader structure and progressively welcoming members from a wide range of scientific disciplines, which has introduced interesting topics beyond the pure engineering focus and will aid future recruitment.

At one time, membership of the British Section was subject to the approval of the French parent body that also registered names and issued membership numbers. Such practices no longer apply directly however, and the British section is a formally constituted *section étrangère* and as such, its actions, aims and objectives are consistent with those of the parent body. This is an extremely important principle and part of its *raison d'être.*

Meetings

David Hattersley acted as dinner secretary for many years. He points out that the meeting arrangements have certainly improved: "For years members met for the lectures at the IStructE. in Belgravia, with those wishing to dine going on to one of the restaurants in the locality. Much time was spent in travel from one place to another, a miserable exercise, especially in the winter months. As Dinner Secretary, I slowly put together a list of venues near to an Underground station, which might be persuaded to accommodate all our requirements under one roof. Many professional institutions and clubs were found wanting, or too expensive, until we established a core of five venues, plus of course, our 'home base' at the Institution of Civil Engineers. Now few who attend the Lectures fail to stay for dinner!"

David also comments that "Independently of all this an increasing number of our members now also belong to a City Livery Company, and have brought the added values of Fellowship into IESF. Likewise the introduction of a less formal summer event without a speaker, initially at the St Stephen's Club and more recently at the Royal Thames Yacht Club, has further strengthened the bonds within our organisation. In a similar vein we now take for granted the IESF supper, at the ICE or the RICS, which follows the Annual Inter Institution Carol Service at St Margaret's Westminster: an ideal way for our members to wish each other a Happy Christmas."

The President, the Council, and the French Connection

The success of the British Section depends heavily on the initiative and resourcefulness of its various Presidents and its Council officers. This involves the organisation and running of the AGM and four other meetings. The President also gives a lecture to members to set the scene for the year ahead. A major commitment for the Section surrounds the organisation of a Voyage d'Etude in the autumn and, since the 1990's, a Spring Voyage for members and their partners. The arrangements for the Voyages are particularly challenging because of the numbers of people involved and the complex logistics

needed to ensure that a busy itinerary goes ahead smoothly. Until recent years the main Voyages were organised by a dedicated person or couple. The names of Mathé Harris, John Dixon, John Wright, Paddy Manning, Humphrey Pocock, the Mitchells, and the Hounslows feature here. However, since the decision to exist without a dedicated Voyage Officer a lot more responsibility has fallen on the President and those she/he can enlist.

So far as membership of the Council of the British Section is concerned, the practise in the early years seems to have been for existing Council members to nominate the officers from amongst their number and then to request nominations for a long list of suitable candidates to replace retiring Council members which was then put to a ballot of the wider membership. Certainly, election results were still being announced at the AGM in 2002. By the next year the minutes record that three members had agreed to join the Council and by 2004 Council membership appears to have been uncontested. It was at this point perhaps that a ballot of all members no longer became a necessity since those prepared to stand did not exceed the places available. In recent years, as with many voluntary organisations, there has been more difficulty in id entifying su itably ta lented and willing members to serve and the British Section has been fortunate that good people have been prepared to step forward and help 'steer the ship'.

Links to the Ingénieurs et Scientifiques de France (IESF) parent body have obviously remained important to the British Section, although the relationship has moved more to one of mutual recognition and support rather than one of control. Over the years the Paris Headquarters have sent representatives to the British AGM. For example, in 2005, 2006, 2008 and 2010 Daniel Ameline, Délégué Général (Executive Director) from CNISF Paris Headquarters attended, accompanied by Madame Dominique Ameline. Although Daniel Ameline had retired by 2009 as Executive Director, he retained his international responsibilities on a voluntary basis. Subsequently, François Lureau (IESF Board member) attended in 2014 followed by Sandrine Monfort (Président Comité International) in 2015 and Philippe Deltombes (Vice President) in 2016.

Presidents and the Honorary Secretary have continued to visit Paris to liaise with Headquarters and to attend official functions. For example, John Beck attended a champagne reception in 2011 at the invitation of Bernard Accoyer, President of the Assemblée Nationale, in honour of the Conseil National des Ingénieurs et Scientifiques de France, also providing an opportunity for him to meet incoming CNISF Président, Julien Roitman. As Honorary Secretary he has attended the IESF AGM on two occasions and met French headquarters staff with President David Park in 2013 to discuss future strategy.

Voyages

For many members the highlight of the year is associated with the spring and autumn 'voyages'. The more established of the two annual events is the Voyage d'Etude which normally takes place in September or October each year and which has certainly been organised most years since the 1970s. These are intended to be substantial visits to France to investigate recent or significant engineering projects and to enjoy French hospitality. Although high-visibility jackets and hard hats feature prominently, so do fine foods, good local wine and fellowship.

Meanwhile, the Spring Voyage has become established since the 1990s and has usually taken the form of a three day visit across the Channel, although other destinations in Britain (e.g. Cornwall, Guernsey, Poole) have featured occasionally where they fit with the President's theme. Engineering is still a significant ingredient of course.

In 2008 the President David Hattersley organised his Spring Voyage to Paris with the express intention of visiting the French Headquarters and to get to know the people there. This was probably a 'first'. The visitation was warmly welcomed by Daniel Ameline and several members of his staff and included discussions about the IESF's role in the French professions in comparison to British arrangements.

To reflect the importance of Voyages in the life of the British Section in recent years, an Appendix is included at the back of this book featuring some of the photographs captured by members over the years.

Lectures

Bringing the members together to listen to four lectures each year and to enjoy a dinner afterwards is the central activity of the British Section when at home. Over the years a considerable number of high quality informative talks have been given by prestigious speakers, often introducing topics which are later taken further with site visits during voyages. Examples include Dr Michel Virlogeux talking about the bridges of Normandie in March 2009, and the nuclear physicist, Dr Alan Norton, who had been living and working at CERN, on the borders of France and Switzerland, who talked about the challenges of physical particle research that same April.

Each President has also introduced their year by giving a lecture after the Annual General Meeting. In 2000 Robert Benaim talked about 'Elegance in Engineering'. In 2005 the lecture was held as usual at the ICE building in George Street where the President, Mike Winney, lectured on the "Elan des Ingénieurs et des Scientifiques de France". For this he reproduced a scale model of the Eiffel Tower in Meccano in the foyer. The Meccano set had belonged to his

father, whose diary confirms that he had first constructed the model on Sunday 18th September 1949.

As a contrast, in 2008 David Hattersley gave an insight into the connections between the heraldry of Britain and France and in 2009 Grahame Barwell talked about Leonardo da Vinci, the outstanding polymath who spent his last years in France. In 2011, as a total departure from tradition, John Beck took CNISF away from technical subjects entirely, with a discourse on the development of the international trade in raw cotton and the fierce Anglo-French rivalry that entailed.

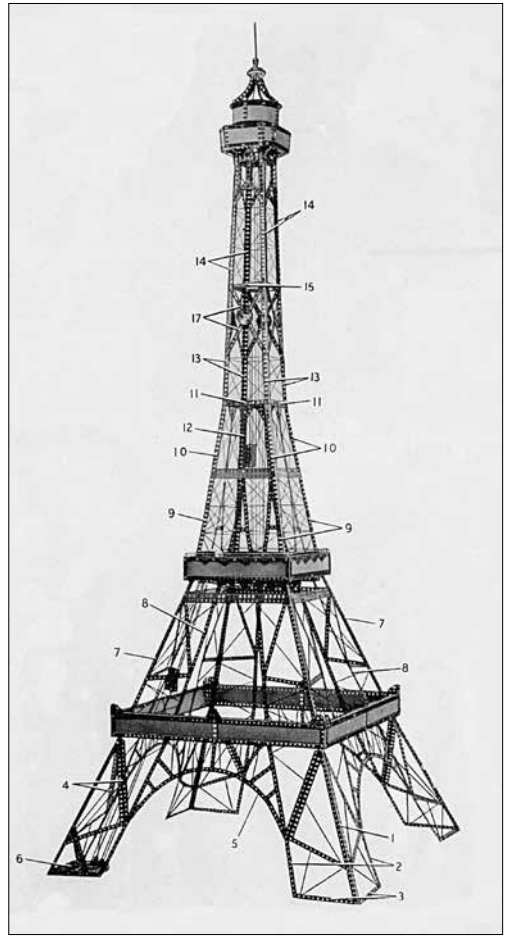
In recent years the Section has also run a series under the title of 'the Gustave Eiffel Lectures'. These prestige events have brought guests together from a wide variety of organisations. The first lecture was given in April 2000 when Sir Alastair Morton talked about 'Britain, France and the EU: integrating rail'. In May 2005 the second Eiffel lecture was given by Mike Chrimes (Head Librarian of the ICE) who outlined the Institution's archive of diaries and documents relating to the late Sir Alan Harris and which resulted in an emotional response from Sir Alan's family and friends who were present.

In April 2014 it was the turn of Sir Michael Pepper (Professor of Physics at the Cavendish Laboratory Cambridge for many years and holder of the Pender Chair at University College London). He lectured on nanotechnology and its many implications for engineering.

11.01 Mike Winney reading the Eagle in 1952

11.02 The Eiffel Tower Meccano set

11.03 Mike Winney resting after completing the tower



11.04 Part of the instructions for assembling the Meccano

A list of some of the other recent lectures is given in Chapter eight.

Other activities

In addition to the core activity of learning about French engineering the British Section has for many years felt it important to include social events within its calendar. In 1996 a summer evening visit was made to the newly completed Globe Theatre on the South Bank the year before its official opening– a visit repeated for the Amis in 2011, organised by Frances Beck. In 1997 there was a guided tour and champagne reception at the recently opened British Library.

Other events have included a visit to Kew Gardens, two tours of the Victoria and Albert Museum led by Lady Diana Copisarow, an evening at the Tate Modern the year it opened, an outing to the Henry Moore Foundation at Perry Green (2001), dining under the aircraft in the American hangar at Duxford (2005), visits to the College of Arms (2008), dining on a boat on the Thames (2009), viewing the pumping engines at the Kew Bridge Steam Museum and visiting Bentley Motors (2011).

As explained in Chapter twelve, the partners of members have also become organised, arranging their own lunches and visits. These have included guided tours of the Institution of Civil Engineers by their archivist (2001), and visits to Parliament (2004), the Fitzwilliam Museum in Cambridge (2005), the Wellington Arch (2008), and a visit to the Royal Opera House (2009) hot on the heels of Michelle Obama and the ladies from the G20 Summit.

In 2007 the Council agreed to establish a new category of membership – 'Les Amis de la Section Britannique'. This caters for people who would otherwise be excluded from involvement in the British Section because their spouses have died.

Conclusion

The changes in the British Section which have occurred in recent years are dictated by the changing environment in which engineers operate. As well as spreading technical knowledge, the British Section today also acts as a society of friends sharing an engineering or scientific background and drawn together by a mutual interest in France and French engineering achievements. It is likely that few members see the information presented at meetings as fundamental to their professional standing and career development. That is the role of their particular Institutions. Rather they are more likely to view the activities of the British Section as giving a fascinating insight into the engineering projects being advanced in the country they admire and love to visit.

12. LES AMIS

"It was also a good opportunity to invite the widows as we did not wish to lose touch with them. I have made a point of being at every one of the meetings. I was delighted that after my husband's death I was invited to become an 'Ami', otherwise I would have lost touch with all the friends I have made over forty plus years."

For more than twenty years there has been a recognised role for partners in the affairs of the British Section. Traditionally there had always been the expectation that wives (as they usually were in that male dominated world) would often attend dinners and accompany their spouses on organised trips, resulting in an enviable reputation for friendship and enjoyment for all. However Pamela Crozier started to put things on a firmer footing.

She says "I originally started the 'Ladies Day' so that the wives could meet up as they never got time to chat at meetings."

Then, as Jane Hughes (previously Winney) explains, "during their Presidential years, Mike Winney (2005) and Peter Smith (2006) recognised, with others on Council, the value of such friendships and support suddenly surrendered [by partners] on the death of 'the member'. The annual 'Ladies Lunch' went part way to gather 'old friends' together informally. But why not acknowledge their past, and indeed, promote and encourage their ongoing support by enabling them to continue to attend our meetings and events? And so it was "Les Amis de la Section Britannique" (Friends of the British Section) was inaugurated by Council, AGM, 2007. Urged on by John Cox, who died 4th March 2007, for Rosemary, little did Mike expect that with his sudden death 25th March 2007, I too could join this very special membership?"

Pamela adds "It was also a good opportunity to invite the widows as we did not wish to lose touch with them. I have made a point of being at every one of the meetings. I was delighted that after my husband's death I was invited to become an 'Ami', otherwise I would have lost touch with all the friends I have made over forty plus years."

12.01. At the Royal Opera House in 2009

A list of the events enjoyed by the Amis is as follows:-

Date	Focus of the day
1998	Lunch at the RAF Club
1999	Victoria and Albert Museum
2000	The Guild Hall and St Paul's Cathedral
2001	The Henry Moore Studio
2003	Hampton Court
2004	The Houses of Parliament
2005	Fitzwilliam Museum, Cambridge
2006	Wimbledon
2007	Greenwich
2008	The Wellington Arch
2009	The Royal Opera House
2010	Kew Gardens
2011	The Globe Theatre
2012	Manchester Lowry
2013	The British Museum
2014	Portsmouth
2015	Cambridge
2016	The Portrait Gallery
2017	Kensington Palace
2018	Portraits of 100 First Women
2019	The Wallace Collection

13. SOME PRESIDENTS REMEMBER THEIR YEAR

"I had a tremendously enjoyable year and am honoured to have served in the capacity of President for the British Section."

(John Beck)

Each President's year turns out to be something special. That is one of the joys of being a member of the British Section. A small number of Presidents describe and comment below on activities during their years.

David Shillito's Presidential Year – 2007

Like many of my predecessors my Presidential Address was an indulgence reflecting my career as an accident investigator at major mishaps. I touched upon the explosion at Flixborough, the Kings Cross Fire, the loss of the Piper Alpha Platform, the Clapham Railway Crash and the Perrier water contamination.

March was a sad month with the deaths of two of our best-loved members, John Cox and Mike Winney. The first lecture of the year was presented by Gwilym Roberts past-president of ICE: Chelsea to Cairo –'Taylor-made' Water Through Eleven Reigns and in Six Continents. The Old Royal Naval College at Greenwich provided the venue for the Ladies Lunch on the 25th April.

The theme for my year was "Energy" and, being a long-term supporter of Tidal Energy, I invited Dr Tom Shaw to present his views on how we could progress from the French Tidal Barrage on the Rance in Brittany, to the engineering dream of a barrage across the Severn Estuary.

The Spring Voyage continued the dream taking us to Brittany to inspect the Rance Barrage and power station exhibition. Guided by Roger and Claire Emberson we explored the Rance estuary and valley, Dinan and St Malo. On the last day we visited the cathedral construction museum at Dol de Bretagne, en route for Mont St Michel where a major project had started for the restoration of the Bay. At this stage the site works were limited to the construction of a barrage on the Couesnon, which will control and redirect flow around a new bridge and causeway, allowing the sea to recover the salt marshes and again surround the Mount. Our more athletic voyageurs had sufficient time to walk to the Mount, scale the heights and enjoy the tourist facilities before our return via Caen.

President's Day was held aboard HMS Belfast in the Pool of London (similar to Gwilym Roberts's old ship). The Dinner for 60 members was held in the Ship's Dining room, as unfortunately we were too numerous to be accommodated in the Ward Room.

13.01 Enjoying the Spring Voyage

September 2007 – The Autumn Voyage d'Etude was centred on the city of Montpellier, and took place in glorious weather with the blue skies and warm evenings of the South of France. The voyage included a conducted tour of the old City, a technical visit to the Tram and Bus Centre for the City of Montpellier. We visited the old town of Aigues Mortes moving on for dinner at the rotating restaurant of le Phare de Palavas where the sunset panorama was scarcely believable. Saturday included a visit to the old City of Nimes before making a pilgrimage to the Pont du Gard. The Saturday Night dinner followed wine tasting at La Maison des Vins du Languedoc.

On Sunday morning we visited Sète and the covered market before scaling the heights to the top of Mont St Clair for the sensational view across the Etang de Thau and the Old City and Port. At the Auberge de la Mandoune, the local cuisine was truly excellent, as a result we arrived late at the next technical visit to the works of Noilly Prat & Co for instruction about French Vermouth. The last technical visit of the Voyage on the Monday morning was to the works of Perrier near Nimes, to the production facilities and the source building.

The October meeting at the RAF Club continued the energy theme. Our speaker Jean-Bernard Sigaud had just retired from the post of Director of Research of the Refining Division of Total Petroleum. He talked about the future need for reliance on hydrocarbon fuels.

13.02 The new tram system in Montpellier

13.03 Tram system control room

13.04 The Pont du Gard

13.06 The Perrier Museum

13.05 The coast from Sète with wetlands inland

13.07 A bus gets in the Perrier act

The November meeting was at the National Liberal Club with a presentation delivered by Georges Serviere, the Deputy Director of EDF's Nuclear Engineering Division. He explained the development of nuclear energy in France and the far-sighted way in which they are planning to meet future energy requirements. He also gave a history of the EPR project and how the new reactors were being built. He showed how nuclear generation facilities involved all the engineering disciplines, and how their planned operational lives of 60 years involved new standards of design and a new approach to quality.

John Beck's Presidential Year – 2011

I enjoyed my time as the 79th President of the CNISF British Section enormously and it was gratifying that so many members supported the eleven (amazingly…) events and lectures arranged during my year in office. My approach to the lectures was to attempt to secure the services of the very best practitioners in their respective fields, to offer variety and to maintain a link with things French, wherever possible.

The slightly intriguing title of my President's address in January was '*Surviving in a Material World*' which was a discourse about the development of the global cotton industry, culled from my time with the International Cotton Association and charting how the industry drove and in turn was driven by the developments in engineering and technology. In March a large audience was enraptured by Professor John Burland's presentation of his celebrated story '*A Tale of Two Towers',* describing his exciting challenges in arresting the accelerating lateral movement of the tower of Pisa and as a bonus, the instability following adjacent deep excavations of the St Stephen's tower in the Palace of Westminster, the one which houses Big Ben.

April saw us departing for France, so to speak, to hear Tony Marjoram, the Head of Engineering Sciences at UNESCO's Paris headquarters, describe the many facets of the international engineering focus of UNESCO, relating to sustainable development, poverty reduction and climate change mitigation.

April also brought the now established Ladies Day. This involved a lively guided tour around the Globe and Rose Theatres and attendant exhibitions, with a fine lunch at the adjacent Swan Inn. My wife Frances was delighted with the good turnout and that her organisation of this, the first 'external' event of the year, had worked out in such a satisfying manner.

For the spring voyage in May we made a visit to Evian-les-Bains, the delightful spa town on the French shore of Lake Geneva, staying in the slightly unusual Hotel les Cygnes in an excellent position on the edge of the lake. Our location close to the border allowed us to visit

locations in Switzerland without the considerable penalty of paying for an entire voyage in Swiss francs.

We visited Lausanne by boat and had the privilege of a private visit to the fascinating TRIDEL waste-to-energy complex. This was followed by a wine tasting in a medieval castle, dinner in a high-Alpine valley, visits to Chamonix and the medieval lakeside village of Yvoire,

13.08 John Beck in full flow

13.09 The TRIDEL waste-to-energy project

13.10 The jetty at the restaurant at Saint Sulpice near to Lausanne

13.11 Into the Alps

13.13 The paddle-steamer 'La Suisse' on Lake Geneva

13.12 The glacier at Chamonix, minus ice – it was a warm spring

13.14 Some of the group

interspersed with numerous gastronomic delights. The usual range of voyage transport to satisfy our engineering appetites included the ubiquitous *petit train*, a rack and pinion mountain railway, a driverless metro train and a solar-powered boat. In summary, this was a satisfying and somewhat different spring voyage.

At the end of May, I received an invitation as President of the CNISF British Section to attend a reception '*in honour of the CNISF on the occasion of the General Assembly in Paris*'. As the invitation was from the President of the Assemblée Nationale (the French lower house of parliament) himself, Bernard Accoyer, it would have been churlish to decline. The champagne reception was held at the President's official residence, the Hôtel de Lassay, a typically ornate 18th century palace and I joined the delegates, being attentively guided through numerous introductions by our long-time friend, Daniel Ameline, and warmly welcomed by all those I met.

During the summer months there were three events for members to enjoy. For my President's Day on 15th June we went to the Kew Bridge Steam Museum. This is housed in a London waterworks built in 1838, and contains several enormous steam pumping engines, including two brought from other waterworks and put back into working order. On our private tour, we were able to observe the engines in operation, followed by a short walk across Kew Bridge to a nearby pub for an excellent supper. Then, our informal summer dinner in July was as usual, at the St Stephens Club, where on a delightfully warm evening, we were obliged to share the garden for a time with a gathering of Conservative Party politicians and assorted supporters. Undeterred, we embarked on a mildly challenging trivia quiz after dinner and generally passed a very pleasant time amongst friends.

Also in July, I risked injecting an extra element into the programme to visit my home county of Cheshire in the frozen North, to visit the Bentley factory and then the Jodrell Bank radio-telescope, interspersed with lunch at an attractive country pub. As it turned out, the North was not frozen at all and the Cheshire countryside looked delightful in the sun. A Bentley has now made its way onto my highly unlikely Christmas wish-list. Unfortunately, Bentley Motors had restricted the size of our party to just 24, against the slightly-surprising 38 applications I received. Thus, I had to operate on a strictly first-come-first-served basis, meaning that sadly many members missed out.

In September, forty members and wives joined the Voyage d'Etude to Nantes, France's sixth largest city, an interesting place in its own right and a useful base from which to tour the Loire valley and the sea ports to the west. Our itinerary included a tour around the enormous

shipbuilding yards at Saint-Nazaire, followed by lunch in the unusual setting of the historic Second World War German submarine base. Amongst other things, we visited the seaside village of Batz-sur-Mer, where we were guests of John and Paddy Manning, took in an evening dinner cruise on the River Erdre and were given a guided tour of Château Serrant, it transpired, by the Princesse de Mérode Westerloo herself.

Thanks go to Humphrey Pocock for his valuable assistance in organising some of the important elements of this voyage, particularly the highly-successful rail travel from London via Lille to Nantes, by Eurostar.

The year progressed with two more lectures. In October, we were pleased to welcome M. Bertrand Lemoine, a celebrated architect, engineer and well known speaker from Paris, who had been appointed by President Nicolas Sarkozy as Project Director for the Grand Paris project, to analyse the problems of the city and to come up with solutions for the development of the greater Paris area. Then, on 23rd November the climax of our lecture year was the visit of ICE Past-President and internationally renowned engineer, Douglas Oakervee, who described the conception and construction of Hong Kong International Airport, for which he was the Project Director. The project was fascinating not just for its scale and technical excellence but for its delivery at a time of political turmoil

13.15 David Hughes on the Loire after a good lunch

13.16 Chateau de Serrant, St-Georges-sur-Loire

and uncertainty in Hong Kong, as control of the territory was handed back to China.

I had a tremendously enjoyable year and am honoured to have served in the capacity of President for the British Section.

Richard Groome's Presidential Year – 2012

The highlights for Janet and I were the two Voyages and the President and Ladies event in Manchester (and in between we had Michel Virlogeux back and a speech from Sir Alcon Copisarow amongst others).

The Spring Voyage to Guernsey started with unusual travel for IESF as we virtually all flew there on the little Aurigny airline, taking up most of the plane! Guernsey is a very special island with a rich heritage, a strong French influence and friendly people. (One can sometimes hear Guernésiaise, the ancient Norman French language still spoken by older inhabitants).

Shortly after arrival, we had a Civic Reception (Vin d'Honneur) in Castle Cornet, Guernsey's greatest fortress, which was memorable for the wine that flowed; a really warm welcome! The next day we visited Guernsey Clematis, a highly technical plant producing centre exporting to countries worldwide. The company was started by the owner Raymond Evison O.B.E., V.M.H., the leading world expert on clematis. We then wended our

13.17 The Old Government House Hotel

way on narrow lanes to the 'Triple Link' power station, where we heard about their plans for tidal power; and the harbour to see the 'new' steel reinforced concrete jetty built in 1920. It is a 19th century harbour using 20th century work practises trying to solve 21st century problems. (The cathodic protection under the jetty is state of the art).

In the next day and a half we visited various places of interest, including the Little Chapel, the Occupation Museum and the Shipwreck Centre. As usual, there were also memorable dining experiences including the Guernsey Bean Jar, lots of fresh fish and the final gala night at Old Government House.

13.18 Guernsey Clematis

In May, we took to the North to see the transformed Manchester and Salford Quays. In an unusual President's and Ladies joint event, the Ladies went to the Lowry centre for an exhibition and lunch, whilst the men went round one of the state of the art waste processing plants including recycling and composting. Sufficiently deodorized, the men were then brought to the St James's Club for dinner with the ladies, and then all boarded transport to the Lowry theatre to see Opera North's production of Carousel, which was amazing (and features the famous tune, 'You'll Never Walk Alone').

But it wasn't over yet, next day we all shot off early to the water powered, working cotton mill at Styal (the Quarry Bank Mill), a stunning cultural and engineering experience including the Apprentice House and Gardens as well as all the machinery.

We were so pleased to be able to fit this trip into a busy schedule and to reset some views of Manchester that it is a dark and dank place, where it always rains. As our members will confirm, the sun shone on all our endeavours in 2012, and particularly our main Voyage to Bordeaux.

Long known as La Belle Au Bois Dormant (Sleeping Beauty), we saw Bordeaux well and truly awake after years of slumber. The turn of the millennium was a major turning point for Bordeaux, when the former mayor, controversial ex-Prime Minister Alain Juppé, roused this graceful city, pedestrianising its boulevards, putting many of the car parks underground, restoring its neoclassical architecture, and implementing a high-tech public transport system (or the very sexy trams as Richard called them). We were very lucky to have help from the local branch of IESF who met us on the first evening and arranged a lecture on the Cockleshell Heroes (celebrating the 70th anniversary of the Commando raid that Churchill said, shortened WW2 by six months). Next day, we were up early to visit the construction site of the new Bacalan Bastide lifting bridge designed by Michel Virlogeux, and then to see the space

age trams which use the Alstom APS system and have no overhead lines in the city centre. The trams draw power from the street in a way that leaves no live rail once the tram has passed, truly very clever and of course there is no unsightly catenary in the city streets.

The next day was our heritage visit to the totally gorgeous St. Emilion World Heritage Site, where members imbibed and explored in the hot sunshine. In a surprise highlight for our Dining Secretary David Hattersley, he was inducted into the ancient order of wine judges, the Jurade de St. Emilion, in an ancient ceremony held in the medieval cloisters. A lovely meal at Chateau de Pitray followed, thanks to the owner Pierre de Boigne, and a chance to taste some wine from the President and Lady's vineyard connection!

A walking tour of old Bordeaux was our Sunday excursion, finishing at the spectacular new Mirroir d'Eau on the quayside, following which we boarded a boat for a river cruise and restaurant to the south of the city. (During this, we were lucky enough to see a barge en-route to Airbus at Toulouse with a large wing on board).

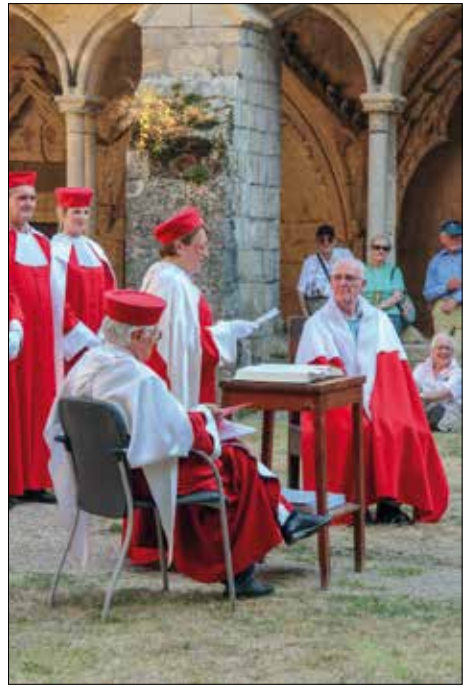
Finally, a vineyard visit to a producer of Loupiac, similar but some would say superior to Sauternes, which is run by 4 engineers!

Yes, 2012 was a memorable year for Janet and I, made very special by our supporters at IESF, and it was a real pleasure to have achieved so much.

13.19 Guernsey Power Station

13.20 The Bacalan Bastide lifting bridge

13.21 A closer look at the Bacalan Bastide



13.23 David Hattersley's induction

13.22 Bordeaux tram maintenance

13.24 The Chateau de Pitray

Peter Blair-Fish's Presidential Year – 2015

There were two Voyages to France in 2015. The first was to Poitiers in April to see some of the construction of the Ligne Grand Vitesse from Tours to Bordeaux and cultural attractions including burial chambers up to 4500 years old at the Tumulus de Bougon and frescoes in the Abbaye de Saint-Savin. The second was to Aix-les-Bains in September, with technical visits to the CEVA railway project in Geneva and the Romanche Gavet hydroelectric project SE of Grenoble. Cultural highlights included the Museum of the Revolution at Vizille, the Abbaye de Hautecombe, the view from Mont Revard, a lunch overlooking Lac du Bourget, and bathing in hot spring pools.

Technical presentations in London included my Presidential Address "Offshore Structures – the French Connection"; "Marine Renewable Energy – R&D Overview and Focus on Market Opportunities" by Félix Gorintin of Innosea, a consultancy based in Nantes; "Anaerobic Digestion Bio-Gas and CHP in France & UK" by Andy Bull of Severn Wye Energy Agency; "The Construction of the Lee Tunnel from Beckton to Abbey Mills" by François Pogu of Vinci Grand Projets; "Tunnelling beneath cities – advances in research and practice" by our Patron, Professor Lord Mair; and "Floating Production Storage & Offloading Systems (FPSOs) and their turret moorings", by Andrew Newport of SBM Offshore, Monaco. Our Patron hosted a visit to the geotechnical centrifuge in Cambridge, followed by a dinner in Jesus College. The Sir Alcon Copisarow Medal was awarded for the first time.

13.25 Peter Blair-Fish

13.26 At the CEVA railway project

13.27 The Romanche Gavet near Grenoble

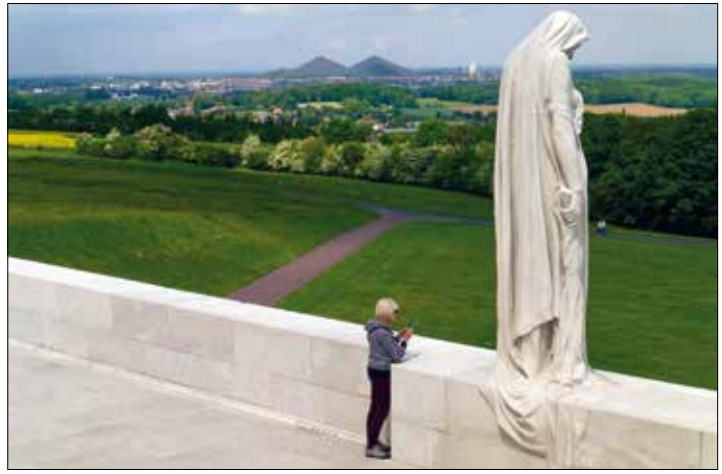
13.28 At Cambridge

Edmund Morgan-Warren's Presidential Year – 2016

To be President of the IESF British Section was a rich privilege, and I was keen that it should reflect my professional and personal interests whilst, of course, providing interest and enjoyment for the participants.

Having spent much of my career associated with the nuclear energy industry, it was natural that this be reflected in my inaugural lecture, covering the discovery, principles and applications of radioactivity. This was followed in March by an illuminating presentation by EDF Energy on the progress of the Hinkley Point C project, at a pivotal moment in its development.

The year 2016 was the centenary of the Battle of the Somme, one of the most poignant events of the First World War, in which Anglo-French cooperation laid the foundation of the British Section which we are commemorating now in 2019. To mark the Somme centenary we were treated to a brilliant lecture by the historian and writer Taylor Downing on "The Engineers and Scientists of the First World War", describing some of the technical and cultural developments that influenced the outcome of the struggle. This was followed by our spring voyage to Arras and the Somme battlefields, with a tour led by Major John Charles of The Welsh Livery Company. During this voyage we laid a wreath in memory of my father's friend who was killed at the Battle of Arras



13.29 The visit to Vimy Ridge

13.30 In the trenches

13.31 Edmund at the Arras Memorial

13.32 Wind power

in 1917 – an occasion of deep emotion shared by all those present at the ceremony.

The biggest event in the presidential year is the autumn voyage, and two years of preparation yielded a most rewarding visit to Orléans. This continued the theme of energy production with a nuclear power station visit and a lecture on wind energy, complemented by a visit to Orléans University's space laboratories, a study of the city's redevelopment, and a lunch cruise on the late nineteenth century Briare Canal Aqueduct, an engineering

13.33 Orleans – modern technology meets historic buildings

masterpiece. Cultural visits to the Gien pottery, the grand Chateau of Chambord and the charming Chateau of Chamerolles provided wider interest, and a civic reception in the elegant Old Town Hall added the final touch of gravitas to this memorable trip.

The President's Day visit to Brooklands Museum provided further technical interest, with many members trying their hand at the Formula 1 simulator. The Picasso exhibition at the National Portrait Gallery was the venue for the Partners' Day, during which the accompanying engineers enjoyed another technical day at the London Transport Museum.

Later in the year it was my special pleasure to introduce my own son Peter, who enlightened us on the technicalities and challenges of helmet-mounted vision systems for aircraft pilots.

The grand finale of my presidency came in November when I chaired a lecture by our distinguished patron, Professor Lord Robert Mair on the controversial subject of "Fracking for Shale Gas", followed by a dinner with an attendance which challenged even the accommodation facilities of the Institution of Civil Engineers.

13.34 The Briare Canal Aquaduct

13.35 Chateau de Chambord

13.36 Chateau de Chambord

13.37 Chateau de Chamerolles

13.38 Civic Reception

13.39 The group at Orleans


LA SUISSE

14. PATRONS

"CNISF Patron, Gladwyn Jebb is remembered as having an extremely lively and energetic social life, often attending several functions in one evening."

Whilst CNISF was founded in 1919, it would appear the appointment of a Patron was not considered until 1931.

The notes of the Council meeting held in December of that year reported that the Prince of Wales (ascending to the throne in January 1936 as Edward VIII, abdicating in December 1936) and Prince George (becoming Duke of Kent in 1934, killed in action in 1942) were both invited to be Patron but both declined on the basis that they were involved already with many societies. The Council of the British section cannot be accused of lacking ambition.

It was agreed at that point that the appointment of a Patron for the British section should be left in abeyance for the time being.

Eventually, **the Rt Hon Edward Stanley, seventeenth Earl of Derby KG PC GCB GCVO,** was appointed the first Patron sometime before1941.

After a distinguished military career, as Edward Stanley he entered Parliament in 1892, first in the House of Commons for Westhoughton in Lancashire, serving under Lord Salisbury and holding Treasury posts until the government fell in 1905. He took a seat in the Lords upon the death of his father in 1908. He re-entered government in 1916 where he held several cabinet posts, including twice as Assistant Secretary, then Secretary of State for War, and subsequently as President of the Army Council. He was Ambassador to France from 1918 to 1920, further enhancing his credentials as a future Patron of CNISF.

14.01 Lord Derby

The Earls of Derby had enormous interests in and involvement with horse racing over many decades, the Epsom Derby being named after the twelfth Earl and the Oaks being named after his house near Epsom. The seventeenth Earl was a prominent racehorse breeder/owner and horses from his extensive stables won some twenty of the English classics.

He died in 1948 at the age of 83.

Lord Derby was succeeded as Patron by **Gladwyn Jebb, later Lord Gladwyn GCMG GCVO CB**, although it is unclear if there was a short period without a CNISF Patron.

He was born Hubert Miles Gladwyn Jebb in 1900 and appropriately for his role as Patron of what was at that time an engineering society, he married Cynthia Noble,

the great granddaughter of Isambard Kingdom Brunel, an elegant and vivacious woman. French engineers were reportedly impressed by her famous lineage but equally by her persona, dubbing her privately the 'pocket Venus'.

Jebb was a career diplomat, serving in Tehran, Rome and London. In 1940, he was appointed to the Ministry of Economic Warfare, then as Chief Executive Officer of the Special Operations Executive. He was dismissed in 1943 following a change of Minister. Later he returned to the Foreign Office, first as Head of Reconstruction, then as Counsellor, in which capacity he attended many conferences, including the summits at Tehran, Yalta and Potsdam.

After the war, Jebb served as Executive Secretary of the Preparatory Commission of the United Nations, being appointed Acting United Nations Secretary General from October 1945 to February 1946, until the appointment of the first Secretary-General, Trygve Lie.

Jebb returned to London as Deputy to the Foreign Secretary, Ernest Bevin at the Conference of Foreign Ministers. He became the United Kingdom's Ambassador to the United Nations from 1950 to 1954 and Ambassador to Paris from 1954 to 1960. He was Great Britain's first permanent UN representative. Reputedly angered by the secret negotiations between Britain, France and the Israelis at Sèvres without his knowledge, in advance of the Suez invasion in 1956, he was effectively 'sidelined' by Harold Macmillan at the Paris summit in 1960.

Knighted in 1949, Jebb was created a hereditary peer as the first Baron Gladwyn of Bramfield in 1960. A member of the Liberal Party, he was its Deputy Leader in the House of Lords from 1965 to 1988 and spokesman on foreign affairs and defence. He was an ardent European and served as a member of the European Parliament from 1973 to 1976. He stood down from the role of CNISF Patron in 1992 and died in 1996 at the age of 96.

When CNISF Patron, Gladwyn Jebb is remembered as having an extremely lively and energetic social life, often attending several functions in one evening.

Lord Gladwyn was succeeded as CNISF Patron by Sir Alcon Copisarow in 1992. The two men were known to each other as Copisarow had reported to Gladwyn for six years, following his appointment as HM Scientific Attaché in Paris, based at the British Embassy during Gladwyn's term as Ambassador. In his memoires, Sir Alcon remembered Gladwyn as, "a highly-intelligent, well-connected and impressive individual, always elegantly turned out, but for most not an easy man to know. He had a natural aloofness and apparent disdain which did not encourage familiarity or small talk". Despite this, it seems the two got on remarkably well.

Copisarow acknowledged that Gladwyn had immense experience, had met almost everyone of any significance on the world stage and had the stature to operate on equal terms with Secretaries of State.

In 1992, Copisarow was approached by Gladwyn, long after the latter had retired from his diplomatic career, to succeed him as Patron of what was referred to as the 'French Civils', the *Conseil National des Ingénieurs et Scientifiques de France*. Gladwyn had assured him the he was far better qualified for the role than he himself had been. And so it happened.

Sir Alcon Copisarow was born in Moss Side, Manchester in 1920. His parents were Jewish émigrés from the Russian Empire and his father became a noted research chemist.

He read geology and crystallography at Manchester University during the years which included the Manchester blitz, followed by later studies at Imperial College and the Sorbonne. After graduating he had a long and distinguished career. He was present at many of the key events of the twentieth century and played important roles in shaping the course of British and international affairs. During his career, he met many of the significant figures in world politics and economics.

Serving in the Royal Navy during World War II as a Lieutenant, he was engaged in the unfamiliar discipline of the application of radar technology. Thereafter, he spent twenty years as a civil servant. Following his post as HM Scientific Attaché at the Paris embassy he was DSIR Laboratory Director, in association with Appleton, Cockcroft and Blackett and Chief Scientific Officer of NEDC.

In 1966, he became the first non-American senior partner of McKinsey & Company, assigned to disparate tasks such as improving the efficiency of the Bank of England, reorganising the Californian aerospace industry and overhauling the administration of Hong Kong. Subsequently, on his return to the United Kingdom, he became a Board member of the British National Oil Corporation and of British Leyland.

He held numerous other important positions, and amongst other things, was co-founder and Chairman of the Prince's Youth Business Trust and Chairman of the Eden project.

Sir Alcon was always very proud of his association with CNISF and enjoyed his visits to meetings, speaking memorably in 2012 at an IESF meeting at the Athenaeum Club, where he had been a long-time member and former Chairman, regaling the audience with tales of the many characters who had passed through its doors.

He had married Lady Diana Castello OBE in 1953, who herself is a prominent figure in and supporter of

the V&A and was the founder Chairman in 2001 of the Personal Support Unit (PSU), which provides assistance and support to people faced with a court appearance, who otherwise have no legal representation.

Sir Alcon stepped down as Patron in August 2013 and was made the first Honorary Life member of CNISF. He also received la Medaille de l'IESF France in recognition of his service. It was presented personally by IESF France Président, Julien Roitman on the occasion of the third Gustave Eiffel lecture in April 2014.

In conversation with the Hon. Secretary, Sir Alcon had made clear his desire to step down, offering the view that at the age of 92 he believed 'it was high time'. Prolonged discussions about potential successors ensued, including informal consultations with the Duke of Kent.

Sir Alcon died in August 2017.

Sir Alcon was succeeded as Patron by **Professor Robert Mair CBE FREng (now Lord Mair**), former Master of Jesus College Cambridge and Head of Civil and Environmental Engineering and who became President of the Institution of Civil Engineers in November 2017.

He is a specialist in underground engineering and is highly respected in his field, with a long list of major project credits across the world from Hong Kong to Westminster to his name. He was appointed Professor of Geotechnical Engineering at Cambridge in 1998 and was

14.02 President David Park (centre) is seen with Sir Alcon and Lady Copisarow (right) and Professor (later Lord) Mair and his wife Margaret (left) in 2013.

Sir Kirby Laing Professor of Civil Engineering from 2011 to 2017. He was appointed Chief Engineering Adviser to the Laing O'Rourke group in 2011.

Recent international projects have included railway tunnels in the cities of Amsterdam, Barcelona, Bologna, Rome, Singapore and Warsaw, as well as road and motorway tunnels. In London, he became closely involved with the Jubilee Line extension, the Channel Tunnel Rail Link and

Crossrail. He was responsible for the introduction of the compensation grouting technique, used successfully in stabilising the Palace of Westminster clock tower housing Big Ben during the deep excavations necessitated by the construction of the Jubilee Line extension.

He is also a member of a number of Expert Panels.

He was appointed as an independent cross-bench member of the House of Lords in October 2015 and is a member of the Lords Select Committee on Science and Technology.

Robert's wife is Margaret, a qualified lawyer and former Deputy Lieutenant of Cambridgeshire and the couple have two children.

15. THE SIR ALCON COPISAROW MEDAL

In 2014 the IESF British Section instituted an Award "to recognise professional engineers and those in related scientific disciplines who have made a significant contribution through innovation and Anglo-French collaborative enterprise to the translation of engineering and scientific achievement into the means of benefitting future generations".

The Award, which takes the form of a hallmarked sterling silver medal, is named in honour of the late Sir Alcon Copisarow, Patron of the IESF British Section between 1992 and 2013. The objectives behind the award reflect those of Sir Alcon, whose long and distinguished career spanned both public and private sectors including roles as Scientific Counsellor at the British Embassy in Paris, Chief Scientific Officer in the Ministry of Technology and then Senior Partner of the consulting firm McKinsey and Company.

Sir Alcon did much to foster and promote international cooperation, innovation and collaborative enterprise. His commitment to future generations was particularly exemplified by being a co-founder and Chairman of Trustees of the Prince's Youth Business Trust. He died in August 2017 at the age of 97.

15.01. Sir Alcon Copisarow (left) with Christopher Bakken

Recipients will be professionally qualified engineers or scientists from any background who, in the opinion of IESF British Section Council, have fulfilled this purpose either in an Anglo-French or wider international context. This may be in a creative, operational, advisory or other leading role. The quality and significance of the

contribution, rather than the period over which it is made, are the key criteria. It was anticipated that the award would be made every five years

The first Award, in 2015, was made to Christopher Bakken for his outstanding contribution as Executive Director of EDF Energy's Nuclear New Build Team, with Sir Alcon presenting the sterling silver medal in person on that occasion.

The second award was made at the British Section's centenary event on 1 July 2019 at the Institution of Civil Engineers in London, when the medal was presented to Professor Roger Frank by Sir Alcon's widow, Lady Diana Copisarow. Roger Frank is an eminant global expert in geotechnics, is Honorary Professor and Emeritus Research Director of the École National des Ponts et Chausées, and Past-President of the International Society for Soil Mechanics and Geotechnical Engineering.

16. THE PRESIDENT'S BADGE

The idea to have a President's badge emanated from the partners of Sir Frederick Snow, including Brian Scruby and Arthur Brown (the "Snow Men" who were all past presidents), in the 1970s. Alec Leggatt and his late wife Valerie, an amateur jeweller, developed the design, which was executed by a jeweller at Goldsmith's College for a cost of around £600.

The design shows the land masses of Great Britain and France, either side of the English Channel and symbolised by the Clock Tower of the Palace of Westminster (now the Elizabeth Tower) and the Eiffel Tower, respectively. These icons are linked by the French Tricolour surmounted by the Union Jack, and the sun depicted high in the sky. The design includes the initials "icf" in gold lettering, and the whole design is framed with the inscription, "PRESIDENT OF THE BRITISH SECTION – SOCIETE DES INGENIEURS CIVILS DE FRANCE" – a permanent reminder of our origins as "The French Civils". Apparently a spelling error was noticed in the finished article, resulting in an extensive reworking and a colourful atmosphere with the maker!

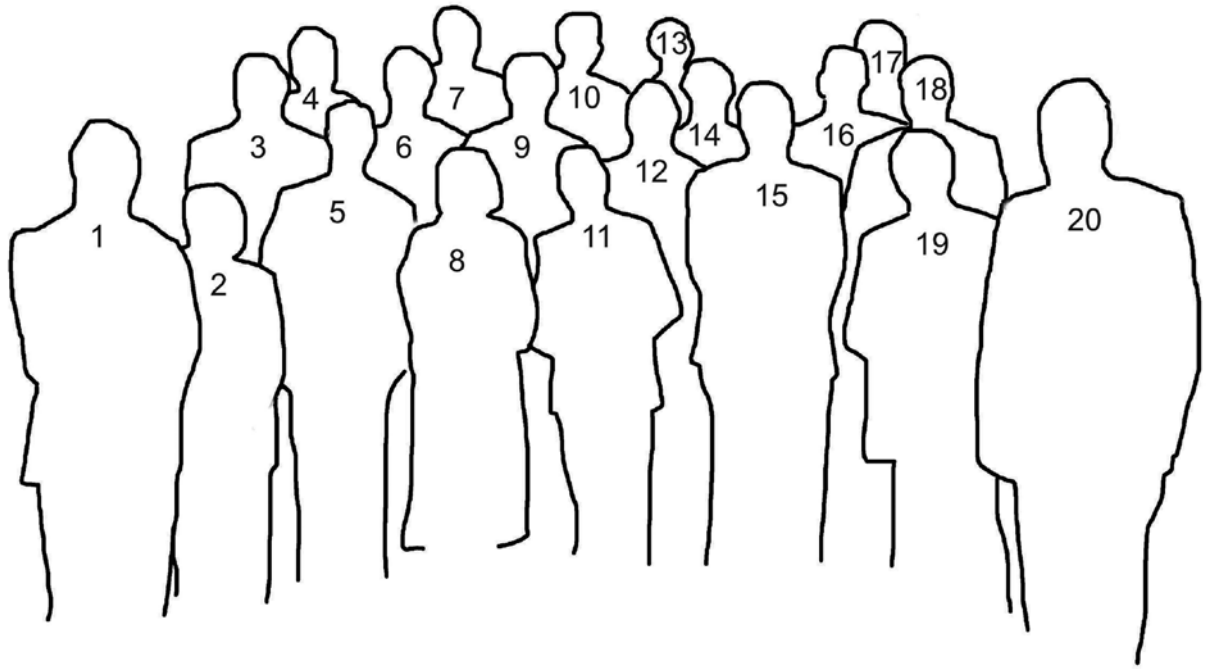
The hallmark on the reverse of the badge is also of interest. As well as the leopard's head for the London assay office, the lion passant for sterling silver and the date letter, the hallmark includes the Queen's head to commemorate the silver jubilee of Her Majesty's accession, 1977. There is no maker's mark.

16.01 The President's Badge

17. THE CENTENARY CELEBRATION GALA EVENT 1ST JULY 2019

Twenty Presidents Together

17.01



1. John Beck - 2011
2. Chris Mitchell - 1988
3. David Lloyd - 2002
4. Roger Venables - 2003
5. Edmund Morgan-Warren 2016
6. Andrew Graham - 2017
7. John Manning - 1993
8. Jean Venables - 2018
9. Robert Benaim - 2000
10. Peter Blair-Fish - 2015
11. Melvyn Grant - 2004
12. Bryan Cooper - 1999
13. David Hattersley - 2008
14. Grahame Barwell - 2009
15. Peter Smith - 2006
16. David Shillito - 2007
17. Michael Muller - 1996
18. David Park - 2013
19. Bill Bayly - 2010
20. Richard Coackley - 2019

Unable to be present:
Alec Leggatt - 1981
Sydney Lenssen - 2001
Richard Groome - 2012
Peter Varley - 2014

Nearly two hundred members, partners and guests attended the Centenary Celebration Gala Event of the British Section hosted by Professor Lord Robert Mair held in the Great Hall of the Institution of Civil Engineers on Monday 1st July 2019. Attended by VIP guests from fourteen organisations, including a representative of the French Embassy, M. Jean Arlat, the full evening of events included the Society's IVth Gustave Eiffel Lecture and the presentation of the second Sir Alcon Copisarow Medal by Lady Diana Copisarow to Professor Roger Frank.

Humphrey Cadoux-Hudson, the Managing Director of Nuclear Development of EDF Energy, delivered the Gustave Eiffel lecture on the theme of 'Collaboration, Communication and Knowledge'. He considered the importance of each of the three aspects, especially when delivering large projects involving collaboration between workers from different countries who may come from different cultures and follow different working practices. His example was the construction of two new nuclear power stations at Sizewell B and Bradwell B involving collaboration between British, French (EDF) and Chinese (CGN) companies. He described how language could present some problems, often linked to colloquial expressions, but that in engineering terms most issues could be resolved through the common language of mathematics.

17.02 President Richard Coackley

He spoke warmly and passionately about the importance of respect for one's colleagues irrespective of their position in the workforce. He referred to the need to be prepared to embrace diversity and to take a cross-cultural approach. It is no longer enough to work in relative national isolation; he felt that we must all be prepared to listen to the ideas and working practices put forward by colleagues from an international field. This is, of course, exactly the role for which the British Section was established 100 years ago.

Professor Roger Frank graduated from the École Nationale des Ponts et Chaussées in 1972 and was appointed as Professor of geotechnical engineering in 1997. He has dedicated his professional life to the French Highway Administration. His expertise concerns in-situ testing and foundation engineering and consulting on civil engineering projects, active across many countries.

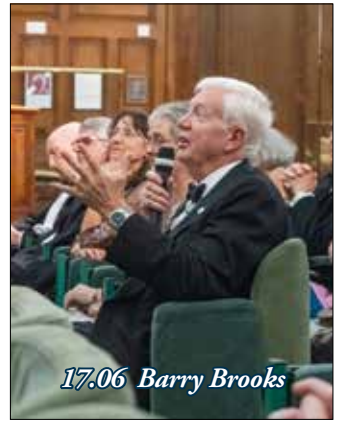
17.03 Lady Diana Copisarow and Professor Roger Frank

He is the Immediate Past President of the International Society for Soil Mechanics and Geotechnical Engineering. In receiving the award Professor Frank explained how honoured he felt at being recognised in the name of Sir Alcon Copisarow, whose own career was an outstanding example of the promotion of international collaboration, in particular with scientific and engineering achievements for the benefit of future generations.

In addition to the formal proceedings the evening had an enjoyable social aspect. The occasion brought twenty Past Presidents of the British Section together and many friendships were further strengthened. Guests were entertained by the gypsy jazz trio, 'Django Lives!'. The after dinner toasts were celebrated with a fine port wine which had been provided by Sir Alcon's son, Edward. It was originally laid down for a celebration of Sir Alcon's 100th birthday, which would have been celebrated in 2020, had he lived. Thus 2019 would have been his 100th year, the same as IESF's British Section. So we celebrated two 100 year anniversaries together – rather poignant.

17.04 Humphrey Cadoux-Hudson

17.05



17.06 Barry Brooks

17.07 Humphrey Cadoux-Hudson and Jean Arlat

17.08 Django Lives!

17.09

17.10 Lord Robert Mair


17.11


17.12


17.13


17.14


17.15


17.16


17.17


17.19


17.18

17.20

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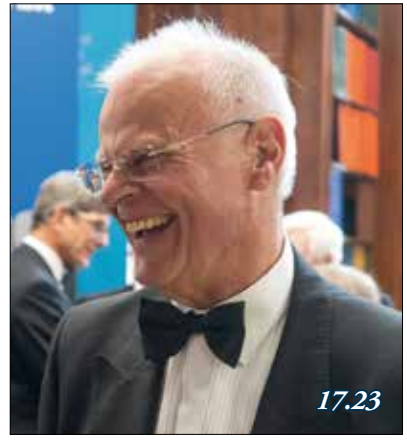

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18. THE SOCIĒTĒ TODAY – REFLECTIONS OF AN HONORARY SECRETARY OVER TWENTY YEARS

"The Société might be small numerically but as has oft been quoted in the most elevated of company, it is highly respected and 'punches well above its weight', to quote former Patron, Sir Alcon Copisarow."

John Beck writes:

Early beginnings

18.01 John Beck

Formally appointed in late 2000 and arriving shortly afterwards at the Institution of Civil Engineers in Westminster as the newly appointed Director International, I found an organisation, in a state of gradual evolution as it strove to constantly re-invent itself to remain in tune with a rapidly changing marketplace and offer the best service to its members and to society. This trend has continued and gathered pace in recent years. It is very easy for any long-established organisation to rest on the laurels of its glorious history and become atrophied and ultimately, irrelevant.

A few months earlier, whilst minding my own business on one of the sofas in the ICE reception hall, quietly sorting out my committee papers, having just chaired a European Affairs Committee around the corner in Smith Square, I was approached unexpectedly by the then ICE Chief Executive & Secretary to see if I would be interested in taking up the newly vacant post at the head of the ICE international department. Protesting that I knew little about it, he assured me that I '*would be fine – the members know it all*'.

Several interviews later, I was duly appointed.

As the Director International of a stand-alone department, responsible for the promotion of the Institution and the welfare of members in 130 countries, via (eventually) ten overseas offices and 95 in-country representatives, it was a busy but never less than exciting and interesting life – different regions of the world in their respective time zones demanding individual and undivided attention at different times of the day.

Ian Moore, perhaps better known as Colonel Ian Moore CBE, an ex-commanding officer of the Royal Marines, whose charges had included Prince Edward, had been ICE's External Affairs Director for ten years before his eventual early retirement in early 2001. Among many other roles during his tenure, he had acted as CNISF Honorary Secretary. With reluctant retirement beckoning, he invited this recently arrived International Director to his office to ask if I would be interested in considering taking over the CNISF Secretary's role. His words were, "*it is a lovely little society, dear boy, nice people. They go on these Voyages…. I am sure you would be ideal, and you will like each other.*" This sounded familiar...

Assuming incorrectly that *'voyages'* meant river cruises on the *Thames,* I agreed that I might be interested in meeting some senior CNISF officers to explore the matter further.

Ian was a larger than life character, with a booming voice echoing around the marble halls of One Great George Street (something about which I reminded him later) and apparently had a good singing voice with a penchant for Gilbert and Sullivan. He was a hard act to follow – and we became firm friends in our few short months working together.

Accordingly, a few weeks later I was invited to join CNISF President, Sydney Lenssen and Membership Secretary, Caton Crozier for lunch in the ICE Brasserie, what is often referred to these days as – '*trial by vol-au vent*', presumably to check if I knew which knife and fork to use…..

Having passed the test, I was invited a few weeks later to present my credentials to IESF Council, before being approved to take on the Hon Secretary's role.

Whilst not traditional, it was convenient for the CNISF Hon Secretary to be an ICE Director, as you were present in the office in Westminster to deal with any matters arising and had the service of a Personal Assistant to deal with many aspects of the CNISF administration, such as typing letters (before CNISF embarked on electronic communication), mailing documents and dealing with members' queries – very useful when, as in my case, your paid employment required you to spend long and frequent periods overseas.

When I left ICE for pastures new in 2003, CNISF Council asked if I would stay on as Hon Secretary, making the fact that my Assistant Secretary was based in One Great George Street even more important. This role passed from my former PA, Pam Walls in 2004 when she too left ICE, via a short hiatus when no obvious successor could be identified by ICE, to Angela Rodgers, who gave excellent service and support for many years up to her retirement.

When subsequently, I found myself again travelling the world, having the security and reliability of Angela manning the barricades in Westminster was a great comfort.

Duties and responsibilities

In his report of December 2003, Vice-President Mike Winney helpfully set out what he perceived to be the correct duties and functions of the various CNISF officers. This was based on the fact that the Hon Secretary had been an ICE Director over some years, with direct access to all of the ICE's administrative facilities and backup. The latter was to change subsequently, as described earlier.

Mike's analysis was based, unsurprisingly, upon the arrangement of CNISF Officers operating at that

time, which included an Hon Meetings Secretary and designated Voyage Organiser, both of which disappeared subsequently, along with a much-diminished role for the Membership Secretary from how this is cast currently.

Officers 2003

- President
- 2 x Vice-Presidents
- Hon Secretary (assisted by the Hon Membership Secretary) – to deal with membership, meetings, Council matters and relations with IESF Paris.
- Hon Treasurer
- Hon Meetings Secretary – to advise on the selection of lecturers and subjects, establish dates and venues for lectures and make all arrangements with lecturers.
- Hon Dining Secretary
- Plus, a named Voyage Organiser who reported to Council as necessary but was not a member of Council.

To clarify for the uninitiated, so-called 'honorary' posts simply signify that the roles are unpaid, unlike the much larger parent body in Paris (approaching one million members) which unsurprisingly, has a number of paid officers and permanent staff.

Pam Walls modified and updated Mike's report in May 2004. Naturally, the various roles and arrangement of duties have evolved over the intervening fifteen years, with the introduction of a Newsletter Editor/Website organiser and an expanded role for the Membership Secretary.

Whilst membership of Council has a natural cycle of three years, followed by a mandatory one-year gap before possible re-election, Officers can and often do, stay longer. I am in my nineteenth year as Hon Secretary and will step down after I have completed twenty, whereas David Hattersley, as former Dining Secretary stayed in post for 21 years. This has the advantage of providing essential continuity between succeeding and often very different Presidents with different tastes, different professional interests, different strengths and inevitably, different areas where they are less accomplished. The longer serving Officers also act as a repository of that all-important corporate memory.

Regardless of this long legacy, now stretching back 100 years, it is important that successive Presidents are encouraged to put the stamp of their own personality on their presidential year. Whilst there are broad guidelines and certain expectations from the members, it is vital that they are able to look back on their presidential year with satisfaction as having been truly 'theirs'.

Over the past ten years, successive IESF Presidents, either by design or default, have taken on the duties and responsibilities of the Officers who disappeared from the structure. There is a perceived need to ensure that otherwise good and worthy candidates for Vice-Presidency and subsequently Presidency, are not deterred by the prospect of a large workload commitment.

My report to Council of November 2014, outlining this issue emphasised the fact that in his or her year of office it was the President's responsibility to ensure that the programme for his/her year of office is technically interesting with lots of variety, is logical, deliverable, affordable and complies with the underlying ethos of IESF. This did not mean that the President had to undertake every task him/herself.

The Société might be small numerically but as has oft been quoted in the most elevated of company, it is highly respected and '*punches well above its weight*', to quote former Patron, Sir Alcon Copisarow, so it is not always as easy as it appears to be President.

Accordingly, we need to change the paradigm with a return to the previous status quo, with designated officers and willing and able volunteers from among the membership undertaking many of the more onerous tasks. It would relieve the President of those responsibilities, especially delivering two Voyages. This seems essential in the interests of ensuring the future of the Société.

It is the President's year and it is he/she who will be remembered years later, not the Voyage organiser.

Presidents, Patrons and others, 2001 – 2019

It would be churlish to consider the attributes of the eighteen IESF Presidents (plus myself in 2011, making nineteen) over the years, except to say that unfailingly, as Secretary I have enjoyed good relations with them all, despite often tackling challenging issues during their particular year.

What passes between the Secretary and the President of the day remains confidential, even after that particular President has long departed from office – despite the occasional frustrations. As Secretary, I pass on as much helpful information as I have at my disposal and then it is up to the incumbent as to whether he or she chooses to use it, or sometimes to seek or take your advice at all!

The information passed runs to several score of sometimes long messages and numerous long telephone conversations. I recall to my surprise and disappointment on one occasion, overhearing the wife of the previous year's President complained woefully that, '*there is so much – and nobody tells you anything…*' As they say, you can't win them all. Clearly, the information had not been shared.

One of the Secretary's primary roles is ensuring good governance, which is where experience as a company

secretary or some knowledge of the law and procedures, particularly surrounding associations or unincorporated trusts, is useful. Very occasionally, advice you have to give can be unwelcome, but you have to stick to your principles, in that it is the integrity of the Société that is most important.

Another important role of the Secretary is that you act as 'gatekeeper', in that all external correspondence or notices come across your desk for final vetting before despatch, including the approval and countersigning payments above a certain value issued by the Treasurer.

As IESF Secretary, I enjoyed a remarkably good relationship with our former Patron, Sir Alcon Copisarow from 2001 onwards. We corresponded regularly and met for long discussions from time to time, until just a couple of few weeks before his death in August 2017. Our discussions ranged far and wide, from the current political developments in China, to industry and trade, to the writing of his memoirs and very occasionally, to IESF. His knowledge and vast experience, his insight and his ability to analyse both situations and people were remarkable.

By common consent, Robert Mair has proved a worthy successor as Patron and has given freely of his time to IESF, despite an incredibly busy life in the House of Lords, as ICE President in 2018, in Cambridge and beyond. It is so important to have the support and seal of approval of the Patron in all we do as a society.

Future Strategy

During his presidential year of 2015, Peter Blair-Fish, ably abetted by Norman Train, chaired a number of strategy meetings, attempting to chart where IESF was going, its strengths and weaknesses and where there might be future opportunities for growth. They drew heavily upon earlier studies led by David Cawthra in 2007, Edmund Morgan-Warren assisted by David Park in 2013 and membership data provided by Ron Walker.

Norman Train produced from the findings of those meetings a comprehensive 2020 strategy document and this is presented in Appendix One to this book. Clearly, something for consideration over the years ahead.

To examine the bald facts for a moment, membership numbers declined 25% in a 7-year period from 2000 to 2007; from 200 to 150. Since 2007, the numbers have fluctuated around 150. With an ageing membership, there is a chronic decline in the numbers that can be as high as 7 or 8 per annum, counterbalanced by the recruitment of new members to replace those losses of members and those who no longer attend for various reasons.

However, as has been voiced numerous times, we are an ageing group, a fact we need to address in our recruitment strategy. The average age of new members in 2013 and 2014 was 63 and those who take part in voyages somewhat higher. Thus, we must attract more mid-career members

who will derive real benefit from the knowledge and social opportunities provided by IESF.

Norman Train's 2020 strategy document outlines various initiatives that taken together would help to ensure the future health and long-term survival of the British section.

Concluding remarks

When President in 2011, I decided that it was simpler to continue with the role of Secretary at the same time rather than trying to pass it on to someone else just for one year. I had the considerable luxury of having retired from a full-time working life just two months earlier. Running both roles worked remarkably well, if not being somewhat demanding.

On looking back at the brief aide memoire I made for my valedictory speech at the AGM in January 2012, it set out the statistics. It details with alarming clarity just how many e-mails, letters, documents prepared, and telephone calls were made in that year.

Other memories include good times on the Voyages, which are as much about sharing time, good food, wine, experiences and tales with friends – and making some new ones. Lots of *Petits Trains*, every form of transport imaginable, including mountain railways and numerous boats. The experiment in my own presidential year was with the first '*out of town*' president's trip away from the Home Counties, to see if members would venture to the frozen north – to Bentley Motors in Crewe. The members came and found that the north was not frozen at all, but the countryside was bathed in sunlight– plus we all left wanting a Bentley of our own.

The traditional mould having been broken, the following year, Richard Groome took us all to Manchester, then David Park went as far as Rolls Royce aero engines in Derby and a glass factory in York.

Peter Varley's trip to McLaren cars in Woking was another memorable event as was Mike Winney's visit to the then new Millau viaduct. Then there was Bill Bayly's visit to the Flammanville nuclear power station, visits to ITER, to Airbus in Toulouse and Richard Groome's mini-wine tour in Bordeaux.

Frances and I remember sitting with Leslie Genoux, as she recounted tales of having been a fighter and bomber ferry pilot in France during the Second World War and other wartime exploits as a fluent French speaker. Other fond memories include a lovely summer's evening visiting and having dinner at the Chateau Pitray owned by WFEO's Pierre de Boigne and his wife Alix, of trips to vineyards and seeing some fabulous structures, of sitting with our picnics in the rain. A rich tapestry.

Central, of course, must be the many memorable lectures heard in twenty years, some but not all –

something I referred to once as at its best, like receiving a shot of intellectual adrenalin. Amongst many memorable evenings was Michel Virlogeux's discourse on the Millau viaduct and Sir Alcon Copisarow's highly amusing tales of the Athenaeum Club over the years. Regrettably, most of these have not been captured for posterity – something we intend to address in the future.

On this more serious note, our ongoing and mutually beneficial relationship with our host institution, the ICE, will be much more firmly based in the future by knowledge sharing, by the dissemination of the wonderful learning opportunities our lectures provide. Discussions as to how we achieve this worthy goal have been ongoing during 2018 and 2019. It is an important part of the future of IESF and part of our *raison d'être.*

I have really enjoyed my time as Secretary and the 100th year of the British section will bring a fine celebration of those dedicated people who over the years have put their time and energy into forming and maintaining this fine society.

All of the people I met on my arrival in 2001 are nineteen years older, as indeed am I and of course, we have lost many valued and much-loved members over those years.

In this respect, this Centenary Book will be welcomed by many, not just as an extant record of the origins and development of this remarkable society and its many eminent members over the years but as an aide memoire of earlier times, illustrated by reminiscences, pen pictures of a selection of celebrated members and numerous photographs.

The future health and progress of the British section depends upon members coming forward to walk the path of so many before them, in giving up a little of their valuable time to serve as Council members, Officers and potential future Presidents. It is both a worthwhile enterprise and a rewarding use of those many years of accumulated knowledge and experience.

Vive l'Entente Cordiale! Vive la Société!

APPENDIX ONE – 2020 VISION: A STRATEGY FOR THE NEXT FIVE YEARS, BY NORMAN TRAIN

Strengths of IESF

1 The British Section is a unique combination of technical and social activities echoing a bygone era of the institutions. The success of the British Section is its social dimension; the technical meetings fulfil the remit of being interesting and informative without being 'cutting edge' learned society presentations. With an engineering wide perspective, we complement the technical meetings of individual Institutions.

2 A strength of the Section is that it embraces scientists as well as engineers and in David Hughes we have the opportunity to engage with the medical profession as another cadre of applied scientists.

3 The greatest strength of the British Section is the involvement of partners which makes it a very friendly organisation in a way that a majority of the engineering institutions are drifting away from as their business models become less member orientated and more international and commercial. This focus on people as individuals has to be an opportunity for the Section.

4 The Section has well established procedures with low cost centres, relying, I suspect, on the goodwill and free time of recently retired members.

Weaknesses of British Section

5 The membership is aging.

6 The Section is inwardly focused and consequently is not known in the broader engineering community.

Membership Mix and Qualification

7 It appears that historically the membership has been biased to civil engineers. The inclusion of other engineers and construction professionals has been to the benefit of the Section.

STRENGTHS	WEAKNESSES
• *Combination of technical and social activities, especially Voyages, and involves partners* • *Embraces scientists as well as engineers* • *Low costs by using free time of retired members* • *Healthy bank balance*	• *Internal focus* • *Ageing membership, few still working* • *Inclusion of partners biases the membership to late career/early retirement when couples have the spare time and cash for such social activities* • *Members do not volunteer to join Council* • *Recent Presidents have taken on lots of admin, especially for Voyages*
OPPORTUNITIES	**THREATS**
• *Do more for wider engineering community* • *Raise profile through SAC award, IESF centenary events etc* • *Seek new members: Chartered Engineers of all descriptions, Chartered scientists, medical professionals, French IESF technocrats* • *Increased use of Information Technology to reduce admin effort* • *Collaborate with other associated societies of ICE and kindred bodies on topics with a French content*	• *Organisation dies out* • *Potential volunteers dissuaded by effort and time commitment needed*

8 The British Section is not a qualifying organisation to practice; it is neither IESF, France, nor the Engineering Council, UK, and hence can be far freer in its interpretation of the required calibre and professionalism of potential members. We do not need to have a strict application of any rules but can embrace two strands of the French tripartite national motto of ***Égalité, and Fraternité***. It is the professionalism of the individual rather than their precise qualification on which we should focus.

9 As policy, the necessary qualifications should be chartered membership of the Engineering or the Science Council. Incorporated engineers/ scientists could also be considered. Other applicants to be considered on merit but with enthusiasm being at least as important as formal qualifications. Strict application of qualification in what is primarily a social group is both elitist and counterproductive.

Other Pan Engineering Organisations

10 IESF is not unique in that there are a number of pan engineering groups in the UK including:

i. Engineering Council, as the behemoth regulatory authority for registration in UK, which is probably the nearest equivalent to IESF in France;

ii. Royal Academy of Engineers, as the elite group championing engineering excellence. This is a well-funded think tank having the ear of Government;

iii. Worshipful Company of Engineers as a charitable organisation with strong military connections

iv. Smeaton Society as the oldest engineering society with a bias to civil and railway engineers and although smaller it is similar to the Section in that it does not have a high profile.

11 We have our own identity and whilst we are not looking to ape other organisations, we may plagiarise any good ideas that other pan engineering organisations may have or use them as potential contacts for new groups.

Demographics and Numbers

12 The numbers declined 25% in a 7 year period from 2000 to 2007; from 200 to 150. Since 2007, the numbers have fluctuated around 150. With an ageing membership, there is a chronic decline in the numbers that can be as high as 7 or 8 per annum

13 The inclusion of partners biases the membership to late career/early retirement when couples have the spare time and cash for such social activities. With the pressure of longer hours and reduced pensions, it is unlikely that this trend will be reversed with a dearth of members less than 60.

14 Clearly managing our own membership numbers has to be one of the objectives for the next five years. The focus needs to be on late career candidates rather than contemporaries of the retired members. With the continual erosion of numbers, doing nothing is not an option and the current method based on encouraging current members to introduce potential members suffers from diminishing returns and is never going to be sufficient to grow the Section. We need to be more creative; how about a lapel badge for any member who introduces 10 new members?

15 There has to be an optimum number of members for the current modus operandi. Too many members would take the Section up out of the current lecture room/catering facilities and voyages that need more than one coach are far more challenging to organise. An initial target of 200 should be adopted with consideration as to how venues and voyages need to evolve above this number.

16 There are a number of groups where we can find suitable candidates:

i. Chartered Engineers of all descriptions

ii. Chartered scientists

iii. Medical Professionals

iv. French technocrats based in London; [although with this group strict application of the French IESF qualifications will be required].

South East Branch Chairmen

17 Focusing effort on those individuals that are likely to give us the greatest return, I would suggest the immediate past chairmen of the local Institution Branches in the Southeast are worth approaching.

They will:

i. Have free time after their year in office
ii. Are more likely to be in their 40s or 50s.
iii. Demonstrated both professionalism and enthusiasm for their core discipline.
iv. Be more outward looking with a partner who is also likely to be similar.
v. Will be good ambassadors with their own network of contacts

18 Institution liaison officers would make contact with past chairmen, inviting them to an evening meeting with the premise that they would be eligible to join if so minded. Where we lack contact, we may have to use other pan engineering organisations to form the introduction.

French Technocrats

19 Attracting technocrats in the large French community in London has proven difficult in the past. This is not that surprising in that the Section probably offers the worse of Le Roast Boeuf without any Culture Français benefits.

Whilst such a cadre would require us to embrace French culture and language more, it would be vibrant introducing a younger group of members. If we could generate a critical mass, could one of the supper tables be reserved for French speakers?

Objectives

a) Existing Objectives

20 The Section has five objectives which can be summarised as:

i. Professional and social links with IESF in France
ii. Programme of technical meetings
iii. Develop social intercourse between engineers and scientists in UK
iv. Welcome and support of French members of IESF on visits to the UK
v. Arrange technical visits in France.

21 These objectives are all inward looking to either the Section or possibly the main IESF.

22 With the exception of the voyages, the French connection is limited.

23 The annual programme of the British Section is:

i. Series of Technical Lectures and suppers.

ii. 2 voyages

iii. 1 informal ski trip

iv. Presidents Day?

v. Ladies Lunches?

vi. Periodic Gustave Eiffel Lecture (3 in the past 15 years)

vii. Sir Alcon Copisarow Medal

With the possible exception of the Copisarow Medal and the Gustave Eiffel lecture, these all relate to the Section rather than society as a whole.

b) Additional Objectives

24 Are there charitable, educational or cultural activities that the Section could undertake? Suggestions could include

25 Educational: Placement of engineering students for vocational experience across the Channel.

26 Charitable: Support of engineering charities working in Anglo French Africa

27 Cultural: Prize for military engineering cooperation and joint operations between British and French armed services.

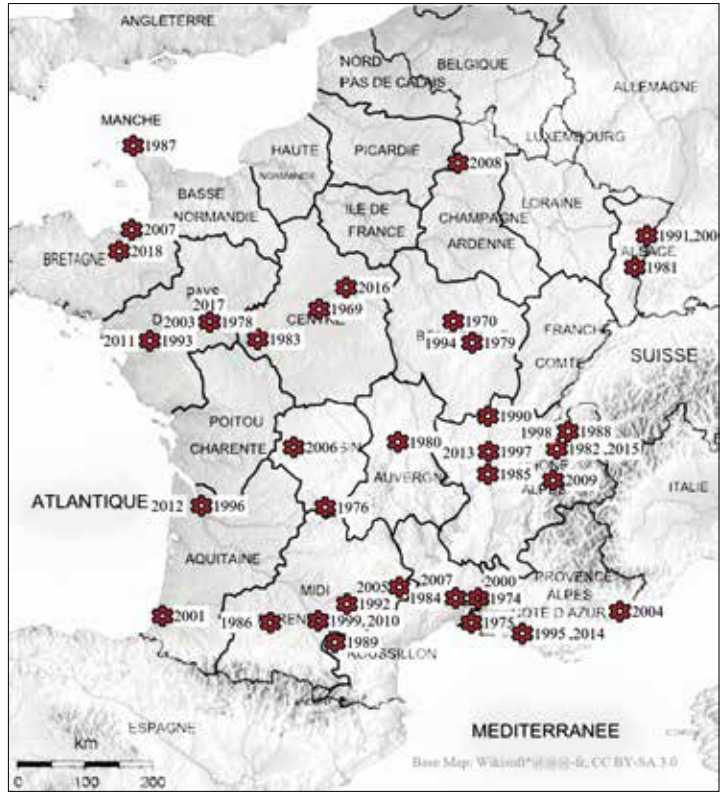
28 If we are to have additional objectives or initiatives, these will need to be costed and funded. We need to be smart, playing to our strengths, where we utilise the volunteer time of the newly retired members rather than those activities that need high capital expenditure.

APPENDIX TWO – STUDY TRIPS

In the autumn of each year since 1969 members of the Société have embarked on a study trip to France. The aim has been to investigate some aspect of French engineering, either historic or contemporary and evolving. Partners have always been welcome to be part of the party, and the Voyages (as they are termed) also involve the chance to enjoy French food and scenery.

The various centres visited on the Study Trips over the years are shown on the accompanying map and a selection of photographs from recent years aso follows.

Date	Study Trip Location
1969	President: G A Wilson Voyage to Val de Loire
1970	President: A J Harris Voyage to Burgundy
1974	President: K H Best 125th Anniversary Voyage to Provence: Avignon.
1975	President: K F Scott Voyage to the Camargue: Arles.
1976	President: J D Harris Voyage to the Dordogne: Rocamadour.



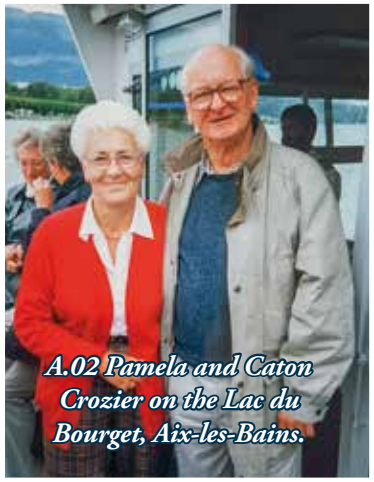
Date	Study Trip Location
1978	President: D R Sharp Voyage to the Loire: Angers.
1979	President: A H Brown Voyage to Dijon.
1980	President: A C Paterson Voyage to Clermont Ferrand.
1981	President: A J Leggat Voyage to Alsace
1982	President: W K Laing Voyage to Aix les Bains
1983	President: S B Tietz Voyage to the Loire: Chinon.
1984	President: R I Lancaster Voyage to the Pont du Gard
1985	President: D J D Wood Voyage to the Condrieu and the Rhône Valley
1986	President: A C E Sandberg Voyage to Auch
1987	President: E V Finn Voyage to Normandy: Cap de la Hague (The nuclear centre at Flamanville)
1988	President: C M Mitchell Voyage to Annecy
1989	President: J C Dixon Voyage to Aude: Castlenaudary
1990	President: D J Palmer Voyage to Macon
1991	President: J.F.S Pryke Voyages to Lille and Strasbourg
1992	President: D Dennington Voyages to Ghent and Albi
1993	President: John Manning Voyage to Nantes
1994	President: G Hornby Voyage to Dijon
1995	President: Geoff Porter Voyage to Aix en Provence
1996	President: Michael Muller Voyages to Nord Pas de Calais and Bordeaux
1997	President: Paul Ahm Voyage to Lyon
1998	President: Caton Crozier Voyages to Paris and Annecy
1999	President: Bryan Cooper Voyage to Toulouse

Date	Study Trip Location
2000	President: Robert Benaim Voyages to Honfleur and Avignon
2001	President: Sydney Lenssen Voyages to the Eden Project and Biarritz
2002	President: David Lloyd Voyages to Lille and Strasbourg
2003	President: Roger Venables Voyages to Caen and Angers
2004	President: Melvyn Grant Voyages to Rochefort and Nice
2005	President: Mike Winney Voyages to Vallee de l'Eure and Millau
2006	President: Peter Smith Voyages to St Omer and Limoges
2007	President: David Shillito Voyages to St Malo and Montpellier
2008	President: David Hattersley Voyages to Paris and Reims
2009	President: Graham Barwell Voyages to Rouen and Grenoble
2010	President: Bill Bayly Voyages to Contentin and Toulouse
2011	President: John Beck Voyages to Evian les Bains and Nantes/Loire Valley
2012	President: Richard Groome Voyages to Guernsey and Bordeaux
2013	President: David Park Voyages to Amiens and Lyon
2014	President: Peter Varley Voyages to Le Havre and Aix-en-Provence
2015	President: Peter Blair-Fish Voyages to Poitiers and Aix-les-Bains
2016	President: Edmund Morgan-Warren Voyages to Arras and Orleans
2017	President: Andrew Graham Voyages to Bruges and Angers/Loire Valley
2018	President: Jean Venables Voyages to Poole and Dinan
2019	President: Richard Coackley Voyages to Chester/North Wales and Paris

SEPTEMBER 1998 – ANNECY

A.01 Setting of the Grand Maison pumped storage hydroelectric station.

A.03 The 'Aeroplane Race' at Ponts de la Caille, near Cruseilles.



A.02 Pamela and Caton Crozier on the Lac du Bourget, Aix-les-Bains.

A.04 The Group.

SEPTEMBER 2002 – STRASBOURG

B.01. The welcome ceremony for the Group

B.02 The European Parliament

B.03 David Lloyd , centre

B.04 Little Venice in Colmar

SEPTEMBER 2003 – ANGERS

C.01 Cathédrale Saint-Maurice d'Angers

C.02 Works at the Chateau de Saumur

C.03 View from the Chateau d'Angers

C.04


C.05 Mike Winney


C.07


C.06


C.08

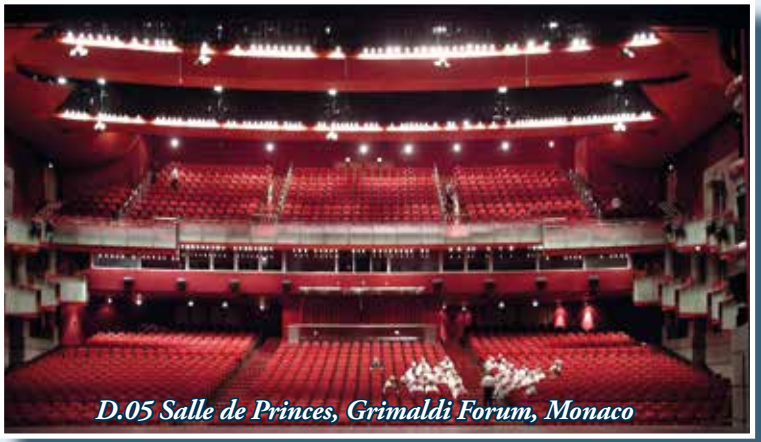
SEPTEMBER 2004 – NICE AND MONACO

D.01 The Nice Observatory

D.03

D.02 Smelling the perfume plants

D.04 View from the Ancien Chateau, Nice



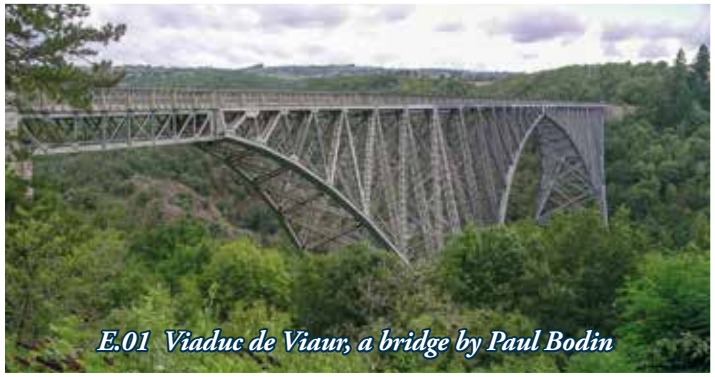
D.05 Salle de Princes, Grimaldi Forum, Monaco

D.06 Mike and Jane Winney

D.07

D.08

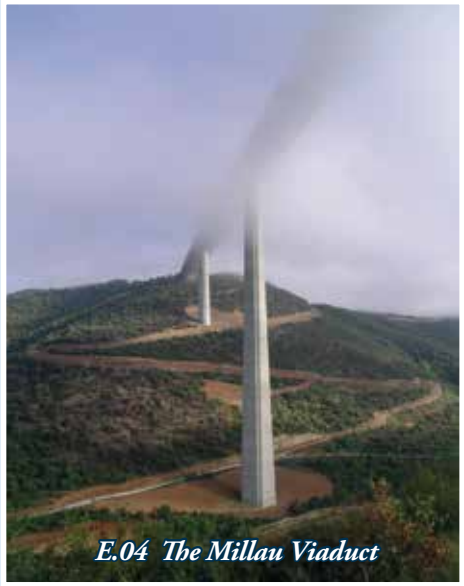
SEPTEMBER 2005 – MILLAU VIADUCT



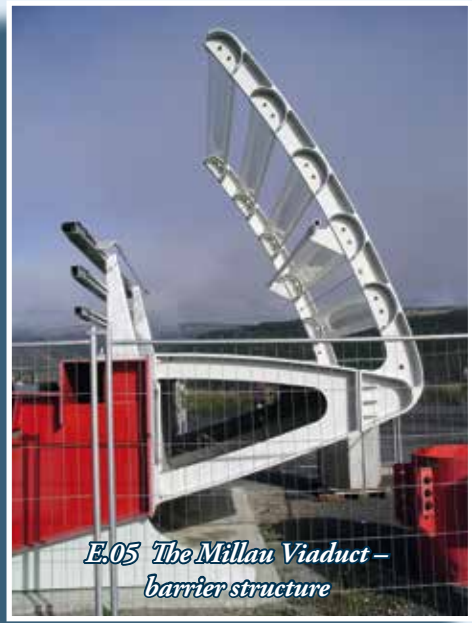
E.01 Viaduc de Viaur, a bridge by Paul Bodin

E.02 Punto Panoramico lookout over the Millau Viaduct

E.03 Punto Panoramico lookout over the Millau Viaduct



E.04 The Millau Viaduct



E.05 The Millau Viaduct – barrier structure

E.06 The Millau Viaduct

E.07 The Millau Viaduct

E.08 Mike and Jane Winney

SEPTEMBER 2006 – LIMOGES

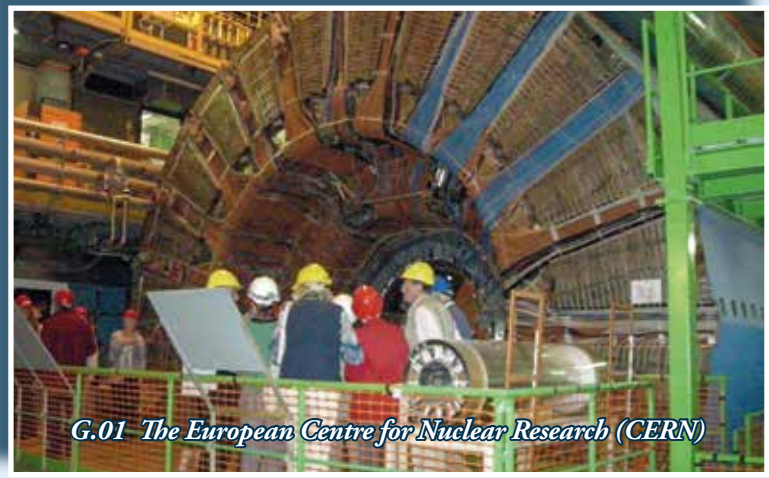
F.01 Limoges Benedictus Station of 1929

F.03 Le Moulin du Got paper and printing museum

F.02 ESTER Science Park, Limoges

F.04 Lac de Vassivière

SEPTEMBER 2009 – GRENOBLE



G.01 The European Centre for Nuclear Research (CERN)

G.03

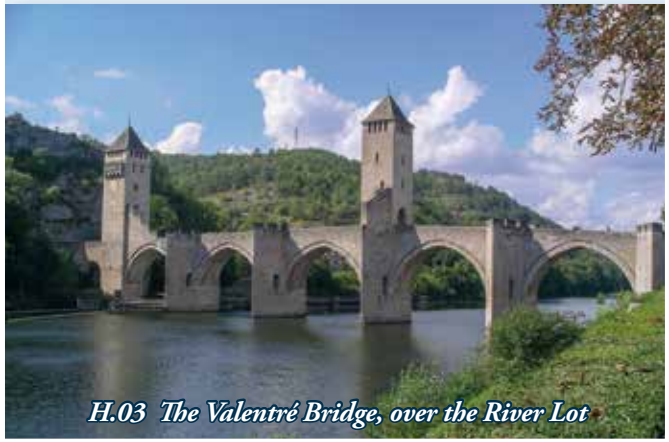
G.02

G.04 Lac de Monteynard-Avignonet

SEPTEMBER 2010 – TOULOUSE

H.01 Saint-Cirq Lapopie on the River Lot

H.02 Toulouse City Hall



H.03 The Valentré Bridge, over the River Lot

H.04 At the Valentré Bridge, Cahors

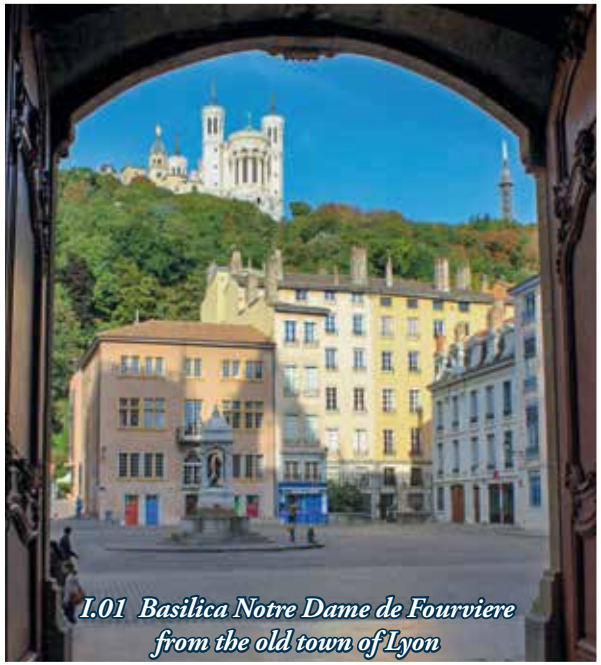
H.05

H.07

H.06 On the canal in Toulouse

H.08

SEPTEMBER 2013 – LYON

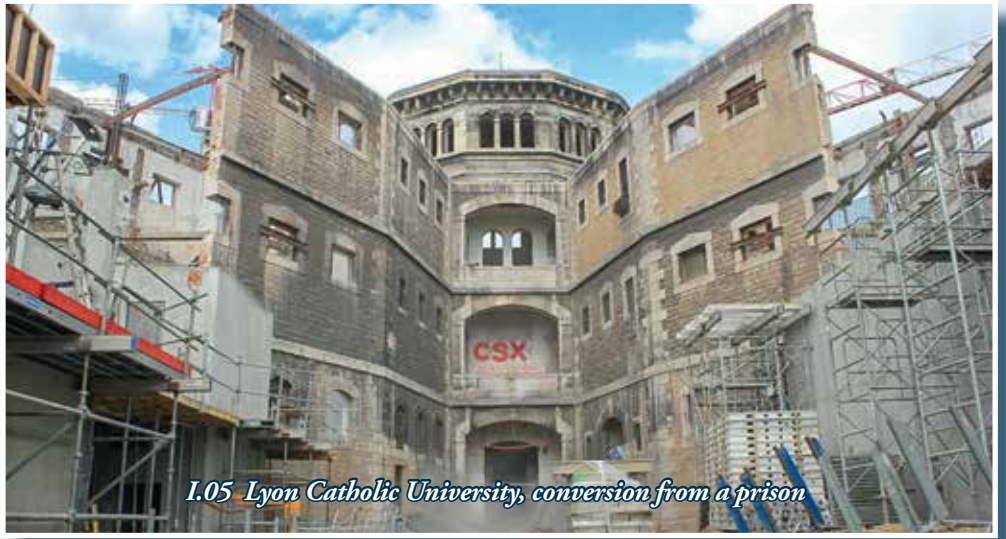


I.01 Basilica Notre Dame de Fourviere from the old town of Lyon

I.02 The Musée des Confluences in Lyon nears completion

I.03 Theatres Romains de Fourvière, Lyon

I.04 Electric charging point



I.05 Lyon Catholic University, conversion from a prison

I.07

I.06 A Jacquard loom – a Lyon specialism

I.08

SEPTEMBER 2014 – AIX-EN-PROVENCE

J.01 Place d'Albertas, Aix-en-Provence

J.03 Wine tasting at Chateau La Coste

J.02

J.04

J.05 Chateau La Coste

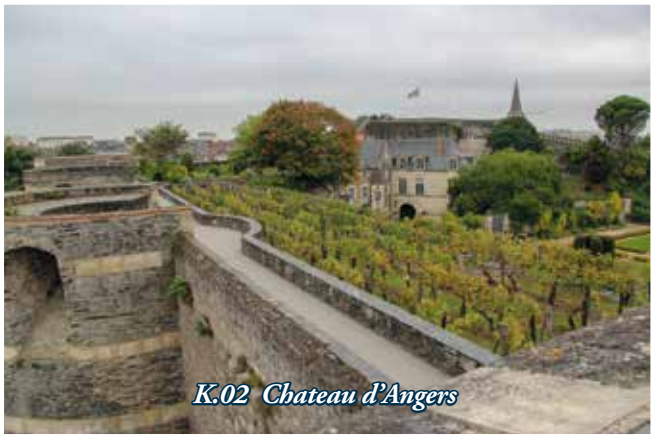
J.06 The International Thermonuclear Experimental Reactor (ITER)

J.07 The International Thermonuclear Experimental Reactor (ITER)

OCTOBER 2017 – ANGERS

K.01 Verdun Bridge and Cathedral, Angers

K.03 The Apocalypse Tapestry at Château d'Angers



K.02 Chateau d'Angers

K.04 Château de Brissac-Quincé

K.05

K.07 Plage de Monsieur Hulot, near Batz-sur-Mer

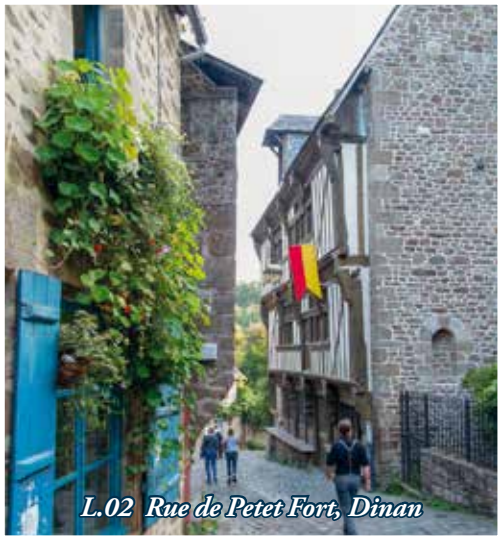
K.08

K.06 The Cointreau Museum

SEPTEMBER 2018 – DINAN

L.01 Dinan Port from the City ramparts

L.03 Dinan



L.02 Rue de Petet Fort, Dinan

L.04 Preparing to receive silt from the River Rance

L.05 Claire Emberson meets the party at St Jacut de la Mer

L.06 Ile des Hébihens

L.07 L'Abbaye de Saint Jacut

L.08 L'Abbaye de Lehon

APPENDIX THREE – SKI TRIPS

The CNISF skiing party was conceived in 2011 in John Beck's presidential year.

On the coach back to the hotel after a trip to Chamonix and riding on the cog railway, Meg Everitt came up with the idea of organising a ski party to celebrate the 80th birthday of Michael Leeming (a keen skier) the next year. She trolled the coach and found enough interest among members to form the basis of a skiing party. She organised a chalet at Les Gets and, as a result, the Becks, Groomes, Shillitos, Venables, Greenways, Pococks, Chris Head, Jane Winney and David Hughes plus 3 friends made up the party of 20. Several of the party had either not skied before or had not skied for 20 years or more, they spent their mornings in Ski-School. The rest of the party of experienced skiers took to the slopes. Temperatures did not stray much from -12° to -14°C in the village – and much colder at higher levels – but the skies were clear and blue and the surrounding mountains looked stunning in the virtually unbroken sunshine. The snow was excellent, for those who understand such technicalities, and the daily progress was punctuated by welcome cups of chocolat chaud or more fortifying vin chaud.

The party descended each afternoon for tea and cake and with aching limbs bathed, re-joined their colleagues for dinner accompanied by 'adequate' quantities of vin, to be regaled with tales of everyone's latest adventures and tumbles. Some intrepid folk braved the freezing temperatures to gaze at the stars in the hot tub.

Two of the party were non-skiers. David Shillito in large, serious snow boots and a fine, military-style, black cap, strode purposefully around the mountains to seek out the finest views for some quiet sketching, whereas Frances explored the neighbouring villages (...and boulangeries) utilising the numerous local buses.

This was a highly enjoyable trip, well organised by Meg, developing new skills for some and, most importantly, engendering tremendous camaraderie amongst the participants. As a result, it was decided to organise another party the following year in Courchevel 1650 at the Chalet Monique.

Most of the original party came again accompanied by some new skiers making a party of 24. In 2014 and 2015 the party again returned to the Chalet Monique. In 2016 it was decided to change venue and the group went to Tignes du Lac. For the first time the weather was mostly dull with wet snow falling most of the week making skiing difficult. Unfortunately Miranda Greenway fell and broke her hip and had to be airlifted off the piste, she has now

returned to the best of health. The next year Italy and the Dolomites beckoned. Another successful holiday with fine weather but unfortunately Michael Leeming fell on the first day and incurred a serious knee injury and had to return early to England with Meg. In 2018 the group returned to the Chalet Monique in Courchevel 1650. The party had a good skiing holiday without injury. A chalet has been booked in Les Deux Alps for 2019. It is hoped that there will be many more successful skiing parties in the future as an addition to our normal voyages.

SKI TRIPS


M.01

M.03


M.02


M.04

APPENDIX FOUR – PAST PRESIDENTS OF THE BRITISH SECTION

1919	C H Wordingham
1920	C H Wordingham
1921	T J Guéritte.
1922	W N Twelvetrees.
1923	R T Smith
1924	L A Legros
1925	L A Legros
1926	E F Etchells (died in office)
1927	G C Lynde
1928	F Merricks
1929	F Merricks
1930	N G Hackney
1931	J M Moncrief (died in office)
1932	F M G Du-Platt-Taylor
1933	F M G Du-Platt-Taylor
1934	W R Howard
1935	H K Scott
1936	Sir George Humphries
1937	Sir George Humphries
1938	Sir William Halcrow
1939	Sir William Halcrow
1940	W J E Binnie
1944	W J E Binnie resumed the chair in November 1944.
1945	W J E Binnie
1946	C Gribble.
1947	C Gribble
1948	M G J McHaffie
1949	W Hawthorne
1950	R D Gwyther
1951	R C S Walters
1952	J E Swindlehurst
1953	J E Swindlehurst
1954	W E Blizard
1955	Sir Frederick Snow
1956	L Turner
1957	B A E Hiley
1958	A Apostol
1959	Sir Angus Paton
1960	W C Andrews
1961	B Donkin
1962	D C Coode
1963	A W Hill
1964	P J Gerard
1965	J Guthrie Brown
1966	P A Scott
1967	J Singleton-Green
1968	F W Slatter
1969	G A Wilson
1970	Sir Alan J Harris
1972	G F B Scruby
1973	C D Crosthwaite
1974	K H Best
1975	K F Scott
1976	J D Harris
1977	E A Shaw
1978	D R Sharp
1979	A H Brown
1980	A C Paterson
1981	A J Leggat
1982	Sir Kirby Laing
1983	S B Tietz
1984	R I Lancaster
1985	D J D Wood
1986	A C E Sandberg
1987	E V Finn
1988	C M Mitchell
1989	J C Dixon

1990 D J Palmer
1991 J F S Pryke
1992 D Dennington
1993 J T Manning
1994 G Hornby
1995 G H Potter
1996 M H S Muller
1997 P B Ahm
1998 A C Crozier
1999 B W Cooper
2000 R Benaim
2001 S Lenssen
2002 D O Lloyd
2003 R K Venables
2004 M Grant
2005 M Winney
2006 P L Smith
2007 D E Shillito
2008 D R Hattersley
2009 G D Barwell
2010 A E Bayly
2011 J R Beck
2012 R L Groome
2013 D K Park
2014 P Varley
2015 P M Blair-Fish
2016 E J Morgan-Warren
2017 A L Graham
2018 J Venables
2019 R J Coackley

Four Presidents together – Richard Groome, John Beck, Bill Bayly and David Park

APPENDIX FIVE – A LIST OF ALL KNOWN MEMBERS SINCE 1919

The following is a list of all known members since 1919. It is undoubtedly incomplete since, for example, about 50 engineers joined en bloc after World War II and remain unknown unless their names have cropped up in other records since that time.

Forename(s)/ Initial(s)	Surname
Robert J	**Adam**
	Adams
Peter R	**Adams**
Daniel	**Adamson**
Edward	**Adie**
Povl	**Ahm**
Soloman Paul	**Akerib**
H E	**Aldington**
John Willis	**Alexander**
Richard A. F.	**Allen**
B. J.	**Allison**
John A	**Allison**
E L	**Allman**
A G	**Allnutt**
Anthony Kenneth	**Allum**
Norman L	**Anderson**
David	**Anderson**
	Andrews
Walter C.	**Andrews**
Ian Brinsley	**Andrews**
E S	**Andrews**
A Stanley	**Angwin**
A.	**Apostol**
Petros Zacharias	**Argyrou**
Fred Hugh	**Armitage**
Ove Nyquist	**Arup**
W C	**Ash**
J B	**Ashton**
Norman F	**Astbury**
J.	**Atherton**
G Laurent	**Atthalin**
Philomena M	**Bach**
Charles Auguste	**Baglin**
E. M. A.	**Baikoff**
E S	**Baillie**
Miles S C	**Baird**
Richard Geoffrey	**Baker**

A Christopher	**Bakken III**
John Allan S.	**Baldry**
Hugh Crawford	**Balfour**
D R	**Balfour**
J.	**Ballantyne Dykes**
Eric	**Ballard**
John K	**Banyard**
R S V	**Barber**
W A (Tony)	**Barber**
Michael J.	**Barclay**
Peter Gordon Rigby	**Barlow**
Peter William Cecil	**Barnard**
J	**Barnhill**
Lindsay A	**Barr**
Eric Lionel	**Barron**
John V.	**Bartlett**
H H C	**Barton**
Grahame D	**Barwell**
Bryan Harry	**Bates**
S	**Bath**
J D	**Battra**
J. W.	**Baxter**
A E (Bill)	**Bayly**
David Reginald	**Beadman**
Peter W	**Beard**
Andrew	**Beardmore**
Michael James	**Beasley**
John R	**Beck**
Haro M	**Bedelian**
R L	**Bedeneau**
Laurent	**Beeuwsaert**
K. S.	**Bell**
Brian C	**Bell**
Paul William Rowland	**Bell**
Cyril	**Bell**
Robert	**Benaim**
Elizabeth Mary	**Bennett**
Philip Anthony	**Bennett**
M.	**Benoit**
E A	**Benson**
	Bentley
H E	**Bergmann**
M	**Bernon**
P W	**Bertlin**
Dennis Percy	**Bertlin**
A	**Bertrand**
Keith Howard	**Best**
A V	**Bestre**
A.	**Beveridge**
J Nixon	**Bewsher**
Amar	**Bhogal**
David William	**Biddle**
J	**Bilbie**
Geoffrey M	**Binnie**
W J E	**Binnie**
Christopher Anthony	**Binnie**
M J	**Bion**
Maurice Paul Lafleur	**Blackham**
B. A. S.	**Blackie**
W.E.	**Blackmore**
Peter	**Blair-Fish**

H Leslie	**Bland**
W E	**Blizard**
Thomas Robin Eardley	**Blois-Brooke**
Cyril V.	**Blumfield**
G. E. K.	**Blythe**
Andrew	**Boagey**
Jan Jozef	**Bobrowski**
J. G.	**Bodhe**
George	**Boex**
J M	**Bogle**
Roger Lovis	**Bonafont**
Derek	**Bond**
Edmund D	**Booth**
O	**Borer**
P Lionel	**Boucher**
Percival Lionel	**Boucher**
B. W.	**Boughton**
Paul L R	**Boulard**
Denis	**Boulet**
Robert Lucien	**Bourqui**
Peter Thomas	**Bowden**
Rudolph	**Bradescu**
Donald Ralph	**Bradley**
Peter D	**Bradley**
Frederick Joseph	**Brand**
Raymond Middleton	**Brant**
P. H.	**Bray**
L G	**Brazier**
Kieran	**Brennan**
D. E.	**Brett**
Denis Gabriel Emile	**Bretton**
David C E	**Brewerton**
Christopher	**Bridger**
Frank Geoffrey	**Bridgman**
W. E. L.	**Bright**
K. H.	**Brittain**
John	**Broad**
W	**Broadbridge**
J	**Bronstorph**
L.	**Brook**
Peter Kenneth	**Brooke**
Alan Wilson	**Brookes**
Barry P S	**Brooks**
S	**Brotherhood**
J A	**Broughall**
C W E	**Brown**
Charles Bell	**Brown**
Arthur Harry	**Brown**
J. Guthrie	**Brown**
Peter Allan	**Brown**
W H	**Brownjohn**
Anthony G	**Bruce**
Phil	**Brumby**
Peter Anthony	**Bryan**
T H	**Bryce**
Derek	**Buckley**
James William	**Bunce**
J M	**Bunny**
M H J	**Bunny**
Peter John Oakley	**Burgess**
Robert William	**Burr**
J David	**Burrow**

E J **Burt**
Edward George Mowlem **Burt**
R. H. **Busby**
Leslie Michael **Bush**
J **Bussey**
S **Bylander**
Tyler Seymour James **Byrd**
D **Bywater**
Roger **Cagney**
Leonard Cecil **Callaway**
M **Calonier**
R. P. **Camilleri**
Peter Leonard **Campbell**
Robert **Campbell**
John Gray **Campbell**
Robert Hugh **Campbell**
David J **Canning**
A. H. **Cantrell**
J. R. **Capo-Bianco**
Peter **Carbery**
Harry Neill **Carey**
G T **Carpenter**
R **Carpmael**
James Robert M. **Carr**
H. L. **Carson**
Clifford A **Carvell**
C V **Cassal**
H. R. **Cater**
David Wilkinson **Cawthra**
Peter Ronald **Chambers**
Henry M. **Chambers**
P **Champin**
Stewart **Champion**
K K **Chander**
John M **Chandler**
John Richard **Chandler**
Leonard Basil **Chapman**
J R **Charles**
M **Charlet**
Frederick Rodney Dodds **Chartres**
Louis de **Chasseloup-Laubat**
J. M. **Chasser**
R V **Chate**
H. J. **Chate**
R A **Chattock**
A B **Chester**
O S **Chettoe**
M D **Chhabra**
S R **Chhabra**
John Pierre **Chinal**
Alan E L **Chorlton**
S.P. **Christie**
S P **Christodoulides**
Keith **Cima**
Brian Padraig **Clancy**
E Kitson **Clark**
E Graham **Clark**
C B H **Clark**
Bernard L. **Clark**

J. A. M.	**Clark**
Clifford Heeley	**Clark**
J. R.	**Clarke**
R. J. J.	**Clarke**
Simon Christopher	**Clarke**
F Gerry	**Clarke**
E.	**Claxton**
D. M.	**Clignet**
G H J	**Clogenson**
	Clougher
Richard J	**Coackley**
H.	**Coates**
Geoffrey Hamilton	**Coates**
C. G.	**Cobbett**
W C	**Cocking**
R. W. J.	**Cockram**
L	**Codet**
A.	**Cofler**
E. H.	**Cole**
Alec Hinton	**Cole**
Kenneth Wilson	**Cole**
Arthur Richard	**Collins**
John	**Collins**
B. H.	**Colquhoun**
J.C.	**Comati**
J	**Conacher**
W R F	**Connell**
F G	**Connor**
Douglas Cecil	**Coode**
E J	**Cook**
E. C.	**Cookson**
James Henry	**Coombs**
Bryan W	**Cooper**
A. J.	**Cooper**
Hugh Edmund	**Cooper**
William Howard	**Cooper**
H J	**Cooper**
Geoffrey Hulme	**Cope**
Alcon	**Copisarow**
Brian Oliver	**Corbett**
E P	**Corbett-Sullivan**
J. V.	**Corney**
Richard John	**Cornwell**
R. K.	**Corrie**
Michael Norman Tizard	**Cottell**
Geoffrey Neville	**Coulter**
P H	**Couroulieu**
Raymond J R	**Cousins**
S. H.	**Coverman**
J. D. F.	**Cowderoy**
Brian E.	**Cowley**
F G	**Cowlrick**
S. W.	**Cox**
Laurence Jack (John)	**Cox**
Peter A.	**Cox**
Peter Edward	**Coysten**
James Peter	**Craggs**
Cameron	**Craig**
Richard Munir	**Craig**

Thomas	**Cramp**
R. S.	**Crawford**
G W	**Crawshaw**
Leonard Richard	**Creasy**
E. W.	**Crisp**
John Earnest	**Crofts**
	Crompton
Jacques	**Crosjean**
Roland M	**Crosskey**
Charles Doveton	**Crosthwaite**
Anthony Caton	**Crozier**
Edward Alan	**Cruddas**
William	**Cullen**
E. John	**Cullen**
E J	**Cullis**
Robert James	**Curtis**
David M	**Curtis**
Stanley	**Cussons**
K	**Dabrowski**
Alan Frederick	**Dadds**
James	**Dallaway**
P John C	**Daniels**
A. Clifford	**Darlow**
John Munville	**Darracott**
Neil H	**Darracott**
F. C.	**Dart**
J D	**Daruvala**
H J	**Davey**
T B	**Davey**
C. A. C.	**Davies**
C. D.	**Davies**
C. A. C.	**Davies**
John F	**Davies**
Roy	**Davis**
John	**Davis**
E R H	**Davis**
A. J. H.	**Davison**
O.	**Dawson**
James Lawrence	**Dawson**
Michel	**Deal**
B S	**Deane**
Robert Clive	**De'Ath**
James D P	**Delaney**
William H	**Delano**
Ralph	**Delbourgo**
L F	**Denaro**
P L	**Denis**
Alan K	**Denney**
Dudley	**Dennington**
L	**Denonvilliers**
John Anthony	**Derrington**
Christian	**Detourbay**
William David	**Dewey**
E C R	**Dibdin**
Derek	**Dicks**
P	**Dieny**
John Chapman	**Dixon**
C.	**Djanoeff**
Kenneth Sutton	**Dodd**
A Kirkwood	**Dodds**
W	**Doig**
Bryan	**Donkin**
Lawrence Dennis	**Dooley**

David Kenneth **Doran**
Archibald M. **Douglas**
Thomas Harrison **Douglas**
Walter John **Dowdell**
Patrick Joseph **Dowling**
H. G. E. **Downes**
Anthony Leighton **Downing**
Edwin Joseph **Doyle**
John David **Drake**
John Norman Seton **Drake**
Brian J. S. **Dredge**
John Whitehead Wilson **Drysdale**
W. F. H. **Dufour**
E **Duittoz**
G E **Duncan**
Ronald Benjamin **Dunn**
J Mike H **Dunn**
Charles Emilien **Dupenois**
F M G **Du-Platt Taylor**
R J **Durnford**
Ian James **Dussex**
John C **Duthie**
J **Duvivier**
Eric **Dwyer**
H Kempton **Dyson**
Michael **Dyson**
Bogdan Maria **Dziewanowski**
Robert F. **Earley**
E. **Easton**
R N **Eaton**
Norman Stanley Theodore **Ebborn**
Keith Robert **Edmonds**
R H **Edwards**
Geoffrey **Edwards**
John **Ekins**
Ernest J **Elford**
James Gilbert **Elliot**
C. R. **Elliott**
David William Charles **Elliott**
V **Elmont**
Roger **Emberson**
V E **Emmanuelov**
Garry J **England**
A. E. **Erdal**
E. J. **Evans**
R. H. **Evans**
W. A. **Evans**
E. B. **Evans**
J. D. **Evans**
Clifford John **Evans**
Donald Ferguson **Evans**
John G. **Faber**
Fagard
Raymond Arthur **Fairhead**
W. A. **Fairhurst**
J S **Fairlie**
G H **Farleigh**

Arthur George	**Farmer**
John F	**Farquharson**
Kevin M	**Farrelly**
S.	**Farrer**
Anthony James	**Faulkner**
M J-J Daniel	**Fayolle**
W. A.	**Feather**
G Noble	**Fell**
Hugh Maris	**Ferguson**
F. F.	**Fergusson**
I	**Fiander-Etchells**
Duncan Macdonald	**Finlayson**
Edward Vivian	**Finn**
J Robertson	**Finniecone**
P A	**Fisher**
F. J.	**Fisher**
R. L.	**Fitt**
E M	**Fitt**
William M	**Fitzgerald**
Patrick Alan	**Fitzpatrick**
J H Woulfe	**Flanagan**
Kenneth John	**Flemons**
Weng Meng	**Fong Wah**
Dennis	**Fong Wah**
Herluf Trolle	**Forchhammer**
T A S	**Fortune**
Llewellyn	**Foster**
W L	**Foster**
Chris	**Foster**
David William	**Fowler**
Roderic David	**Fowler**
W Mitchell	**Fox**
Barry Vincenzo	**Franchi**
Michael Lucien Fernand	**Franck**
Adrian John Douglas	**Franklin**
William	**Freeman**
Ralph	**Freeman**
W.	**Freeman**
D Landale	**Frew**
Wilem W	**Frischemann**
Richard J. H.	**Fryer**
Angus Anderson	**Fulton**
Ryszard January	**Gabrielczyk**
J. H.	**Gandhi**
C C V	**Gandon**
L de la	**Garde**
R T	**Gardiner**
G A	**Gardner**
Eric Cyril	**Garner**
J. B.	**Garnett**
Peter Edward	**Garratt**
Charlie	**Garrigues**
Waryn Thomas Mogridge	**Gaskell**
John Francis Court	**Gayner**
Nicholas George	**Gedye**
Erol	**Gelenbe**
W. E.	**Gelson**
Pierre A.	**Genoux**
Pierre Joseph	**Gerard**
M E	**Gérard**

J	**Gerrard**
Paul D	**Gerrard**
S. K.	**Ghaswala**
Alexander	**Gibb**
M. E.	**Gibb**
Francis Ross	**Gibb**
Christopher R. P.	**Gibbs**
Brian Derrick	**Giddings**
G M	**Gidwani**
C M	**Gilbin**
E F	**Gill**
Jolyon	**Gill**
R. S.	**Girardau**
Hubert Miles	**Gladwyn Jebb**
Anthony Reginald	**Glaysher**
R	**Glossop**
David Edward	**Glyn-Woods**
John Arthur	**Goldsmith**
Alfred	**Goldstein**
P. H. T.	**Gooding**
G H J	**Goodman**
R	**Gornick**
Michael Charles	**Gougeon**
Alexander Wallace	**Gourlay**
H J	**Gourley**
Henry	**Grace**
S.	**Graff**
Frank	**Graham**
Edgar Barrett	**Graham**
Andrew L	**Graham**
John Gordon	**Grant**
Melvyn	**Grant**
James C	**Grassie**
Philip Arthur	**Green**
David Frederick	**Green**
John Nicholas Morgan	**Green**
F C	**Greenfield**
Simon E	**Greenway**
R W	**Gregory**
John	**Gregory-Cullen**
Conrad	**Gribble**
Patrick W A	**Griffin**
A	**Griffiths**
G V	**Griffiths**
Vivian Henry	**Gritton**
Richard L	**Groome**
F	**Gros**
Frederick	**Grover**
Alfred Tony Jules	**Guéritte**
J. E.	**Guest**
John Augustus	**Guiness**
Victor James	**Guiver**
Kenneth	**Guiver**
R D	**Gwyther**
Noel G	**Hackney**
Robert	**Hadfield**
William T	**Halcrow**
J W	**Hall**
Isiah	**Hall**
Herbert V L	**Hall**
David John	**Hall**

A **Hall-Brown**
E L **Hallé**
Patrick Xavier **Hallinan**
Penrose T **Halsey**
Roy Joseph **Ham**
Edmund C **Hambly**
A. M. **Hamilton**
John **Hanford**
C M P **Hannoyer**
F. J. **Hansen**
Bjorn N **Hansen**
Peter G **Hansford**
M J **Haraki**
Joseph Michael **Harakis**
David John **Hardcastle**
Philip James **Hardie**
Arthur W **Hardwicke**
G T **Harrap**
R J **Harrington-Hudson**
Alan J. **Harris**
J. D. **Harris**
R. B. D. **Harris**
Edward George **Harris**
William Brown **Harris**
Richard John Stombury **Harris**
Charles **Harris**
R E W **Harrison**
Roger Stancliffe **Harrison**
Charles Peter **Harrison**
Robert Arthur **Hartland**
John Terence Crawford **Harvey**
Michael Raymond Sixte **Harvey**
A J **Haselfoot**
J. H. R. **Haswell**
David R **Hattersley**
Geoffrey Fort **Hawker**
R. W. **Hawkey**
W E **Hawthorne**
J B M **Hay**
David J R **Haythorn**
Rudolf **Hazzledine**
Ian Walker Hanbury **Head**
Christopher R **Head**
David Ian **Heaps**
Michael John **Heard**
Peter James **Heath**
Hedley
Kenneth David **Heeps**
G. **Heggs**
B. M. **Hellstorm**
C **Helsby**
Peter William **Helson**
W. **Henderson**
A. B. **Henderson**
Neil B. **Henderson**
John Michael **Henley**
V **Henny**
Richard **Hermon**
Roger **Hetherington**
Roger le Geyt **Hetherington**
W. Gerald **Hetherington**

Bruce A O	**Hewett**
Howard A.	**Hicks**
Owen	**Higby**
John S	**Highfield**
W E	**Highfield**
Bernard A.E.	**Hiley**
A W	**Hill**
R B	**Hill**
Arthur William	**Hill**
Louis Parkinson	**Hill**
Ronald L.	**Hillier**
J. D.	**Hills**
David	**Hill-Smith**
Keith	**Hinde**
R J	**Hird**
Martin Beverley Bodenham	**Hirst**
Geoffrey Richard	**Holland**
Edmund	**Hollinghurst**
P. W. E.	**Holloway**
Ernest	**Hollowday**
A. J.	**Holmes**
I. M.	**Holmes**
David Nixon	**Holt**
Wong Gai	**Hong**
David Morgan Alfred	**Hook**
H	**Hoover**
Adam	**Hope**
J Russell	**Hopper**
Graham	**Hornby**
R. W.	**Horner**
Keith M	**Hounslow**
Walker Robert	**Howard**
C L	**Howard-Humphreys**
William	**Howie of Troon**
Robert John	**Hubbard**
John W	**Hudson**
Alexander Benedict	**Huggins**
H C	**Hughes**
Wm.	**Hughes**
Ronald Frederick	**Hughes**
Frederick Hesketh	**Hughes**
David R	**Hughes**
Peter	**Hughes**
A. P.	**Humble**
Thomas H J	**Humphrey**
George W	**Humphreys**
J H	**Humphreys**
E F	**Hunt**
Frederick I.	**Hunt**
Ernest Sidney	**Hunt**
J	**Husband**
Matthew Nwafili	**Igwe**
G C	**Imbault**
	Ingersley
D P	**Ingham**
F. W.	**Ingle**
P	**Ingman**
Terence S	**Ingold**

Mohd	**Iqbal**
J S	**Ireland**
D. B.	**Irving**
Mohammed	**Ismail**
Edward Wykeham	**Jacomb-Hood**
F V	**Jago**
Dennis Frederick	**James**
David S	**James**
Henry	**Japp**
M de	**Jarny**
Stephan A	**Jefferis**
Ray	**Jefferson**
L F	**Jeffrey**
J H	**Jellet**
R. S.	**Jenkins**
Robert A.	**Jenkinson**
E H	**Jesty**
S. J.	**Joannides**
W M	**Johns**
E L	**Johnson**
A D	**Johnson**
Thomas J	**Jones**
David	**Jones**
Clifford John	**Jones**
D W K	**Jones**
A	**Jouve**
Charles Octave de	**Juniac**
Richard Wilfred	**Kabawitas**
Janis Osvalds	**Kalnins**
M'Siri Ghislain	**Kalungwishi**
L	**Kamm**
C S	**Kang**
J M	**Karim**
John G	**Kay**
K. A.	**Kaye**
E.	**Kaylor**
Harry	**Kaylor**
Harold G.	**Keefe**
John Francis	**Kellerman**
Peter John	**Kelsey**
Maurice John	**Kenn**
Geoffrey F.	**Kennedy**
F	**Kennerley**
Lewis E.	**Kent**
Oleg Alexander	**Kerensky**
Colin John	**Kerr**
T. P.	**Kidman**
Charles R	**King**
Peter	**King**
John Robert	**King**
Joseph	**Kirk**
Cyril	**Kirkpatrick**
J	**Kitchin**
C	**Knap**
Demetre	**Koussios**
Chris A A	**Kraushar**
C.	**Krekis**
W	**Lachlan**
W. B.	**Lack**
William Kirby	**Laing**
Christopher M.	**Laing**
David E.	**Laing**

John Martin Kirby **Laing**
H. J. **Lajus**
L. M. **Lake**
Paul **Lakra**
Rex Ivan **Lancaster**
J. H. **Lander**
F **Lange**
Eric A **Langridge**
Pierre **Lantz**
William James **Larke**
Howard James **Larkin**
J P E **Laurent**
Henri **Laval**
E C **Le Jeune**
J. A. **Le Pivert**
Oliver Walter Ferriby **Leach**
F **Lebeter**
R. **Leclercq**
David John **Lee**
Philip Michael **Lee**
Norman William **Lee**
Derek Alan **Lee**
Nicholas Robert Paul **Lee**
Mike B **Leeming**
Nigel **Legge**
Alec J **Legggatt**
L A **Legros**
Robert Edward Leonard **Lelliott**
Donald Edward **Lennard**
Sydney **Lenssen**
Stephen **Leonard**
E **Leroyer**
E. G. **Lester**
Joseph **Levy**
L. **Lewis**
David M. **Lewis**
Brian W. **Lewis**
A.E.P. **L'Herminier**
A S **Lindsay**
A **Lisle**
A. C. **Little**
Michael Edward Raymund **Little**
J. R. **Liversedge**
David O **Lloyd**
Robert Boleslaw **Lockhart**
E. **Loewy**
J. **Lonergan**
John R **Lonergan**
C. E. **Lord**
de **Lorenzi**
W. S. **Lovely**
James Neville **Lowe**
W L **Lowe-Brown**
Robin **Lowndes**
Robin **Lumb**
Christopher **Lumb**
A R **Luyken**
A J **Lyddon**
G C **Lynde**
J A **Machin**

F. R. **Mackley**
R A **MacMahon**
Ernest H **MacMillen**
MacNeil
David V **Maddock**
A. S. **Magasiner**
D. Peter **Maguire**
Alan Raymond **Mais**
Reginald J R B **Maitland**
R. F. **Maitland**
D. N. Guha **Majumder**
Mohsen **Malek**
P de **Malglaive**
G. C. **Mander**
H. D. **Manning**
John T **Manning**
R. P. **Manning-Coe**
D. **Manolopoulos**
G F **Mansbridge**
J. B. **Manson**
M L J de **Marassé-Enouf**
P V **Marchant**
Kenneth James **Marchant**
Tony **Marjoram**
George **Mark**
Croydon
R. W. **Marks**
E. F. **Marriage**
H F **Marriott**
Clifford **Marsden**
C W **Marshall**
A E **Marshall**
G. H. **Marston**
N **Martin**
John Neville **Martin**
Alexander **Mason**
Gordon Grier **Masterton**
Thomson
Jerzy Stamislaw **Matarewicz**
N A **Matheson**
George **Mathieson**
E **Matthews**
W **Maughan**
J. C. **Maxwell-Cook**
P T **Maybury**
William J **McAuley**
Francis Joseph **McCann**
A. E. **McCarthy**
Rachel **McCarthy**
H. **McClusky**
Michael John **McConnell**
Ernest **McCullough**
A **McDonald**
G. S. **McDonald**
C. W. N. **McGowan**
G. R. de Launey **McGregor**
Malcolm G J **McHaffie**
A J W **McIntosh**
T **McIntyre**
Kenneth Kraige **McKelvey**
John Cormack **McKenzie**
O. Wm. **McLaren**
Peter R **McNair**
Andrew G **McNaughton**
McNeile
N A **McNeill**

Paul F **Mead**
E. O. **Measor**
John S. C. **Megit**
A L **Mellanby**
Roy Edward **Meller**
Alexander **Melville**
Peter **Melville-Smith**
John B. **Menzies**
L. J. A. **Merckx**
F **Mérindol**
Frank **Merricks**
D. M. **Meynell**
Frederick Tabor **Middleton**
James Donald **Miller**
A B (Tony) **Miller**
Maurice **Milne**
J T **Milton**
P B **Minett**
Reginald Hugh **Minion**
P J **Mitchell**
Peter Burgess **Mitchell**
J. W. **Mitchell**
Christopher M. **Mitchell**
Joseph Alexander **Modro**
B D **Mohury**
Ian William Morham **Moir**
A **Moller**
G. A. N. **Molloy**
Alan **Moncrieff**
J **Monserand**
J Mitchell **Montcrieff**
R F **Moore**
F G **Moore**
Ian M. H. **Moore**
Martin Somers **Moorhead**
Frederick H **Morfey**
Morgan
H. D. **Morgan**
Cyril D. **Morgan**
Edmund J **Morgan-Warren**
Peter Beaumont **Morice**
D. B. **Morrell**
Christopher John Easton **Morris**
Richard **Morris**
John Robert Drake **Morse**
E. J. **Morton**
M C G **Mosman**
Basil **Mott**
John C S **Mott**
R W **Mountain**
O **Mueck-Tattersall**
Alan Marshall **Muir Wood**
Michael H S **Muller**
J. C. **Munro**
B **Murad-Moses**
C **Murdoch-Smith**
A M **Murray**
T P **Murray**
Mohamed A M **Mustafa**

Haydn John	**Mylchreest**
C. A.	**Nahmacher**
David	**Nash**
S. M.	**Nasim**
V G	**Naudeau**
A de	**Naurois**
Frank Roy	**Neal**
R M	**Neilson**
John K.	**Nesbit**
A. M.	**Neville**
H W	**Newall**
Keith	**Newton**
E.	**Newton**
Raymond Frank	**Nicholson**
Duncan Herbert	**Nicholson**
E P	**Nicolaides**
R S	**Nilsson**
Max	**Nohr**
Evelyn Hugh	**Norie**
J.	**North**
A	**Norton**
Edmund Keith	**Nuttall**
Brian	**Nuttell**
Douglas E	**Oakervee**
R	**Oates**
Kevin	**O'Keefe**
Antony	**Oliver**
H.	**Olivier**
Peter M. R.	**Olley**
Linley Barrett	**Ollier**
P S	**O'Maolain**
E A V	**O'Neil**
Charles Egerton	**Ortner**
Andrew Henry	**Orton**
E C (Ted)	**Osborn**
M	**Osherovitz**
R H	**Osler**
T. P.	**O'Sullivan**
Graham	**Owens**
S.	**Packshaw**
Christopher John	**Padfield**
Archibald	**Page**
J. E. G.	**Palmer**
M. F.	**Palmer**
David John	**Palmer**
Frank	**Parfett**
	Parikh
David K	**Park**
P I	**Parker**
John F.	**Parkhouse**
H B C	**Parsons**
H	**Parsons**
Keith	**Parsons**
T W	**Parsons**
Philip	**Pascall**
P	**Patel**
Alastair Craig	**Paterson**
John	**Paterson**
Percy Harold	**Paton**
H. John	**Paton**
Thomas Angus Lyall	**Paton**
Barney	**Pattenden**
Derek Arthur	**Pattinson**
R	**Pavry**

N. J.	**Payne**
L C	**Paysant**
Charles J	**Paysant**
B.	**Pearlstone**
Eric	**Pearson**
Richard Cooper	**Pemberton**
A	**Perchais**
Christopher J	**Pertee**
A	**Petit**
Edmond	**Petit**
E A	**Petit**
J. Foster	**Petree**
Edward P R E	**Pettit**
David Lawrence	**Pexton**
G C D	**Phillips**
Moeng	**Phok**
Evelyn Mary	**Piall**
G. H. A. (Tony)	**Piall**
A	**Picard**
Z	**Pick**
John Kay	**Picknett**
G de	**Pierres**
C	**Pierret**
I. D. B.	**Pilkington**
R N	**Pink**
J B	**Pinkerton**
Frederick Luckin	**Pitt**
A. R.	**Pittendrigh**
M L L	**Plat**
Humphrey P	**Pocock**
J P C	**Pognan**
V de	**Poliakoff**
Isobel A	**Pollock-Hulf**
Donald Lorenzo	**Poppy**
John Reid	**Porter**
J. A.	**Posford**
Jan Bart	**Pot**
Geoffrey Heddon	**Potter**
E. F. Le P.	**Power**
William G	**Powles**
Louis M. M.	**Prat**
F K	**Preston**
Derek Ian	**Price**
Jon L	**Prichard**
James	**Priestley**
John Fordham Speaight	**Pryke**
Peter J	**Pugh**
Malcolm John	**Puller**
T Charles	**Pullinger**
Y R	**Puri**
F	**Purton**
Simon E	**Quarrell**
A	**Queneau**
R W	**Querée**
Graham McKinnon	**Raine**
G.	**Raistrick**
F. T.	**Raleigh**
J I	**Rana**
W. R.	**Rangeley**
Mohan	**Rao**
F. L.	**Ravelli**
Donald Edward	**Rayner**

R S	**Read**
W.	**Redlich**
L J	**Redman**
H A	**Reed**
Glyndwr Cirwyn	**Rees**
L	**Reincke**
Ian Hunter	**Reith**
Robert	**Reith**
Peter	**Rennison**
J	**Revy**
J J Raymond	**Rey**
	Reynolds
Richard St.John	**Reynolds**
James	**Rhind**
Brian	**Rhodes**
Roderick	**Rhys Jones**
James Arthur	**Riccomini**
Philip	**Richardson**
John	**Richardson**
H A	**Rickwood**
Tony Melville	**Ridley**
Paul F	**Rieder**
Jean Louis	**Riester**
Louis	**Rikker**
G M	**Ritchie**
J. O. C.	**Ritchie**
Howell	**Ritson**
Frank Alfred	**Roberts**
D Gwilym M	**Roberts**
V A M	**Robertson**
Stephen Allan	**Robertson**
M	**Robinson**
W. C.	**Robinson**
C	**Roch**
A D (Tony)	**Roche**
J.	**Rodin**
Brian Henry	**Rofe**
H S	**Rogers**
J A S	**Rolfe**
Andrew	**Rose**
Douglas F.	**Rose**
John Couch Adams	**Roseveare**
D. E. J.	**Ross**
Vivian D.	**Rossi**
A G	**Rotinoff**
M E R	**Rougier**
J M	**Rounthwaite**
M de	**Routkowsky**
F. S.	**Rowe**
R. E.	**Rowe**
K P	**Rush**
Philip	**Rushton**
Robert	**Russell**
Frank E	**Ryder**
Rony Maurice	**Sabah**
Armand Simon	**Safier**
J.	**Safir**
Terence Herbert	**Salter**
C	**Sampaïo**
Stewart	**Samson**
A. C. E.	**Sandberg**
Neil C D	**Sandberg**
James Sydney	**Saunders**
Ian Harry	**Saunders**

B F	**Saurin**
A	**Sauvée**
E	**Savill**
K C	**Savory**
	Saxild
W Harley	**Saxton**
V. T.	**Schaerer**
J N	**Schilizzi**
J. W.	**Schlaepfer**
Max	**Schlaepfer**
Reginald William	**Schofield**
H K	**Scott**
Peter A.	**Scott**
Kenneth Farish	**Scott**
W D	**Scott**
Gordon	**Scott Mackie**
L	**Scott-White**
G. F. Brian	**Scruby**
John	**Seaman**
M. G.	**Searle**
P H	**Séguin**
Michael A	**Selfe**
C E A Marcel	**Semet**
Chris	**Senior**
Kenneth	**Severn**
Roy Thomas	**Severn**
Charles A	**Seymour**
W B	**Shannon**
B	**Sharma**
Frederick Andrew	**Sharman**
Douglas Raymond	**Sharp**
R. H.	**Sharpe**
N. R.	**Sharpe**
Emil Archibald	**Shaw**
M. T.	**Shaw**
Duncan Stewart	**Shaw**
Hugh Erving	**Shaw**
Timothy Olaf Richard	**Shaw**
R.	**Shearcroft**
William Walker	**Shearer**
T. D.	**Shephard**
W P	**Shepherd-Barron**
E	**Shepley**
R. A.	**Shewring**
David E	**Shillito**
F	**Sholefield**
A.	**Short**
R. Martin	**Silber**
Stanley George	**Silhan**
H. B. De	**Silva**
V	**Silvera**
Keith Foster	**Simm**
	Simon
Brian	**Simpson**
Donald James	**Simpson**
W J	**Sinclair**
John	**Singleton-Green**
J.	**Singleton-Green**
F. W.	**Slatter**

Gordon M	**Sloan**
H	**Sloog**
R T	**Smith**
Alfred E	**Smith**
Archibald Augustus	**Smith**
Ewart	**Smith**
Ernest C.	**Smith**
William Finch	**Smith**
Peter Frederick	**Smith**
Fraser K.	**Smith**
Peter Leslie	**Smith**
David Charles	**Smith**
Brian W	**Smith**
David C	**Smith**
Allen Donald Warren	**Smith**
William Joseph Rudd	**Smyth**
J. B. O.	**Sneeden**
	Snellgrove
Frederick	**Snow**
Lester	**Sonden**
Assumcao Baltasar de	**Sousa**
John H.	**Spelzini**
Basil James	**Spillett**
Michael	**Springett**
J J	**Spyra**
J. J.	**Spyra**
T J	**St Roch Coogan**
C C	**Stainer**
Alan I	**Stainer**
J. F.	**Stanbury**
R Harry	**Stanger**
Charles Harry	**Stanger**
David H	**Stanger**
Brian William	**Stanley**
	Stedman
M.	**Steenbrugge**
Jim	**Stevenson**
Brian James	**Stocker**
E	**Stokoe**
A	**Stonebridge**
Leigh	**Stopford**
S G	**Stork**
Alexander G	**Strathern**
T W	**Street**
Andrew Herbert	**Stroud**
A.	**Stubbs**
Adrien J. G.	**Sturgeon**
Patrick J E	**Sullivan**
Kenneth J.	**Surridge**
E J	**Sutcliffe**
R. J. M. (James)	**Sutherland**
John	**Sutton**
M. H.	**Sutton**
R A	**Swainson**
J. Eric	**Swindlehurst**
Walter Burrans	**Sykes**
R. C.	**Symes**
Matthew J	**Symes**
Michael Albert	**Symmons**
Gilbert S.	**Szlumper**
John Pinder	**Taberner**

M. A. **Tadlaoui**
James Victor **Tagg**
J B **Talati**
John C S **Talbot**
C H **Tarr**
C A **Taylor**
Brian Joseph **Taylor**
Maurice J **Taylor**
P. R. **Taylor**
John Alan **Tetlow**
J **Thame**
James Michael **Thomas**
J G **Thomas**
R **Thomas-Jomes**
I **Thompson**
John H Hannay **Thompson**
J Hannay **Thomson**
Andrew Gordon **Thomson**
H. V. Leon **Thomson**
H C **Thorpe**
Leonard **Threadgold**
Stefan Berthold **Tietz**
W F **Tillson-Freehold**
G J **Tissandie**
Georges Lucien **Tixerant**
R. N. H. **Tofts**
Gordon **Tomalin**
T A **Tomlinson**
D. H. **Tompsett**
R. J. **Towler**
Norman C **Train**
R.E. **Tree**
Robert John Rodolph **Trefusis**
F **Tremain**
Ernest F C **Trench**
R. L. **Triggs**
Raphael Eugene **Troome**
Ian George **Trotter**
Austin **Trueman**
Geoffrey Ashworth **Truesdale**
Peter Harold **Truphet**
David Leonard **Tully**
Richard Edward **Tully**
E A W **Turbett**
Jeffrey Alan **Turnbull**
F H **Turner**
Leslie **Turner**
Joseph Vernon **Turner**
David John **Turner**
F **Turquand**
W Noble **Twelvetrees**
R **Twelvetrees**
Robert F **Twiss**
Andrew P **Tyrrell**
S **Tyrwhite**
John **Uff**
E. N. **Underwood**
E **Vallenet**
Peter J **Varley**
Stanley **Vaughan**
A. **Veck**
Jean **Venables**
Roger K **Venables**

N E de	**Vesian**
J S E de	**Vésian**
Jean	**Vicariot**
A. V.	**Waddell**
S	**Waite**
Ian D	**Walker**
J.	**Walker**
Ron H	**Walker**
R. C. S.	**Walters**
Douglas D	**Ward**
H. L.	**Waterman**
G Bernard	**Waterworth**
P A	**Watford**
G. R.	**Watkins**
Graham	**Watkinson**
	Watson
Victor	**Watson**
Peter William	**Watson**
Bjorn	**Watson**
Terence S	**Watson**
L. E.	**Wattebot**
	Weaser
H J E	**Webbe**
F	**Webster**
Christopher D	**Webster**
	Weekes
Gordon	**Welch**
H C	**Wells**
John F.	**West**
John B.	**West**
Percy	**Westacott**
J T	**Westcott**
Alfred Whitaker	**Whalley**
Jeffrey John Gerard	**Wheeler**
A J (Jim)	**Wheeler**
Graham	**White**
Barry Thornton	**White**
Bruce	**White**
Alan	**Whitfield**
E. F.	**Whitlam**
P. C.	**Whittingham**
John Anthony	**Whitwell**
Frederick J.	**Whyte**
Dudley	**Wightwick**
R J	**Wilkinson**
Philip J	**Wilkinson**
Anthony George	**Willenbruch**
Ian Malcolm Herbert	**William**
Evan Owen	**Williams**
D. T.	**Williams**
Ivor Frank	**Williams**
Idris Howell	**Williams**
Geoffrey Theo	**Williams**
Gareth	**Williams**
Keith H	**Williams**
John A R	**Williams**
Anthony Thomas John	**Williamson**
Peter	**Willows**
J S	**Wilson**
R F	**Wilson**
G. A.	**Wilson**
T. D.	**Wilson**

Peter Fiennes	**Wilson**
Michael Wilson	**Wilson**
Norman Angus	**Wilson**
Gordon Charles	**Wilson**
Robin Lee	**Wilson**
John Lindsay	**Wilson**
Jim	**Wilson**
Guthlac	**Wilson**
James Gordon	**Wiltshire**
F. G.	**Windsor**
Peter Frederick	**Winfield**
Michael	**Winney**
R M M	**Wisner**
I.	**Withycombe**
P. J.	**Witt**
C V	**Wolff**
C. T.	**Wolley**
A. L.	**Wolley**
Gai Hong	**Wong**
Albert Peng Choon	**Wong**
David John Dargue	**Wood**
Jonathan Guy Martin	**Wood**
Timothy John	**Woods Ballard**
W E	**Wooley**
James V	**Woolf**
Malcolm W. T.	**Woollard**
C H	**Wordingham**
George Chico	**Workman**
F. E.	**Wotton**
C J	**Wright**
John Alfred	**Wright**
C Terrel	**Wyatt**
Michael S.	**Zakrzewski**
W. V.	**Zinn**
Simon B.	**Zukas**

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13.23	Roger Venables	17.11	Ray Jefferson	B.03	Roger Venables
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D.04	Roger Venables	I.02	Roger Venables	L.08	Roger Venables
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E.03	Roger Venables	I.08	Peter Blair-Fish		
E.04	Roger Venables	J.01	Peter Blair-Fish		
E.05	Roger Venables	J.02	Peter Blair-Fish		
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G.02	Bill Bayly	K.05	Peter Blair-Fish		
G.03	Bill Bayly	K.06	Peter Blair-Fish		
G.04	Grahame Barwell	K.07	Roger Venables		
H.01	Roger Venables	K.08	Roger Venables		
H.02	Roger Venables	L.01	Roger Venables		

A HUNDRED YEARS OF HISTORY

Since the end of the First World War engineers in Britain have taken a keen interest in the work of their French counterparts. This book takes an intimate look at the story of the British Section of the Ingénieurs et Scientifiques de France. Using over 200 illustrations, the various chapters explain the historic links between British and French engineering, the origin of the British Section as a reaction to the destruction of France's infrastructure in the Great War, the subsequent flowering of interest in French projects and engineering methods, and the development of the British Section into a modern society encompassing an interest in both technical matters and a love of things French.