DUDLEY MAURICE NEWITT
(1894—1980)

Part II

1919-1945

MARRIAGE, THE ROYAL SOCIETY AND SOE:
THE MAKING OF 'Q'

by

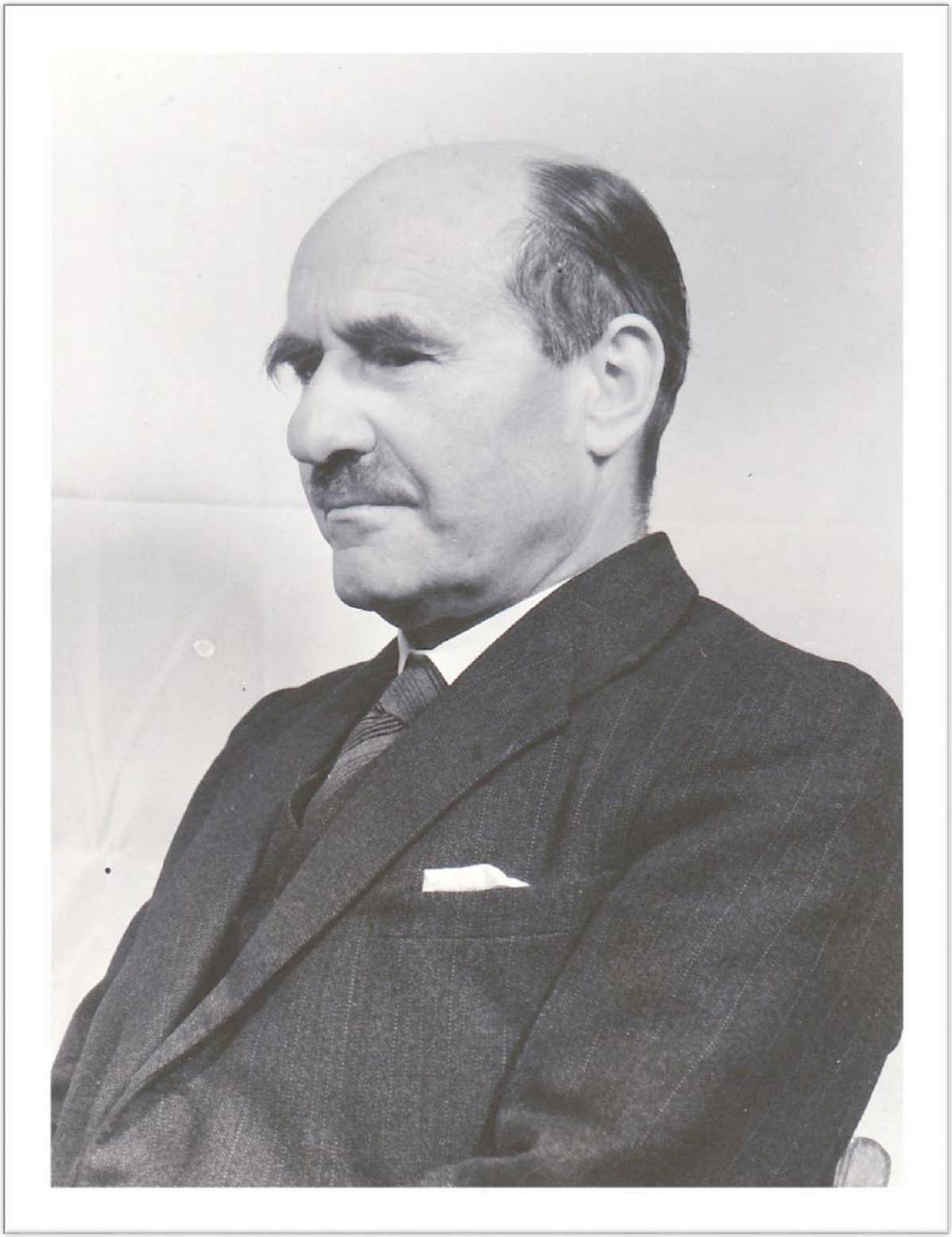
Malyn and Joan Newitt

2015

ACKNOWLEDGEMENTS

We are very grateful to Des Turner for arranging a visit to The Frythe and for letting us use a photo of the building in its prime. This picture, that dates from 2006, was taken by kind permission of Gary Wood of Smith, Kline and Beecham who owned the property at that time.

Thanks also to Bernie Newitt who provided indispensable help with the production of this book.



The first part of this biography entitled *India, Mesopotamia, Palestine* was printed in 2014. It covered the first 25 years of Dudley's life, in particular his experience in the First World War. It was based on his private papers and on the Memoirs that he wrote in retirement. This second part also makes extensive use of Dudley's private papers and his Memoirs but is supported by many other sources, published and unpublished, relating to his work for SOE and for Imperial College. As in the first part, the text of Dudley's Memoirs is reproduced almost complete and is printed in italics.

Return from the War

Dudley returned from the Middle East in July 1919 to be demobilised and recommence a civilian life. He was 25 years old. His Memoirs, written when he was 70, take up the story.

I was at rather a loose end in London. Most of the family were in America, my brother Lewis was still in France. It was Easter time and London was crowded. I stayed for a time at Bailey's Hotel in Gloucester Road whilst I acquired a civilian outfit and made arrangements for continuing my university training. I applied to the Royal College of Science for a place in the Chemistry Department, but had to wait until October before resuming my studies.

In the meantime I went over to France to stay with Madame Schaeffer, an old friend of the family, in Rouen. She was an Alsacien and a

woman of considerable charm and vivacity. Her only daughter, Alix, and I were married during the summer and spent our honeymoon on an old farm in Normandy. We returned to England in September and managed to buy a small house in Camberley Avenue (No 13) Raynes Park, where we lived for some five years whilst I completed my undergraduate and post-graduate courses.

Madame Angelique Schaeffer

These short sentences designedly bury, almost out of sight, what was a long, and in the end very sad, story. Alix Schaeffer was a year younger than Dudley. She was the only daughter of Madame Angelique Schaeffer who was the owner (or manager) of the Hotel des Carmes in Rouen. Her father was unknown but family gossip had it that he was an important man, possibly a nobleman, and that Madame Schaeffer had been his mistress. When Dudley and Alix married, Alix was provided with a lavish trousseau of linen, all with her monogram AS embroidered into it. There was also a life-sized oval portrait done in pastel and magnificently framed. All this suggests a rich, indulgent, if invisible father.

Alix and Dudley had met before the war when Alix came to stay with the family in London and a photo survives with her in a family group in 1913. Thereafter she and her mother kept in close touch with the Newitt family.

Eddie, Dudley, Lewis, Rita and Alix 1913

Letters and cards sent by Alix and her mother to Dudley during the war have survived, full of gossip and family news of the Newitts scattered around the world, as well as the doings of the Schaeffers. From these letters it is clear that Alix was already very much part of the family. The letters are addressed to "Mon Cher Dudley" and end "Votre petite amie qui vous embrasse bien. Affectueusement".

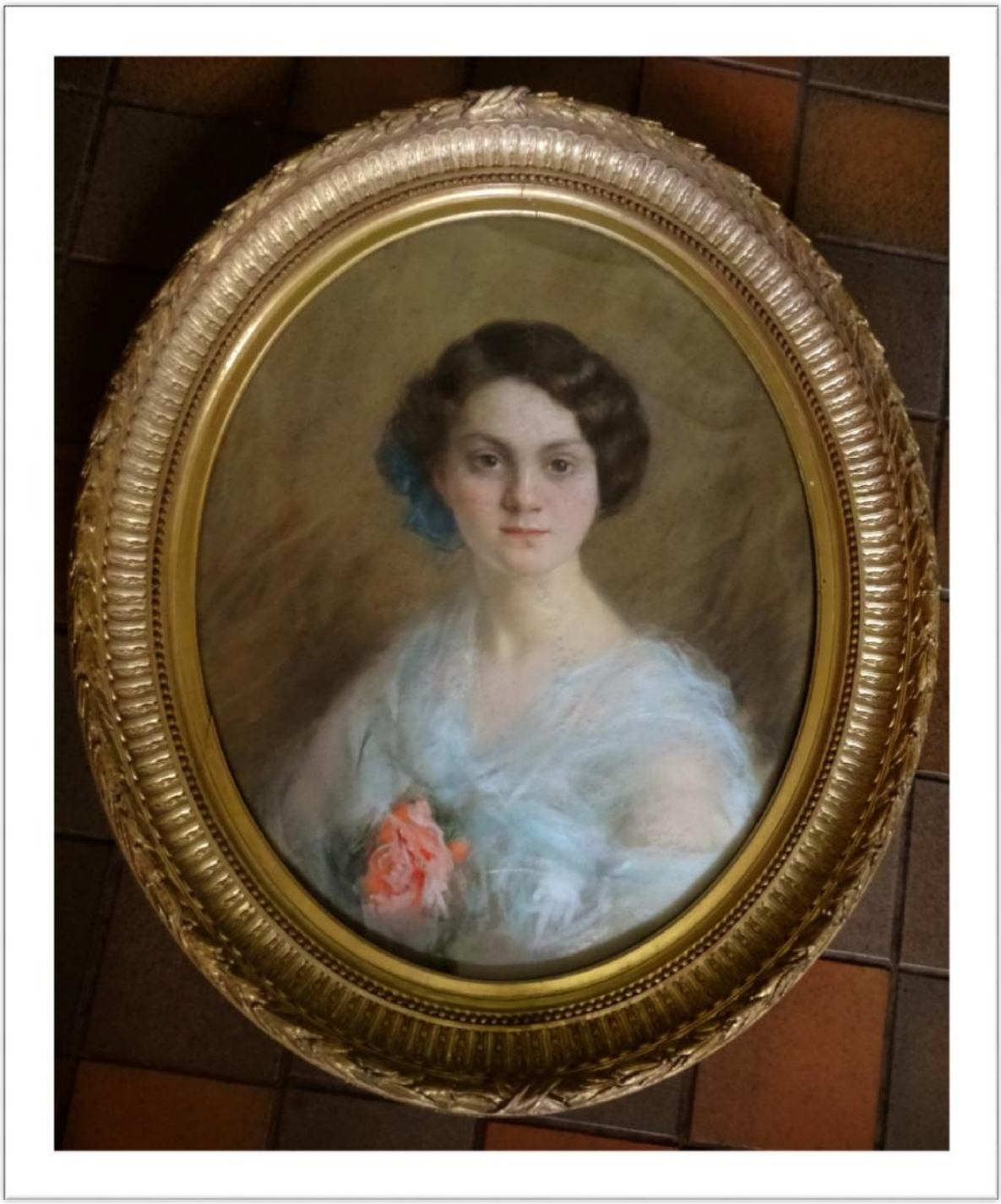
A single photo seems to show Alix in a nurse's uniform in a Temporary Hospital in Rouen but the letters say nothing of this and describe her travelling to England to see friends, spending time at her "Cottage" in Bihorel or going with her mother to the south of France on holiday. Alix sends Dudley little gifts - on one occasion a "mackintosh, a portable inkwell and a wallet" - and she describes meeting an Indian captain and talking with him about his country which made "me feel in those brief moments close to you". The letters are at once rather formal but with a naïve intimacy as Alix passes on to the wider family Dudley's news from the battlefields of the Middle East and replies to him with the light chit chat of a family in the provinces.

Alix was intimate with all the Newitts. Bonnie, Rita and Phyllis she refers to as the "Demoiselles", remarking that they have become real Americans. Lewis in her letters is always "Louis" and family folklore has it that Lewis

Alix Schaeffer

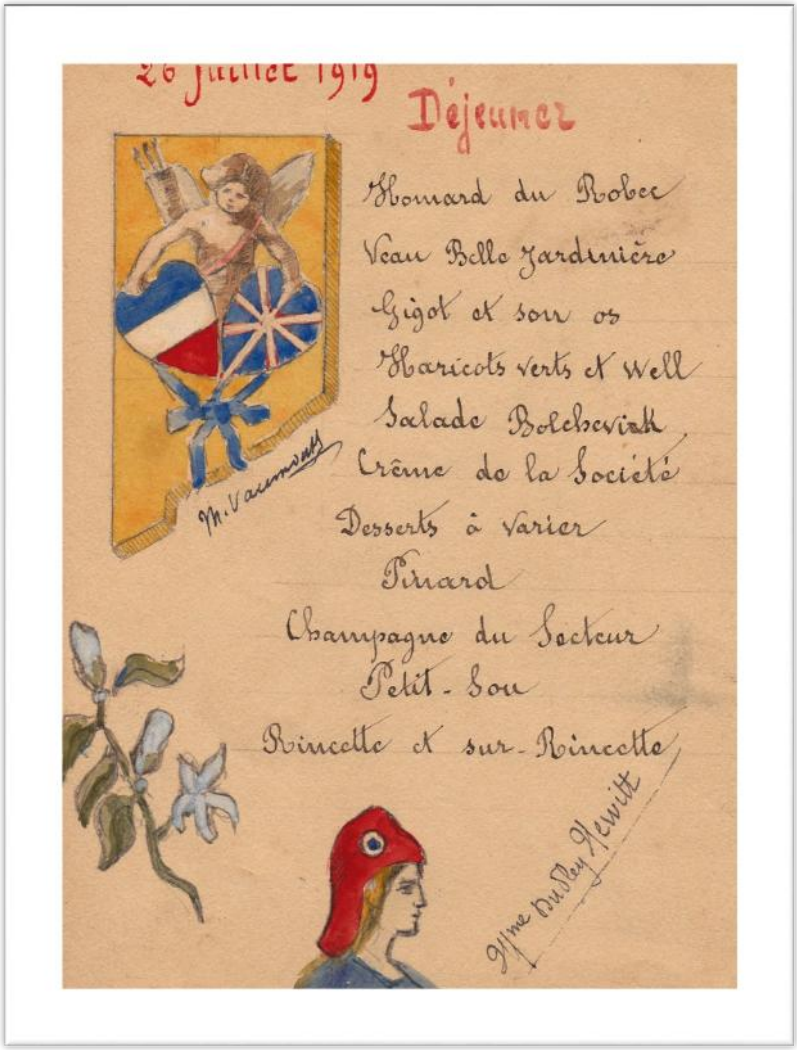
Bihorel church

Honeymoon cottage



Alix Schaeffer

was Dudley's rival for Alix's affections and lost out to his younger brother. Whatever the truth of this, the long courtship via the regular exchange of letters ended when on 26 July Dudley and Alix were married in the church in Bihorel near Rouen. Dudley's sister, Bonnie, then aged 17, wrote an account of the wedding some fifty years later. "After the main ceremony where the bride and groom knelt all through the Mass – more refined than our ceremony, there being no harping on being fruitful and multiplying – we all sat down to a light repast of seven courses, then carriages took us on lovely drives through the forest. Another banquet, and I was sent to bed while the other guests drove through the streets of Rouen tossing money to the populace". Unfortunately it is impossible to know how much of this is anything other than the product of a lively imagination. According to Dudley's Memoirs the couple spent their *honeymoon on an old farm in Normandy.* A small packet of photos survive and show views of the church at Bihorel, a view of an old half-timbered Norman country cottage and some snaps of Alix and the Schaeffer ladies.



Dudley and Alix returned to England and settled in a house in Raynes Park while Dudley enrolled to study Chemistry at the Royal College of Science. In 1922 Alix became pregnant and for reasons unknown went to the hospital of St Roch in Nice for the birth of the child. On 23 August 1923 she gave birth to a still born child and she herself also died. She was buried in the Caucada Cemetery in Nice. It is not known if Dudley was there at the time. A year later the doctor who had attended Alix wrote a cold letter in English to Madame Schaeffer simply saying "that your dear daughter died at the St Roch's Hospital at Nice, under my direction". What led him to write this letter? Does it suggest that Madame Schaeffer also was absent?

Dudley's house (on the left) in Camberley Avenue Raynes Park

How did Dudley cope with the tragic death of the young wife who had been such a good and loyal friend throughout the war? According to Professor Paul Ubbelohde, who wrote Dudley's obituary for the Royal Society, this was "a tragedy Dudley could not bring himself to mention even to his closest colleagues, who were unaware for several years that he had ever been widowed". Dudley's youngest sister, Phyllis, many years later, wrote in a memoir entitled 'My Brother Dudley':

> "I was 9 years old. I did not know the meaning of grief. My mother would pack a small basket with food and sent me to Raynes Park in the tram. Dudley would be in his study bent over his books. I did not

know what to say or do, I would sit on the floor for a time while he went on working. Then I would leave, cast down by something I could not fathom".

Dudley coped with his loss in the way that he and so many of his generation had learnt to manage the countless deaths they witnessed during the war. The memories were put aside and walled off from his on-going life. In his Memoirs he made no mention of the fact that Alix had died, but he did keep all the letters she and her mother had written during the war along with a sad little collection of photographs and a few papers relating to her death and funeral. She was never again mentioned in the family but, although never talked about, she was not quite forgotten for the magnificent pastel portrait, made on the occasion of her marriage, continued to hang in Dudley's study until his death.

Madame Schaeffer remained in touch. According to Phyllis, "from time to time [Dudley] was visited by Alix's mother, Madame Schaeffer, who had been so shattered by the death of this her only child, that she never recovered and was frequently quite out of her mind. I remember one day when, in a fit of despair, she jumped from the bedroom window, falling right through the glass roof of the sun-room below. Dudley lifted her in his arms and managed to carry her upstairs although she was a large woman. He was always very caring towards her. She called him 'mon fils' and frequently wept over him but he bore it all patiently. She died in a French Nursing Home looked after by nuns".

Dudley received a letter shortly before her death from a correspondent in Nice seeking authorisation for her funeral in the event of her death. Finally a brief telegram arrived dated 30 August "Maman decedee". Dudley inherited a lifetime's collection of books, silver, porcelain, pictures, antique furniture and bronzes. These had probably been the contents of the Hotel des Carmes but they may be linked back to the shadowy figure of Alix's father. So, although Alix herself passed from his life, he remained until his death surrounded with the material possessions of her and her

mother, the successive houses he lived in being filled with these relics of old Rouen.

The apprentice scientist - 1921-33

After his return to England Dudley had enrolled at the Royal College of Science to study for a degree in Chemistry. The Royal College of Science had formally come into existence in 1890 following the merger of a number of earlier institutions and in 1907 became one of the constituent Colleges of Imperial College. Dudley was an undergraduate from 1919 to 1921. *It was a period of hard and concentrated work. After five years in the army it was difficult to settle down to a course of study – the sudden change from an active to a sedentary mode of life posed many problems and required great strength of mind. However, I persisted and in due course obtained my first degree in Chemistry about 1921. The Royal College of Science (a constituent of the Imperial College of Science and Technology) then had a high reputation in the field of Chemistry and Physics. There was keen competition to obtain a place in either school and the standard demanded was high and exacting. The head of the Chemistry Department was H. Brereton Baker, the Professor of Physical Chemistry was J. Phillips and of Organic Chemistry, Jocelyn Thorpe. Callender was head of the Physics Department and, on his death, was succeeded by Lord Rayleigh.*

Amongst the students of my year were several who had done a number of years military service and were more adult than the average undergraduate. We had little or no time for social activities and were generally classed as 'brown baggers' the name coming from the leather attaché cases containing our books and from which we were seldom parted. Amongst my particular friends were Parsons, the son of Sir John Parsons, a famous ophthalmist, Brian Mead who later held a senior position in one of the big oil companies, Quastel, who became Professor of Biochemistry at Cambridge, Reavell, the son of the director of the Kestner Evaporator Company, and Reeve Angel.

In 1921 Dudley obtained an upper second class honours degree, "with a Governor's medal for skills in practical chemistry". After he had graduat-

ed, and while still living with his young wife in Raynes Park, he had to make an important decision about his future. *After I had graduated, my father, who had returned to England with the family,* [from the United States where he had settled during the war] *was anxious that I should join him in establishing a company for the sale of American Chemical Plant. I, on the other hand, wished to continue my studies and engage in chemical research. It was one of those cross-roads in life, the choice of which determines one's whole future. My father, who had been much impressed by American enterprise and high pressure salesmanship, was very persuasive. He did, in fact, induce my two brothers Lewis and Edward to settle in America and take up the precarious and unrewarding career of salesmen. To me this held no attractions whatever. The financial rewards, although high, depended upon establishing and maintaining personal contacts, having a tough approach, impervious to rebuffs, and an unusual buoyancy and optimism – qualities which I did not possess and had no wish to acquire.*

Eventually we reached a compromise, my father set up a company, Newitt & Son, of which I was a part-time director, while I obtained a grant at Imperial College for research in the field of Chemical Technology. I was transferred to the Department of Fuel and Chemical Technology, then directed by Professor William. A. Bone, a fuel technologist of great repute, with William Hinchley as Professor of Chemical Engineering, and George Ingle Finch as lecturer in Chemical Technology. As fate would have it I spent the remainder of my active life in this Department, ending up as Head of Department, Courtauld Professor of Chemical Engineering and Pro Rector of the College.

In 1923 I began research under Bone on the effect of high pressure on the combustion of gases. I was joined by Donald T. A. Townend who had transferred from East London College, and we formed a partnership which lasted until about 1938 when he was appointed Levesey Professor of Fuel at Leeds University. In collaboration with Bone we published some twenty papers in the Proceedings of the Royal Society on the results of our work. At the same time I attended Hinchley's lectures on chemical engineering and was greatly attracted by the subject which lies on the borderland between physical chemistry and mechanical engineering. Hinchley, whilst in no sense a great scientist, had all the fanaticism of a

pioneer, and was an inspiring teacher. It was due to his efforts that the Institution of Chemical Engineers was founded in 1922. I was appointed Assistant Secretary to the Committee which drew up the articles of association of the new Institution, and I was one of the founder associate members. I was also one of the first to contribute a paper to its transactions.

Donald Townend was Dudley's closest friend and associate for fifteen years. Following postgraduate study in fuel and chemical engineering at the Imperial College of Science and Technology, he worked with Dudley and Professor Bone carrying out investigations into combustion and high-pressure problems and held successively a Salters research fellowship and a Rockefeller international research fellowship. He became a leading expert in the field of combustion, and in 1933 discovered the two-stage ignition phenomenon of higher hydrocarbons.

Dudley's research career began, not unusually, with registration for a PhD which he duly obtained in 1924, after which he continued to work in Professor Bone's Department of Chemical Technology. As Professor Ubbelohde later wrote, "established teaching posts in chemistry were scarce at that time. Young scientists with academic ambitions had to organize intervening financial support for a number of years largely by their own efforts, from diverse grants for postgraduate work and from consultancy contracts."

Two surviving letters, dated June 1925, cast some light on the precariousness of this means of supporting a research career. The letters come from the Advisory Council for Scientific and Industrial Research which announced it was making "a personal payment" of £300 per annum [equivalent to about £16,000 in 2015] "to enable you to act as assistant to the Supervisor [Professor Bone] in an investigation of Gaseous Combustion at High Pressures". A separate letter rather curtly announced that the Council "desire me…to inform you…that they will be unable to entertain any further application for the renewal of the grant".

According to the official list of his publications, appended to his Royal Society Obituary, Dudley's first five scientific papers were published between

1923 and 1926 in the *Journal of the Chemical Society* and the *Proceedings of the Royal Society (PRS)*, all co-authored with Bone and Townend and all dealing with gaseous combustion at high pressure. Five more papers followed between 1926 and 1928, all concerned with similar experiments and published in *PRS,* co-authored with Bone, R. P. Fraser, and C. M. Smith. In fact Dudley's first published paper was entitled 'American Wooden Tank and Vat Practice'. The description of wooden tanks was almost certainly based on information gained via the activities of his father who had just formed the company (Newitt & Son) to market new American technology.

In 1928 Dudley applied for the Ramsay Chair of Chemical Engineering at University College London. Two references were supplied, by Professor Dixon of Manchester University and by the Nobel Explosives Company where Dudley had worked as a teenager. He was not appointed (the successful applicant being W. E. Gibbs) and one wonders whether perhaps this application had not been supported by Professor Bone, who was reluctant to lose his assistant. The same year Dudley was head-hunted for a chair at the University of Cawnpore but turned down the offer, in spite of the happy memories of his time spent in India.

Research with Professor Bone continued. In 1929 a grant from ICI enabled the high pressure laboratories at Imperial College to be re-equipped. Five more papers on gaseous combustion were published in *PRS* between 1929 and 1933, all co-authored with Bone and Townend or Frank Lamont, A. E. Haffner, or B. J. Byrne and H. W. Strong. This phase of Dudley's scientific research reached its peak in 1930 when he was granted the higher doctorate of DSc by Imperial College and when the magisterial volume entitled *Gaseous Combustion at High Pressures*, co-authored with Bone and Townend, was published by Longmans, Green and Co. In a description of this book, which appeared in *The Chemical Age* (January 1930), the reviewer wrote, "in the performance of the work described in this book, Professor Bone and his colleagues have shown both on the experimental and theoretical sides resource and imagination of the highest kind,

and in the era of high pressure work which is now opening before us, their book will undoubtedly take rank as a classic."

B.W.Bradford, who worked in the Department between 1928 and 1934, later wrote:

> "around the professorial nucleus there orbited several closely bound but nevertheless individual planets. Newitt and Townend were the guardians of the high pressure laboratory, the holy of holies, a region of steel walls and rope screens, entered through an antechamber filled with compressors, gas holders and enormous storage cylinders. Little ever seemed to be happening in that quiet place, but over a long period of years there emerged from it a stream of papers on explosions at ever increasing pressures and basic studies of gaseous combustion. It was not a place which the uninitiated entered lightly: there were legends of catastrophes which had befallen the careless, and smoking at an inopportune moment had been known to result in banishment to the basement for the rest of the term".

Professor Bone was aware that his research was controversial and that he had enemies in the College. Well-managed publicity was the strategy he employed to counteract this. In 1927 he staged "A Special Course of Eight Lectures upon High Pressure Gas Research". These were held on Friday afternoons and were open to the public for a fee of one pound. The same afternoon the equipment in the Department "will be open to inspection between 3 and 4pm".

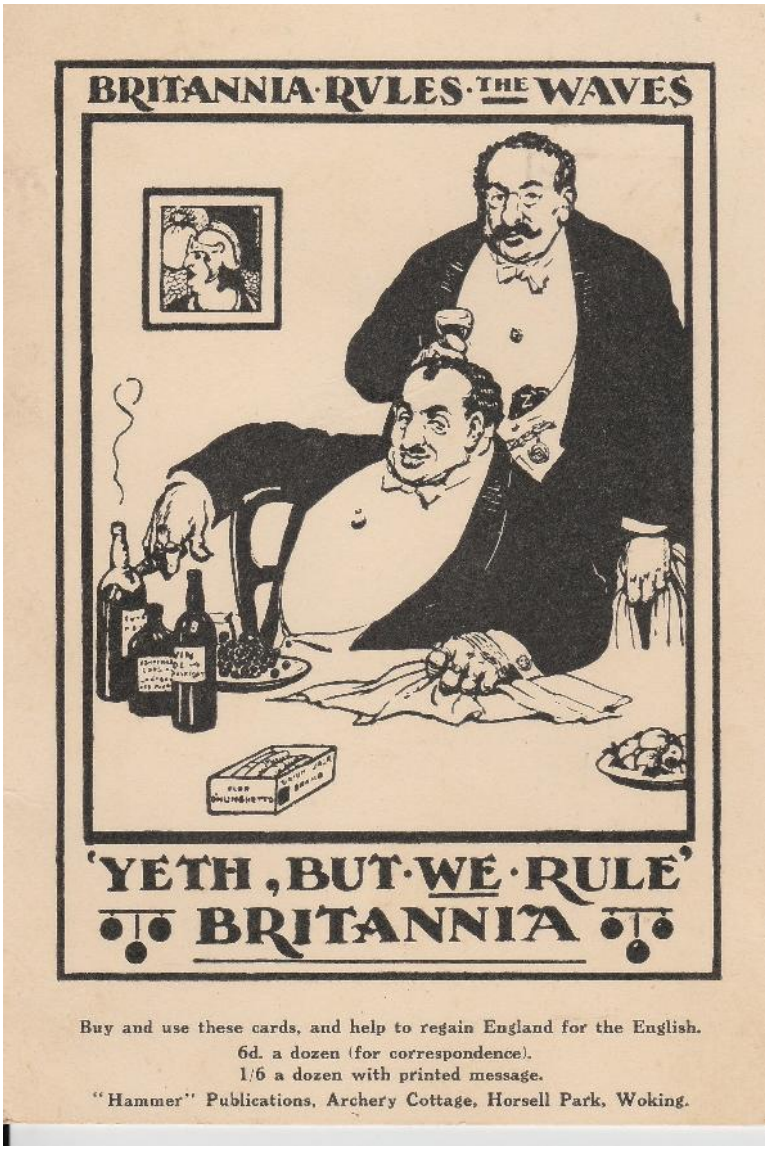
The activities of Bone and his team had already attracted the attention of the London media. On 11 July 1928 a staff reporter of *The Evening News* was invited by Bone to view the laboratories at Imperial College where he worked with Townend and Dudley. The article that subsequently appeared described how Bone's team had been "exploding gases at initial pressures up to two hundred atmospheres". The explosions took place inside "bombs" made of forged steel. When asked what would happen if one of these "bombs" burst, Bone simply replied that "it wouldn't". Nevertheless,

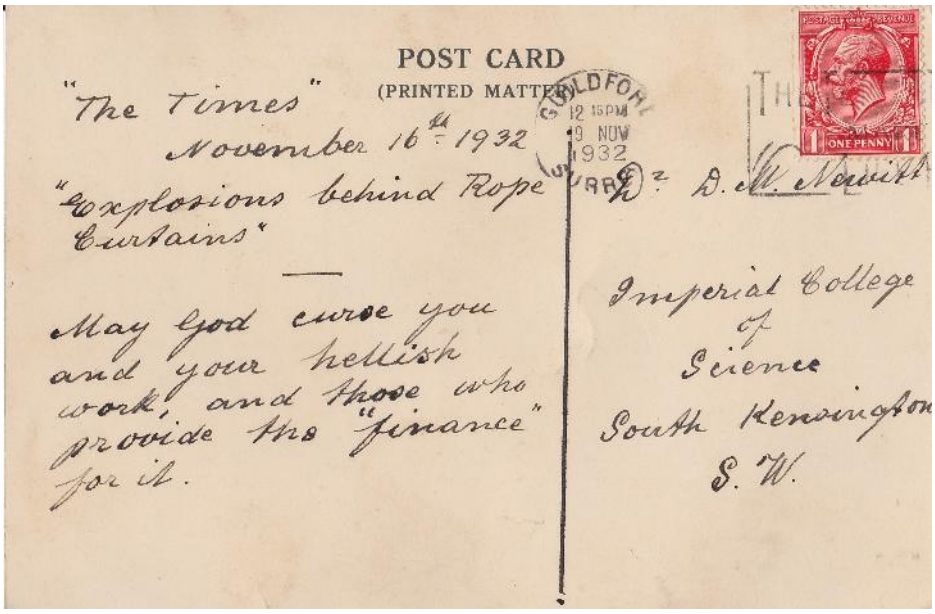
when an explosion was about to be ignited the team took refuge behind "collision mats hung on a frame to provide a screen". The mats were made of individual ropes that hung loosely. Four years later Bone released a press statement, picked up by the *Daily Sketch* (16 November 1932), which appeared under the headline 'Three Men and a Bomb'. It struck a note of alarm.

> "Explosions greater than those of the biggest naval guns have occurred in South Kensington – and no one heard them. Sufficient power was generated to blow South Kensington to pieces…. 'It is the first time', said Professor Bone, 'that such high-pressure explosions have ever been attempted, and I doubt whether anyone else except my two collaborators could repeat them safely. At any rate I should not care to remain in the room with anyone else working the apparatus."

The Times (16 November 1932) also had an article on these experiments which prompted an anonymous person to send Dudley a postcard showing two fat businessmen in evening dress, intended to be caricatures of Jews, with the slogan "Britannia Rules the Waves. Yeth, but We rule Britannia". Written on the card in a neat hand was, "May God curse you and your hellish work, and those who provide the 'finance' for it". Dudley kept this card but it remained hidden in the pages of an old French medical dictionary which he must have inherited from the Schaeffers. A very similar report appeared in the *Star Special* (6 December 1932) when Bone described explosions reaching up to 10,000 atmospheres which had the effect of distorting the steel threads of the screwed in valve and signalled the limits of what they were able to do with that equipment.

In spite of Bone's protestations that accidents 'wouldn't happen', high pressure research at Imperial College had proved hazardous. In 1920 an MSc student, A.W. Haward, was killed when a pressure gauge blew up while he was working on research into explosions at high pressure and in 1927 there had been a "serious explosion" which caused "considerable material damage due the unexpected ignition of a mixture of carbon monoxide and oxygen contained in a commercial gas cylinder". Then in March 1934 the impossible happened. "The first explosion occurred about


BRITANNIA·RVLES·THE WAVES
'YETH, BUT·WE·RULE'
BRITANNIA
Buy and use these cards, and help to regain England for the English.
6d. a dozen (for correspondence).
1/6 a dozen with printed message.
"Hammer" Publications, Archery Cottage, Horsell Park, Woking.


POST CARD
(PRINTED MATTER)
"The Times"
November 16th 1932
"Explosions behind Rope Curtains"
May God curse you and your hellish work, and those who provide the "finance" for it.
Imperial College of Science South Kensington S. W.
ONE PENNY

1.30am when with terrific force, a cylinder containing high-pressure gas blew up; almost immediately there was a fire in the laboratory, and, a moment later, came a second explosion. The windows were blown out, and smoke and flames came pouring from the laboratory, which is a fire-proof room and protected by heavy steel doors. Police and firemen kept large crowds of students who had been awakened by the explosion from approaching the building." According to the report that appeared in the *Evening News* dated 23 March 1934, the College was maintaining "the utmost secrecy…about the cause of the explosions". No one was hurt in this accident though there was a lot of damage and loss of equipment.

Working with Professor Bone

My chief, Bone, was a rugged Yorkshireman, aggressive, autocratic and given to strong and pungent language. He was a typical Victorian survival – a queer mixture of meanness and generosity. He would often take me into a Lyons tea shop, order two cups of tea and ask for separate bills. On one occasion, Townend and I spent a holiday with him in Yorkshire. Here, on his native heath, he was a different man. We took formidable walks over the moors, lunched at small inns, and returned late at night to our hotel. He was great raconteur, and could tell endless tales in broad Yorkshire dialect. Interspersed with stentorian bursts of laughter. He would have us up at dawn to go bathing in some local river or the sea, a testing experience since the water was seldom much above freezing point.

Professor Bone

On another occasion I went with him to Berlin to fight a patent action in the courts, and later we returned via Heidelberg where he had been a

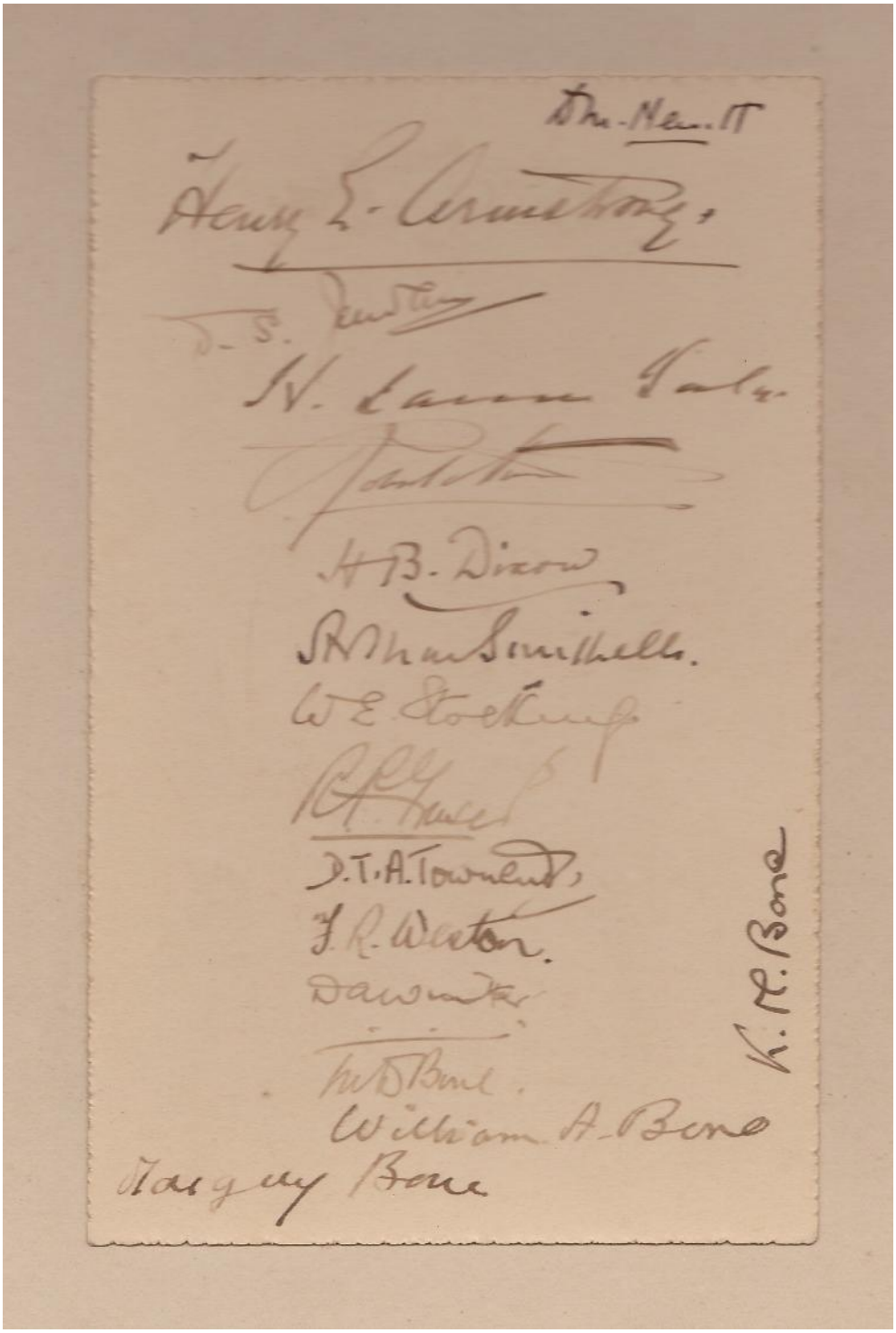
student some thirty years earlier. I walked with him along the Philosophers' Way, entertained by accounts of student life in the early years of the century; and refreshed from time to time by flagons of beer at wayside inns.

Professor Bone was not only Dudley's superior and, to some extent, his mentor from 1921 until his death in 1938. He was clearly one of the senior figures in the world of Chemical Engineering whom Dudley greatly admired. Bone was indeed a figure one might aptly describe as 'larger than life'. In the biographical note written for the Royal Society by one of Bone's assistants, George Finch, the professor's strong and erratic personality is honestly described. "Bone had firm friends in all classes and walks of life; indeed, his avoidance of class distinctions amounted almost to genius. Amongst his opponents, scientific and otherwise, he paradoxically numbered many friends, and there were few who did not admire the courage of his convictions". Bone was a pacifist, a conviction he inherited from his dissenting background, and a committed Christian but this side of his private life did not prevent him from indulging in a series of personal and academic battles which only ended with his death. He was appointed to Imperial College in 1912 where "he had the most magnificent opportunity of his scientific career. To create something new is the born artist's real desire whether he be poet, painter, musician, or scientist, and into the creation of a new department of fuel technology… Bone threw himself with whole-hearted vigour."

The Department, under his direction, was a stimulating place to work in. The students were in general terrified by him, but at the same time, learned to appreciate his scientific insight and devotion to research. He was constantly engaged in scientific polemics with other workers in the field and was a doughty fighter, asking and giving no quarter. We, his juniors, had to provide him with ammunition and in the heat of battle we toiled like slaves in a galley. [The story of his feud with Hinchley is told in detail in the *History of the Department of Chemical Engineering and Chemical Technology* and only ended with Hinchley's death in 1931.] *He and Hinchley were constantly at war, and since I had a foot in either camp,*

I had to listen to their views, of *one another couched in language which, if used publicly, would have provided material for actions of slander and defamation of character. At times the Rector and Governing body were dragged into the fight and the whole College was set by the ears as one or other obtained some temporary advantage.* These feuds enlivened the Department with the students eagerly taking sides and watching the situation "*with intense interest and open partisanship*". Although Dudley was a leading member of Bone's research empire, he also enjoyed good relations with Hinchley and when the latter became involved with the foundation of

THE ZOROASTRIANS
Donald Townend seated left Note the heavily disguised woman (Marjery Bone) seated right



Signatures of the Zoroastrians (from Dudley's photo)

the Institution of Chemical Engineers, he enlisted Dudley to act as Assistant Secretary. Dudley's ability to work with both these rivals reveals a trait in his character that was one of his strengths.

Bone attached a great deal of importance to what would later be described as 'team building'. In 1927 he invited a group of assistants and colleagues to his house to celebrate the publication of a book he had written with Townend. This led to the formation of the 'Zoroastrians', a group of Bone's friends and collaborators who met regularly to discuss ideas and problems of mutual interest. A group photo that was taken of the 'Zoroastrians' has all the light heartedness of a Victorian funeral gathering. Dudley, quite unmistakeable with his round bald head, stands on the edge of the group, his head at a deferential angle that somehow contrasts with the stern frontal gaze of his seniors. Dudley kept a framed copy of this photograph signed by all those present in his study until his death.

Dudley wrote an account of his time working with Bone which is worth quoting at length as it gives a good idea of the kind of life he, Dudley, led during the ten years following his graduation – very much subordinate to Bone and, one suspects, somewhat overawed by him.

> "Working with Bone was in some ways a hazardous and testing experience. His formidable presence, his choleric eye and his bristling moustache were such as to unnerve a timid student. He was himself a gifted and accurate experimentalist and insisted on a high standard of work in all his collaborators; any slackness or carelessness invoked a reprimand couched in language of the most blistering and picturesque description.
>
> Nevertheless, he was quick to appreciate ability and good work in his students, and once his confidence was given, was a staunch and good friend to them. Townend and I worked for many years with him, on the whole, harmoniously. He was active in obtaining financial support for our work and, in the latter part of our association, encouraged us to pursue independent lines of investigation.

Like many Victorians, he was by temperament an autocrat, intolerant of opposition and demanding unquestioning obedience. W.E.Stockings, who had worked as a student under him at Manchester and later came to the Department as a lecturer, was unmercifully bullied. I can remember occasions when Townend and I would be discussing some problem in Bone's room and he would shout for Stockings. On his appearance Bone would completely ignore him for a time, and then, fixing him with a baleful eye would bark out 'Stockings! Fetch me that slide'. Since he had no idea which of a thousand slides Bone happened to want, there would ensue a knockabout scene, with much ill temper on one side and a sullen obstinacy on the other.

Like many north countrymen, Bone was very thrifty and, whilst capable of unexpected acts of generosity, would not condone waste of any kind. We had many uncomfortable experiences when he, for example, after a long journey by taxi, would tender the driver his exact fare or, having invited us to share a cup of tea, would ask the waitress for separate bills.

In the summer of 1934, Bone invited Townend and myself to share a holiday with him in Yorkshire, the arrangement being that Townend would bring his car, that he and I would pay for the petrol and Bone would pay for the lunches. The petrol cost us about fifteen shillings a day – the lunches, which consisted of one Yorkshire cheese cake each and half a pound of unripe plums, came to nine pence. But it was on occasions such as this that Bone was at his very best. The air of his native heath invigorated him; he had an inexhaustible store of Yorkshire folklore and country tales, which he told in an inimitable way; and he enjoyed spending an evening in some local inn, engaging the local farmers and labourers in political discussions. He seemed to be impervious to cold and at sunrise would drag Townend and myself from our warm beds to plunge into some icy mountain stream."

Donald Townend was not only Dudley's colleague and collaborator, he was also a close friend. In his Memoirs Dudley later recorded that

Townend and I worked well together and our names were always coupled in our publications. Many people knew of us but few knew which was Townend and which was Newitt. We still meet on occasions and generally at Lords Cricket Ground where Townend endeavours to impart the finer points of the game, and the superiority of his County, Essex, to Surrey.

The other colleague Dudley singles out for mention in his Memoirs was George Finch. *George Finch was another unusual character – an Australian by birth, a good linguist, a mountaineer of international fame and a scientist of some distinction. He took part in the second Everest expedition, was president of the College mountaineering club, and was every bit as autocratic as Bone. He had the oriental touch and it was generally rumoured that his students always took their shoes off before entering the presence. I have known him for upward of forty years, we have been colleagues for most of that time, and yet I feel no closer to him than I did in 1922 when I first came to the Department.* George Finch was a member of the 1922 Everest Expedition when he led the final assault on the summit, reaching new record height of 27,300 feet. He was married in 1915 to Alicia Fisher. Alicia had one son whom George later discovered was not his. He nevertheless acquired custody of the boy and arranged for his upbringing. This 'son' was the well-known actor Peter Finch.

Dudley and his family 1923 to 1933

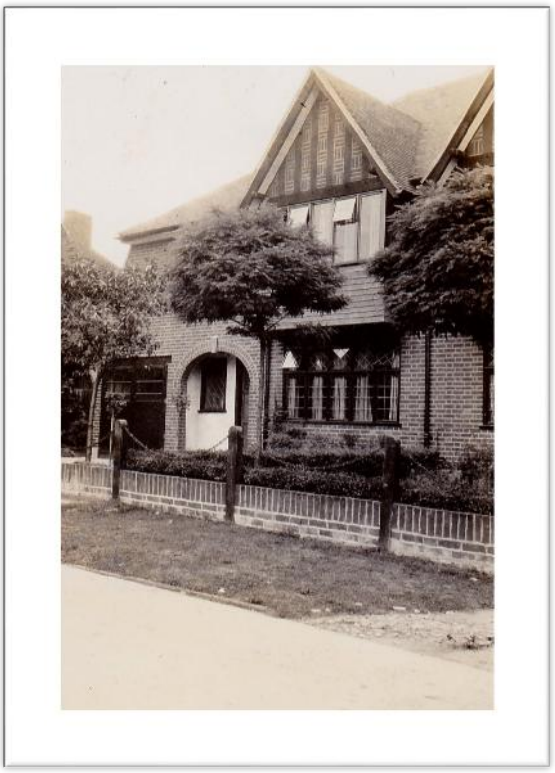
For ten years after Alix's death Dudley lived in the house at Raynes Park. It was his father's stroke, soon after Alix's death, that meant that Dudley, in effect, became the head of the family. His father was not seriously incapacitated by the stroke but, already in his 60s, he was forced to give up any attempt to run a business. He had no money and no pension, and Dudley took over financial responsibility for his parents as well as his youngest sister, Phyllis, and his maternal grandmother. They all came to live at Camberley Road. As Phyllis recalled,

> "Dudley took us in – so many in such a small place! What would have been the 'lounge', was his study and now became his bedroom too. My task each evening was to open out the uncomfortable wooden folding bed which served as a chair during the day and make it

ready. He slept on that for years. Out of his small stipend he somehow supported us all.

For a time there must have been a little extra money coming in. Dudley's two brothers and their families lived in the USA where the 'Depression' was building up. They could not have helped much. May be my father recovered sufficiently to take up some of his former work… I don't know. My sister Bonnie (also living in the USA) came to visit bringing her baby daughter (little Phyllis). Rita and I slept with neighbours to make room. When she left she took Rita with her. Granny [Lewis] died soon after so there was a little more room and I suppose the economic situation eased a little too – eased sufficiently for Dudley to turn his thoughts to me and my upbringing. When I was 13 years [in 1926] he actually sent me to a convent school in France and paid for me to stay there for a whole year. He imagined me growing up with the grace and femininity of his young French bride. (Alas, he must have been sorely disappointed).

I don't know how many years we lived with Dudley in that small house but Mother's caring presence alone must have helped him to recover from Alix's loss."



4 Coombefield Close

New Malden

Somehow, throughout the depression, when he still did not have a permanent position at Imperial College, Dudley had been able to save some money and in 1930 he moved to New Malden. He was improving his social standing and, like so many of the English, upward mobility was expressed first and foremost in moving house. No 4 Coombefield Close was much larger than the house in Raynes Park, though still semi-

detached. In a notebook Dudley recorded moving in on 12 March and, ten days later, "planted rhododendron in back garden". A summary of Dudley's financial affairs in April 1931 records an annual income of £650 plus £17.15.0 consultancy fees (worth £37k and £1k respectively in 2015). His mortgage was £1280 with repayments of £128.8.0. Against his income he claimed a widower's allowance and an allowance for Phyllis for whom he was still acting as guardian. There is also a letter to his father which indicates that he was sending money to help his younger brother, Eddie, who was suffering extreme hardship trying to survive in the USA during the depression.

During the whole of this period I was immersed in my researches, with little time to take account of outside events. My father's business venture had foundered in the depression, he had suffered a severe illness and was no longer able to engage in business, and I had to assume responsibility for the support of the family. I am glad to say that my financial situation enabled me to do this and it was a great happiness to me to be able to repay, in some way, the debt I owed both my parents. I hope and believe their last years were passed free from anxiety and in comfortable circumstances, first at Chilworth, near Guildford, and later in Surbiton.

The affairs of Newitt & Son had not prospered and in 1933 the Company was formally wound up, having ceased trading two years earlier. Dudley, although a partner in the Company, had not involved himself very much with it. However, he took responsibility for winding up its affairs. His letter to the Registrar of Companies, dated 26 July 1933, states that "the two directors, who are also the only Shareholders, have resolved to dissolve the above Company". Debts had been settled and "as the two Directors have no intention of attempting to revive a business which has been insolvent for 2 years, they will be obliged if you would regard it as defunct and strike it off the Register of Companies".

Second marriage

In 1933 Dudley was 39 years old and had been working as part of Bone's team for ten years, supporting the various members of his family from the research grants he obtained. Then, apparently unsuspected by his colleagues and his family, he married for the second time. In her memoir of her brother Phyllis describes how the family learned of this change that was about to come over all their lives.

Dudley and Jane on holiday 1935

> "One day, while Mother, Father and I were still living with Dudley, our Aunt Connie came to take us for a drive in the country. It was a weekend. Dudley had gone off earlier in the day. We were bowling along a leafy lane when who should we see striding towards us but Dudley himself, with a young lady at his side. Aunt Connie had the presence of mind to drive on without the slightest pause. Mother was overjoyed. Now we knew why, in recent weeks a heaviness had been lifted. Dudley had – at times – appeared even gay."

Dudley's "young lady" was a secretary in the Department, Dorothy Wallis Arthur, who in 1933 was 27 years old. For some reason Dudley always called her Jane. Jane was quite different from Dudley's first love. She was short-sighted and had a rather pointed nose but was a funny, talented and exciting person. Her father had been a man of the theatre, composing

songs for the music hall and organising his own concert parties and pierrot groups. He had married an actress, Mildred Reynolds, grand-daughter of George M. Reynolds, a Victorian novelist, Chartist and founder of *Reynolds News*. She had been understudy to Mrs Patrick Campbell on her South African tour and among Mildred's effects was a macabre photograph of dead bodies on the battlefield of Spion Kop where Patrick Campbell, husband of the actress, had been killed. As well as being a flamboyant actress (her studio photos show her accompanied by two wolf hounds) she was a highly gifted painter and made some fine copies of works by Reynolds (to whom she thought she was related) and Romney. She also broke in horses for women to ride.

In 2015 I was contacted by Donald Townend's grandson who said that his mother had had her portrait painted in miniature by 'Mrs Arthur' [Mildred Reynolds] in 1929. An exchange of e mails duly confirmed that this neat little miniature was indeed very similar in style and frame to other miniatures by Mildred. 1929 was four years before Dudley married 'Mrs Arthur's' daughter. Donald Townend had obviously got to know of Jane's mother's talents and it seems possible that it was through him that Dudley and Jane became acquainted.

This exciting, artistic inheritance could not have been more different from the down to earth, solid, rational, not to say technical, mentality of the Newitts. Jane herself acted in amateur dramatics (there is a photo, which her mother later turned into a miniature, showing Jane, apparently clothed only in a discreetly positioned sunshade) and was herself a skilled painter. She also had a wicked sense of humour which often took the form of composing rhymes about her acquaintances. When she met Dudley's sisters they instantly became close - Bonnie describing Jane as someone "who liked a drop of gin and knew what's what".

The registry office marriage was entirely without ceremony, all very much in keeping with Dudley's reserved, undemonstrative character and there are no photos of the couple. However, there are a few photos taken on a camping holiday in 1935 with Phyllis as one of the party. One picture has Jane and Phyllis washing their hair side by side *al fresco*. Marriage to

Dorothy Wallis Arthur

Dorothy from a painting by her mother

Dudley was marriage into his close knit family. Dudley and Jane settled in at 4 Coombefield Close. Jane continued to work, earning £150 in 1934. Phyllis was away training to be a Nursery Nurse and Dudley now bought his parents a bungalow in Chilworth, a small Surrey village, under the shadow of the downs near Guildford. Why it was decided to move out of London to a relatively isolated, if peaceful, village where his parents had no acquaintances, is unclear. They were to remain there until after the war.

No letters between Dudley and Jane survive and she is not mentioned at all in his Memoirs! However, some of Jane's letters to her sisters-in-law in America paint an amusing picture of her relationship with Dudley. Writing to Bonnie soon after her marriage she observes, "It was indeed merciful of you to type your letter if your handwriting is anything like your brother's. I am glad he didn't propose to me in writing because I should never have been quite certain if he wanted to marry me or murder me – so long as the initial letter is there the rest doesn't seem to matter to him." Commenting on the fact that Dudley seemed to get few letters from the family in America - "I suppose they tried it, & finding it about as productive of response as telling a funny story to the Albert Memorial very wisely gave it up." She promised that Dudley would soon be a reformed character "capable of now & again removing his pipe from his face to address the meeting".

Early in 1938, when Jane was expecting her first child, she described to Rita how Dudley and Eddie tried to get a room ready for the baby.

> "Between them they got a wardrobe wedged in a doorway and had to take the door off, knocked a lump off the wall and several pounds off themselves. Whenever I heard the language getting really descriptive I hastened along with a couple of tankards of beer and with the aid of this lubrication the job was done.... My young domestic walked out on me three weeks ago at a few hours notice. She alleges it was because Dudley called her a lazy idle slut but she had been working up to it for some time and the description was well deserved, if tactlessly applied. I've got another maid & have forbidden him even to say 'Good morning' in case she goes too."

At College, after a long period as a research worker, I was appointed to the academic staff as Reader and Assistant Professor. I had remarried in 1933 and Hilary, my only daughter, was born in 1938. This was all Dudley wrote in his Memoirs.

Jane gave birth to their first child on 16 March 1938 in a private nursing home in Kidbroke near Greenwich. The birth was complicated but this time both mother and child survived. Jane described to Rita how, "Dudley simply can't leave her alone – I'm going to be frantically jealous". In July she wrote, "You wouldn't know your dear brother, he has become so human. He often sleeps curled around a wet area after he has had his daughter in bed for a few moments to say goodnight". Dudley and Jane decided to hire a nanny so that Jane could continue to work. The young nanny was Nora Blackman who had trained as a Norland nurse and arrived complete with starched headdress and cuffs. 'Nanny' soon took over much of the running of the household and made all the preparations for the birth of Jane's second child.

In 1939 my wife and I paid a visit to the United States. It was a memorable occasion when, after an interval of many years, my brother Lewis and my two sisters, Dorothy and Rita, entertained us in Boston, New York and Philadelphia. Since then they have come to England on several occasions and I have visited the States at frequent intervals over the years. Our family solidarity has remained unshaken and we have approached old age united as in the time we grew up together in the early years of the century. Dudley and Jane sailed in July 1939 when war was imminent. They had difficulty getting a passage and in the end made do with "a 2-berth room in the bowels of the ship among emigrant Poles" as Jane wrote to Bonnie. "Dudley is very fit and secretly thrilled about the forthcoming trip". Jane must already have been pregnant and on their return her son, Malyn, was born on 3 January 1940. "Dudley says he looks like a ferret" Jane wrote to Rita, "and declares that his eyes glow in the dark – also that he could speak if he wanted to, he has such a cunning look.... His Daddy invariably refers to him as Little Ugly, but everyone says he is just like his father." In May she comments that "Dudley adores the children and is even begin-

ning to like me for having had a share in them" and in a letter to Bonnie describes a long walk she and Dudley took to Box Hill and reflects that "Allen's [Bonnie's husband] influence is working after ten months as Dudley seemed to desire to hold my hand. It may have been the moonlight, or the sandwiches we had for supper might have been working internally but there the fact remains".

By that time Britain had already been at war for three months and this soon brought radical changes to the life of both Dudley and his family.

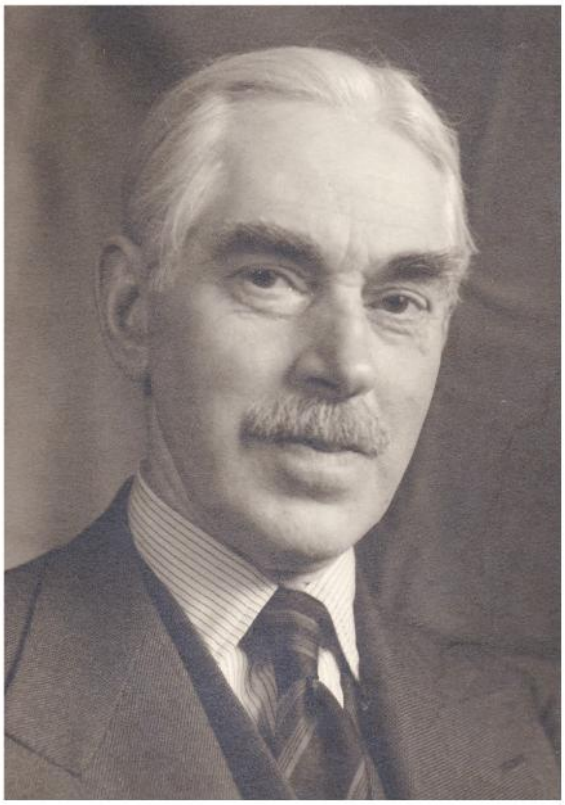
Dudley's scientific career to 1942

As we grew older, Bone gave us increasing independence in the planning of our researches, and also handed over to us the supervision of post graduate students. The reputation of the Department was constantly increasing and the numbers of students grew phenomenally. I began to specialize in high pressure work, branching out into fields of organic synthesis and polymerisation. My work was supported by generous grants from industry and I was able to equip the first high pressure laboratory in the country and establish the first course of instruction in the special technique required. Meanwhile, Bone had reached retiring age and very unwillingly, handed over the reins to Alfred (Jack) Egerton, then lecturer in Thermodynamics at Oxford. In 1933 Professor Bone had been involved in a car accident; it took him some weeks to recover and after this his career faltered. In 1935 the College put pressure on him to retire and in 1936 he formally relinquished his position, retreating to a new laboratory to continue his research. He died in 1938.

The appointment of Egerton changed the whole Department. *It was an intriguing situation since no two men could have differed more in temperament; Bone had for years violently attacked Egerton's work and was much incensed because Egerton refused to cross swords with him. The College Rector was then Sir Henry Tizard, who was an old friend of Egerton's, and refused to listen to Bone's diatribes. He, however, found it necessary to buy off Bone by providing him with lavish laboratory accommodation in*

another building of the College, while Egerton took over control of the Department.

There could not have been a greater contrast between Bone and Egerton. Egerton came from an aristocratic family. His father, descended from the Earl of Bridgewater, was Comptroller to the Duke of Connaught. His mother was the daughter of Lord Harlech and Lady-in-Waiting to the Duchess of Connaught. Alfred Egerton, who was himself knighted in 1943, married the Hon. Ruth Cripps, daughter of Lord Parmoor and sister of Sir Stafford Cripps, the future Labour Chancellor. Jack Egerton was cultivated, soft spoken and of patrician manners. He was also a very accomplished artist. Dudley became close friends with him and his wife, a friendship which lasted the rest of their lives. As Dudley wrote, *the change was not unwelcome. Egerton was a considerate, polite and friendly person to work with. He gave complete freedom to members of his staff to pursue their chosen lines of research; he transplanted his own researches from Oxford, and raised money for extending the Departmental library and workshops. We became great friends; I am indebted to him for numerous acts of kindness and a generous support for my work. Lady Egerton also added to the amenities of the Department, took an active interest in the social life of the students and brought us all together as one family in a way that Bone could never have done.* One of the first developments of Egerton's 'reign'



Sir Alfred Egerton

was the introduction of an undergraduate degree in Chemical Engineering which began in the academic year 1937-8. In 1942 the name of the department was changed to the Department of Chemical Engineering.

In 1936, at the time of Egerton's arrival as head of Department, Dudley was made Reader in High Pressure Technology, and Assistant Professor. Now, at last, at the age of 42, he had a salaried academic position. During the 1930s Dudley's income from consultancy grew steadily. In 1931 he had recorded only £17.15.0, in 1934 it was £50.0.0. In his tax returns for 1938-9 he is receiving fees from ICI, Leonard Hill and Distillers amounting to £250 and in 1941 his consultancy was earning him £560 while his salary remained unchanged at £650. Between 1933 and 1941 Dudley published 34 scientific papers in collaboration with a number of different researchers, some with his old colleague Townend and some with the future Rector of the College, Patrick Linstead. Five of these were published in the *PRS* and 10 in the *Journal of the Chemical Society.*

Dudley was awarded the Moulton Medal by the Institution of Chemical Engineers for 1936 for a paper entitled 'The Design of Vessels to withstand high internal pressure'. He was awarded the medal a second time in 1939 but declined it so that another scientist could receive the honour. In 1937 he contributed an article entitled 'High Pressures and Liquid Phase Reactions' to Thorpe's *Dictionary of Applied Chemistry*. This is not among the list of his publications drawn up by the Royal Society. Then, in 1940, the Clarendon Press published Dudley's *magnum opus*, *High Pressure Plant and Fluids at High Pressures.* This was a massive and complex work, running to 491 pages, and the type-setting and proof-reading alone must have been formidable tasks for the press as well as for the author. In the Introduction Dudley wrote, "in preparing this book an attempt has been made to survey briefly the specific effects of pressure upon physical processes taking place in liquid and gaseous systems". He drew attention to the "serious lack of fundamental data of all kinds relating to condensed systems" and explained that for this reason he had given a lot of detail about apparatus and the design of high pressure plant.

The outbreak of the Second World War

Before Egerton could complete the re-organisation of the Department we were faced with the threat of another great European conflict. Plans for extending the Department had to be shelved, and we began to deploy our activities so as to be prepared to concentrate on a war effort. In 1938 Egerton and I attended a scientific conference in Nancy. We drove across France in lovely summer weather, pausing on the way to sample the produce of the Champagne country and to visit places of historic interest. Whilst the conference was under way the international situation worsened. The French army received orders to mobilize and we were advised to return home as quickly as possible. The English contingent had two private cars at its disposal, Egerton's and Reginald Fraser's. Fraser and his wife were old friends of mine and he had been associated with the Department almost as long as I had. Driving back to Calais, we could not but become aware that the French had little heart for the coming struggle and everywhere was a feeling of anxiety and gloom.

At Calais there was a scene of great confusion as numbers of English tourists converged upon the docks, clamouring for passages home. Egerton and Ubbelohde, one of his students from Oxford days, decided to stay in the queue whilst Fraser, his wife and I decided to take a gamble and spend a few days at Deauville. This luxury holiday centre we found almost deserted, the hotels were nearly empty and the shopkeepers were selling off their stocks at bargain prices preparatory to shutting down. We made a fine haul, our car being loaded with contraband goods of every description. Returning to Calais we found the great rush over and had no difficulty in obtaining a passage. On arrival at Dover we anticipated considerable difficulty from the customs, but in the event they were so exhausted by their efforts in coping with the rush of the previous few days that we were passed through without any trouble.

War was declared in the summer of 1939, and listening to the thin, reedy voice of Neville Chamberlain, patiently trying to capture the deep organ tones of a national leader, one could not help feeling misgivings as to the outcome. There was much hasty improvisation, the digging of trenches and dug outs, the evacuation of children from large towns, the issue of gas masks and the imposition of the black-out. Nearly five years

were to elapse before our streets were again lighted and traffic could flow freely.

I at once applied for military service, was given a medical examination, and was told to wait for further instructions. There was no rush to expand the army as in 1914, and pending calling up I continued to work at the College. The 'phony' war which lasted until 1940 puzzled the military pundits who thought that the Maginot line – a string of heavily fortified strong points and trenches – would be impregnable and would ensure the repetition of trench warfare after the pattern of 1915.

In 1939 Dudley was 45 years old and already beyond the normal age for military service. He also had a young family to consider. However, the outbreak of war seems to have reawakened the sense of excitement and adventure that had led him to enlist in 1914. Life as a research scientist had been rewarding and had absorbed his energies but it had also had its frustrations. Men in their forties often feel that their lives have reached a dead end, and Dudley's eagerness once again to be in uniform is clear from the account he later wrote in his Memoirs. In April 1940 he was told that his application to be enrolled in the Army Officer's Emergency Reserve had been accepted and that he was being assigned to the Royal Army Ordnance Corps – Administrative Staff. Clearly unimpressed with this, he applied to the India Office but was told that "applications for service under the Government of India or for duty with Indian troops in any theatre of war are not at the present time being entertained in England." Moreover "The Indian army reserve of officers was disbanded in 1922". Dudley was told that because he had not been a regular officer in the First World War he would be gazetted as a Lieutenant or 2nd Lieutenant and he was told to report for duty on 19 March 1941, when he was nearly 47 years old. Meanwhile he had found his own way of being active.

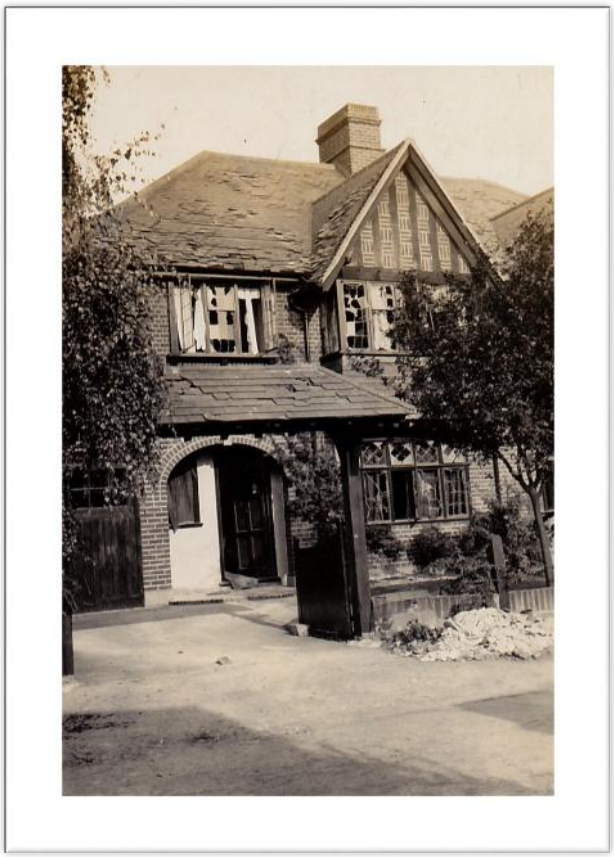
There were occasional bombing raids on a very minor scale but none of the heavy attacks which had been anticipated as a prelude to all out war. To fill in the time, I joined the River Patrol – a semi-naval force of motor launches charged with guarding the river against a parachute landing. Our role was by no means clear – we were issued with a machine gun and

some ramshackle arms and we solemnly patrolled the river – in my case the reach between Kingston and Richmond – stopping to deal with any infringement of the black out and being entertained to free drinks by the string of night clubs which adorned the banks. It was a pleasant, if somewhat bibulous life. Later when the bomb attacks on London began in earnest, we had a wonderful view of the search lights criss-crossing the sky in search of the enemy bombers, the spread of fires in the city and dock areas, and occasionally the descent in flames of a bomber after receiving a direct hit. The river at dawn presented a peaceful picture, with herons feeding in the shallows and barges passing through the locks in strong contrast to the inferno of the previous night.

Dudley's Certificate of Enrolment in the City of London Local Defence Volunteers is dated 6 August 1940.

In the spring of 1940 the real war broke out in earnest with the occupation of Norway, the capitulation of France and the evacuation of our army at Dunkirk. The Germans occupied the channel ports and London came under regular bombing attacks. I was living in Coombefield Close, New Malden at the time, and in one of the first daylight raids, a fifty pound bomb made a direct hit on my neighbour's house. My own house was severely damaged – all the tiles were blown off the roof, the ceilings were cracked and fell in a cloud of plaster, and all the windows came out. Both Hilary and Malyn were in the house at the time and took refuge with Nanny under the stairs. They were not at all perturbed by the wreckage and a short while after Hilary, aged three years, could be seen with a dust pan and brush trying to clear up the mess. I sent them off to Chilworth forthwith to stay with their grandparents, whilst I remained to organise temporary repairs. At the same time I built an underground shelter in the garden in which I slept for the next few years.

This rather dramatic arrival of the war in suburban London came close to putting an end to Dudley's family. Malyn was only a few weeks old and had been placed in the front garden in his pram to get some fresh air. Nanny had brought him in only a few minutes before the raid. The Ger-



4 Coombefield Close

after the bomb

man plane had not only dropped a bomb but had strafed the houses with its machine gun. Bullets came in through a downstairs window and made two holes in a large oil painting of the Seine at Rouen. Dudley never had this repaired and the holes remain as a memorial of the raid to this day. Dudley's barograph was also stopped and was left unrepaired, frozen in time at the moment of the blast. Pictures taken after the raid show the roof of Number 4 still largely intact but the windows in the front all blown out. Early in the war it was possible to get buildings repaired and the house was soon habitable again.

My next door neighbour, Apps, also built a large shelter above ground which soon became a social centre for evening gatherings. As winter approached, the warning sirens sounded at 5.0 pm as regularly as clockwork. Some ten of us would then gather in the Apps shelter, have an evening meal and afterwards play cards. The spectacle outside was frequently dramatic and always noisy. We could hear the drone of the approaching enemy aircraft – then would come the crash of the anti-aircraft barrage – search lights lit up the sky and, after a time, the sky over London would glow with a deep red as fires took a hold.

I had often to stay late in London and either walk or travel to Waterloo by underground. There were no taxis to be had – the streets were often inches deep in broken glass if a bomb had fallen in the vicinity, and there was a constant rain of fragments from exploded AA. shells. The underground railway stations presented a weird picture. They were open to the public as shelters, and about dusk, people poured in with their bedding,

picnic baskets, and personal belongings. It was a good tempered crowd through which passengers had to pick their way to the trains or exit. Waterloo Station with its glass roof was less pleasant. A loud speaker would, from time to time, warn passengers to lie flat on the ground whilst approaching bombers passed overhead. There were only a few dim blue lights on the station and the trains were in almost complete darkness.

As the intensity of the bombing increased, I sent my wife and the two children to the Noyadd near Rhayader in Wales. The house belonged to Sir Alfred Egerton who placed it at my disposal for the duration of the war; it was commodious, had a large garden and was situated on the banks of the Elan river not far from the great dam. Dudley's family, with Nanny indispensable in attendance, spent about a year in Wales before returning after the Battle of Britain had made the skies safer over London. There was an irony in choosing Rhayader as a place of safety as the dams, which supplied the Midlands cities with water, were clearly a possible target for enemy bombers. Jane described the house to her sisters-in-law in December 1940, "there are brick fireplaces, beamed ceilings and stone floors. The whole place was obviously designed with the idea of giving the maids something to do, but we have settled down quite well".

The Noyadd

For the first two years of the war Dudley remained at Imperial College. According to a report written by Egerton, "Dr Newitt in the early part of the war continued to look after some of the foreign students and others

who were completing their research work". Dated 15 April 1941 is a printed document from the Kingdom of Belgium Board of Education thanking Professor Newitt "for the unstinted assistance he kindly gave to Belgian refugee students in England enabling them to continue their studies".

Egerton formed a group to work on the practicability of using methane as a substitute for petrol and Dudley worked on the design of plant for the liquefaction of methane. That he remained active in his research is shown by four scientific papers published in 1940 and a further two in 1941. In 1942 he was elected Fellow of the Royal Society, joining Bone and Egerton as members of that august body.

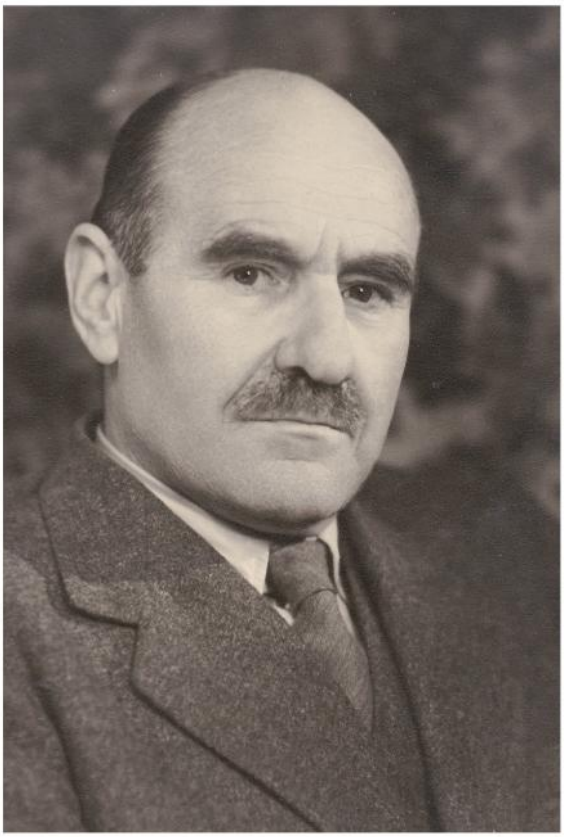
At College we were soon completely involved in war work. One of our objectives was to explore the possibility of using liquid methane as a substitute for petrol, which was then becoming short in supply. The chief source of methane in this country was found among the coal mines in Staffordshire, and we designed, constructed and operated a small plant for liquefying it. Later we demonstrated its use in a motor coach engine. Another objective was the design of incendiary bombs, and as a corollary, the improvement of methods of fire extinguishing. One of my assignments was to watch the progress of fires started by incendiaries and try to formulate the best strategy for confining them. I spent many nights on this hazardous duty – hazardous because a major fire acted as a magnet for the second wave of bombers. The scene was macabre. The fire brigade turned the area into a swamp – the site was encumbered with rubble from falling buildings – broken glass was everywhere. Rescue squads were digging among the ruins and ambulances were coming and going amongst the wreckage. Dawn, when the 'all clear' sounded, revealed a scene of desolation and chaos. During the day cleaning up operations had to be undertaken in order to keep the streets clear for traffic. A mountain of rubble was built up in Hyde Park which grew in size day by day.

I was also involved in bomb clearance operations in the Kensington district. Unexploded bombs of immense size had to be located and removed as quickly as possible. Some of these were fitted with time fuzes and attempts had to be made to remove the fuzes before the bomb could be lift-

ed and carted away…. In doubtful cases, the bombs were taken to Hyde Park and detonated in prepared trenches. My step-uncle, Nevil Newitt, was an officer in the bomb disposal unit and had many dangerous and nerve testing experiences.

The Making of DSR – Ian Fleming's 'Q'

In December 1939, with war just declared, Dudley had been asked to be an Associate Member of the Ordnance Board, an advisory body dealing with matters related to artillery, located in the Ministry of Supply. The war government already had him in its sights. In 1941, at the age of 47 and while still waiting to be called up to serve in the RAOC, Dudley was asked to head the research wing of what was then known as the Inter Services Research Bureau (ISRB). This name provided a false front for a rapidly growing clandestine operation which was part of the secret SOE, the Special Operations Executive. Since his adventurous career in Mesopotamia and Palestine Dudley had spent twenty years as a research scientist, always working with men who were leaders in their field. During this time he had not only become an expert in the field of high pressure science but had taken over control of the high pressure laboratories at Imperial College. He had been a founder member of the Institution of Chemical Engineers and had been active in its affairs. However, his appointment as Director of Scientific



Research for SOE was the first time he found himself in charge of a major organisation which soon came to employ over 600 people.

It is not clear why Dudley was selected or if there were other possible candidates. His appointment must have been made on recommendations from within the scientific community and his name came forward because of his acknowledged expertise in the field of high pressure work (including the management of explosions). His previous military career was an added recommendation because it was thought to give him a perspective on the needs of the soldier on active service. Colonel Tommy Davies, a director of Courtaulds, had been appointed to be head of SOE's Research, Development and Supplies. To head the 'Research' component "Davies sought a scientist who could visualise SOE's needs and gather round him a team of the best minds, skills and knowledge. The organisation had to have a degree of flexibility which would attract original and inventive types." Those working in the secret services were always referred to by initials, never by name. From this time Dudley was officially known as 'DSR'.

In 1943 Dudley was granted the honorary rank of Lt Colonel. Colonel Kennedy making the request explained, "uniform and title would only be used on certain occasions which can be defined as (a) when he visits military stations or (b) when he accompanies operations overseas. It is especially important to provide for this latter contingency in case such an operation met with unfortunate results, particularly in regard to possible capture by the enemy". Copies of the formal correspondence relating to Dudley's appointment have survived among his papers. The formal offer of a post that "we agreed should be termed 'Director of Scientific Research'" was made 29 May 1941. In this letter there is a mysterious reference to "the charter you have described" and to the fact that events may not "permit of a rigid application of your theories". He was to be paid £1250 (the equivalent in 2015 of £62,000). His letter of acceptance was dated 3 June. Notifying Imperial College of his appointment, he wrote that, "the post would be practically whole time, although I have stipulated that I be allowed to supervise work I have going on here...and should probably be

able to carry out my normal lecturing during next session". The Acting Secretary of Imperial College, H.T. Ellingham, responded warmly on 4 June saying that the Rector accepted the secondment, adding that "if the job is what he thinks it is, someone has made a first rate choice."

Douglas Everett remembered Dudley as he was at the time of his appointment.

> "Newitt's tenacity of purpose and resolution were major factors in his leadership of SOE's technical development. His training in chemical engineering and his military experiences in the First World War meant that he was in a good position to make realistic assessments of proposed projects and to curb some of the more fantastic ideas that were propounded from time to time. He was outgoing, clubbable and his good sense and natural kindliness 'tinged with a delicious sense of irony' made him a notable leader. His slightly twisted yet disarmingly friendly smile usually meant he was about to fire a challenging question to which he expected an equally incisive reply. There were those, it is said, who looked upon him as a typical absent-minded Professor. If that was how he appeared to some, then it was almost certainly a deliberate pose concealing his efficiency. The energy and drive he put into his job gave little support to this view".

The main purpose of the Stations under Dudley's overall direction was to provide the full range of technical support for SOE agents operating in enemy controlled territory. When Ian Fleming came to write his famous series of James Bond novels he introduced the character of 'Q' – the director of the department that designed gadgets and secret weapons for Bond and his fellow agents. It is not known if Fleming had any particular individual in mind when he created 'Q' and it has often been assumed that the character was modelled in some way on Geoffrey Boothroyd, a firearms expert Fleming had met. Another candidate who has been advanced as the inspiration for Fleming's 'Q', is Charles Fraser-Smith. However, Fraser-Smith always portrayed himself as a lone individual working in secret, while the 'Q' of the Bond films is the head of a technical research section working specifically to support secret service agents. In the early Bond films 'Q'

was memorably played by Desmond Llewellyn and was the person who provided Bond with equipment ranging from his famous Aston Martin car to briefcases containing golden guineas, and watches with geiger counters. In the process of being kitted out Bond witnesses a wide range of experimental gadgetry in the process of development by Q's technical team – including the levitating tea tray that can decapitate the unwary at a tea party.

In the Introduction to the reprint of *The British Spy Manual,* Sinclair McKay brings the fictional world of Bond close to the real world of the SOE research operations of Station IX. He refers to SOE's "quirky and eccentric genius that later found its mass entertainment expression in Ian Fleming's Major Boothroyd, better known as 'Q'. In the Bond films the visit to the gadget laboratory was always a moment of light relief; the audience were invited to laugh at some of the boffins' excesses. Yet in the real world of SOE, ingenious contraptions were deadly serious." It is also worth noting that Paul Dehn, one of the scriptwriters for the early Bond films, had worked at the SOE training station at Beaulieu. Q's position in the operations of the secret service was exactly the position occupied by Dudley between 1941 and 1945 and the range of explosive and technical gadgets developed by Dudley and his teams were precisely of the kind that 'Q' made available for Bond before he set out on his various adventures. Without a doubt, DSR (Dudley) was the real prototype for the famous 'Q'.

Dudley gives an interview

The description of Dudley as the "absent-minded professor" may have been derived from the only interview Dudley is known to have given about his SOE work. In 1976 he met Stella King who was engaged in researching a biography of Yvonne Rudellat, an SOE agent code-named Jacquelline. She assured him in advance that her manuscript would be vetted by the Ministry of Defence. After the interview she wrote, "I had not realised the scope of your activities in SOE - far beyond those of which I have already heard". She also thanked Dudley for being "kind enough to check the manuscript when I have written the draft" which suggests that what she wrote was accurate enough as far as Dudley was concerned. In her book a whole chapter is devoted to the 'SOE Boffins'.

The chapter begins: "In the carpeted third-floor executive offices at Special Operations Executive headquarters worked a man in his late forties. His name was Dudley Newitt but almost everyone up there called him 'the absent-minded professor'". His absent-mindedness, she wrote, was "because his mind so concentrated on the work on which he was engaged, that to him nothing else seemed as important or worth remembering. 'Have I had my tea today?' he would ask, ten minutes after he drank it. And frequently he forgot his hat, or his umbrella or his overcoat. All of them insignificant items. For never did he forget anything connected with the ultra-secret department he directed from 64 Baker Street; though, to tell the truth, he was rather annoyed at being taken away from his peacetime job at the Imperial College".

According to King, Dudley had first been "seconded to the War Office, where he played a major part in helping Colin Gubbins's Secret Army and, like Gubbins, was then transferred to SOE. There, from his Baker Street office, he was to build up an anonymous high-powered task force of around 500 brilliantly clever, secretive, unsung and sometimes astonishingly brave scientists. Yet so self-effacing was Dudley Newitt that many of those who worked for him throughout the war remained unaware of his identity. He had the same gift of anonymity as Yvonne Rudellat."

SOE and the Inter Services Research Bureau

Dudley briefly described his appointment and the work of SOE in his Memoirs. *In 1941 I was called up and appointed Director of Research to the Inter Services Research Bureau, a branch of SOE. This was one of the very secret organisations set up by the Foreign Office, and charged with organising and carrying out subversive warfare in enemy and enemy occupied countries. Many books have now been written describing some of its activities, but no single one of them covers the whole gamut of operations carried out in the field by propaganda, sabotage, organized guerrilla warfare and other less reputable forms of mayhem. Our agents were active in all countries which were directly involved in open warfare or were suspected of aiding the Axis countries. The general pattern was to establish cells of resistance in occupied territory, maintain wireless contact, and*

provide the means for carrying out sabotage operations. Agents, trained in this country, would be parachuted in and, in due course, brought home again by carefully planned night operations. The Gestapo were very alive to these activities and many of our cells were located and picked up, and a fresh start had to be made. We had to deal with agents and double agents, with partisans, with French and Polish refugees and with an unprincipled body of misfits who cared not one straw for either side but were dedicated to feathering their own nests. All these had to be carefully screened and given a security rating.

The Special Operations Executive (SOE) had come into being in July 1940 through the mergers of three earlier organisations which were involved in clandestine operations. It was a secret organisation and many of those who worked for it in some capacity or other had no idea of its existence. Its activities were hidden behind the facade of a non-existent body, the Inter Services Research Bureau. SOE's remit covered the recruitment, training and equipping of agents to carry out sabotage and subversion in enemy held territory, the organisation of secret operations and the gathering of intelligence. As its activities expanded, it had operatives in all the major theatres of the war and at home had as many as 70 Stations for research, production, distribution and training purposes.

From the start it was seen to be important that SOE should have its own research and development organisation to design and produce the range of weapons and equipment needed for its operations, an organisation which would allow it to act independently of the three Services. A number of semi-secret research and development operations were already in existence. One of these was the so-called Section D of MI6 under Major Lawrence Grand which had recruited a team of military men and some scientists to carry out some initial work on explosives. Meanwhile the War Office had established Military Intelligence (Research), or MIR, with Major Colin Gubbins in charge of research into the techniques of guerrilla warfare and Colonel Tommy Davies in charge of 'facilities'. These units were all brought together in SOE. At first SOE was under the Ministerial control of Hugh Dalton and was headed by Sir Frank Nelson who held the po-

sition until May 1942 when he was succeeded by the banker Sir Charles Hambro and in September 1943 by Gubbins. Fredric Boyce and Donald Everett commented, in their book *SOE The Scientific Secrets,* that "at this stage, with the exception of a few Regular Army Officers, the whole staff was amateur. Mercifully, the organisation was free from the minor bureaucracy of a Government department… SOE was financed by secret funds from the Ministry of Economic Warfare and for some time… its officers were paid monthly in crisp, white £5 notes – until the Inland Revenue became aware that some people were not paying income tax." In February 1942 Lord Selborne took over Ministerial responsibility. Dudley seldom spoke about his SOE work but occasionally indulged in wicked reminiscences, one of which concerned the use of some land belonging to Lord Selborne for testing incendiary devices, with unfortunate consequences when some of these were eaten by his lordship's cows.

Dudley's comments on the organisation in his Memoirs are revealing. *The organisation of my own branch of SOE was curious. At its head was Sir Frank Nelson, an industrialist, supported by a staff of civilians drawn from industry, the banking world, and seconded naval and military officers. Amongst them were Sir John Hanbury-Williams, T. Davies and George Courtauld – all directors of Courtaulds Limited - Sir Charles Hambro of the well known banking firm, Maurice Lubbock a son of Lord Avebury, Lord Bearstead, an oil baron, and in charge of finances, John Venner, a member of a firm of Chartered Accountants. There was an air of amateurism about the whole outfit; no one knew quite what was the role of SOE in the general war strategy. We were regarded with intense suspicion by the three Services. At times I had the feeling that we were playing a complicated game, dangerous and irresponsible. At others there did seem to be an underlying serious purpose to our activities.*

According to the unpublished 'History of the Research and Development Section of SOE', "the duties of DSR were to be a) chief advisor on all scientific matters b) to initiate and plan research on all mechanisms and chemical devices c) to participate in short or long term planning where technical matters are involved". Dudley's first task was to rationalise

SOE's research and development activities and to separate the R & D work from Production and Supply. The former was to be located at Station IX (The Frythe) and the latter at Station XII (Aston House). Camouflage, which at first was also located at Station IX, was later moved to Station XV. In 1943 a Headquarters Research and Production Committee was established to have general oversight of the activity of the Stations. Both Davies and Dudley were members of this Committee, but Boyce and Everett concluded that it had "no great influence on the day-to-day running of the DSR section" where Dudley ruled supreme.

Although Dudley's headquarters were initially at 64 Baker Street, he later moved to Station IX where the major part of the research activity was based and which was located at the famous Frythe, a country house near Welwyn in Hertfordshire. Under Dudley's overall control there were four sections – Headquarters, Experimental (also called the Physico-Chemical section which had sub-sections dealing with explosives, incendiaries, fuses and small mechanisms, and physiological matters), Operational Research and Trials, and Engineering. Dudley described in his memoirs how *we took over an old country house – The Fryth – situated near Welwyn, and set up laboratories and workshops well equipped for our purpose. Given a free hand and a highly qualified staff, the Fryth soon became a centre of great activity. New ideas, ingenious new devices and improved equipment poured out in a constant stream.*

Dudley's other immediate task was to recruit scientists to work in the various fields of expertise that were required. Here his wide connections in the scientific world were employed to good effect and among those recruited were six future professors and Fellows of the Royal Society, among them Douglas Everett, who co-authored the book *SOE the Scientific Secrets*, Gordon Cox, A. G. Ogston, W. J. Cruickshank, K. Callow and C. H. Bamford who was co-author with Dudley of two scientific papers published after the war. "In one way at least", wrote Stuart Macrae, " SOE was like a club, for membership was by invitation only". To have selected such a team of high-flying scientists was in itself a considerable achievement but, as well as academic scientists, Dudley recruited many brilliant, inventive

but frequently distinctly amateur and unlikely technicians, including special effects experts from the world of film.

The Research Department, of which I was now the director, consisted of a small group of scientists and engineers, unorganised and without clear directives. E. C. Bailey, a lecturer from University College, was in charge of the scientific side; John Dolphin, a young engineer, fertile of ideas and with plenty of initiative, was in charge of the equipment side; Leslie Wood, a Director of Bells Asbestos Company, had charge of production. Later I appointed N. Wills a one time film director and an instructor in the camouflage school, to set up a camouflage unit. This proved a great success in that Wills recruited a number of interesting types from the film industry and established a bohemian atmosphere of complete irresponsibility in the midst of our more serious deliberations. On my staff were also M. B. Donald, later Professor of Chemical Engineering at University College, Francis Freeth from ICI, A. Meek an explosives expert from Waltham Abbey, Gordon Cox, later Secretary to the Agricultural Research Council, and Paul Haas, a biochemist from University College.

In this final report written in 1945 and entitled *The Organisation of Research & Development to meet the requirements of Subversive Warfare*, Dudley wrote the following about the selection of personnel.

> "Selection was on the basis of qualifications, age and physical fitness, particular attention being paid to the applicant's capacity for hard and sustained effort and originality of outlook. Post graduate students of Chemistry or Physics with one or two years experience of research proved in many cases very well suited to this type of work. Much more difficulty was experienced in obtaining good development engineers and design draughtsmen; and at no stage was the Drawing Office sufficiently staffed to enable it to keep pace with the work of the Engineering shops. On the Engineering side, therefore, exacting demands were made on the mechanics, instrument makers and other craftsmen in producing prototypes from rough sketches, wooden mock-ups and verbal instructions."

DSR at work

The work of Dudley's research teams has been described in detail by Boyce and Everett in their book *SOE the Scientific Secrets.* This book was carefully researched using official documents released by the National Archives and benefiting from Douglas Everett's own memories and private papers. The account that follows here makes full use of Boyce and Everett's work, supplemented by Dudley's private papers which have not been used by any historian of SOE. Extensive use has also been made of Dudley's Memoirs. However, these were written in 1964, when close secrecy about SOE's activities was still being maintained, which means they are not as informative as they might have been.

Among Dudley's papers are a record of his engagements in 1942 and his diaries for 1943 and 1944. These show the range of meetings he had with his academic contacts, with senior figures in the government and armed Services and with those responsible for various research projects. In January 1942, for example, he had meetings with Sir Henry Tizard "re B.W."; Commodore de Burgh calls "re destruction of maps in aircraft"; he visits Porton Down; has a meeting with Colonel Charly "re fire caused by pocket incendiary"; visited Dr Perron "re uranium and heavy water". As the year proceeds he has meetings with various people on "shipping", "fragmentation", "non-disturbance fuze", "Welman project", "Butterworth gun", the Porton "kummerbund project", "parachutes", "welgun", and "air conditioning of tanks". He meets with Tizard, Lord Rothschild, Lord Bearstead, Lord Selborne, Duff Cooper, Admiral Renny, Professor Blackett and a whole host of others, often lunching at Claridges, the Savage Club or Lansdown Club. He also receives visits from many different people who come to see Station IX.

From these diaries it is clear that Dudley's role as Director of Research was not just technical. He had to maintain a wide range of contacts in government, the academic world and the Services and much of his role was to bring (or keep) important and influential personages 'on side'. In October 1944, for example, he arranged a visit to Station IX for Lennard-Jones of the Armament Research Department. In his letter of thanks Lennard-Jones invited Dudley to visit ARD and said, "I was most impressed with the

many lines of activity which are being developed and congratulate you on having built up such a successful and thriving organisation in such a short time". In February 1943 Dudley also had cordial meetings with Combined Operations Head Quarters, with an invitation from his contact to "show you my workshop and the things we have been doing there".

Dudley invited his contacts to visit Station IX and kept the letters of appreciation that were sent to him afterwards. The range of these letters suggests that he was very successful in convincing his visitors of the energy and efficiency of the research teams at work at Station IX and by the end of the war he had established his reputation as an effective director of scientific research establishments. One notable letter was written by H. J. Gough, Director of Scientific Research at the Ministry of Supply, who had visited Station IX in February 1942.

> "In my time I have acquired an intimate knowledge of a good number of research and development establishments and may have become blase; In any case, one expects efficiency, especially in wartime. But I was really most impressed with what I saw yesterday. There was evident throughout exactly the best spirit of keenness and interest in the work and its objects, coupled with energy and drive in getting things done and results achieved. The results themselves and the rapidity with which they had been obtained showed clearly the scientific and technical competence of the staff and the excellence of the manner in which their efforts were directed and co-ordinated. I came away with the impression not only of performance of first class work but of the presence of a team spirit and clear direction of an unusually high order. All concerned with the planning, direction and operation of the Establishment have good cause to be proud. It is a damned good show."

In his Memoirs Dudley summarised his work, and that of SOE more generally. *It was here* [The Frythe] *that the Corgi motor cycle, a vehicle designed to be dropped by parachute, was first produced. We built large numbers of one man submarines, a range of silent weapons, improved time fuzes, limpets for scuttling ships, devices for derailing trains, knock out drops and poisons for our agents, invisible inks and a host of other*

devices useful for sabotage. We [here he is speaking of SOE more generally] *also took part in the training of teams detailed for special operations. We organised the big raid on shipping described in 'Cockleshell Heroes', the demolition of the Norwegian Heavy-Water plant, an attack on the Bismarck* [he means the Tirpitz] *and many other operations of a varied and minor character. The reputation of our station* [Station IX] *became such as to attract a host of visitors from America, Russia and some of the occupied countries desirous of setting up resistance groups of their own. Earl Mountbatten insisted on piloting a one man submarine on one of the large reservoirs at Staines. Churchill inspected an exhibition of sabotage devices at Kensington and Duff-Cooper, Hugh Dalton, Lord Hankey and other ministerial big-wigs gave us their blessing. We had many training centres in requisitioned country houses in various parts of the country, one of them being Audley End and another at Gorhambury near St Albans. We also had a station on the Helford River where we maintained a fleet of fishing vessels for landing agents on France. Amongst interesting people I met at this time were Nevil Shute, Nigel Balchin, Malcolm Campbell the racing motorist, Gladwin Jebb, later our ambassador in Paris, and Samuel Courtauld.*

Work carried out at Station IX

Fundamental to the work of the research teams at Stations IX and XII was the development and preparation of explosives for use in sabotage operations. Work was done on the development of Plastic Explosives and on Limpet Mines with experiments carried out on the magnets used and on nail guns for attaching them to wooden hulls. Detailed specifications for the Nail Firing Gun, including test reports, are in Dudley's papers. Dated August 1944 it was concluded that "the device has reached such a stage of development that it can be handed over for User Trial...to enable a Mark I device to be put into production". Special explosive devices were developed to burst tyres and to damage rails and it was estimated that on the single night of 5/6 June 1944 there were 950 interruptions to trains in France due to sabotage. Materials to sabotage rolling stock were also developed, in particular substances to cause the overheating of axles and bearings. These became very effective in hindering German operations after the D-Day landings. A paper from Dudley, headed Most Secret,

The Frythe in 2006

From a photo by Des Turner

The Frythe

Under reconstruction 2015

described SOE's contribution to the destruction of the dock gates at St Nazaire on 28 March 1942 - "The greater part of the work of preparation had to be undertaken by Station XII who worked long hours over a period of several weeks". An official minute scrawled on the paper says: "This has been good work". There was also the Mobile Mine - “these are the ‘man-handled’ torpedoes produced by Station IX and under the wing of Professor Newitt...” - and the Sounding Mine which, if the Admiralty wanted, “DSR has undertaken to make a pilot model”.

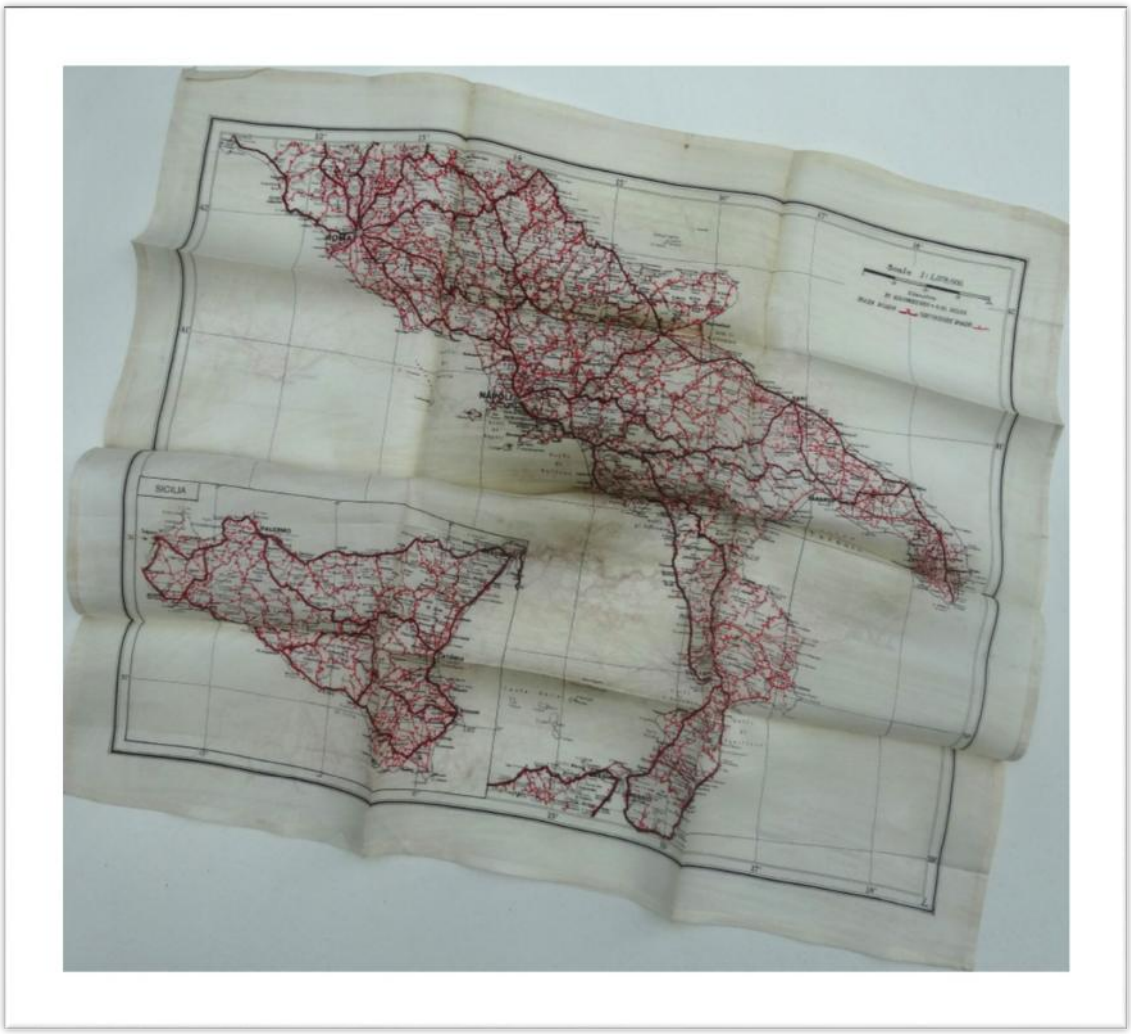
Special work was undertaken to perfect light and weight sensitive switches and the Imber switch for the delayed blowing up of trains. Experiments were carried out to improve Time Pencils and in the end 12 million of these were produced by Station XII where production was concentrated. Among the detonators developed were wireless detonators and an ‘air leak’ detonator which, according to Boyce and Everett, “Newitt thought… might be the ultimate answer for the need for a temperature-independent time-delay”. Among Dudley’s papers is a little loose-leaf booklet entitled ‘B.L.O.’s Pocket Book’ which contains detailed diagrams of mines, switches, detonators and means for industrial demolition.

Large numbers of incendiary devices were developed. Several million ‘pocket incendiaries’, including incendiary cigarettes, were produced based on petroleum gel ignited by a Time Pencil. In Dudley’s papers there is a report headed ‘Instruction for Use of Magnesium Matchhead as a Small Incendiary’ and according to M. R. D. Foot, “Newitt’s chemical ingenuity...devised an ‘incendiary block’ a brick-shaped object that not only generated heat, but emitted oxygen, so that a fire once started in a confined space...could be refuelled at source till it grew strong and took hold properly”. An exploding briefcase was produced and special containers for secret documents that would self-destruct if any attempt was made to open them. Boyce and Everett record that Lord Rothschild asked to see one of the prototypes because he did not believe that it could not be opened. Later it was reported that the briefcase had burnt a hole in the floor of his office. A report by the Ordnance Board was circulated to various units expressing alarm at the problems that might be caused in transporting this device if it should spontaneously ignite, for example in a civilian aircraft,

and recommending that it should never be carried in a submarine or underground train. The range of experimental devices also included a clockwork mechanism to release the harness of dogs dropped by parachute; a device to aid climbing a half inch rope; platinum 'pills' for insertion into submarine batteries; explosives disguised as lumps of coal (three and half tons were made) and dead rats; a device for cutting telephone wires; substances for etching glass; and sandals with specially designed soles which left the impression of a naked foot or a Japanese military boot. It has been claimed that "nine Belgian factory boilers were put out of action by rat bombs".

Dudley kept examples of some of the equipment manufactured for SOE (illustrated on the back cover) – the knuckle duster, the commando knife and a particularly nasty example of a flick-knife. There is also a beautifully made and deadly sharp arrow, short like a crossbow bolt. This has seldom been mentioned in the books on SOE but it seems that Station IX investigated the possible utility of the old fashioned bow and arrow and among Dudley's papers is an article on the 'Physics of Bows and Arrows' reprinted from the *American Journal of Physics* (August 1943) with 'For DSR only' typed at the top.

In 1943 the possibilities for disrupting the German submarine campaign were explored in detail, with SOE being called on to suggest ways of sabotaging the manufacture and supply of the submarines. DSR produced a report on the potential for damaging torpedoes and contaminating batteries and fuel oil, on the camouflage of devices and on ways of interfering with submarine crews. These included adding laxatives to food supplies and itching powder to be sprinkled into consignments of clothing and onto condoms and is known to have been used to infect enemy uniforms. The itching powder was derived from beans of the plant Mucuna Pruriens (apparently also used as either a coffee substitute or an aphrodisiac in Denmark). More controversially Station IX worked with Porton Down on various aspects of biological warfare, always defended on the grounds that it might become necessary "to make provision for a possible extension of SOE activities should the enemy infringe international law in the use of poisons, gases and bacteria". Dudley's diaries show that he was in regular touch with Porton Down.



A map of Italy printed on silk (from Dudley's collection)

A whole section devoted its efforts to various types of camouflage, disguise and forgery. Experts replicated various types of continental clothing and in 1944 alone 90,000 articles were issued and 300,000 fake ration cards were dropped into Germany. The most bizarre attempt to sow dissension in Germany was the issue of postage stamps showing Himmler's head instead of Hitler's. The idea was to give the impression that a coup against the Fuhrer either had taken place or was about to take place. The only result was to create a rare, and much sought after, specimen for keen philatelists to collect. Agents were trained in ways to disguise their personal appearance and there was a photographic section at Station IV which produced over 275,000 microfilmed documents. Dudley was not closely associated with much of this activity though, according to Boyce and Everett, "Newitt also had a small facility [for forgery] at the Imperial College of Science".

In April 1943 an agent was killed when his parachute failed to open. A memo was circulated (a copy is in Dudley's papers) recording the equipment he carried and which was now in German hands. This included " 'K' Tablets, camouflaged as 'volcase' pills. 'B' Tablets, camouflaged as 'Veinotrope' pills. 'Wonder' torch battery, with two false cells containing letters of recommendation" and "an ancient-type oil stove in the interior of which a large sum of money (practically 5 million francs) had been concealed". The B Tablet was benzadrine used to stave off tiredness, the K Tablet was a morphia-based sleeping pill which could be administered in lethal quantities. There was also the L Tablet which was a cyanide suicide pill.

Meanwhile the most serious (and in the event the most controversial) work was carried out by the Engineering Section. This section worked throughout the war on specialised boats, guns and motor vehicles, sometimes in co-operation with similar units in the armed Services but often pursuing its own research to the point of production. The devices and machines produced all had the prefix 'Wel…' after Welwyn where the Frythe was located. Dudley's papers contain numerous photographs of the experimental devices developed by the Engineering Section along with a

detailed paper on “The Destruction of Shipping in Enemy Occupied Harbours”, classified as Most Secret.

Among the experimental devices carried out were the Welbike - a collapsible 98cc motor cycle with a top speed 30 mph and a range of 90 miles which could be dropped together with its paratrooper rider. A report showing paratroopers using this vehicle appeared in the *Evening News* 10 November 1943 and details were published in the journal *Motor-Cycling*. Two days later Dudley wrote a memo pointing out that no reference was made to the fact that this had been designed by a Government Department (ie Station IX) and that although it was called the Excelsior, the Excelsior Company had nothing to do with the design. Indeed, after testing the prototype in May 1942, the Managing Director of the Excelsior Motor Company described it as "the neatest job he had ever seen" and said that he "would adhere strictly to the prototype which he did not think could be improved". Some 4000 were manufactured in Birmingham and, although used in the Arnheim campaign and the Normandy landings, most were exported to the USA after the war. The Corgi Scooter was developed from it, 27,000 of these being manufactured between 1947 and 1954.

The Welman was a 20ft one-man submarine with a top speed of just over 2 knots and a range of 33 miles. It had a delayed action, 425 pound charge of Torpex explosive in the bow. The massive water tank used to test it was built into the Frythe's terraces and was still there in the 1970s. About a hundred of these midget submarines were built by the Morris car company in Oxford, and used by the Special Boat Service. In Dudley's papers there is a copy of a letter he wrote to Winston Churchill on the Welman project.

> "I think you will be interested to see photographs of the Welman, the one man submarine that has been evolved at the SOE workshops. The trials have been so successful that the Admiralty have ordered 150 of these, which are, of course being separately manufactured.
>
> Certain Ideas which I believe are new to submarine construction, partly borrowed from the technique of blind flying in aircraft, have been evolved in its construction by an engineer and a scientist in SOE respectively and appropriately named Dolphin and Newitt. The idea is that the Welman can be carried by a submarine or flying boat

Welbike demonstration (from Dudley's papers)

Welgun

> to within twenty miles of, say, the Tirpitz and that she will then proceed to place a charge of 580 lbs of HE on the bottom of the enemy battleship at the spot immediately below where the magazines are believed to be. The charge is then operated by a time fuse. The Welman actually succeeded in doing this in a trial against HMS Howe for which purpose she had to go through and under nets, and every other form of anti-submarine protection including all the latest detection apparatus. After placing his charge, which adheres by magnetism, the operator either returns the way he came or sinks the Welman in a nearby fjord, and then makes his way by rubber boat to the shore where SOE pick him up. If you would be interested to see the Welman, I hope you will come and watch some trials in Staines reservoir which is within three quarters-of-an-hour's motoring of Downing Street and almost on the way to Chequers. I need hardly say it would give me and SOE very great pleasure to show it to you at any time."

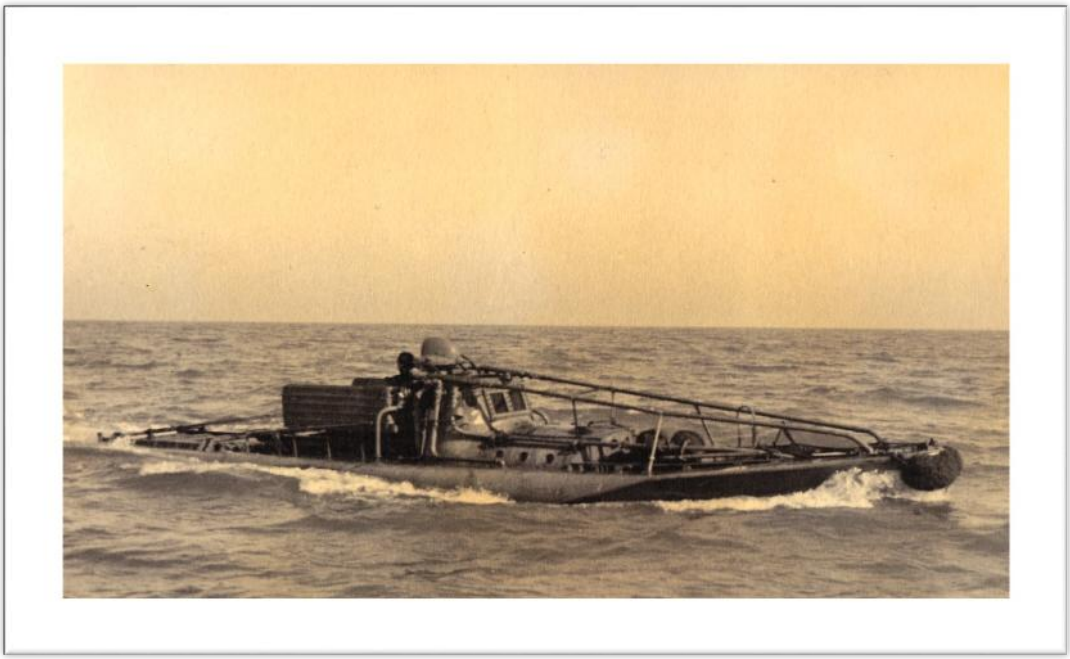
Although it is not known if Churchill accepted this invitation, the prime minister remained throughout the war a staunch supporter of SOE and its work.

From the very beginning the development of the Welman had been carried out in close co-operation with the Admiralty and a submarine officer had been seconded to Station IX to advise. Boyce and Everett, writing about the Welman, concluded that, however well-meaning the project, “it cannot be denied that the design was carried out by a team of enthusiastic amateurs in the environment of a research establishment…. It was the Royal Navy who had the experience of submarine design...and closer co-operation between them and SOE in the conceptual stages might have resulted in a more effective weapon”. After a failed attack on the floating dock in Bergen, one was captured by the Germans and developed into the Biber midget submarine.

Among other developments to come out of Station IX were the Welfreighter, a small submarine freighter that could carry up to a ton of supplies to agents; the Sleeping Beauty, a submersible ‘canoe’, which

The Welman submarine being launched

(from Dudley's papers)



The Welfreighter

(from Dudley's papers)

went into operation under Admiralty auspices, and the Weasel which was a vehicle for use in snow and which was later developed into the snowmobile. The Welrod was a pistol used by the resistance in Denmark after the German invasion (and rumoured still to be in use today). The Welgun was a compact, lightweight 9mm submachine gun, intended for use by airborne troops. It was manufactured by BSA, but never replaced the Sten gun although Boyce and Everett claim that it performed every bit as well in trials. Later Station IX worked on a 'silenced' version of the Sten gun. Other guns included the Sleeve gun (or Welwand) and the Spigot gun which was an anti-tank weapon. Experiments with a single shot firearm, suitably disguised, led to the production of the Welpen, the Welpipe, the Welcheroot and the Welwoodbine. A gun disguised as a safety razor was also produced, useful Stella King observed, if the agent could "manage to persuade a would-be captor to let him shave before being arrested." To assist frogmen to approach their target, Station IX developed an electrical device called the Welbum, a name which gives some hint of the schoolboy culture that surrounded some of the weird experimental work that went on, and which Dudley up to a point encouraged.

It has often been asserted that the 'boffins' of Station IX were not aware of the practical needs of agents in the field. On this matter Boyce and Everett wrote:

> “When Newitt was appointed Director of Scientific Research in January 1941 he soon recognized the need for an Operational Research and User Trials Section staffed by scientifically or technologically trained people. At an early stage in his thinking Newitt had considered the possibility of including a technically trained observer in actual operations but this was considered inappropriate for SOE activities. Newitt set up the Operational Research Section to test equipment before issue to agents.”

However, it was only in August 1943 that a formal Trials Sub-section’ was established to test prototypes against specifications after which a decision was made by DSR [Dudley] on whether to proceed to further development. Devices were tested for safety, silence, rough treatment, water proofing and tropical storage, severe weather conditions and operation in the dark or in gloves. Boyce and Everett record that the Sleeve gun was

tested in a bar with a shot being fired at a sandbag in a corner. So silent was it that no one in the bar noticed that the sandbag had been murdered.

SOE was often criticized for undertaking tasks (including Dudley's research) that was the domain of one of the Services. In the early days of the war, when SOE was still finding its feet, the RAF was very reluctant to provide aircraft needed to supply agents in the field. As the requirement for supplying agents gradually increased, SOE created an Air Liaison Section and this required Dudley's Station IX to produce a range of special equipment including light weight containers, water proofing of containers, roller conveyors for despatching from aircraft, reception committee lighting, methods of locating containers in the dark and parachute delay opening devices. Research was also carried out into devices for identifying dropping zones for parachuted supplies and personnel. These included torches, short wave radio, mirror-based devices and smoke signals. Containers and panniers for supplies had also to be developed, one of them, the K-type Container was originally designed for use in Denmark and, when dropped on a lake, sank to the bottom to be retrieved days later by fishermen. Locating parachute drops was always a problem and Station IX's attempt to find a solution included experiments into luminous clouds, bells and radioactive discs. Research was also carried out into dropping of supplies from high altitudes and without parachutes. The Army School of Dogs contacted Station IX to develop a container to drop dogs safely, while experiments were also carried out on picking up humans from the ground without landing the aircraft.

Until 1942 SOE's communications were dependent on SIS (later M16) which was able to control the issuing of wireless sets and eavesdrop on SOE's activities. In order to develop an independent capability SOE experimented with suitcase wireless sets made by its camouflage section and the development of battery recharging devices including a pedal operated recharger. According to Stella King there was another gadget, "a 'necklace' strung with large and small brass beads. If placed in the right order and stroked by hand, it was capable of transmitting - or 'squirting' - the dots and dashes of morse at 600 words a minute instead of twenty-five".

Monitoring the enemy

As well as developing equipment to meet the needs of SOE agents, Dudley was also consulted on German and Italian scientific and technical experiments. In 1941 he was in close touch with G. A. Saunders of City and Guilds College who was working on nitro-methane as a fuel. In August Saunders wrote, “I find it freezes at 13 degrees C which rather rules it out for the Messerschmidt.... Also I gather it is very unstable and detonates by violent shock. Would this rule it out?” The reference to the Messerschmidt (a German aircraft) suggests that this research was also to assess German capability to find alternative fuels. In 1942 when a limpet mine attached to a ship in Gibraltar failed to explode, details were sent by the Navy to DSR. Measures to counteract German sabotage also came within his remit. Among his papers are printed booklets detailing German and Italian sabotage equipment and a specimen of a German propaganda leaflet, listing allied shipping losses, that was dropped over Britain in a canister that failed to open. There are also letters from Lord Rothschild, one suggesting that small depth charges might be a way of discouraging German divers from sabotaging shipping. In 1943 Lord Rothschild sent photographs of a German explosive device disguised as a lump of coal, complete with an X-ray, and asked Dudley's advice on how to simulate an explosion on board a ship to deceive the Germans into thinking that the lump of coal had indeed exploded.

Debriefing Mario Martini

As the war progressed Dudley was copied into papers on a wide variety of matters. Because of his technical expertise and that of his team he was sent the detailed reports prepared at Farnborough on the experimental V-2 rocket which fell in Sweden at Backebo in June 1944 and on the propulsion systems for the rockets. In October 1943 he received a copy of a report on the information provided by Major Mario Martini, an aeronautical engineer who had defected to the Allies. This included details of the German 'Fernbombe' on which Martini had worked and the radio controlled athodyd bomb. Martini also provided information on German aircraft production, problems with the factory labour force, which was mostly made up of foreigners and prisoners of war, and information on Goering's air

campaign against Britain and the misleading information disseminated in Germany about British losses.

Liaison with the United States

One of Dudley's tasks was to liaise with security organisations in the United States. *In 1943 I paid a short visit to America to contact the OSS, an organisation similar to SOE and presided over by Big Bill Donovan, a tough and belligerent character. We travelled to New York on the Aquitania, without convoy, and without incident, and later spent some time amongst the racketeers, politicians and military types which then infested the capital city. I returned on the Queen Elizabeth, then fitted out as a troopship. She was crowded with American troops, many of them raw recruits from the Middle West who had never seen the sea before this trip. Only one meal a day was served and during the rest of the time the troops sat around playing cards and drinking coca-cola. When it was rough, a row of dustbins was ranged along each deck, into which they vomited by platoons.*

In November 1944 Dudley again visited the US (his diary is blank between 7 November and 3 December) and met representatives of the National Defence Research Committee and the Office of Scientific Research and Development, organisations which had a direct role in war time scientific research, including the development of the atom bomb. Minutes of a meeting held in Washington on 30 November show that Dudley was raising the question of intelligence operations and subversive warfare in the post-war period.

Life at Station IX

In February 1943 Dudley's wife, Jane, wrote to her sister-in-law Bonnie, "Your distinguished brother is getting spoiled by this war. He was staying at some port in Scotland the other week, sleeping on land but spending his days out on a destroyer and a minesweeper. His billets were 'manned' by WRNS. They waited on him hand and foot, polished his shoes, brushed his clothes and said Aye Aye Sir to everything (take that last remark how you please). He comes home and expects Nannie and me to do the same".

One aspect of Dudley's 'reign' at Station IX was the good humour that prevailed. Dudley was excellent at personal relations, and persuading so many eccentric egos to work together in relative harmony needed talents little short of genius. There are numerous testimonies to this aspect of life at Station IX. In a letter dated April 1943, for example, Peter Kemp wrote, "I have seldom met such a congenial and hospitable crowd as I did in your mess". That there was a slightly schoolboyish tone in some of the banter is obvious - as though the Frythe was a public school or Oxbridge College - but this clearly worked. According to Stella King, Dudley told her of an occasion when "he once came down to breakfast one morning to be served with a plate of bacon and egg and a cup of coffee; only to find when he tried to put a fork in the egg that the whole lot - coffee, plate, cup and saucer included - was made of plastic explosive."

Among Dudley's papers is a small official envelope headed 'Most Secret. To be Opened by DSR. Not to Pass Through the Registry' and stamped 'Top Secret' with 'Urgent' in pen. It contained birthday greetings from five women who worked at the Station in the form of a piece of verse, so bad that it deserves quoting in full.

"Three cheers for the Prof., who looks so benign,
But cherishes schemes Machiavellian at Nine.
For production of 'Freighters and Beauties he battles
With resolute heart, and with gusto he rattles
The sabre of war in the teeth of our foes
In a valiant defence of the sweet English rose.

The DSR chariot sweeps up at a run,
With hard on its heels the staunch Colonel Munn;
The galaxy of talent at H.Q. and Nine
With Spigot and sleeve Gun, Delay Switch and Mine.
To back up the leader's the aim of the team
And to win back the peace which is every man's dream.

So the best we can wish for your anniversary
Is peace in the lab. and peace in the nursery

By this time of year; a trip at your leisure,
Then happy return to the work of high ? pressure.

On the other hand a security report dated January 1945 mentioned that reports of 'petty pilfering' at Station IX was causing concern and suggesting that "strong action be taken to prevent the continuation of this nuisance".

The Normandy landings and the Invasion of France

On arriving home [from the US in late 1943], *preparations were in full swing for the invasion of France - our agents were briefed and alerted. Immense quantities of sabotage material were dropped by air and money and materials were sent to resistance groups in Greece, Jugoslavia, Italy and France*. On 8 June, two days after the Normandy landings, Dudley was asked to go into France to investigate some captured German installations. He recounted this exploit in detail in his Memoirs. *Aerial photographs had revealed a number of vast concrete structures in Brittany, the Purpose of which was unknown. They were immensely strong and quite impervious to bombing. They were constantly attacked by our bombers without visible results and there were many wild speculations as to the kind of weapons they housed, and when these weapons would come into use.*

Our landings on the French coast and penetration inland put a stop to all these air attacks based on launching sites in Brittany. I went over to France on D+2 day to examine the concrete structures referred to above. It was an interesting experience and in some ways reminiscent of 1914. We crossed from Southampton in a troop carrier, crammed with reinforcements, most of them suffering from the lavish hospitality of well-wishers ashore.

Arriving near the French coast, we were transferred in batches of about 100 to small landing craft. The sea was rough and these light craft tossed about like corks, the troops still suffering from hang-over, capitulated to the elements. Heavy spray rained down on them but did nothing to relieve their misery. They poured their immortal souls overboard and when eventually the craft beached, they had to be dragged ashore like a lot of sodden sacks.

We had landed on an American sector which was still under heavy bombardment. The beaches were cluttered with equipment of all kinds and, on going inland, most of the troops seemed to be engaged in road making. Huge excavators and steamrollers were shifting mountains of earth and rubble - apart from the uniforms we might have been on some vast building site in times of peace.

I was billeted in an old Normandy farmhouse and took my meals In an American mess. A noticeable feature of the first few weeks following the landings was the inability of the American troops to improvise and make themselves comfortable. Most of the rations were tinned and were eaten straight from the tins, without warming or preparation of any kind. There were no organised camps. Dotted about were huge containers full of chewing gum, coca cola and cigarettes from which one helped oneself. Not far away was a British contingent which presented a remarkable contrast. Tents were laid out in regular lines, field kitchens were preparing hot meals, the troops were smart in appearance and were regularly paraded, and everywhere was an air of orderliness and purpose.

I managed to acquire a jeep with driver and set out to discover and examine the concrete emplacements which had so long puzzled us. Away from the beach head no one could give us any information as to the situation at the front and the location of enemy forces. We had, therefore, to gamble on finding an unopposed route amongst the sand dunes and country lanes leading westwards. It was an exciting and sometimes hair raising experience. We seemed to be travelling most of the time in no man's land, at intervals under heavy machine gun fire from both sides, and occasionally presenting a target for the attention of enemy artillery. The jeep performed miracles of acceleration and speed over rough roads, it skirted shell craters and jumped ditches, it got tangled in barbed wire and brought to a standstill amongst the ruins of deserted villages.

We arrived safely at our journey's end and I spent some days examining and reporting on the installations. Their purpose appears to have been to house gigantic guns designed to bombard London and its neighbourhood. The project was later abandoned in favour of the V1 and V11 missiles.

Among Dudley's papers are his Embarkation Card, issued by the Special Force Headquarters, to join the 21 Army Group to carry out "Operational

Research" and an envelope to 'Joris de Keyser, Feldpost nummer 41639W, St Malo', picked up on the battlefield near Caen - apparently the only 'souvenir' he brought back from this visit.

Evaluating the work of 'Q'

The work of Stations IX and XII is mentioned in almost every study of SOE, along with their Director of research, though *SOE the Scientific Secrets* is the only study devoted solely to the Station IX's work. Most writers have come to similar conclusions. The work carried out at the Stations was extremely diverse and inventive, much of it highly ingenious. Sweet-Escott in his book *Baker Street Irregular* describes Station IX as "very high powered" and Sinclair McKay in the Introduction to *The British Spy Manual* (the catalogue of SOE equipment issued in 1944) wrote of "that element of ceaseless ingenuity" and "the quirky and eccentric genius" that was displayed. All this was undoubtedly down to Dudley's supervision, his selection of brilliant people to work at the Stations and the encouragement he gave to what today would be called 'lateral thinking'. The range and variety of what was produced was extremely impressive. Station IX had an answer, it seemed to every problem encountered by secret agents and resistance organisations, ranging from one man submarines, to collapsible motor-cycles, various types of firearm, explosive devices and fuses, itching powder and suicide pills, camouflage and much more. These inventions were not all used in the field for various reasons but all were well designed and produced - they all worked - and very large quantities of supplies of every description were manufactured and sent to agents and resistance movements in every theatre of the war.

As Dudley's papers make clear, he was also a very effective diplomat on behalf of his Stations and SOE in general, not only getting his odd assortment of individual scientists and designers to work together but smoothing over relations with government departments, the Services and other research establishments. In the end this ability to 'get along' with those who did not necessarily have SOE's best interests at heart was not the least of his qualities. Peter Danckwerts, who worked at Imperial College before becoming professor of Chemical Engineering at Cambridge, commented after Dudley's death, "Newitt had a schoolboyish enthusiasm (which I

shared) for guns and explosions. He had a splendid time devising demolition devices, booby traps and even devices for disabling time bombs. I was in the latter business myself and took a poor view of his method of stopping clockwork fuses by firing bullets into them at the right angle. This led to the destruction of a very expensive house in Park Lane".

Criticisms have been leveled at the work of Station IX. The men who worked there have been described as 'amateurs' who strayed into areas where the expertise of the Services should have prevailed. The Welman submarine has often been cited as an invention that exceeded the remit and capacity of the Station IX designers, though M.R.D.Foot in his book *SOE the Special Operations Executive* states that "Mountbatten and the Admiralty were both keenly interested". By implication, it is implied that the work of Station IX overlapped unnecessarily with work being undertaken elsewhere. In March 1943 there was a meeting at the War Office chaired by Brigadier Mitchell with Davies, Wood (head of Station XII) and Dudley present. "The committee came to the conclusion that co-ordination and liaison had been complete with all services, the MAP and the Ministry of Supply with the exception of liaison regarding design of weapons and ammunition including grenades". Davies commented afterwards that this had been satisfactory for SOE.

In his final report Dudley addressed this criticism directly.

> “The maintenance of an effective liaison with other Service Research Departments is an important function of the Operational Research Section, both from the point of view of preventing overlapping and of making use of their facilities and equipment for certain types of investigation. Throughout the war SOE received valuable assistance from ARD (Explosives), DNC (under water explosions), SMD (mines and fuzes), DMWD Porton (chemical warfare), Longmoor (derailment trials), Enfield (small arms silencers), MRC (physiological tests, rations), Admiralty Research (infra-red equipment), RAE (air dropping) and others.”

Dudley also explained why he thought it right to have allowed his scientists and designers free rein.

> "In only a few instances do standard Service stores meet the requirements of subversive operations; and at the outbreak of the present war, and during its continuance, it was and has been necessary to develop as speedily as possible alternatives. In principle it should be possible to have such development work carried out by existing Service research establishments and to arrange for subsequent production through normal channels. In practice, however, a difficult question of priorities arises and there can be little doubt but that any organisation directing subversive warfare must have its own research and development station and must be prepared to make its own arrangements for production."

In the National Archives there is a note on Dudley's work drawn up by some official on the occasion of his leaving his post in 1945.

> "Under his guidance, a large variety of most valuable weapons have been devised. It is certainly not an exaggeration to say that the special weapons designed for and used by SOE have been far superior to similar weapons produced by other countries. The problems involved in designing such weapons which must be small, light, reliable and easily disguised have been varied and complex. The Group of Scientists under Professor Newitt have solved these problems and this has been in a great measure due to Professor Newitt’s guidance and inspiration. In addition to his leadership of his own Research Team Professor Newitt has been able to assist SOE by using his many valuable contacts in the Scientific World through the Royal Society of which he is a Fellow and this has undoubtedly proved a fact of importance in the provision of the numerous scientific appliances and methods which SOE has employed.”

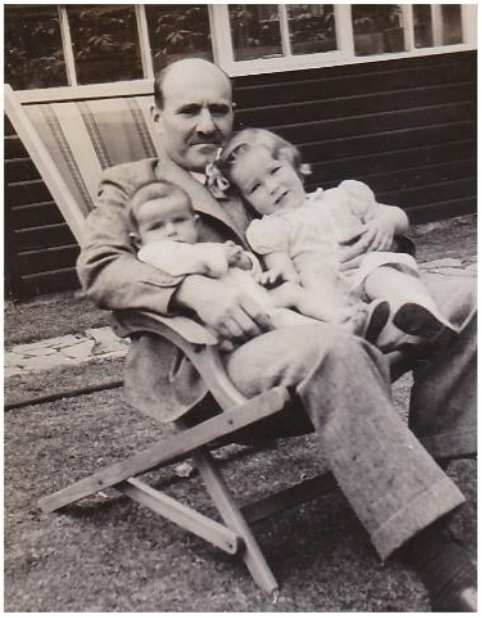
It is not difficult to hear these words as somewhat lukewarm. More generous was H. J. Gough who wrote to Dudley in May 1945; "You will certainly return to College with the knowledge that you have rendered first class service to the Country during this most critical period and carrying with you the deep respect and affection of many with whom you have been associated during that period."

Menu designed for Dudley's farewell dinner

Dudley and his family

Dudley left SOE in May 1945. He was given a farewell dinner at which a splendidly designed and witty Menu was produced. As a leaving present he was given two engraved pewter tankards.

Dudley's ability to move with confidence into a major leadership role during the war was grounded in a strong sense of his own identity. He looked back on his time as a soldier in the First World War as a period of adventure which had tested him physically and psychologically but which he had come through unscathed. He also had had to deal with the tragic loss of his young wife and with assuming the role of head of the family, supporting his parents, his youngest sister and various other family members, before he married for a second time in 1933.



Dudley with Hilary and Malyn

1941

During this period his interests developed and shaped his personality. He became a keen gardener and when he moved into the house in Coombefield Close with its sizeable garden, he systematically recorded his planting of shrubs in a notebook. His strong affection for his father was reflected in the interest he took in his father's genealogical researches. When his children were born he deliberately sought names for them from family history – his daughter Hilary received the names Carrington Dunn and his son was called Malyn, named after an early recorded Newitt baby who died at Hemingford Grey in 1715 – according to family legend drowned in the river Ouse. Dudley's most enduring trait was his pipe smoking. He had acquired this habit on campaign during the First World War, no doubt to help keep Mesopotamian flies at bay, and was never

thereafter seen without his pipe. Unlike many pipe smokers, he was able to keep his pipe steadily alight and was always surrounded with the not unpleasant smell of pipe tobacco. His pipe clenched in his teeth or held in his hand lent an air of confidence, stability and judiciousness to his demeanour.

Coming from a poor middle class background where a large family had to make do in small and cramped suburban houses, Dudley came to value the material signs of success and sought in a number of ways to increase his social status. The most obvious of these was moving into larger and more spacious houses. Coombefield Close was distinctly more respectable than his first home in Camberley Avenue and in 1943 he bought a large and rather grand modern house in Cobham. He had meanwhile been initiated into the Hampstead Lodge as a Freemason where he joined his friend Townend. His Fellowship of the Royal Society and his friendship with the aristocratic Egertons further enhanced his social status. After the war his son Malyn was entered for Winchester College where Sir Alfred Egerton was a governor, and Lady Egerton arranged for Hilary to be presented at Court, as this was still a social practice in high society until the middle of the 1950s. Hilary, however, refused to be presented. Later Dudley arranged for Malyn to enter the Dyers Company, one of the Livery Companies of the City of London.

Douglas Everett describes Dudley as ‘clubbable’ and, like many aspiring professional men, he joined one of the London clubs becoming a member of the Royal Thames Yacht Club and later the Athenaeum. He served on the Royal Society’s wine committee, although his heavy smoking must have damaged his palate for wine tasting. Yet, although Dudley was clearly intent on grounding himself and his family firmly as members of the upper middle class, he never became a supporter of the Conservatives, a transition which would have been natural for many people. It may have been partly the influence of the Egertons (Lady Egerton was the daughter of a Labour peer and sister of Stafford Cripps) which led Dudley to build connections with the Labour Party after war, but his wife, Jane, was also an active member of local Labour organisations.

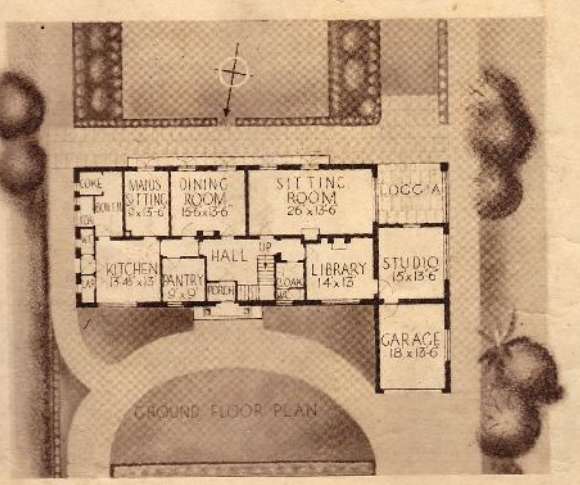
GARDEN front of this brick house is colour-washed in pale pink, the window frames and weather-boarded balconies are in off-white and the shutters are in pale blue-green. A flagged terrace runs across the whole front forming an introduction to a rather formal garden.

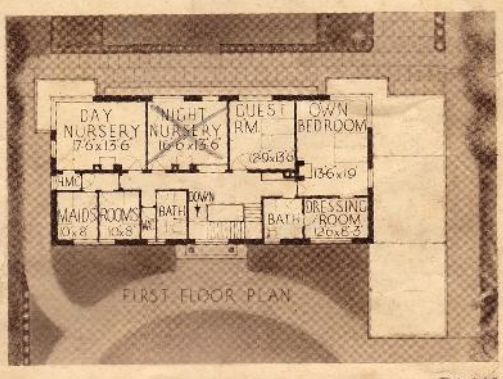
Fair House, Cobham

The home of Mr. and Mrs. Beddington

Architects: Stanley Hall & Easton & Robertson, F/F.R.I.B.A.

AN oblique view showing the step and small terrace in front of the reception rooms of the house. This amenity links the house pleasantly to its setting.





This was the home of Mr. and Mrs. Beddington at the time our photographs were taken. The house has since been acquired and completely redecorated by Professor and Mrs. D. M. Newitt. *See page 266.*

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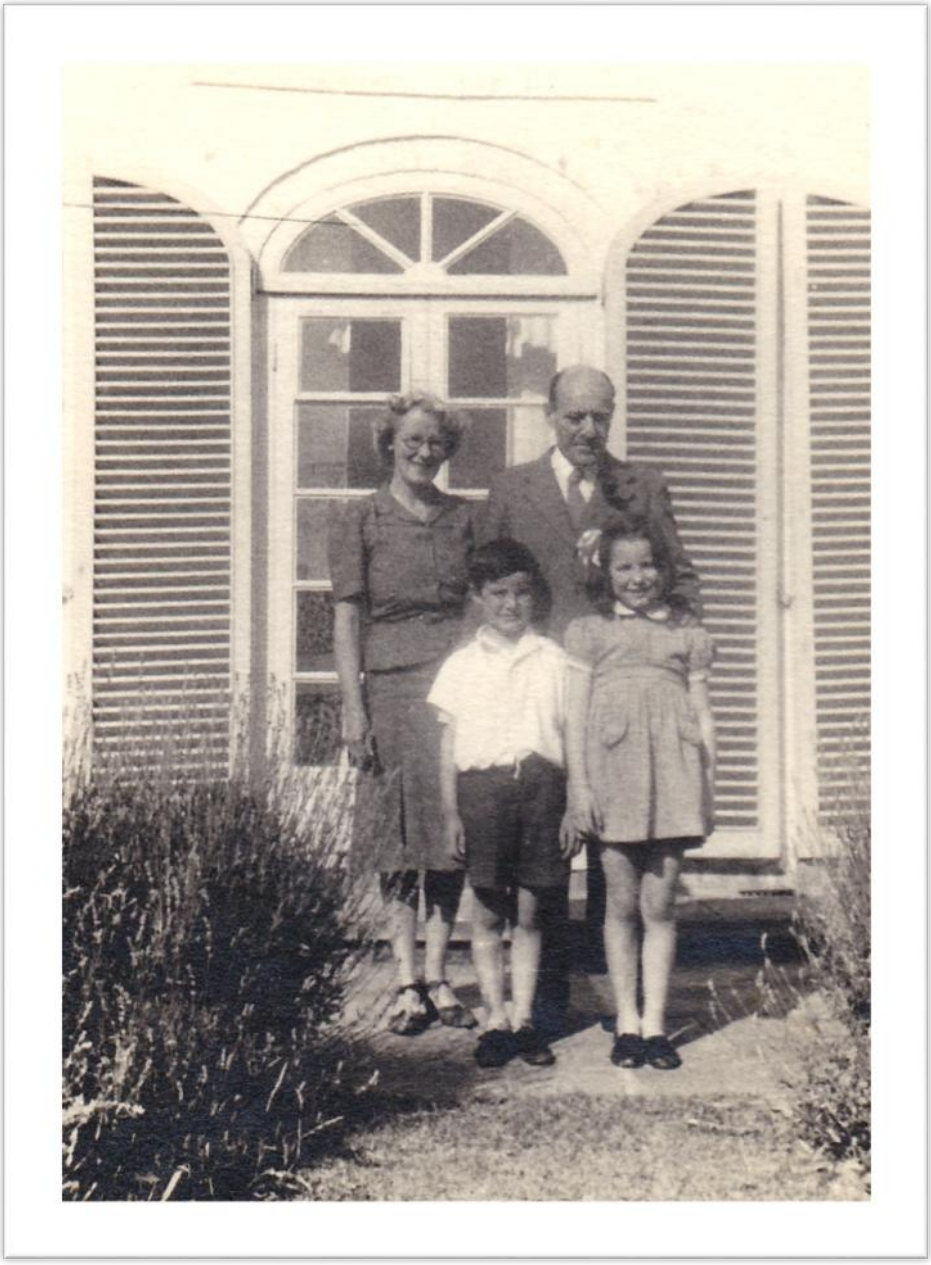
Dudley's appointment as DSR at a comfortable salary had ended the years when caring for his wider family had meant frugal living. In 1943 he bought the Fair House in Cobham. This was more than a step up from the comfortable suburban house in New Malden. Fair House was a large, almost palatial, residence, built in 1920s art deco style by architects Stanley Hall & Easton & Robertson, which had recently been featured in *Ideal Homes*. The house had a nursery wing where Nanny – Nora Blackman – ruled supreme, a separate wing for Dudley and Jane and downstairs a large drawing room, a dining room opening onto a terraced garden and in the kitchen area a separate pantry and a cellar with a monstrous boiler which looked capable of powering a steam engine.

Dudley was away a lot of the time during the war. His family spent much of 1941 in Wales and on the rare occasions when Dudley was able to visit he was driven in an official car with female drivers. In September 1942 Jane, now back in New Malden, wrote to her sisters-in-law: "As for myself, I am a sort of grass widow as your distinguished brother is only home once or twice a week" but the house was always full of people. Nanny's parents lived there for some time and Jane took in the sick child of a single mother of her acquaintance. The child, Alison Roach, sadly died before the end of the war. Guests came to stay and during the war the house was a centre for 'sales of work' to support the war effort and later for rehearsals for the WI drama group in which Jane, with her theatrical background, participated. A daily woman was employed for the cleaning and a gardener to keep the elegant garden in order. The whole establishment, for all its suburban setting, had something of the character of a traditional country house.

If Dudley had hoped, after his house in New Malden had been wrecked by a bomb, to move to an area less endangered by German air raids, this was a bizarre choice. The house was located immediately next to an anti-aircraft battery which regularly disturbed sleep at night. As V1s and V2s began to reach London sirens regularly sounded warnings and the children were taken down stairs and put to sleep in the under stairs cupboard. Eventually the dangerous situation persuaded Dudley to send the children

to Wales with Nanny for a second time – this time to board with the manager of Barclays Bank in the north Wales town of Macchynlleth. The family returned in time to hang out flags on VJ day 1945.



Dudley, Jane and the children
on the terrace of Fair House
1945

Jane and the children c1944