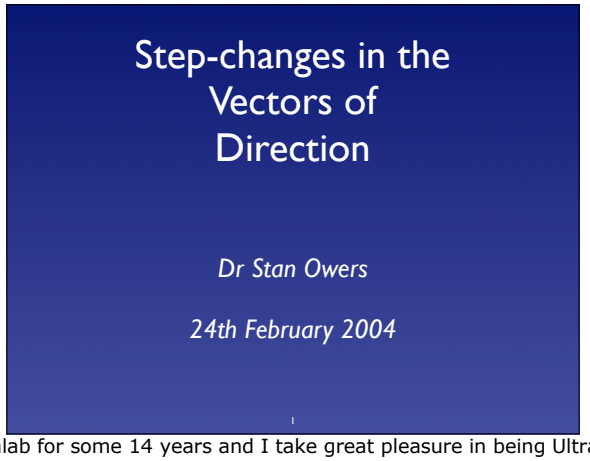


1

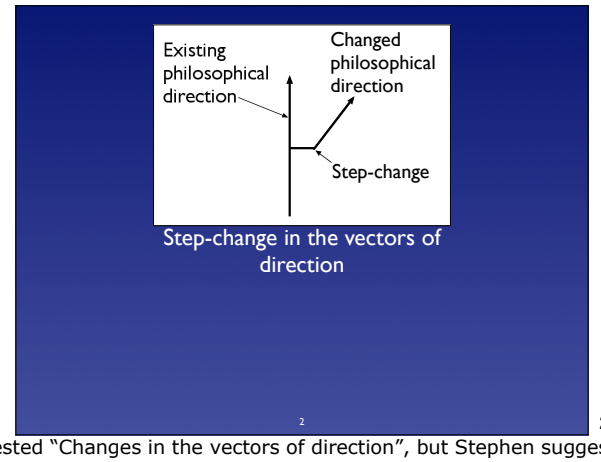
I have been working at Ultralab for some 14 years and I take great pleasure in being Ultranaut No 3. In my time here, I have experienced a huge learning curve, and witnessed many changes.

As you heard, in recognition of my involvement at Ultralab, Stephen has very kindly offered an annual lecture series, and I am flattered and honoured to be presenting the first Owers lecture.

The first of these lectures will take about 25 minutes, and I shall be pleased to take questions at the end.

A lecture series requires a theme, and I began to reflect on what we do at Ultralab at the most basic level. I could see a pattern whereby we would look at a given learning situation and realise that with the introduction of ICT a change of approach could be made.

So we create new learning opportunities using ICT, and crucially we change the philosophical approach to learning in given situations. This can be represented diagrammatically as in the next slide.



2

In the first instance I suggested "Changes in the vectors of direction", but Stephen suggested "step-changes", and I think that is much better. This diagram shows the existing philosophical direction as the straight vertical arrow. We at Ultralab see a possible change in the learning situation with the introduction of ICT, and so we introduce a "step-change".

The next few slides provide some very good examples of the Ultralab philosophy.

3

notschool.net

Notschool.net is an on-line virtual learning community of teenagers who find themselves outside of traditional learning institutions in the long term. It offers them a community of learners, mentors, and experts who share some innovative learning tools. Notschool.net seeks to provide a solution to returning some of these teenagers to learning.

I am sure you will agree this is crucially important!

4

Talking Heads

Talking Heads is an online community for English head teachers. This DfES funded pilot began in January 2000. The DfES recognised that head teachers are frequently isolated, and that there is a wealth of knowledge that this group can share. The support generated between the initial 1200 new heads of schools was so effective, that the community was extended to all head teachers in England.

5

Teachers for Teachers

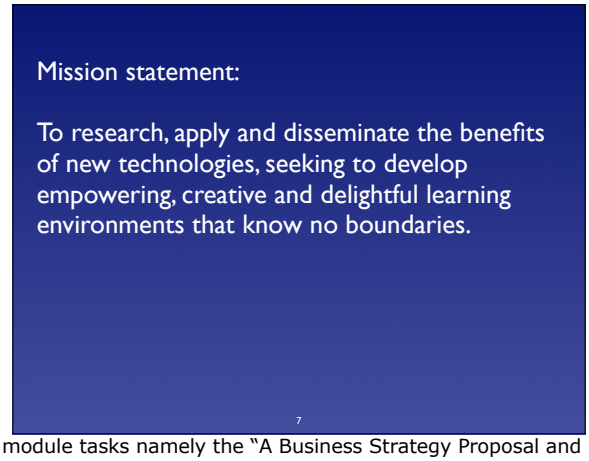
This is a hugely important project for professional development. The web site and allied activity seeks to arm ALL teachers as action researchers to reflect on their practice with ICT. What works for them? What evidence do they have that using ICT was worth pursuing? What improved? The web site implores teachers to contribute context, evidence, thoughts and more. It is not an on-line PhD (!) but IS action research.

6

Ultraversity

The Ultraversity degree is fully accredited by a British University. The degree title is a BA Learning Technology Research. It is a new way to graduate that values the work context. So for people who love what they do and want to move forward, this personalised degree is designed to help them.

These 4 initiatives are fine examples of what we do in Ultralab and of course there are many others. So it is appropriate to be reminded of our mission statement.



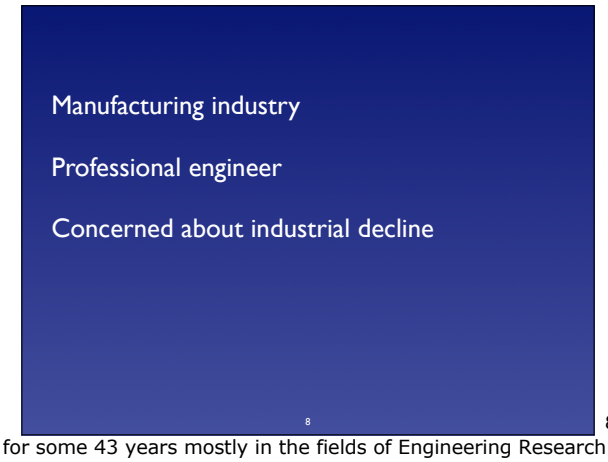
7

This was one of my MA(Ed) module tasks namely the "A Business Strategy Proposal and Mission Statement for Ultralab". What you see here was the outcome of discussions and reflection among colleagues including Stephen, Richard and others.

I believe all the initiatives fulfil our mission statement. But they also share one other characteristic; they have evolved and developed with the direct involvement of the people they were meant to serve. In other words they are driven from the bottom up, rather than from top down.

But how did I come to be here at Ultralab, and what is the step-change that I seek? My overriding concern is that as adults we know the importance of an income to set-up home, but that model has not been successfully transferred to the national situation; this is a serious cause for concern. Education has a crucial part in the transfer process, and the step-change I seek is recognition of that role in our national interest.

These arguments of course require explanation which in turn requires me to let you know a few details about my background, how my interest developed, and how my experience and concerns influenced my career.



8

I worked in manufacturing for some 43 years mostly in the fields of Engineering Research and Product Development. By education and training I am a professional engineer with qualifications in mechanical and aeronautical engineering. So I am a professional technologist.

Since we live in the made world, a world we have created, I am also concerned about industrial decline, and the impact this has on our local socio-economic communities, but I shall come to that later.

D Napier & Son, Engineering, Ltd

Car manufacture

Chassis with engines for Public Service Vehicles (PSV)

Engines manufactured for use on land, sea and in the air

Record breaking, durability and speed events for cars, boats and aircraft

9

9

My professional qualifications were gained at a company called D Napier & Son, Engineering, Ltd. Napier's were a well established engineering company with a fine reputation for the quality and reliability of their products, and that is the reason I went there.

However, before joining the Research Department at Napier's I was concerned that the Company didn't appear to sell very much. But I decided to take a chance because of Napier's engineering reputation. Later, my concerns were to prove very real causing me to change career!

But let me show you a few slides to do with Napier's products that illustrates their engineering and technological prowess:

Napier motor-cabs – part of fleet operated by Coupé Company in 1909

Men & Machines: A History of D Napier & Son, Engineers, Ltd, 1808 - 1958, Wilson C and Reader W, 1959, Weidenfeld and Nicholson, London.

10

10

For their first decade cars were regarded as the plaything of the wealthy, but more utilitarian uses were quickly being developed. This slide shows part of a fleet of Napier cabs in 1909.

The car has made a huge impact on the way we live. Now it is an indispensable tool in the life-styles of most of us.

By the way, I didn't join Napier's until 1951!

Napier cars line up before start of 24-hour endurance trial @ Brooklands in 1907

Men & Machines: A History of D Napier & Son, Engineers, Ltd, 1808 - 1958, Wilson C and Reader W, 1959, Weidenfeld and Nicholson, London.

11

11

In the early days cars were unreliable, so Napier's sought to demonstrate and prove their cars by racing and by participating in observed time trial events.

Here three Napier cars line up at Brooklands for the start of a 24 hour event. The aim was to exceed a mile a minute for 24 hours. All three cars exceeded 60 mph and 1500 miles. The lead car achieved 65.9 mph and 1581 miles. As you see that was in 1907!

By the way, in the world of motor-sport, British Racing Green is Napier Green!

Henry Seagrave's *Golden Arrow* set new land speed record of 231mph at Daytona Beach in 1929 powered by a Napier *Lion* engine

Men & Machines: A History of D Napier & Son, Engineers, Ltd, 1808 - 1958, Wilson C and Reader W, 1959, Weidenfeld and Nicholson, London.

12

12

Napier powered cars raised the world land speed record from 231.36 to 394.19 mph in cars driven by Sir Henry Seagrave in the Golden Arrow (1929) as seen here, Sir Malcolm Campbell (1931) and John Cobb (1938 and 1947).

There were also many different kinds of speed and endurance events in which Napier cars and Napier powered cars competed.

Schneider Trophy International air race
Venice 1927 – Britain's entry powered
by Napier *Lion* engine

Men & Machines: A History of D Napier & Son, Engineers, Ltd, 1808 - 1958, Wilson C and Reader W, 1959, Weidenfeld and Nicholson, London.

13

13

Napier engines were used also to power aircraft achieving many records between 1918 and 1957. Here we see the winner of the Schneider trophy in 1927. This was the second time Great Britain won the event, both with Napier *Lion* engines. In 1931 the event was won for the third time by GB, but with a Rolls Royce powered aircraft, so the Schneider Trophy became the permanent property of Britain.

Tempest fighter of 1944-5 powered
by Napier *Sabre* engine

Men & Machines: A History of D Napier & Son, Engineers, Ltd, 1808 - 1958, Wilson C and Reader W, 1959, Weidenfeld and Nicholson, London.

14

14

This slide shows a WW2 fighter powered by a Napier *Sabre* engine, one of the few aircraft that could catch a V1 flying bomb (known by us as the Doodlebug) in level flight.

Napier powered Air-Sea Rescue launch - 1941

Men & Machines: A History of D Napier & Son, Engineers, Ltd, 1808 - 1958, Wilson C and Reader W, 1959, Weidenfeld and Nicholson, London.

15

15

Here we see an Air-Sea Rescue launch in WW2 powered by a Napier *Lion* engine.

Prototype English Electric *Deltic* express Hull to Kings Cross 1960

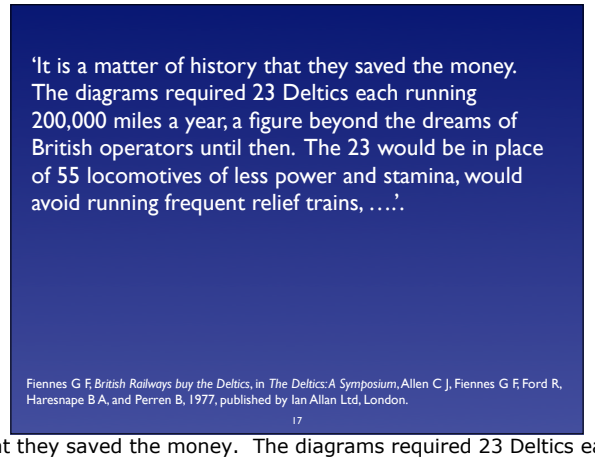
The Deltics: A Symposium, Allen C J, Fiennes G F, Ford R, Haresnape B A, and Perren B, 1977, published by Ian Allan Ltd, London.

16

16

Here we see a passenger train drawn by a prototype Deltic locomotive belonging to English Electric. Napier's were part of the English Electric group, and there were two Napier *Deltic* diesel engines in the locomotive.

This locomotive developed 3300 horse power in 1957 at a time when the maximum available from diesel engines was 2000 hp. This is a quote by a British Rail manager about the operational success of the Deltic powered locomotives:



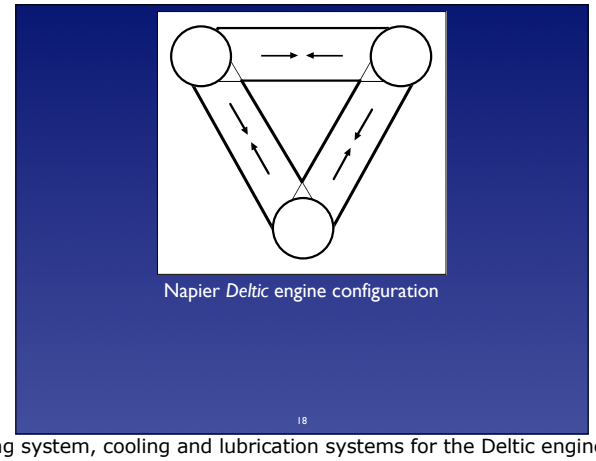
17

"It is a matter of history that they saved the money. The diagrams required 23 Deltics each running 200,000 miles a year, a figure beyond the dreams of British operators until then. The 23 would be in place of 55 locomotives of less power and stamina, would avoid running frequent relief trains, …"—Fiennes (1977:17).

In service the Deltic locomotive established many new records for British Rail, not only improving the passenger train times, but as you see, also reducing running costs.

The name *Deltic* derives from the unusual engine configuration which in cross section looked something like this:

Fiennes G F, *British Railways buy the Deltics*, in *The Deltics: A Symposium*, Allen C J, Fiennes G F, Ford R, Haresnape B A, and Perren B, 1977, published by Ian Allan Ltd, London.



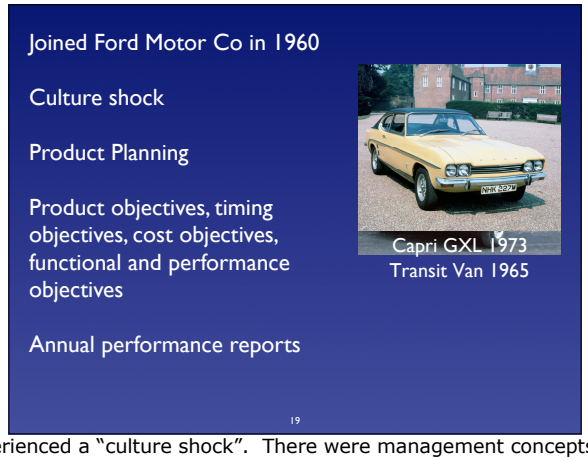
18

I worked on the cold-starting system, cooling and lubrication systems for the Deltic engine. I also worked on many other engine projects. The Deltic locomotive, was a stopgap for British Rail while they built the electrification infrastructure. The Deltic engine was taller than myself.

What I have to say now was crucial in my experience causing me change career. In the mid 1950s, the MD at Napier's was alleged to have said "You needn't worry about the future of Napier's, the government will always want us to make engines for them", and certainly that appeared to be the guiding policy.

However, by the late 1950s, cuts in government defence programmes hit Napier's hard. My earlier concerns about the sales of Napier products were being realised.

I decided to look for a job with a Company that had a more commercial outlook, producing products that people wanted to buy, and I joined that company in January 1960. Before I tell you about that move, a last word about Napier's. By 1962 their aero-engine interests had been sold to Rolls Royce, and their marine and traction diesel engine interests had been sold to Paxman's at Colchester. Now, Napier's only design and make large turbo blowers for marine diesels, and they are based in Lincolnshire.



19

When I joined Ford's, I experienced a "culture shock". There were management concepts such as 'Product Planning', 'Product objectives', 'Product Assumptions', as well as 'piece and investment cost objectives and controls'. These and other new concepts made so much sense.

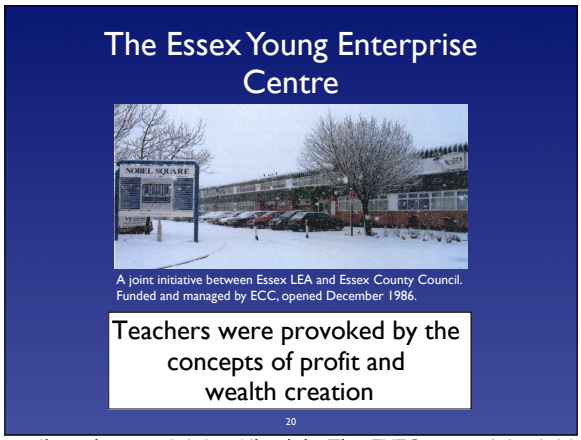
In 1962, I was Manager for Commercial Vehicle Testing responsible for prototype test programmes on the Transit van and 'D' Series trucks, leading to their first launch in 1965.

Later, I worked on the launch of Mk IV Zephyr/Zodiac, and launch of Cortina Mk 2. Subsequently, I worked in the Capri design office and then the Sierra design office. This is only a brief resumé.

By the early 1970s, the UK had problems in export markets, and I began to ponder why it was we had given the world the Industrial Revolution, but had been in relative industrial decline ever since.

By the mid 1980s, Ford had made a series of changes to remain competitive. Ford became concerned about their succession planning, and keen to recruit new young blood to grow with the Company. So in 1986, Managers over 60 years of age were offered the opportunity to take a secondment package coupled with subsequent early retirement.

More than 100 managers took secondment to local and national initiatives and there was a great variety. I was the 12th Manager to be seconded; in January 1987 I went to the Essex Young Enterprise Centre in Basildon.



20

My experience at the EYEC contributed to my joining Ultralab. The EYEC was a joint initiative between the LEA and Essex County Council, aimed at helping young unemployed people start a business of their own. Help was available with business plans, to obtain grants or loans, and successful applicants rented one of the 30 workshop spaces in the centre — CLICK.

The centre was located in Nobel Square in Basildon. For people starting their own business, rents started at zero, gradually increasing to full commercial rate by the end of 3 years. Business advice and counselling was available on a full-time basis.

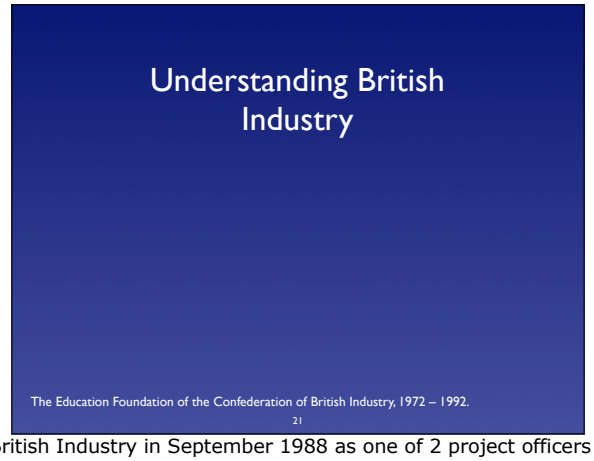
The Centre opened the month before I joined, and I worked there as a Business Counsellor helping the young manager.

The EYEC was a novel idea creating national and international interest. We conducted tours explaining what was going on in each business, followed by a Q&A session.

Teachers were encouraged to visit because the idea was attributed to the LEA. During the teacher-group visits it became apparent that they were provoked by the concepts of "profit" and "wealth creation". This was a regular occurrence, and we realised it was a cultural issue.

After some 17 months at the EYEC, and because of my interest to understand our industrial decline, I felt a compulsion to move on and get closer to a subculture that could be provoked by the concepts of "profit" and "wealth creation".

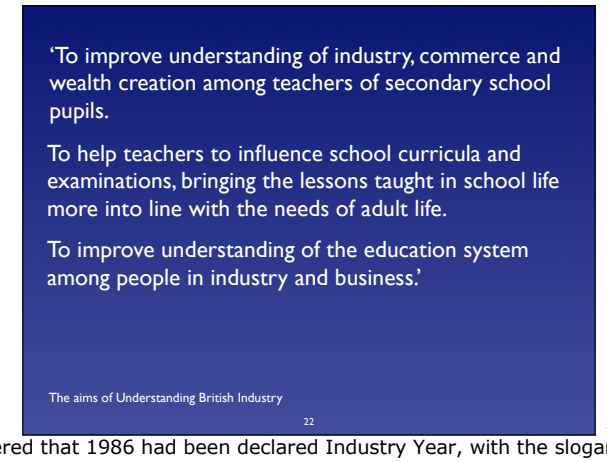
I discussed my wish to move on with the manager for secondment at Ford. Not only was he supportive, he already had an initiative in mind.



21

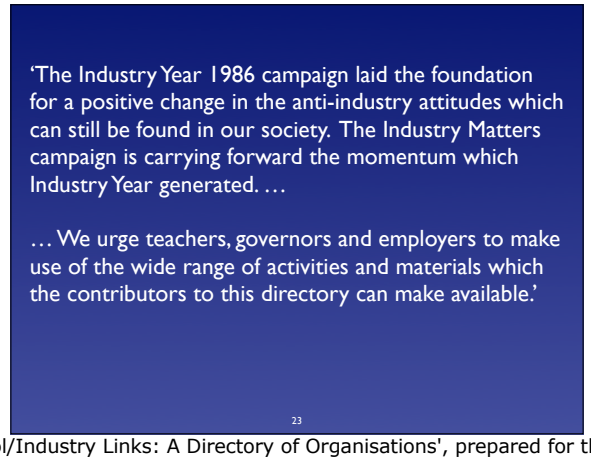
So I joined Understanding British Industry in September 1988 as one of 2 project officers covering East Anglia. UBI began in 1977 as a project of the Confederation of British Industry (CBI) Education Foundation.

UBI had three aims as shown on the next slide. Given my experience at the EYEC, they make interesting reading.



22

After joining UBI, I discovered that 1986 had been declared Industry Year, with the slogan "Thanks to Industry". The initiative was backed by government who launched it with the following statement:



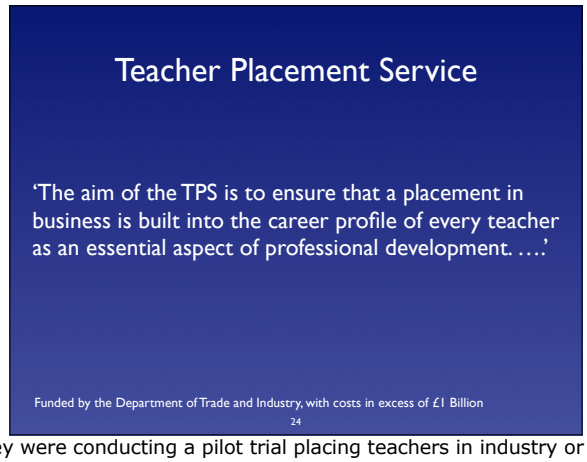
23

A publication entitled 'School/Industry Links: A Directory of Organisations', prepared for the Department of Education and Science, the Department of Trade and Industry, and the Welsh Office by the Central Office of Information, and published in 1988. The foreword states:

"The Industry Year 1986 campaign laid the foundation for a positive change in the anti-industry attitudes which can still be found in our society. The Industry Matters campaign is carrying forward the momentum which Industry Year generated. … But there is still much to do. We want every school involved with local industry and commerce because it is central to our policy that pupils' experiences at school should have increasing relevance to adult life and the world of work.

The organisations listed here are to be commended for their efforts. … We urge teachers, governors and employers to make use of the wide range of activities and materials which the contributors to this directory can make available."

Signed jointly by:
Rt. Hon. K Baker, MP, Secretary of State for Education and Science,
Rt. Hon. The Lord Young of Graffham, Secretary of State for the DTI,
Rt. Hon. Peter Walker, MP, Secretary of State for Wales.



24

At the time I joined UBI, they were conducting a pilot trial placing teachers in industry or commerce for a period of two weeks.

This programme was funded by the DTI, and some 380 teachers were placed. The trial was deemed so successful that UBI were authorised and funded by the DTi to run a national scheme, so I also became Teacher Placement Service Network Manager for Essex, Herts and Beds.

Here, I would like to refer to the aim of the TPS:

"The aim of the TPS is to ensure that a placement in business is built into the career profile of every teacher as an essential aspect of professional development." Peter Davies, National Director, TPS, 1989.

It was while working for UBI and the TPS that I became aware of a national upsurge in initiatives to do with Economic and Industrial Understanding. All these initiatives were an outcome of Industry Year 1986 and in particular as a service to the world of education.

Later I was to discover the huge variety of such initiatives both locally and nationally, and I heard it described as "the only growth industry". What a disaster!

Industry Year 1986

Our society does not value industry

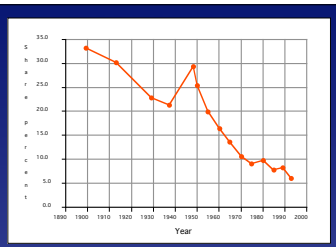
Products and services of industry are the life-blood of society

We cannot do without industry

25

25

This slide discloses what all these initiatives were telling us, but there was another reason, and I believe the explanation lies in the following slide.



Exports of manufactured goods – decline of UK world-wide share from 1899 to 1993 – %

Ref. 1 *The British Economy Key Statistics 1900-1970,* London and Cambridge Economic Service
Ref. 2 *Review of External Trade Statistics,* Annual Supplements 1980-1988. Government Statistical Service
Ref. 3 The 6% figure for 1993 quoted by Michael Heseltine and reported in *The Times* November 24 1993. Heseltine compared 1913 at 33% with 1993 at 6%.

26

26

This slide shows the UK share of world-wide exports of manufactured goods.

- In 1899 we had 33.2% share of exported manufactures world-wide.
- By 1937 this was down to 21.3%.
- By 1948 our share was 29.3%, and
- By 1993 it was down to 6%.

The products and services of industry are the lifeblood of society, but we fail to take industry seriously. The Industrial Revolution brought wealth to the UK, but we took the rewards while disparaging the means.

It was while working for UBI and the TPS that I met Stephen Heppell. As my secondment from Ford was about to end in 1989, Stephen invited me to look him up "because you never know what might develop".

What a marvellous invitation; I can't thank Stephen enough. So I joined Ultralab in January 1990 on a full-time voluntary basis and what a learning curve I have experienced. Within two months of joining Ultralab, Stephen asked me what I hoped to get from my experience. I said to learn a bit about computers, and to take a higher degree.

Within a year I was enrolled on a 4 year modular MA(Ed) course. In addition I was delighted and privileged to have my first computer.

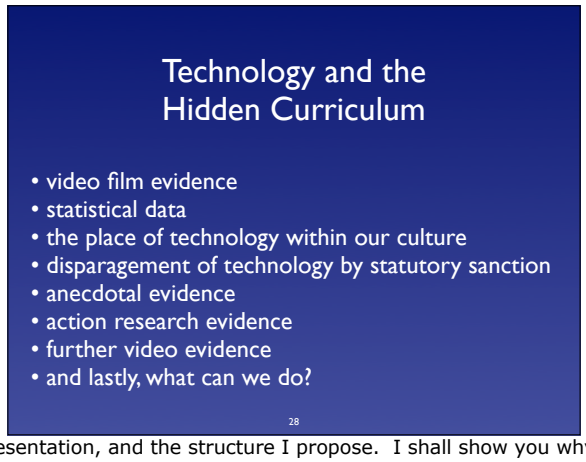
In 1994, I was awarded an MA(Ed). On hearing of this, Stephen said "Why don't you keep going"? So I researched 'the place and perception of Technology in the National Curriculum'. I now wish to share my understanding, and this is where you may be able to help.

27

I sent a copy of Chapter 10 Conclusions and Recommendations from my Doctoral Thesis to the Chairman of the Parliamentary and Scientific Committee, saying I would like to share a few concerns with him. So Ultralab were invited to become a member of the committee.

Clearly we in Ultralab were being given an opportunity to present our concerns. After a suitable break, I plan to make a further presentation.

The purpose of the second presentation is not only to share some of my research findings with you, but to test what I would like to say to the Parliamentary and Scientific Committee if I get the opportunity



28

So here is the title of the presentation, and the structure I propose. I shall show you why the step-change I seek has to do with recognition by our society that we need to take seriously the business of sustaining ourselves economically. Our technological competence must be a key element in this process, but I shall show you that we have been taught as a society to disparage technology and industry, even though we are dependent on both.

Meanwhile thank you for listening. Are there any questions from this presentation?