LEO COMPUTERS SOCIETY

Newsletter and Review

ISSUE Spring 2018,Vol. 4

67 Years

Progress, Archiving, Anecdotes and Reminiscences

Editor: Hilary Caminer - Layout: Bernard Behr

1951 – LEO I Operational

LEO III / 7
J. Lyons
Elms House, Hammersmith

This Issue

Message from our Chairman - Peter Byford

I must apologise for the time that has elapsed since our last Newsletter which is partly due to our efforts being concentrated on the Heritage project. The Society has been focussing on promoting and protecting LEO's history and has made great progress in the last couple of years resulting in LEO's importance in the history of business computing being recognised more and more.

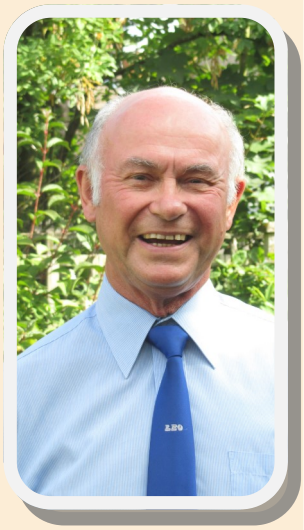
The Society is still evolving, as it must if it is to continue into the future; more about that later in the Newsletter. We are attracting new members who are not 'LEO' people. We need to attract younger people to take the Society and LEO history forward.

Probably the most significant development that has occurred in recent times is our proposed partnership with the Cambridge Centre for Computing History (CCH). CCH will be providing a safe repository for LEO materials and will be co-operating with us in other ways. One of those is to make a joint Heritage Lottery fund bid. This will be aimed at cataloguing, protecting and digitising LEO material. In addition, we are also planning to produce a LEO film and a Virtual Reality film of LEO I.

We are also applying to become a Charitable Incorporated Organisation (CIO) which will help us with various activities and provide some protection to committee members/trustees.

As you probably know, a Plaque and Information Board celebrating Lyons and LEO have been installed in Lyons Way near the site of Cadby Hall.

The Society now has over 800 members – from 24 different countries. Some are not LEO people, for example, a recent applicant said he was joining because he was not a LEO employee but was fascinated by the LEO story and the achievements - and still unheralded impact - of the first non-mathematical application development team. This is typical of the comments by many of our new members.



This edition of the Newsletter focuses on our work to preserve LEO's history and has been guest –edited by Hilary Caminer, working with Bernard Behr, our ongoing Newsletter publisher. John Daines tells you more about the Heritage project which has occupied much of our time since its launch in early 2017. Frank Land gives an insight into our Oral History project – and asks for more volunteers to help us in this work.

LEO is well represented in many museums and in this edition we are pleased to welcome a guest contributor from museum sector – Lisa McGerty of the Centre for Computing History, Cambridge which I mentioned earlier, reports on their exhibition last November.

We are pleased that research into LEO and the early days of business computing is being supported by the AIT Trust, and Elisabetta Mori, the LEO-supported PhD student at Middlesex University, tells us about the research she is doing. Elisabetta is doing a great job helping us with the Oral History interviews and supporting the committee, as well as helping to promote LEO in the international community through her work at overseas conferences.

Also in this edition, we are particularly pleased to have a tribute to Peter Bird, who wrote the first book on the history of LEO. As members may remember, Peter died last year. This contribution has been penned by Philip, Peter's son.

We returned to the HAC for our Reunion last October, and, as well as the usual displays, we had one on Lyons, supported by a talk about Joseph Lyons, from a family member, Neville Lyons. Mike Storey, who did such a sterling job organising the 2017 Reunion writes about the day and about our plans for the next Reunion, probably in April 2019.

The edition concludes with some reminiscences from former LEO employees which I am sure you will find fascinating and some News in Brief bringing you up to date with our activities.

Finally, I would like to say how much we enjoy hearing from our members and how much we welcome your participation in our activities. As you read this Newsletter, you will find references to ways you can take part in our endeavours to ensure that LEO's heritage is well and truly preserved. Please do contact us on *info@leo-computers.org.uk*.

The History and Evolution of the LEO Computers Society by Peter Byford

The key role of the Society has always been to organise Reunions. This will continue to be the priority whilst LEO people wish us to do this and are able to attend. We now also spend much of our time on promoting and protecting LEO History. This change of *role is* reflected in the fact that we changed our name in 1996 from the LEO Computers Reunion Society to the LEO Computers Society. The pending partnership with the Cambridge Centre for Computing History (CCH) will make a tremendous boost to our efforts to protect our historic "stuff".

As I mentioned in my Introductory message we are applying to change our legal status so that we will be a Charitable Incorporated Organisation or CIO. This will enable us to do more things in the future and protect our committee members from any liabilities.

A Short History of the Reunion.

Sometime either in the late sixties or early seventies informal get-togethers were arranged for operators and engineers who worked for LEO Computers. Often these were at The Redan in Bayswater. In November 1978 the first "official Reunion" of LEO Computers people took place at the Rugby club in Great Portland Street organised by Roy Farrant. At this Reunion he passed the baton to me to organise the next Reunion. To do this I inherited a team of Frank Kelly (secretary), Geoff (aka Godfrey) Parry (treasurer) and Dick Warren. We met in local pubs in Hertfordshire about 5 times a year. There have been many changes to the committee over the years. Some current committee members are scattered around the Country so meetings are nowadays held in central London. The committee has expanded from the original 4 to 10 or 12 with a number of additional support people. Probably about time we had a change of chairman.

Since that first Reunion we have organised 14 further ones, 8 at the Honourable Artillery Company (including the 2017 one) all sponsored, a further 2 at The Rugby Club , 2 at the Doubletree Hotel , 2 at Middle Temple and one at the Bramah tea museum at London Bridge. The 16th Reunion will be held in Spring 2019.

Our sponsors have been ICL and Lyons for most of the HAC Reunions, 'Computing' for two of the HAC Reunions, the AIT trust and Google. Attendance has varied from a high of about 150 to around 90 in recent years.

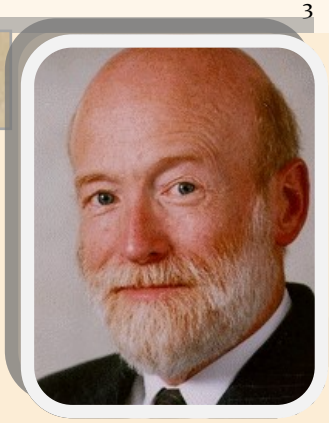
Our Membership

Our membership criterion was originally a restrictive 'only employees of LEO Computers or successor companies'. In the nineties membership was opened to people who 'worked on or with LEO Computers'. A few years ago we opened membership further to 'people who had an interest in LEO Computers'.

We are now keen to enlist more members from a younger generation to help us take the Society forward and assist us in our Heritage project aims. These may perhaps be students of IT and related subjects at college or university or those working in the modern computing field curious about how we got to where we are. If you know of people who may be interested, please point them in the direction of our website.

LEO Computers Society Reunion
Park Hotel, London. April 2010.

The Heritage Project - by John Daines



None of us is getting any younger. As time marches on, memories fade and even more "junk" is either thrown out or left for someone to dispose of after a death. Luckily, much has already been saved and collected in the form of documents, artefacts and oral histories. Overall this may be generalised as "stuff" and there is stuff in many places in the UK and abroad. We are fortunate that Frank Land has created and maintained a document that is known as LEOpedia and available at *http://www.leo-computers.org.uk/images/LEOPEDIA.pdf*. It contains information and signposts to vast amounts of stuff.

Over the last two or three years the academic world, and people generally, are beginning to realise just how important LEO was in the development of computing. As Colin Williams said in the Issue 3 Newsletter, there is an urgent need to formalise and structure the preservation of our stuff. To this end the committee has taken a couple of actions. Firstly, a project has been defined to identify, store and make accessible all the stuff. I gave a presentation about the project at the last reunion and here it is:-

1

LEO

Lyons Electronic Office

The world's first business computer

Heritage Project

2

"STUFF" exists:-

- **Material**
  - Documents – Manuals, listings, engineering drawings – logics, specifications, photographs, memos, notes etc, personal files
  - Media – mag tapes, paper tapes, cards (80, 40, 65, 51 column)
  - Hardware – packages, panels, parts of peripherals etc
- **Memories**
  - People, places, pioneering activities, projects, training, social etc
  - Computer files
- Some of it we have, some we know about but don't have yet and some we don't know about. It is important to identify any LEO stuff while it still exists (some of it up to 70 years old).

LEO Lyons Electronic Office - the world's first business computer

3

"STUFF" needs to be preserved - some is safe already

- **Physical items**
  - Manchester – National Archive for Historic Computing (docs, photos)
  - Bletchley Park – various pieces of hardware
  - Warwick – Modern Records Centre (Simmons papers)
  - Science Museum – various hardware and documents
  - Cambridge – Cambridge Centre for Computing History
  - Several others in UK and overseas – see LEOPEDIA
- **Memories**
  - Oral histories, "selfie" recordings, LEO Remembered and other books
- Some of it is still in peoples' homes awaiting decisions on a permanent home.

LEO Lyons Electronic Office - the world's first business computer

4

"STUFF" needs to be accessible

- **For Research and Education**
  - Academics are increasingly realising the importance of LEO
    - First commercial usage, First "on-line" data collection, endless Firsts
    - Invention of Systems Analysis and disciplined Programming procedures
    - High data volumes – drove hardware and software development
    - Micro-programming, multi-programming etc
- **For General consumption**
  - Historians, General interest from public
  - Exhibitions – Corby, Cambridge – November is LEO month, women in computing
- It needs to be easy to find and get at.

LEO Lyons Electronic Office - the world's first business computer

5

The Project – main elements

COLLECT  Hilary Caminer — What have we got? Get hold of the rest. Identify, classify.

STORE  Peter Byford — What places have stuff? Other possible storage locations? Criteria for matching stuff with storage location (the best place to put it).

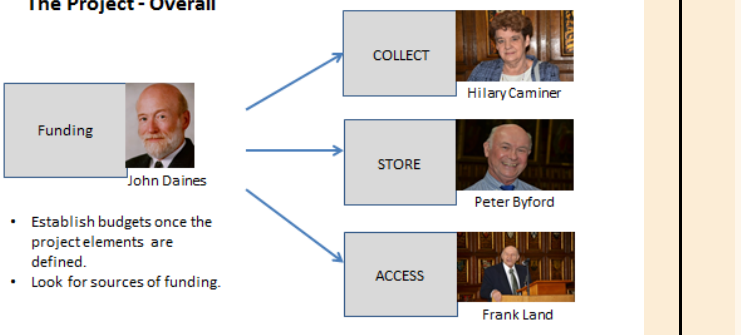
ACCESS  Frank Land — Build network of storage locations and devise an "easy" access strategy by using an overall "virtual" catalogue like LEOPEDIA as a gateway.

These people WILL NOT do all the work – they "own" the project element

LEO Lyons Electronic Office - the world's first business computer

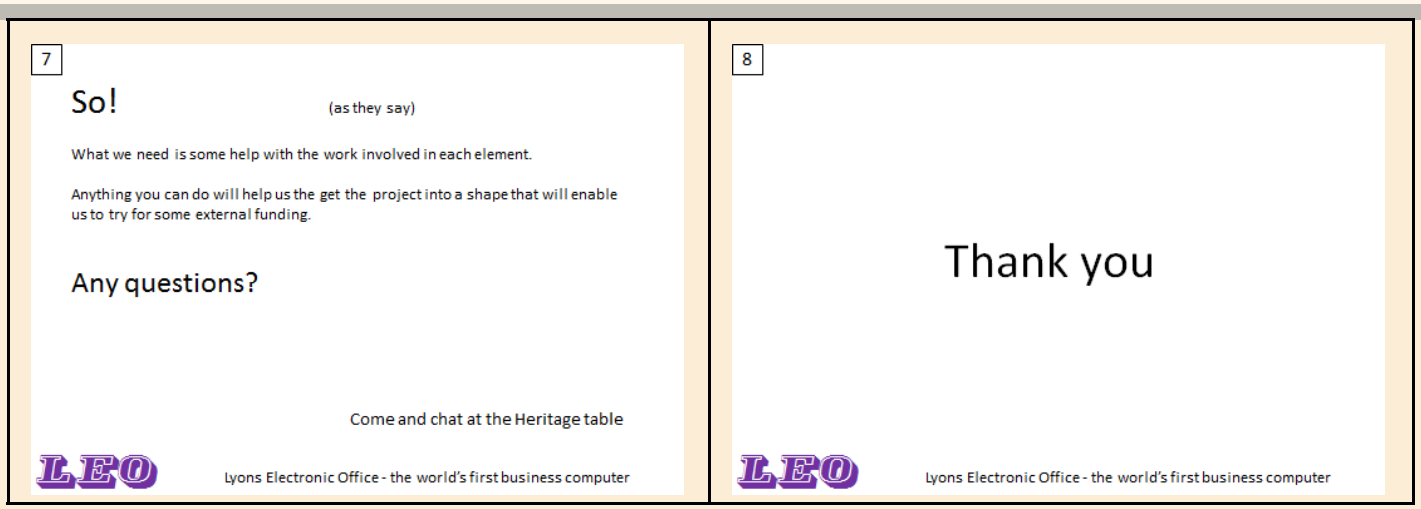
6

The Project - Overall



- Establish budgets once the project elements are defined.
- Look for sources of funding.

LEO Lyons Electronic Office - the world's first business computer



That leaves us with a well-structured project and clear responsibilities for the key activities. Note that those "owners" don't have to do all the work; members are welcome to contribute their time, so please make contact if you can help. You will have received a note from Hilary Caminer enquiring whether you have or know of any material that should be preserved. If you have not yet contacted her then please write and let us know if you have any stuff to donate; if you have then you will shortly be contacted with details of what happens next.

Secondly, we have been talking to the Centre for Computing History (CCH) in Cambridge *http://www.computinghistory.org.uk/* . It has been set up as a pioneering educational charity that opened at its current site in Cambridge in August 2013. CCH was established as an educational charity to tell the story of the Information Age through exploring the historical, social and cultural impact of developments in personal computing. It maintains a long-term collection of objects to tell this story and exploits them through education and events programmes.

The collection aspect is important to us because, as they say in their Collections policy "The fast-paced nature of the computing industry, along with its tendency to discard irrelevant technology as soon as it becomes outdated, means that the heritage around its origins and subsequent developments is at risk of being lost. CCH aims to preserve this fundamental part of our heritage and ensure it is valued, celebrated and secured for posterity." CCH has an internationally significant collection of vintage computers, memorabilia, artefacts, documents and hands-on displays – in total about 24,000 items. The core collection consists of 800 historic computers including an Altair 8800, usually considered the first home computer, as well as mobile phones, games consoles and calculators. CCH is currently developing two new Cambridge-related archives: a Sinclair collection and an Acorn collection.

They are excited about LEO because LEO was derived from EDSAC, the pioneering machine that was developed in the Mathematical Laboratory of Cambridge University. Last November, 2017, was the 70th anniversary of the university agreeing to the J Lyons offer of £3,000 and the assistance of Ernest Lenaerts to help them complete EDSAC. Although Ernest Lenaerts helped with EDSAC his primary goal was to learn about EDSAC so that he could help with the design of LEO. John Pinkerton joined Lyons to head up the engineering side of LEO, which was substantially different to EDSAC because it had significant design changes to support, amongst other things, the input and output of bulk data and the need for greater reliability. The Society and some members worked with CCH to help them put on a one month exhibition about LEO that included presentations on one weekend. Society members from Stewart and Lloyds, which was based in relatively nearby Corby, contributed their experiences of LEO II/3, an early customer machine that broke much new ground with its applications. CCH has since continued with the major LEO displays.

The Society's committee has been working with CCH to develop a partnership that will facilitate the objectives of the Heritage Project. In particular they will be able to provide a permanent home for much of the stuff that is held by committee and other members in their houses. Further, they are a suitable body to apply for funding to help with the cataloguing and provision of an on-line access window to the overall content and locations of all the "stuff". The committee is working hard to turn us into a legally recognisable body that will be a necessity for a joint bid.

Please do whatever you can to identify, hand over (when asked) or generally assist in the project to protect and preserve our heritage for future generations. Remember, it all started in the UK and the more that this is known, the more that misconceptions will be corrected.

Notes on John Daines

John Michael Daines was born 1943 in Huddersfield, West Yorkshire. After A Levels he attended numerous company and computer courses over the following 40 years.

John joined LEO Computers Ltd October 1961 as an operator in the LEO II/5 Bureau. In 1964 he transferred to the Minerva Road

factory as an operator running acceptance tests on LEO III and thereafter System 4 until January 1968.

He then went to the Winsford factory in Cheshire and afterwards to Kidsgrove to get the first large 4/70 machines tested for National Giro, DHSS, UKAEA.

In January 1969 he moved into software development, supporting the "J" operating system for System 4 and then development on the New Range that subsequently became ICL 2900. From 1972 he worked in ICL's Local Government unit for nearly 30 years in support, project management, sales consultancy on land and property information systems, business planning and also consultancy on business process re-engineering. Redundant March 2002 after 40 years with the same company.

Member of the British Computer Society (MBCS) since 1964.

The Oral History Project

by Frank Land

An important part of the LEO Computers Society mission is to record the story of LEO for posterity. This can take a number of forms – the collection of artefacts relating to LEO, the reconstruction or simulation of lost items of LEO software, and the recording of the experiences and memories of those who worked for or with LEO computers. We try to identify all of such material in LEOPEDIA – as comprehensive a listing as we can make it of everything we know of relating to LEO. You can see a link to it on our website.

The building of an archive of people's histories and memories takes a number of forms:

- **Published obituaries**. LEOPEDIA lists many of those who have passed away and provides links to the published obituaries. For example, the obituary of David Caminer provides links to 6 obituaries.

- **Reminiscences and memoirs written by individuals.** These can vary in length from a few paragraphs to life histories. These are listed in LEOPEDIA with short extracts and stored in full in our Dropbox archive. Dropbox is a commercial archive site which permits the sharing of data amongst certain named individuals – and our archive is currently restricted to a short list of LEO Computers Society members. Any member wishing to see or hear any of these items should apply to Mike Tyzack or Frank Land. (Please see contact details at the end of this article. Many of these written histories provide fascinating insights into life with LEO from its birth to its final demise as well as illuminating the personal history of the writer. You can read some examples of written reminiscences later in this Newsletter.

- **Oral Histories of LEO people**. Oral histories have been recognised by historians as an invaluable way to capture not only technical facts about an epoch, but also the social environment which played an essential role in how history unfolded and the individual's own perceptions of that unfolding and the part they played in it. The importance of capturing the individual voice is highlighted by the Oral History Society, which also provides advice on, for example, the appropriate standards and equipment to ensure that recordings don't deteriorate over time.

  A number of institutions interested in the history of computing include oral histories of eminent contributors to the development of IT, and amongst these are a number of LEO pioneers. Thus the London Science Museum holds interviews of John Simmons and John Pinkerton by Chris Evans; the Charles Babbage Institute in Minnesota holds the script prepared by John Pinkerton for an oral history; ArchiveIT has taken the oral history of Ninian Eadie and includes it in its archive of dozens of UK based IT pioneers; the Computer History Museum in California includes the oral history of Chris Date in its archives; the Engineering and Technology History Wiki holds the interview by Jane Abbate of Betty Newman; and the British Libraries oral history project Other Lives includes the oral history of Mary Coombs and Frank Land.

  Google interviewed and filmed a number of former LEO employees including Ernest Kaye, Mary Coombs, Peter Byford, Ralph and Frank Land as part of the celebration at the Science Museum of the 60th anniversary of the roll-out of the first business application on the LEO I computer. The sequence of interviews is presented by Georgina Ferry, who wrote an excellent history of LEO. The recordings can be heard on YouTube - LEOPEDIA provides details.

  Although all these histories provide insights into the evolution of LEO, they only account for a small fraction of the many individuals who have contributed to the LEO story. After all, the LEO Computers Society has over 800 members - the majority of whom have interesting stories to tell. A few years ago the LEO Computers Society

decided to run its own Oral History Project with the object of capturing the stories of many more of the hundreds of individuals with diverse jobs who had played a role in that story.

But to launch such a project required firstly members of the Society willing to act as interviewers and editors on a voluntary basis, secondly a management team to organise the project and thirdly funding to help pay for suitable recording equipment, to pay the expenses of interviewers and to pay a commercial firm for transcribing recorded interviews. We were lucky that the Association for Information Technology Trust considered that the project would make a valuable contribution to the history of UK computing and they agreed to provide the funding the Society asked for and when the Society needed a further tranche they again helped.

Mike Storey first took on the role of planning the schedule of interviews and finding volunteers willing to act as interviewers. The initial list of interviews included some hundred or so members of the society. It was agreed that priority should be given to the oldest and to those it was felt had contributed most to the LEO enterprise. These included, of course, those who had worked with LEO in South Africa, in Australia and in East Europe. But also included were Society members, like Mike Gifford, who had left the UK to live elsewhere.

Subsequently Mike Tyzack has taken on the role of organiser. As such he selects and briefs interviewers, furnishes them with the Society's recording equipment and puts them in touch with the interviewee. Once the interview is completed he arranges to have it transcribed into a digital text. Typically an interview will take several hours and will often take the form of a rather messy conversation which may well include inaudible sequences. Next Mike has to select a Society member willing to take the messy transcript and do a first edit eliminating repetitions and verbal infelicities so as to provide a coherent text. There may be queries which have to be resolved by contact with the interviewee. The text is next sent to a second editor tasked with producing a text fit to be published. At its best the whole process can be completed in a few weeks, but problems of scheduling and availability can stretch the process between first contact and posting the finished text to Dropbox to many months and even years. Where the interviewee lives away from possible interviewers alternative methods of interview have to be found and interviewing via Skype has been found acceptable.

To date some 45 oral histories have been recorded or are in process of being edited. All phases of the process are stored in Dropbox. Let me summarise some features of the oral histories, memoirs and reminiscences which throw a further light on J. Lyons and LEO:

- **The very wide range of backgrounds of people who enabled the success LEO achieved at the beginning of the information age**. These ranged from the classic establishment route of Eton and Oxford (or public school and Oxbridge) like John Aris, Peter Hermon, Doug Comish and Ninian Eadie, to some who left school at 16 (or even earlier) and made successful careers at LEO and elsewhere. This group included Sam Waters who finished his career as Professor of Information Management at the University of the West of England, and Joe McNulty who after leaving school without any qualification became an electrician in a coal mine, before joining LEO as a trainee engineer in 1966 rising to a senior engineering position with LEO before finishing his career as an independent consultant. In his reminiscences (see LEOPEDIA) he writes "For me, I think, LEO provided an environment and situation in which I could succeed in my own terms. I was doing work that I could understand, that I liked and that made sense to me. In a sense, that gave me an attitude of if I can understand and use a computer, I can learn to do anything. That's a big thing to say about a company but I believe that, even then, it was a special sort of company with special people in it".

- **The demands made by the LEO management of its employees enabling them rapidly to master a range of skills often well above their own estimation**. Thus individuals recruited as operators had to develop skills related to programming, engineering and management, and above all the skills of coping with unexpected, potentially catastrophic situations. The career of Bob Gibson and Derek Jolly as expressed in their oral histories illustrates the point.

Some of the respondents spent only a small part of their career working with LEO and made a name for themselves elsewhere. Good examples include Mike Gifford who rose to be the CEO of the Rank Organisation, and Peter Hermon who joining BOAC was responsible for the development of the ground-breaking BOADECIA airline reservation system and rose to be a Director of British Airways. Others made their main career with Lyons, LEO and its successor companies. These include Ninian Eadie who finished as a Director of ICL. What is most interesting that so many of them talk of their admiration, esteem and sheer enjoyment of their time with LEO. Typical is Chris Date. He spent only a few years with LEO at the beginning of his career, but subsequently became one of the most widely recognised data base experts. He started his computing career with LEO and in his oral history reports "so when they (LEO) offered the job I took it. And that was a great place. They had first built the LEO I, which was used in fact to do the U.K. census in 1951. It was one of the first commercial [electronic computer] applications in the world. Then they built a range [of machines] called LEO II. There were a few machines there. I came on board at the time they

were developing LEO III, which was another range of huge machines. But the team, the software people I was dealing with, they were just wonderful."

I could select many such quotations from our archives and they serve to enrich the memory of what Lyons and LEO achieved and the individual efforts which made that possible.

But there are still many members of the LEO Computers Society whose voices have not been heard, or who would like to join us in acting as interviewers or editors. Please let me or Mike Tyzack know if you would like to participate in one category or another in the Oral History Project.

(Contact details: Frank Land: *f.land@lse.ac.uk* or use *Secretary@leo-computers.org.uk* and your message will be forwarded.)

Cambridge celebrates LEO

by Lisa McGerty

The11th and 12th November 2017 marked the 70th anniversary of the presentation of a cheque for £3,000 by Lyons to Douglas Hartree and Maurice Wilkes of Cambridge University to part fund the development of the EDSAC (Electronic Delay Storage Automatic Calculator). John Simmons had persuaded the board of Lyons to invest in the development of the machine and to lend a staff member, Ernest Lenaerts, to work with Wilkes, on the condition that Lyons could create a copy of EDSAC for themselves if it worked. It did work and from it, as I'm sure you know, LEO was born.

To mark this momentous occasion - what turned out to be the birth of business computing - the Centre for Computing History (CCH) in Cambridge put on a temporary display to tell the LEO story. Cambridge is at the centre of the EDSAC story of course, and CCH has a chunk of EDSAC II on display but less is known locally about LEO. The Centre's own collection focuses very much on later developments in computing, particularly in home computing from the 1970s onwards, but we recognise that stories like LEO's set the scene for everything that came after. We were keen to tell this story to visitors to our museum, especially as we had profiled Mary Coombs (née Blood), in her role as the first woman to work with the LEO computers, in our October 2017 Women in Computing Festival and that had gained much press attention.

The LEO Computers Society loaned us some heritage objects for display that, together with some Stewarts & Lloyds items borrowed from Corby Heritage Centre and one or two items from our own catalogue, created a fabulous display of LEO memorabilia. Of particular interest to our visitors were handwritten documents from David Caminer's personal files from the late 1940s on (thanks to Hilary Caminer), letters, photos, and objects like a mercury-display line, core store, tape reels and valves that summed up those earlier days of computing for a museum audience unused to seeing these early machines in the museum in any way other than as pictures. We also created a LEO timeline (still available at *www.computinghistory.org.uk/pages/46083/the-leo-timeline/*), which we continue to flesh out.

We prepared a series of information boards to tell the LEO story and to summarise its considerable legacy and over the weekend of 11-12th November a whole raft of LEO Computers Society members came to the centre to talk to visitors (thank you to all who came along or loaned items for the exhibition). It was true that many of our visitors knew all about the EDSAC but had no knowledge at all of how Lyons took the EDSAC design and adapted it to work for the world of business!

Over the course of the weekend, over 130 people visited the museum, almost 50 of whom were children. We intended the exhibition to last for the whole month of November but the displays were of such interest to our visitors that we kept everything out until March 2018! In that time almost 6,000 visitors saw the exhibition.

LEO information board at The Centre for Computing History. Cambridge 11th and 12th November, 2017

We were so impressed with the enthusiasm of the Society's members and the quality of the documentation and heritage

objects the Society has access to – about that very dawn of business computing, an important moment in history - that we started to talk to the Society about ways that we could work together in the future. The idea of CCH offering a long term home to the Society's collection of LEO memorabilia and of launching a partnership heritage project to digitise it and make it accessible to all was an opportunity we wanted to seize. The LEO story complements the stories the rest of the museum tells so well. Both parties are passionate about gaining greater recognition for LEO and we are now jointly seeking funding to make the project a reality. Watch this space!

Centre for Computing History

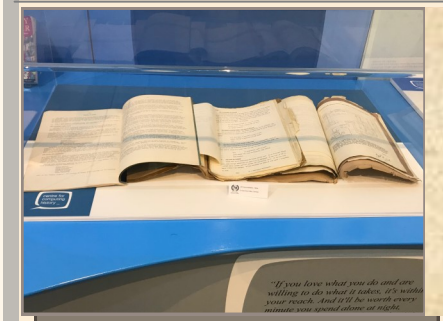
The Centre for Computing History is a young, independent, charitable museum in Cambridge with a passion for heritage and for learning. Much more than a museum, it hosts hands-on exhibitions, educational workshops and a wide range of activities and events to tell the story of the Information Age and its historical, social and cultural impact.

We have a nationally important collection of computing artefacts and run regular wide-ranging, vibrant, interactive pop up exhibitions and events on site and externally, like our forthcoming 40th anniversary of Space Invaders, Synthesized: a celebration of computers and music and our 2018 Women in Computing Festival (for this we are currently asking for contributions from women who work, or have worked, in the tech industry; if you have a story to tell please get in touch). We have over 18,000 visitors each year and have an extensive schools programme. We find that the schoolchildren of today have almost no understanding at all of how the technological world they inhabit and take for granted has come to be. We aim to change that!

The Centre for Computing History website can be found at *www.computinghistory.org.uk*

Notes on Lisa McGerty

Dr Lisa McGerty, the curator of the LEO Computers exhibition at CCH, was one of the founding trustees of the museum and is currently employed as its finance officer. She has an academic interest in the social impact of computing and a personal passion for LEO computers. She looks forward to working on the LEO heritage project with the Society and helping to unlock the stories within what she is sure will become a unique heritage archive.



Document display at CCH

Hilary Caminer & Jason Fitzpatrick, CEO at CCH

Schools programme at CCH

Researching LEO: report from the David Tresman Caminer Scholarship by Elisabetta Mori

In 2016, I was selected for the David Tresman Caminer PhD Studentship in the History of Computing at Middlesex University London, funded by a generous grant from the Association for Information Technology Trust (AITT). The research project, which focuses on the LEO Computers (Lyons Electronic Office) developed by J. Lyons & Co between 1947 and 1963, is supervised by Giuseppe Primiero and Balbir Barn at the Department of Computer Science at Middlesex, with the collaboration of Peter Byford and Frank Land of the LEO Computers Society. Now almost halfway through my PhD studies, in this spring edition of the LEO newsletter I would like to report on the activities I have accomplished so far.

The LEO heritage in the history and philosophy of computing is wide and it involves several aspects. My final dissertation will be the first extensive academic work on the LEO Computers, including a detailed analysis of the historical context, the technical developments of systems and hardware design, the specification and implementation of application software. It will also provide essential highlights in the advances in business and administrative practice at LEO and analyse the social, political and business aspects that led to the successful production, marketing and later decline of LEO Computers.

Activities so far have been divided between different research and academic tasks. The most essential and first aim has been the consultation of primary and secondary sources, spread in archives and museums around Europe, together with the production of oral history interviews. One of the early sources of information has been The London Metropolitan Archives, holding the J. Lyons & Co. archive. Later I visited the National Archive for the History of Computing (NAHC) in Manchester, which has a considerable amount of LEO documents. The NAHC used to be the principal repository of LEO papers for a long period. The Modern Records Centre, University of Warwick, Coventry collects the papers of John Simmons. They have digitized some of the more important papers relating to LEO. The David Tresman Caminer Archive, preserved by

Caminer's daughter Hilary holds different materials of interest for the research: original reports, manuscripts and private correspondence.

As one of the objectives of my research is to frame LEO Computers in the broader context of the European history of computing, the required reconstruction of the attempted agreements to build a consortium of European computer companies in the early 1960s has led me to consult several other companies' archives abroad: the Siemens Archives in Berlin, the Olivetti Archives in Ivrea, and the Archives Nationales du Monde du Travail in Roubaix, France, where the papers of the Compagnie des Machines Bull are kept.

Other primary sources I surveyed included the LEO artefacts, spread in British and European museums. One of the first sites I visited was the London Science Museum, where pieces of LEO I and II are on display together with an audio and visual installation about LEO Computers. The National Museum of Computing in Bletchley Park holds a small collection of parts of LEO, such as memories, tapes and valves. Moreover, a recent on-going collaboration between the LEO Computers Society and the Centre for Computing History in Cambridge led to a small exhibition in November 2017, which collected and showed other parts of the machines. In my survey, I also visited The National Museum of Scotland in Edinburgh, where a LEO III is preserved - almost complete in its components but not publicly displayed. In July 2017 I also visited the Nixdorf Museum in Paderborn, Germany, which hosts a small section dedicated to LEO.

On behalf of the LEO Computers Society Oral History Project I have recorded two oral histories with Jean Elliott and Mike Thompson, former LEO employees. The plan is to realize several more in the next few months. This was just one of my activities for the LEO Computers Society, along with participation in several other events like the unveiling of the plaque in Hammersmith, London, celebrating LEO I first routine job, in November 2016 *http://ta.mdx.ac.uk/leo/leo-plaque-unveiling-in-london/* and the LEO Computers Society Reunion in October 2017.

My academic activities have included participation in conferences and workshops, the delivery of talks and the preparation and submission of papers for publication. I have also been contributing to the delivery of classes in a Third Year BSc Computer Science Module on History and Philosophy of Computing (Giuseppe Primiero is Module Leader).

The first outcome of my research is the paper Validity & Correctness before the OS: the case of LEO I and LEO II, co-authored with Giuseppe Primiero and Rabia Arif and to appear in L. de Mol, G. Primiero (eds.), Reflections on Programming Systems – Historical and Philosophical Aspects, Philosophical Studies Series, Springer (forthcoming 2018) *http://ta.mdx.ac.uk/leo/validity-and-correctness-in-leo-i-and-ii/*. Efficient and reliable computing is based on ways to ensure validity and correctness of design, routines and their implementations. Techniques to ensure these essential features have been in place since the early days of computing. The study focuses on the hardware testing, data validation and program correctness techniques designed and implemented for LEO I and II machines in the UK during the 1950s. We have provided the first detailed and accurate reconstruction of both formal and informal practices that allowed LEO engineers to advance in the provision of reliable machines. This represents an especially interesting case study in the context of a debate within the newly-born discipline of computing, in which academics were focusing on ensuring logical validity of programs, while companies were concerned with the business-based requirement of efficiency.

A second working paper is titled Coping with the "American giants": Mergers, Relationships and Attempted partnerships in the European Computer Industry in the Early 1960s. It was presented at the 4th Conference on the History and Philosophy of Computing in Brno, Czech Republic. The study reconstructs what agreements were attempted between 1962 and 1964 among computer companies, focusing on the contacts between the UK manufacturers ICT, LEO Computers and English Electric Company, the Italian Olivetti, the French Compagnie des Machines Bull and the German Siemens. I investigate the original plans of the negotiations and why they failed, framing them in the broader European context after 1957's Treaty of Rome and the establishment of the European Economic Community. The full abstract is available here: *http://ta.mdx.ac.uk/leo/coping-with-the-american-giants/*.

Lately, I have been invited to join the ANR research project What is a program? Historical and philosophical perspectives (PI: Liesbeth De Mol), aiming at developing a coherent analysis and pluralistic understanding of the notion of computer program and its implications to theory and practice. *https://programme.hypotheses.org/*.

Future plans include an invitation to the HEPIC workshop on the history and philosophy of computing at the University of Lille in May 2018: I will contribute to a session on business computing, together with Pierre Mounier-Kuhn, historian of computing and IT in France, associate researcher at CNRS and Paris-Sorbonne University. On that occasion, I will present a comparative study on the early business computers in UK and Italy. In particular I will outline the evolution from the EDSAC to LEO, from the design and practice of a machine conceived for scientific computing to a machine with business purposes. I will survey the role of Lyons in the British Organization & Methods movement and their use of flow charts before computers as a possible convergence in their programming techniques.

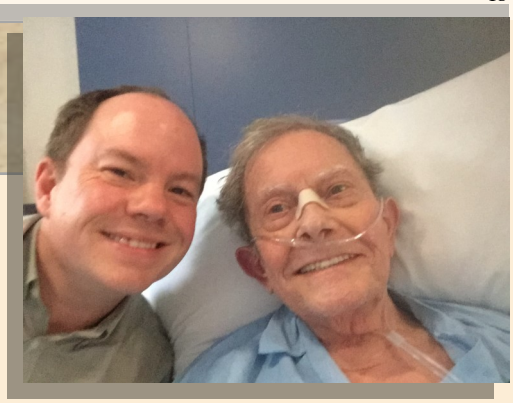
The support of the LEO Computers Society in these months has been fundamental. My thanks go to their precious help in checking and commenting on the drafts of my papers and for giving me access to documents not publicly available. I would like to thank the whole Society, but in particular Hilary Caminer, Frank Land, Peter Byford, John Daines and Ralph Land.

News and updates about the PhD are available on the website of History and Philosophy of Computing at Middlesex University: *http://ta.mdx.ac.uk/leo*

Notes on Elisabetta Mori

Elisabetta holds the David Tresman Caminer PhD Scholarship in History & Philosophy of Computing at Middlesex University.

Peter Bird 'LEO Historian'
A reminiscence by his son, Philip Bird



As some of you may already know, my father Peter sadly passed away last August. However, he is someone who most definitely left his mark on the world and his two books are testament to that fact. The first 'LEO The First Business Computer' published shortly after his retirement in 1994 was followed by a second book 'The First Food Empire A History of J. Lyons & Co', six years later. If you had told Peter in 1970s that he would one day write two well researched and presented books about his workplace I am sure he would have looked at you in disbelief.

Peter started working at J. Lyons & Co. in 1964 as a LEO operator. This role was quite different to his previous career as a merchant seaman, where he rose to the position of First Officer. At the ripe old age of 30 swapping a life on the waves to a life in a basement must have taken some adjustment. However, there were similarities - fault checking and running routines. After all you want to make sure the ship is going in the right direction!

Peter was always driven by innovative ideas and computing appealed to his sense of adventure. As a LEO Operator his initial tasks required laborious checks and fixes but his attention to detail and discipline stood him in good stead and he quickly rose through the ranks, particularly after George Stevens was given the job to run the Computer division in 1968. George correctly identified Peter's natural organization skills and maturity and Peter was soon promoted. However, during this time it was just a job to Peter. Whilst the work itself became more interesting and his responsibilities expanded there was no indication that he felt compelled to write. That came later, when as a Director of Lyons Computer Services in the late 1980's, he was asked by the internal communication team to write a potted history about LEO. This was the spark that then catapulted him to become the de facto expert/historian/curator/pundit etc. on all things Lyons-related. Little did he know of depth of the rabbit hole he was about to enter.

To put it into context: the late 1980s were winding down time for J. Lyons & Co, who by that time had become Allied Lyons. The Computer division was no longer busy or required as various parts of the business were being sold off. Peter found himself, as many people do in these situations, with time on his hands waiting for redundancy. However, rather than waste his time, he started researching about LEO for the potted history article and found himself becoming more and more fascinated by the story of not only LEO but also the origin of J. Lyons & Co. He correctly identified that both stories needed to be told to the wider world. So began his meticulous research, starting with the LEO story. In that regard he was lucky as Lyons were overhauling their archives and he managed to locate important documents, particularly through the help of Yvonne Walker. Plus, he was lucky that most of the key players were still alive and were more than happy to help him in his research. What started as a 1000-word article ended up ballooning into a 250-page book. It took him about 4 years to write. Having been made redundant in 1991 he had the time to devote 100% of his focus to the book, no swanning round golf courses for Peter.

Whilst you might say 'why write a book about the company that just let you go?' he was more sanguine and realized that the characters and decision makers who decided to embark on LEO in the 1940s and 1950s were a World away from the managers of decline in the 1980s. It was a story of British ingenuity which really lit his fire and he felt strongly that they all deserved their place in history.

The writing of the book did not come easy to Peter but he persevered, and through tenacity and sheer arduous work he made it through the other side. His overriding mission was accuracy – which is the whole point of early computing. However, as any author will tell you the first draft is just the beginning. So began the drawn out process of editing. Once again Peter was lucky to have received support from those who shared his belief that this story had to be told. He acknowledges: Derek Hemy, Tony Morgan and Alan King as particularly helpful and eventually he got to the point where a professional editor was required.

Through her guidance Peter was able to pull the book together into a concise and readable format. Whereupon he started to look for potential publishers. With his usual focus on the task in hand he wrote to scores of publishers, all of whom unsurprisingly declined to publish. It was a big ask to expect them to take a risk on an unknown author and a book that, particularly at the time, had niche interest. The idea of computing as history was not even a concept in 1994. This was a time before the world wide web. Computing was regarded as the preserve of geeks, nerds and boffins. Times have certainly changed.

Undeterred Peter decided to self-publish the book with an initial run I believe of 5000. He managed to market and sell to many ex Lyons employees and LEO folks and the book received some reviews and press. Most of the books were sold and he was still selling them until his death last year. To write a book is an achievement in itself. However, rather than that being the end of the story it was only the beginning. Shortly after finishing it he embarked on his next project - '***The First Food Empire A History of J. Lyons & Co***'. Now that's a whole other story…..

LEO Books for sale

Members are still able to buy copies of Peter Bird's hardback 'LEO, the first Business Computer' for the special price of £10 (plus p and p). We also have copies of 'LEO Remembered – by the people who worked on the world's first business computer' for £5 (plus p and p) This is an anthology of reminiscences about LEO written by members themselves. It was prepared as a tribute to Peter

Bird and presented to him shortly before his death.

If you would like to buy either book, please consult the website for full details or contact ***Secretary@leo-computers.org.uk***.

The Society's 2017 Reunion, A report by Mike Storey, reunion organiser.

On Sunday 15th October 2017, in excess of 80 guests attended our bi-annual reunion, held (as in many previous years) at the Honourable Artillery Company, in City Road, London. (Rail disruption had unfortunately prevented some members from arriving, always a potential problem on a Sunday.)

As a first however, we had booked the Prince Consort Suite, which gave us the largest floor space that we have ever had. This was only possible due to generous sponsorship from Google Inc., plus a substantial discount from the venue itself, the HAC.

Tetley Tea and UCC Coffee generously provided Lyons tea and coffee bags respectively, and they were consumed on the day.

For many years we have displayed our memorabilia and other artefacts, at these reunions. This year, we added a special display relating directly to J. Lyons & Co Ltd. - to mark the centenary of Joe Lyons' birth.

In addition to this, we took the opportunity to showcase our new Heritage Project - John Daines has written an article on this subject earlier in the Newsletter. Our newly acquired exhibition backdrop panels were set up to provide us with four separate displays:-

1. J. Lyons & Co Ltd – hosted by Veronica King and Neville Lyons
2. LEO Hardware exhibits – hosted by Tony Morgan and Vince Bodsworth
3. LEO Software and Paper memorabilia – hosted by Bob Stevenson and Peter Byford
4. The New Heritage Project- hosted by John Daines and Elisabetta Mori

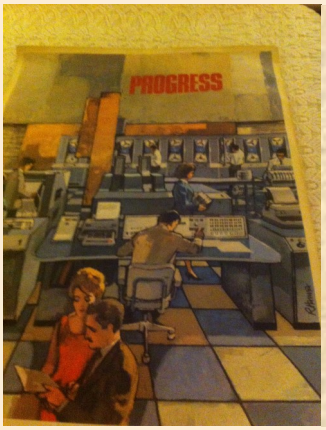
After time for guests to circulate and look at the displays, meet up with old friends and have a light buffet lunch, the formal proceedings were introduced by our chairman, Peter Byford. Peter went on to give a roundup of activities since the previous reunion, and then took a vote on acceptance of the Society's New Constitution.

Our guest speaker was Neville Lyons, with a fascinating illustrated talk on the formation of the J. Lyons catering empire; from its very early roots as a cigar importer, to its heyday with tea shops in abundance as well their famous Corner houses and hotels. Although heavily based in London, the tea shops themselves were spread far and wide throughout the country.

John Daines then explained the ethos behind, and the future plans for, our new Heritage Project.

We had a financially successful raffle, with prizes donated by several industry-related companies/organisations, together with many members of the committee. In addition we had merchandise and book sales, with a very nicely-designed and inscribed mug.

One specific piece of memorabilia that was recently donated to the Society, concerned a picture that had been painted of one of the (then) GPO LEO III installations. The picture was reproduced, by the GPO, to make an internal poster; this was then widely displayed in many of their computer operation establishments, around the country. The poster and painting are reproduced below, and both will be on show again at the next reunion.



GPO Poster showing LEO III installation derived from original study on the right.

The society is indebted to

Malcolm O'Neal

for the donation of both the original and the Poster

Preparatory Study for GPO Poster on the left.

The committee would like to thank all those members who completed a subsequent reunion questionnaire, regarding such issues as the preferred geographical location, day of the week, ticket price and general forward direction that our 2019 reunion should take. It was satisfying to discover that the committee's existing views were largely confirmed by the questionnaire's consolidated

answers.

At the time of writing, the venue for 2019 is still under review, although a short list has been drawn up. It is, however, scheduled for the Spring of 2019 – and we will let members know in good time of all the details.

Notes on Mike Storey

Mike's involvement in the IT industry started in the mid 1960's, with English Electric LEO Marconi. Part of a 3 man team, he was a site shift engineer at Phoenix Assurance, Norbury, working on LEO 111/33.

Commissioning LEOs — a Memoir by Tony Morgan

From Left to Right: HRH Duke of Edinburgh, Stan Holwill (see p.14) and Tony Morgan.

I joined LEO Computers Ltd. at the end of 1957 at Minerva Road on the second LEO II Engineers' Training Course half way through the eight week basic training course. The computer company had occupied an old Lyons tea warehouse at number 42 because of the orders they were receiving for LEO IIs. The research, development, manufacturing, purchasing and accounts departments were housed there and LEO II/2 for Imperial Tobacco at Bristol (high speed Ferranti magnetic drums for file storage and Powers Samas 300 lpm alpha/numeric printers) and LEO II/3 for Stewart and Lloyds at Corby (virtually a clone of II/1) were being tested. Towards the end of the twelve week main course I was posted to Elms House on LEO II/1 to fill a shift vacancy without taking the end of course test. Ironically in later years I sat on boards for trainee engineers' end of course tests. I had already expressed a desire to do factory testing. While at Elms House II/3 was delivered. In March 1959 I returned to Minerva Road. II/4 for the new Ford's Aveley spares facility was now on the factory floor.

At about this time Tony Barnes, the Production Director, issued a memo titled 'Commissioning Engineers' Roles'. This was when the word commissioning was formalised in the LEO lexicon and I believe came from Tony's Royal Navy career where warships, another very complex system, are 'commissioned'. The first sentence is significant and I quote. 'Senior Commissioning Engineers are engineers who are qualified to direct the entire commissioning of a specific computer up to and including the process of delivery and installation.' I became involved on II/5 for our bureau at the new sales and marketing department in Hartree House, part of the Whiteley's department store in Queensway, Bayswater, testing our first magnetic tape system. When II/5 was installed almost the entire Minerva Road team were on a 24 hour shift system and that's where I got my taste for curry at a restaurant in Queensway. In this era two other engineers and I had the responsibility, and took it in turns, to accept the magnetic tape decks from Decca. On each trip we were treated to a very fine Michelin Rose lunch at The Ship at Shepperton, a restaurant used by the film industry.

In July 1959 I was introduced to the secrets of the garden shed which had appeared in the corner of the car park at Minerva Road and Pinkerton, other senior research personnel and Steve Farrow who had commissioned II/4, spent a lot of time in there. It contained the magnetic core storage rig which also was our first use of transistors. This system was intended to replace mercury acoustic storage from II/8 onwards. I was appointed Chief Commissioning Engineer for II/8, Standard Motors, Coventry. Steve and I got the store working but we were experiencing unexpected drop outs and pick ups, not unlike the behaviour on the earlier mercury storage system. Pinkerton and Research got involved and thermostatically temperature control blankets were put round the core stacks but this was not the complete answer. Fortunately the answer was found in an American research document. It involved the addition of what is called post-write disturb which added a microsecond to each store cycle. The heated blankets persisted on the core stacks on the Standard LEO IIIs and all the Plessey store cabinets on the IIIFs had to return to their factory to have post-write disturb added.

Because of the number of orders, two experienced electronic engineers were employed, Dave White for II/6, Ministry of Pensions, Newcastle and Dave Frost for II/7, British Oxygen, Edmonton. Dave White stayed with Commissioning for many years but Dave Frost, after programming 'The Sailors' Hornpipe' with Alan Potter for Prince Philip's visit to II/5 in Hartree House, left. I had the honour of showing the Prince II/8 in Minerva Road.

In July 1960 after installing II/8 I joined Steve again and we spent a year commissioning the half-word LEO III/1 pilot. The main problem we experienced was the instruction microprogram assembly. It was going to be both a manufacturing and maintenance nightmare. Paddy Salem, the LEO IIIS designer came up with a great solution. The instructions were split between 12 black boxes. I likened them to attaché cases. Offline the Ampex magnetic tape was being tested by George Manley and Frank Walker and the Anelex printer by Vic Kleiner. We had just completed the expansion of the pilot to a full word machine and the full configuration was being laid out when in July the Commissioning Manager, Peter Mann, left for Honeywell, the start of a mini exodus. George took over as manager and I took over II/2

for the joint LEO Computers/ Rand Mines bureau in Johannesburg from him (see my previous article in Newsletter Vol. 3).

From July 1962 to January 1964 I did II/5, III/9 and spent 4 months with Frank Wroe who had done III/10, at Kidsgrove helping find the problems with KDF9, seven of which were already in the field. English Electric did not have a dedicated commissioning team. There is one story about III/9, Customs & Excise, Southend, which was the largest LEO III to date. My girl friend at the time was an operator on the three IBM 1401s at their Wigmore Street HQ. One evening we watched the operation from the pavement. I told her I'd show her a real computer so one evening we went to Minerva for which I had the keys. I revved up III/9 which was already running the acceptance trial suite. I explained each job as I started it and when the card reader, most of the fifteen tape decks, two printers and the background store test was running, in the Crocodile Dundee and the knife phraseology, I said "That's a computer!".

I was then brought back to Minerva Road when we received the order from the Post Office to do III/90 (ninety because it was an insertion in the production schedule between III/18 and III/19, the second machine for the Post Office). All LEOs underwent factory and site Acceptance Trials which were observed by the customers and in the case of central government and the Post Office there were established teams. The central government team was known as the Treasury Support Unit (TSU) and it was staffed by seconded Post Office engineers. The Post Office team of engineers was TD9, Technical Department 9, from their HQ. In the case of LEO III the acceptance suite was based on old run of a bureau job known as Home Grown Fruits. It multiprogrammed a data vet, a sort, a process and a print run. If there was a second printer it did a 'wallpaper' print test and a store test of any unused store ran in the background. There was a team of Commissioning Operators who prepared and ran the tests. The Chief Operators over the years were Bob Elmer, Alan Lyon and then John Daines. One operator John and I employed was a young lady who was part of the III/11, Smith and Nephew, Birmingham staff who was so keen on the factory operation that she left them and moved to London and became one of our operating team leaders. At this stage we had four sites in number 42, production and design having moved to number 24 there was a fifth air conditioned site made of Dexion angle metal and hard board which housed the development III/12 IIIF prototype on which Alan Potter gained experience. We then took over number 1 with accounts and purchasing in the front and three more commissioning sites in the back.

In July 1964 when I returned from III/90 I had started III/22 but George Manley left for Honeywell and I became Commissioning Manager. At that time Alan Potter was doing the first customer IIIF, III/23 for Dunlops. On my first morning as manager, Peggy Williams, our Personnel Manager, brought me pile of files, the individual personnel files for my staff. In going through them I was surprised at some of the engineers' salaries having over the years worked with them. Fortunately Lyons policy allowed three monthly reviews. I was able to establish my own salary scale. The less talented left and I was able to develop the best to the IIIF machine.

The IIIF developed significant technical problems as transistor manufacture improved and they were switching on faster and developing noise and ringing problems in the circuits. We disastrously failed a Post Office trial for the third time. This led to a crisis meeting with Development, the famous 'Four Tonys' meeting. Headley, the Development Manager, Williams, one of his lieutenants, Barnes, Production Director and Morgan, Commissioning Manager. I had a dossier of thirty-three problems which had not been addressed. We gave them a later machine to investigate with Research, including Pinkerton. Alan Potter and I moved the failing machine into Development's air conditioned room which they had vacated. Alan and I froze it, cooked it, sped it up, slowed it down, beat it and put positive and negative power margins on it while running the acceptance suite, all to no avail. One day we were round the back and the machine stopped. It had failed. Immediately Alan said he knew what was causing the problem. He unplugged the soldering iron which we always had ready.

Maybe he had an acute sense of hearing when the iron switched. It was one of a batch of thermostatically controlled irons we had inherited when LEO production moved to Kidsgrove. I immediately binned them. That afternoon Tony Barnes came down to check on progress. I told him we had found the problem and we'd better go to my office to sit down. Instead he swept the top of a nearby document storage cabinet off and we sat up on it side by side. I told him about the soldering iron but then pointed across to the machine we had handed over and said that it had got a great investigation going. He laughed like a drain. Like most of us he did not like Headley. The investigation led to huge earthing bars in both the mainframe and store cabinets.

With eight sites and predominately a larger number of IIIFs than Standard LEO IIIs, (IIIS), in the my three years we doubled the throughput of the number of machines and probably quadrupled the capital value. The staff overall was forty or so, twenty engineers, twelve operators and eight or so support staff which included a secretary, an electrician, three wiremen, a store man, a progress chaser and a modifications clerk. These latter were under Brian Harris as my Chief Administrator who had been a production supervisor from the early days.

I wonder if we were beginning to experience global warming but we had always commissioned the machines in an open factory environment with birds flying around in the roof. Customers used to question why they needed air conditioning. They were told we tested them in extreme conditions. However humidity in particular began to affect both paper media and magnetic tape. Temporarily we came up with a very Lyons solution. We draped the sites in number 1 round with dust sheets and humidified the area with boiling tea urns! Particularly with System 4/50 looming in the future the decision was taken to air condition the sites. Initially the four in number 42 were done first with the commissioning schedule worked in around it. The three sites in number 1 came up for a new quote. By then the engineer who had handled number 42 had his own company and we got him to quote as well. The contractor who had done number 42 came up with a totally different scheme for number 1 whereas their original engineer's scheme was virtually identical to the original number 42 one. A friend of mine who at one stage had worked for the

original contractor by then had his own specialist company. I borrowed the quotes and he and I poured over them on his lounge floor. He recognised that the original contract was trying use up equipment that had been bought for an old contract that had not gone ahead. I recommended we proceeded with the alternative quote. Ironically System 4/50 commissioning at Minerva Road, due to lack of orders, never happened. It was all done at Winsford alongside System 4/70s.

As LEO wound down I was asked to see it through to the end including a few customer enhancements. One of these was a second Autolector for Lyons III/46 to go alongside their first on III/7. This could only be done at night. I had become a bit of an Autolector expert. We only ever did seven so at the end I was back at Lyons on night shift in Elms House. I had gone full circle!

At the beginning of 1968 I went on to train as a system consultant, having been encouraged by Mike Gifford who became Government Civil Sales Regional Manager and David Caminer, and in January 1970 moved on to do the final System 4 and 1900 product planning, elements of 2903 and the operating control desk for 2900 in the company HQ, ICL House Putney.

Postscript. The extra LEO 326s for the Post Office.

Shortly after our merger with ICT in 1968 there was a wine and cheese reception at Computer House for the English Electric-LEO sales staff to meet with 5 ICT Directors. Doug Comish and Ninian Eadie poured wine down me to try and get me go to Winsford to commission 5 new LEO 326s for the Post Office, the biggest order the combined companies had ever received. I declined. Alan Potter, who had moved to Kidsgrove on Design and several of my staff who had moved up there to do System 4 commissioned and installed them. In later years, before Alan died so tragically before he was 50 he told me that when they found that a very special transistor used in the adder carry line was apparently unavailable so he came down to Tottenham Court Road and went back with a 'bucket load'!

Beyond that there's LEO DME, but that's another story……

Notes on Tony Morgan

Tony first served on the LEO Computers Society committee 20 years ago. His current role is to identify and explain the LEO hardware artefacts which are received or discovered by the Society. He has been keen to ensure that LEO's history is preserved and donated money to allow the Society to erect both a commemorative plaque and an Information Board in Lyons Walk, next to where Cadby Hall once stood.

My LEO Involvement & Memories

by Stan Holwill

Stan Holwill
System 4-50 at Minerva Road

I started my working life in 1947, with an interest in engineering, at an electrical engineering firm - Clifford & Snell in Sutton Surrey. I served a five years engineering apprenticeship. During this time I spent one day a week at Wimbledon Technical College studying for ONC & HNC.

This was followed by two years compulsory National Service in the Royal Corp of Signals where I spent eighteen months in Malaya as a radio mechanic. During my time in the Army I developed an interest in electronics. When I was demobbed and went back home I started building a six-inch television set. I used components from government surplus electronic equipment such as radar sets, which I bought from Proops Brother's shop in Kingston.

Whilst looking through a copy of a Wireless World magazine I found an advertisement by J Lyons & Company Ltd, Cadby Hall, London. They wanted electronic engineers to service their "High speed electronic digital computer". I applied for the job and was interviewed by Ernest Lenaerts and Peter Mann. Following my interview I received a letter from TRThompson offering me a job with J Lyons as a junior computer engineer. I was delighted and accepted. Without ever changing my job I spent the rest of my working life in the computer industry, finally ending up working for ICL after many take-overs and mergers.

January 1956 – June 1956 Junior Computer Engineer on LEO, J Lyons, Cadby Hall

I started work at J Lyons in January 1956 as a junior computer engineer to work on LEO at Cadby Hall, London. During this period I spent my time studying LEO and attending maintenance sessions. Every day the engineers had a one-hour period for maintenance. This involved running engineering test programs, under margins, to check that LEO was functioning correctly. The maintenance period was also used to investigate faults and for routine changing of the thermionic valves in one of the electronic units. Each valve had an identification number painted on it. A history was kept of each valve. The valves removed were tested on a valve-testing machine and if satisfactory would be reused otherwise they would be thrown away.

During one engineering maintenance session, several engineers and operators had gathered around the paper tape readers, and I joined them to find out why. The engineers had modified the paper tape system so that the paper tape stopped on a 'block end' (BE) character instead of every row to read the data. This meant the tape was read on the move until a BE character was de-

tected and stopped the tape. It was a great improvement to the performance of the paper tape system.

June 1956 – February 1958 LEO 11 Prototype Commissioning/Maintenance
In June 1956 I was transferred to work on the LEO II prototype computer being commissioned on the second floor of a building in Olaf Street, Shepherds Bush, London.

Ernest Lenaerts (Len), who spent twelve months working on EDSAC at Cambridge University, was in charge of the commissioning. Len worked on the arithmetic unit, co-ordinator and store and was assisted by two electronic engineers, John Herning and Vic Wellington. I was given the task of commissioning the input/output electronics and peripherals and had the assistance of Laurie Bristow. On the 1st July 1956 the J Lyons staff including myself, who up till this time that worked on LEO, were formally transferred to J Lyons subsidiary LEO Computers Ltd.

In 1957, the LEO II prototype was moved from Olaf Street to the Elms House office building at Cadby Hall, London, where the final development and commissioning was completed. It was here where LEO II/1, as it became known, was eventually used operationally by J Lyons.

Shortly after moving to Elms House I became responsible for the final commissioning. The mercury delay line storage system was not very reliable. All the LD1 storage units were replaced with a new storage unit LE1, designed by Matt Taub, which greatly improved the reliability of the main store.

When LEO II/1 became operational I was appointed Engineer-in-charge of the maintenance.

At the time II/1 became operational only one known fault was outstanding. This was an intermittent card punch annex fault. After punching thousands of cards the output electronics would stop working showing the row counter stuck on a count of thirteen. This occurrence was about once every ten days. I finally resolved this problem whilst I was asleep. I usually slept well, however, I woke up at three o'clock one morning with a theory as to what was causing the problem together with a modification to stop the fault happening. The following day I applied the modification and the fault never occurred again. The interesting thing about the modification is unless someone explained it to you it would be very difficult to understand why the logic was there. It is amazing what the brain is doing whilst sleeping. This has happened to me twice, both times on a LEO II/1 problem.

I remained responsible for the engineering maintenance until February 1958 when I was transferred to the factory at 38-42 Minerva Road, East Acton, London to work on the commissioning of LEO II/3 reporting to Peter Mann.

February 1958 – November 1958 Commissioned and installed LEO II/3 and assisted engineers on site for six months.
For the first three production LEO II installations, LEO II/2 (W.D. & H.O. Wills Ltd.), LEO II/3 (Stewarts & Lloyds Ltd.) and LEO II/4 (Ford Motor Co.), it was company policy for customers to have their own computer engineers and be responsible for the maintenance of their computer system.

LEO II/3 was being built for Stewarts & Lloyds Steel Works at Corby, Northants. To commission LEO II/3 I had three of Stewarts & Lloyds staff, to help and gain practical experience in fault finding, a senior engineer Ian Fulton, and his two engineers, one electronics and one mechanical. I was then responsible for re-commissioning II/3 on site at Stewarts & Lloyds and running the acceptance trails. Following the acceptance of the machine I then worked for six months on site, Monday to Friday, training and assisting the Engineers. I travelled to Corby from Ewell by car every Monday morning arriving about midday, it was a slow journey having to travel through London: there were no motorways. I would then leave for home midday Friday. During the week I stayed at the Corby Hotel together with an operator, from LEO Computers Ltd, who was assisting the Stewarts & Lloyds operators. At the end of my six months at Corby, when I returned to the factory at Minerva Road, Peter Mann appointed me Commissioning Manager for the LEO II machines.

November 1958 – 1961 Commissioning Manager LEO II's
When I arrived at Minerva Road there were three sites laid out with a machine being commissioned, on each, they were:-

LEO II/5 for LEO Computers Ltd., Hartree House, Bayswater, London
LEO II/6 for the Ministry of Pensions, Newcastle-upon-Tyne
LEO II/7 for the British Oxygen Co., Edmonton, London

As each machine was completed and left the factory commissioning of another LEO would begin on its vacated site. A further four LEO II's were commissioned:-

LEO II/8 for the Standard Motor, Coventry
LEO II/9 for Ilford Ltd., Ilford, London
LEO II/10 for W.D. & H.O. Wills Ltd., Bristol
LEO II/11 for the Ford Motor Co., Dagenham, London

The last two LEO's II/10 & II/11 were customer maintained.

Before each LEO system left the factory it was subjected to a 100 hours reliability trial. This involved running cycles of Engineering Test Programs and a suite of typical jobs. This was again repeated on site after the system had been installed and re-commissioned.

On the 22nd March 1960, during the period I was Commissioning Manager for LEO II's, H.R.H. Prince Philip, Duke of Edinburgh visited the factory at Minerva Road and the LEO II/5 computer installation in Hartree House, Bayswater. Prior to the visit a rehearsal took place at the factory. I accompanied Tony Barnes (Production Director, LEO Computers), Isidore Montague Gluckstein (Managing Director J Lyons) & Anthony Salmon (Managing Director LEO Computers) around the LEO II/8 installation, upon which Tony Morgan, Chief Commissioning Engineer, and I were to demonstrate to the Duke of Edinburgh how we use the computer to test the Samastronic printer. Mr Gluckstein turned round to me and said "I understand you can play music on these machines" to which I replied "Yes Sir". Mr Gluckstein then said, "I would like 'The Sailors Hornpipe' played on the Hartree House Machine as the Duke of Edinburgh enters the computer room".

I asked Ernest Kaye, the Purchasing Manager, to buy me a copy of the music for 'The Sailors Hornpipe', which I gave to my Commissioning Engineers with a request to write a program to play 'The Sailors Hornpipe'. They produced a pack of punched cards, which contained the program they had written and tested. I then visited LEO II/5 to have a test run to ensure it would work okay for the Duke of Edinburgh's visit. I still have a copy of the card pack.

1961 – 1962 Maintenance Manager LEO II & LEO III
When my job of Commissioning Manager LEO II's ended with the commissioning and delivery of the last LEO II, I was persuaded to become Maintenance Manager by Tony Barnes, the production director. It was a job I wasn't keen on doing. When I took over the job from John Wheeler there were seven systems, LEO I and LEO's II/1, 5, 6, 7, 8 & 9 under maintenance by LEO Computers Ltd., and thirty-five on site engineers/mechanics. During the period I was Maintenance Manager I interviewed and offered jobs to dozens of applicants, for training as engineers/mechanics, to maintain LEO II machines & LEO III machines that were in production. I also took over the maintenance of the Ford Motor Company LEO II's, (LEO II/4 & LEO II/11), together with their Ford engineers and mechanics that were transferred to LEO Computers Ltd. When the LEO III's started coming off the production line the prototype LEO III/1 plus several others LEO III's became under my control for maintenance together with the staff that I had recruited.

After nearly two years of being Maintenance Manager I wanted to get back into a technical role. Being Maintenance Manager with all the power and prestige was a great privilege. However, I was frequently called out in the middle of the night to help in diagnosing and repairing a faulty LEO II system which I enjoyed. However, the sales director, David Caminer, then expected me to be back at my desk at 9am the next day.

The opportunity arose for me to provide an engineer to set up a Maintenance organisation in Melbourne, Australia for which I volunteered myself. The company recruited Charles Ashby from W.D. & H.O. Wills Ltd, Bristol to take over my job as Maintenance Manager.

However, shortly afterwards I decided not to go to Australia after all because my wife was not happy about moving there with our one-year old daughter. Now having found myself without a job, I was asked, by John Pinkerton, to take on the task of improving the performance of the LEO II magnetic tape system, which was suffering from corrupt data blocks.

1962 – 1963 Development Engineer LEO II and LEO III magnetic tape
I discovered that the LEO II magnetic tape corrupt data blocks were mainly caused by a spurious mark on the block start marker (BSM) track. The design department designed a BSM checking device. This verified that the BSM track did not contain any spurious marks. I built and installed one of these devices for each LEO II that had a Decca magnetic tape system.

I also investigated a problem with the TM2 magnetic tape units on LEO III systems. They were suffering from the tape sticking in the tape chambers. This was caused by static building up on the tape path in the chambers. Sticking anti-static tape on the tape path inside the tape chambers cured the problem. I modified all the TM2 magnetic tape units that had left the factory and were in use by customers.

1963 – December 1970 Manager of the Maintenance Development Department (London). Systems included LEO III, Systems 4/40, 4/50 & 4/60. This involved specifying and supplying all the maintenance manuals, documentation, engineering test programs & spare computer parts/components for each LEO III being delivered to a customer. For new peripherals and systems under development this involved specifying the maintenance facilities, engineering test programs, spare computer parts/components, maintenance manuals and documentation.

December 1970
I was made redundant, when the factories in Minerva Road were closed, and sadly my fifteen years involvement with LEO came to an end.

Looking back over the years it was an exciting time particularly working on the LEO II prototype system which I enjoyed the most. I still remember the excitement when I fed the first card into the card reader and watched the data being displayed on the control desk cathode ray tube display.

I remained with ICL working on other systems and projects until I took early retirement in December 1991.

Addendum LEO II/7
I was responsible for the recommissioning of LEO II/7 when it was transferred from British Oxygen Co. at Edmonton, London to LEO Computers Ltd., at its Hartree House building in the Queensway, London.

Notes on Stan Holwill

Stan joined LEO in its very early years working on the LEO II prototype from 1956 and stayed with LEO and its ICL successors until he took early retirement in 1991. It was Stan who was responsible for organising the famous 'Sailor's Hornpipe' composition on LEO to be played to welcome the Duke of Edinburgh on his visit to LEO in 1960.

Reminiscences – working on LEO computers for Shell Mex BP

by Bill Forfar

It all started when Wendy Craig woke me up with "A Cup of Tea and Lyons Tea Shops" ……

I was dozing on the settee when I became aware of 'LEO' on the screen and Wendy Craig uttering the words Lyons Electronic Office.

Acronyms, acronyms … they are a part of everyday life and the acronym 'LEO' reminded me that in 1963 I chanced into the world of computing when my first job was as a Computer Operator for Shell Mex and BP on their new LEO 326 machines in Hemel Hempstead. What an introduction, right at the cutting edge of the brave new world! 1024 words of 40 bit memory, made up of a matrix of magnetic rings each threaded on three wires which made it look rather like a thread-bare tapestry on a plastic frame about 12 inches square. You could SEE the bits in each WORD.

Sept 63…… Love, love me do

A wonderfully air-conditioned room with two LEO 326's: each with 8 tape decks, 2 paper tape readers, a paper tape punch, card reader, card punch, two printers, main console and Engineer's Control panel. The place was jammed by trolleys filled with the input for the jobs - mag tapes to read, some work tapes for the sorts, mag tapes for output into the next job and paper tape with daily sales tickets to be read by the Elliott Readers. This tape was punched from the handwritten dockets sent from the depots where the road tankers filled up with diesel or petrol.

I remember we had one operator on Mag Tapes, one on Peripherals, one on Buttons.

The cry rang out - "Allocate mag tape on Channel 2 Route 2: Printer on 6/1: Paper Tape output on 7/1" The job started and the P/T began to fly through the reader into a large metal bin. Mag tapes inched forward, reports printed out, reel after reel of P/T filled the bin. Don't lose the end – it's all got to be rewound in case the job fails or the tape needs to be dibbed.

The jobs failed sometimes due to mis-punches in the P/T so out with the dibber and the black-and-sticky to re-punch a character or two. One day a reel stopped at the same place repeatedly just after a splice point, the data prep girls had joined two reels together. However the second tape had been turned over and joined upside down to the first one. The sprocket holes seemed to match but the 2-track side had been joined to the 3-track side and carefully trimmed to make a neat splice so it looked like the 5-track tape was supposed to look.

Another day came the words – "I bet you can't hit the big red EMERGENCY STOP on the Engineer's panel from here with that reel of black and sticky"…. Zooom……Ooops……. Silence except for "You've won the prize, Jim!" Then the problem was how to doctor the console log to cover up the re-run time.

July 64…. Please, please me

The task now was to learn Assembler, then CLEO for writing programmes. Wow, a step up the employment ladder. The DSR – Dealer Site Record -with filling station information covering the number of pumps, A-road or B-road, car dealership, gallonage for the storage tanks, throughput per week, location and so on. Did you know there are even waterside filling stations for barges? Then began my introduction to a look-up table to check the map reference was correct for the site. It was planned to use this to work out the best road route for the tanker from the depot to each filling station and back to the depot – this was leading edge use of computers and might save money. The edge of the whole country was set up in map references so garage could be mistakenly put in the sea somewhere! In fact this routing idea was too heavy on computing calculation and, anyway, the tanker drivers were the experts on minimising the road miles. Development deferred!

Oh, the elapsed time it took to get a compilation and test of the programme back from the machine! One turn round every three days only to find there was a simple coding error. There were too many programmers, too many mistakes and too much operational work for the hours in the day. But the LEOs proved their worth and SMBP's profitability rose.

Sep 65 … What's new Pussycat?

I bade farewell to Hemel and enrolled on the Computer Science degree at Hatfield, which had 2 periods of 6 months working in a business during the 4Jyear course. But now the computer (I hesitate to use the word) was an Elliott 803B, all paper tape and not a mag tape to be seen. However it did have longJlife plasticised paper tape from which to load the operating system! Output had to be via paper tape and then printed via a Teletype. Still I learned a lot. At the start of year 2 it was back to Hemel for 6 months commercial experience working on another programme. All acronyms were related to the sales and delivery world of the oil industry in the UK. Then other languages, FORTRAN, COBOL, Algol and more needed to be mastered.

Mar 1968 ….. Come on baby light my fire…..

…..I spent time somewhere else…. NO, not at Her Majesty's Pleasure!

Aug 1969 …Zebedee time

EELM had lost the sales battle to Univac at the Shell site. The machines had changed to become Univac 1100's with the FASTRAND storage device holding an infinite amount of information so you wouldn't need to store information on mag tapes anymore….. wait a moment, what was that saying about systems expanding to fill the available storage? We were soon back using mag tapes and there were too many programmers developing too many programmes and too many operational programmes to run in the available time.

What goes round comes around; things don't really change, do they…..? Which brings me in a roundabout way to the time I witnessed Real Magic. The office block had a magnificent view of the junction where six roads met. A scaffold tower went up in the middle, six large white blobs appeared at the end of each road and many concentric circles were drawn. At five minutes to four o'clock the High Priest climbed the Tower holding a megaphone. Work stopped and our windows were crowded with baffled observers. His yellowJjacketed assistants hovered on the kerbs and at precisely 4pm they leapt into action to make a Magic Roundabout. Two lanes each way and six miniJroundabouts later it soon slowed the traffic to a crawl but after a few days the locals became accustomed to it and they zoomed round. In at road 1 go left to road 2 or 3; it's quicker to go right to 5 and 6, but which way to road 4?

Postscript

The Magic Roundabout.

There were six roads which converged to make a large roundabout, it also had the River Gade running under it which fed the Grand Union Canal.

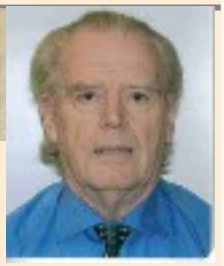
These six roads comprised:J

A4146 Hemel to Leighton Buzzard, Hemel High Street, 414 Hemel to St Albans, Lawn Lane from Hemel to Watford via a back lane, Two Waters Road and finally the A4146 from Hemel to the station. This became one of the Magic Roundabouts with four lanes of traffic, two running clockwise and two running anticlockwise. At each of the six junctions was a mini roundabout. Traffic circulated whichever way suited your journey, hence driving from road 1 to road 2 meant a shorter trip by turning right and right again.

Notes on Bill Forfar

Bill worked on two LEO 326 machines at the Shell Mex BP building in Hemel Hempstead for about a decade from the early 1960s. The town had been developed since the war as a New Town and SMBP occupied a modern building complex straddling the streets below . Bill recalls the inauguration of the famous and fiendishly complex roundabout in the town – nicknamed the Magic Roundabout! In this reminiscence, Bill blends his memories of working with LEO with other flavours of the period.

Johns story by WEJ Parry



I would not have worked on LEO II if I hadn't had some previous experience of working on some very exciting and advanced technology when helping to build and test 7 of the H Bombs that the UK tested in the Christmas Islands during 1957/58. I was initially trained at the RAF Electronic Training School as a National Serviceman. I had a scholastic deferment so I didn't have to do my national service but I played around and my father and my headmaster were friends and they decided that I needed a bit of discipline. So they agreed that my scholastic deferment was withdrawn and I had to do my 2 years national service. The RAF electronic training was absolutely rigid. It was a 13 week training course, Monday to Friday, 8.30 until about 5 pm. Every Saturday morning you took an exam. And every Saturday you had to pass that exam before you were allowed to go to the next week. I did very well in that. So much so that they actually said if I signed on for another two years, they'd give me even more technical training. So I signed on for another two years and on completion of technical training I was posted to 1321 Flight, the team of 14 people based at RAF Wittering that worked with the Atomic Weapons Research Establishment.

Stewarts and Lloyds at that time was a real powerhouse of original thought and advanced thinking. I had met and become engaged to a Corby girl who was born in Corby Old Village so when I left the RAF I wished to live and work in Corby. The RAF gave me a good reference and I was interviewed by a Dr Blair, the head of The Department of Research and Technical Development at Stewarts and Lloyds, Corby. They offered me a job as a junior technician in their electronics department maintaining the ARL Quantographs in the Routine Research Laboratories. Computers today work in trillionths of seconds. Computers in the 1950s worked in hundredths of a second. The LEO computer was the first commercial computer designed to work in fractions of a millionth of a second. The industry was short of people that had that knowledge. Working with the AWRE I had gained the technical knowledge that was needed to work with the LEO II Computer.

Until 1960, the LEO II computer was running a single shift system, 9-5 Monday to Friday. By 1960, the payroll for over 10,000 employees was being calculated every week and they needed to go into a second shift. To go into a second shift they needed an extra engineer. They offered me the position of being a LEO II computer engineer. In those days you only read about computers in comics so I said, 'yes, I'll do that'. And that was it. They trained me and I was a shift engineer on LEO II for over 4 years.

The LEO II was huge. It was so large that you could actually get inside some parts of the machine to fix things and we had a badge which you used to pin on the door of the main power cabinet which said, 'Do not switch on, engineer inside'. Throughout the 15 years of LEO operation the computer didn't fail to produce the payroll on-time for any week throughout the whole of that period.

After four years of working shifts as an engineer, as more work was being processed by LEO they were desperately short of programmers. I was very keen on programming and they came to me because I was interested; I talked to the programmers and I learnt with them. They asked if I would like to move to the programming department and I said yes. They sent me to the LEO programming training school with two other new recruits who worked on the really clever mathematical stuff. I became responsible for the payroll programmes. We would start doing the payroll about midday on Monday and it had to be finished by Wednesday night, so that they could send the cash analysis to the bank. In those days all 10,000 weekly paid employees were paid with cash in an envelope. The bank would deliver the cash on Thursdays, around about a quarter of a million pounds and it would be sorted and put into the pay packets. I became a Senior Programmer, running the programming teams for the payroll and other commercial work and helping in the training of new programmer recruits.

After Stewarts and Lloyds I worked for SATRA in Kettering, helping them install their first computer and then moved to International Computers Limited, where I worked for 18 years. I was a Technical Specialist on a number of major projects in the UK and in 1975 I was transferred to their International Division and I worked in 17 countries. My wife, Marie and our children came with me to live in the USA and Singapore. We are a Corby family but we have lived and travelled to many other countries. When the children were older and had left home, Marie came with me and we travelled everywhere together but we always came back to Corby. When I was in Singapore working for International Computers Limited we computerised the Singapore Post Office and several other businesses. With the 4 Singapore banks we designed and installed one of the first electronic funds transfer systems in the world using payment by credit card. The early pin pads were tested in our kitchen! I actually did the first transaction. I bought a packet of sweets and it was the first transaction that went through live.

We've been so fortunate. We've travelled and seen a lot of the world. It's been a fantastic experience.

The Leo II machine is historic. It's fascinating. Its total memory was 2,000 words, which today, a modern microwave wouldn't work with that limited memory. Our phones which we carry in our pockets today have a million times more memory. It was a wonderful machine. There were aspects of it which I didn't fully appreciate at the time. I have worked in computing ever since and I've actually come to understand how smart and clever the LEO computer was.

Notes on WEJ Parry

John worked at Stewarts and Lloyds in the Computing and Calculating Department, working on the LEO II; the first computer in the world made for routine commercial uses by businesses, becoming a pioneer in an industry that we now take for granted.

News Roundup

- ***Friend of LEO is made a Companion of Honour.***

Members may remember that the Society was delighted in November 2016 when Dame Stephanie Shirley was our special guest and unveiled our plaque commemorating the birthplace of LEO at Cadby Hall. We were very pleased to learn that Dame 'Steve' was honoured by the Queen in the 2017 Birthday Honours with the order of the Companion of Honour, the CH. This special award is granted to those who have made 'a major contribution to the arts, science, medicine, or government lasting over a long period of time' and is made to no more than 65 people at any one time. The Society sent Dame Steve its warmest congratulations.

L-R - Frank Land with Dame Stephanie Shirley and Tony Morgan at the unveiling of the LEO Plaque

♦ *Cadby Hall to rise again?*

Cadby Hall, a familiar edifice to many of our members, was demolished in June 1983. After that, the area was developed and a series of tall office blocks took its place along Hammersmith Road. The Society was recently contacted by a firm of developers who have plans to replace the current 66, Hammersmith Road, with a new, taller block. We met them and their architect to talk through the ways they would like to include the history of the area. They would like to celebrate Lyons and LEO in an enhanced Lyons Walk area, maybe with a timeline stones set into the pavement to complement the memorials we have recently erected ourselves. The developers have submitted their plans to Hammersmith and Fulham Council's planning committee and the Society has registered its interest in keeping in touch with the plans as they develop. The development company have stated their wish to name the new building 'Cadby Hall'.

Honouring LEO with an IEEE Milestone Plaque

by Tony Davies

The IEEE is the world's largest professional engineering society and has a programme of History Milestones which recognise important inventions and achievements in the history of electrical, electronic and computer engineering. Each Milestone takes the form of a cast-bronze rectangle, including a short citation describing the reason for the award of the Milestone, and they are normally installed at the place where the invention or achievement took place. The award must be for something which took place 25 or more years ago. One of IEEE's slogans is that its members 'invent the future' and clearly an awareness of the past is essential for that.

In the UK and Ireland Section of IEEE , there are Milestones at Bletchley Park for WW2 code-breaking, at King's College London for Maxwell's Equations, at Cheltenham for Public-Key Cryptography, at Imperial College for Holography, at Abbey Road Studios for Blumlein's Stereo Sound inventions, at Frith Street in London to recognise John Logie Baird's first public demonstration of television in 1926; at Gallanach Bay near Oban, Scotland, the first trans-atlantic telephone cable (TAT-1) - with additional plaques at the other end at Newfoundland and Nova Scotia, and many more. .

Recently unveiled Milestones include

- at Warsaw, the first breaking of the Enigma code;
- at Karlsruhe, Germany, Heinrich Hertz' demonstration of electromagnetic waves;
- at Kharkiv, Ukraine, the Zenit parabolic-antenna L-band three dimensional pulsed radar;
- at Eindhoven, Benelux, the compact-disc audio player.

Approval of a Milestone proposal is a long process (at least two years and often more. It is open in that the details are submitted via the ETHW website, and comments for or against may be recorded there by IEEE members and others.

The Life Members Group of the IEEE UK Ireland Section believes that there should be a Milestone to commemorate LEO as the world's first business computer. The 'ideal' location would be where Cadby Hall used to be, but there is, unfortunately, no obvious location for the plaque there, although there is no shortage of documentation to justify and assist with making a strong proposal.

Notes on Tony Davies

Anthony C Davies (Tony) is an Emeritus Professor of King's College London, who retired from a decade in the Electronic Engineering Department there nearly two decades ago. Prior to that he was Director of the Centre for Information Engineering at The City University, London, and has spent a year each at The University of British Columbia, Purdue University in Indiana, USA and British Aerospace Army Weapons Division. He has a BSc(Eng) from Southampton University, an MPhil from London University and a PhD from The City University. Before all that he was in the REME, and at one time worked for GEC in Coventry. He is a Fellow of IEEE and IET and a Member of BCS and is a Chartered Engineer.

COMMITTEE

Peter Byford	Chairman
Frank Land	Chair History Sub-committee
Bernard Behr	Treasurer
Hilary Caminer	Secretary
Gloria Guy	Merchandise
John Daines	Archive
John Paschoud	Education
Mike Storey	Reunion Planning
Mike Tyzack	Oral History
Ralph Land	History & Fundraising
Tony Morgan	Technical Consultant
Vince Bodsworth	TMOC rep. Heritage
	Project & Membership
Bob Stevenson	Website Manager

In addition we have a number of volunteers who are helping with the history projects. Our recruitment of new members is mainly by way of our website and publicity. We now have over 800 members around the globe.

www.leo-computers.org.uk

newsletter@leo-computers.org.uk

Published by LEO Computers Society

♦ *Peter Byford meets up with the Australian LEO-ites in January 2018*

LEO sold 6 LEO III's in the sixties to three Australian companies -

Tubemakers Pty. Ltd – 1963, Shell Australia – 1964 & 1966 (326) and Colonial Mutual Life -1964.

Some 100 LEO staff were employed in Australia covering the installations which were based mainly in Melbourne with only Tube-makers installation in Sydney.

One of the Managers, who was based in Sydney was Wallace Weaving. Wallace sadly died in 2012. One of his children is Hugo Weaving, the star of many films including the Matrix trilogy and Lord of the Rings.

Many of the LEO staff stayed in Australia and were eventually absorbed into the ICL (Australia). We have quite large number of Australian members, some of whom we do see at Reunions. Some ICL Australia pensioners publish ICL All Stars magazine every two or three months. It is a big newsletter usually around 35 pages containing gossip, news and photos of ICL Australia people, nearly always with references and photos of LEO people –if you want to look at it we have a link through our website :

http://www.leo-computers.org.uk/images/ICL%20OZNewsletter%201708.pdf

We have had two major LEO Reunions in Australia, one in Melbourne and another in Sydney. Both many years ago.

My daughter and family live near Melbourne so we try and visit Australia once a year if possible. During the 2018 visit we managed to meet up with some of the Melbourne contingent, thank you Dave Jones for organising it. We had a nice chat with them over a meal and a few beers in restaurant in Federation Square in the City.

(clockwise from the left): Graeme Hunt, Len Edwards, Alan Sercombe, Dave Jones, John Hoey, Robert Timms, Peter Byford , Margaret Byford and Judy Hoey.

Parting Shots

♦ *Some statistics from our website.*

by Bob Stevenson, Website Manager

The total number of sessions in 2017: 4053, was a lot less than in 2016: 5786, (as measured by Google). However there were some anomalies: Belgium doubled from 14 to 28; Japan was up from 19 to 47 and China increased from 22 to 23 (!) but on looking closer at some of the other stats, not all were as good as they seemed.

South Korea surprisingly showed in the top ten countries with 29 sessions but the average time spent on the site was zero.

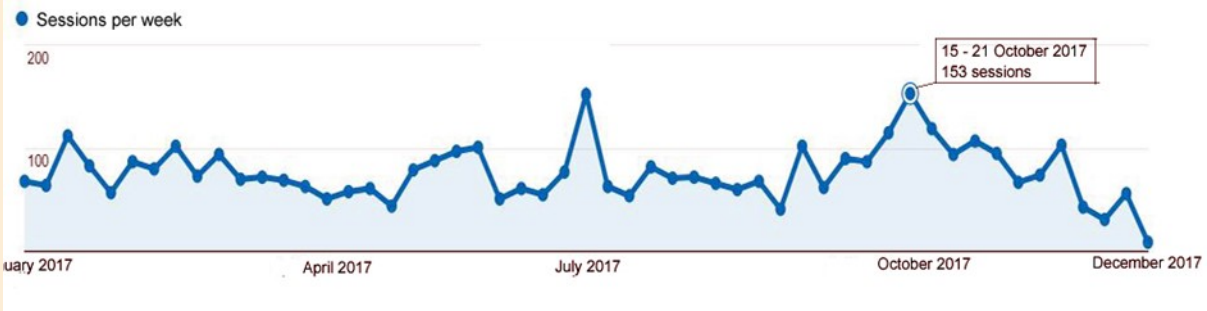
Among other unusual areas that appeared to have landed on the LEO website in error were Colombia, Iraq, Laos, Zimbabwe.

The top cities that viewed the sites were as expected mainly British, with Tring, (92 sessions), second to London for some reason. The only city outside the UK was Melbourne at 19th place with 28 sessions – possibly connected with Chairman Peter's trips down under.

Three quarters of our viewers use Desktop/Laptop computers:

Device Category	Sessions	% New Sessions	New Users	Avg. Session Duration
	4,053 % of Total: 100.00% (4,053)	63.85% Avg for View: 63.68% (0.27%)	2,588 % of Total: 100.27% (2,581)	00:02:38 Avg for View: 00:02:38 (0.00%)
1. desktop	**3,079** (75.97%)	62.13%	1,913 (73.92%)	00:02:42
2. tablet	**489** (12.07%)	64.42%	315 (12.17%)	00:02:59
3. mobile	**485** (11.97%)	74.23%	360 (13.91%)	00:01:53

Chart of sessions on leo-computers.org.uk in 2017



♦ *Our next edition:*

We are already gathering material for our next newsletter and would greatly welcome contributions from members—long or short. Readers are warmly invited to send us their written contributions for the next edition which we hope to publish towards the end of the year.
We would particularly welcome reminiscences written by

a. the women who worked with LEO

b. people who worked with LEO machines in companies other than LEO Computers Ltd.

If you would like to send us an article - or discuss what you might write - please contact ***secretary@leo-computers.org.uk.***

We look forward very much to hearing from you!