HISTORY OF MAWDSLEY'S 1907-1984

1907-1968

Long before the Industrial Revolution, many of the streams flowing from the western escarpment of the Cotswolds, famous for its sheep, were harnessed to provide power for the small mills which had sprung up in the valleys and were engaged in the woollen industry. It was on one of these streams, the Caswell, that in 1783 the Rivers Mill, now Mawdsley's Zone Works, was established. This is probably the oldest building in Dursley to be used continuously as a factory.

The Rivers Mill was formerly a fulling mill but has since been used as a wire mill. In a fulling mill, damp wool was mixed with fullers earth, a friable clay quarried locally and pounded and scoured to remove the natural greases. A deed of 1804 describes the property as having been a fulling and gig mill. There is reference to paper being made here. When the mill was destroyed by fire during 1783, it had already changed from being a fulling mill to a wire mill. By 1796, it was a paper mill and the Rivers House was added. The old mill was demolished and a new works was established for wire drawing and card making. The steep fall of the Caswell stream and its abundant flow of water provided an ideal site for water power until it was tapped at its source by the Zone Works. The overshot water wheel used at Rivers Mill was 25 feet in diameter and was last run during the first world war. Reports credit the wheel with developing 15HP (11¼kW) on occasions! This compares with Mawdsley's present day load of about 1000HP.

There is some doubt about the earliest products of the Rivers Mill but it is certain that a simple type of pin was made before the invention of the headed pin which is now so common. Later on, carding engines employing pin-making techniques, as well as other similar textile machinery, were produced. In those days a large quantity of leather was used on machinery and in mills which account for tanning being introduced into the Rivers Mills in the early 1880's. The bottom floor of the old factory is honeycombed with tan pits. The bottom stores, in the old Zone Works, was then known as the bark shed and is still referred to as such by our older employees.

The Rivers House, where the owner of the mill originally lived, was built over three periods in the style of the old stone houses of the area with certain special features peculiar to a small locality, such as the barge boards and finials.

In 1894, Rivers Mill became the Lister Electric Light and Power Manufacturing Company which was formed by the sons of William Lister who s was a highly eccentric character. To this day, the old Mawdsley's employees joke about his ghost on the water wheel. Electrical machines were made here only 20 years after they were first introduced for use in industry. Compared with modern standards, the machines were of an elementary design consisting of a simple 2-pole type with no interpoles. On 23rd January 1907, Mr. H. St. Hill Mawdsley came to Dursley and on that day took over the Rivers Mill and formed the company which still bears his name. He had already earned a reputation as a designer of electrical machines. It was he who renamed the mill "Zone Works" to commemorate his "Zone" patents. (See Patent No.6666). Mr. Mawdsley lived for some years at Rednock, now the site of the Dursley Comprehensive School, until he moved to a house called "Danescourt" situated in Barnwood which is a residential area two miles outside Gloucester and he travelled daily by car to and from the works.

The early Mawdsley dynamos and DC motors were manufactured with a high cast iron content making them big and heavy compared with those of today. It was at this stage that Mr. Mawdsley invented his "Zone" patent which was a form of interpoling to improve the output of DC machines. The factory provided its own DC supply from two gas engines in the Power House.

During the first world war (1914-1918), Mawdsley's were suppliers to the Admiralty and amongst their products were torpedo motors (Frame size M02) approximately 6 inches diameter and submersible machines - both DC motors.

The design of DC machines changed in the early 1920's with the introduction of cast steel frames and ball and roller bearings instead of oil bearings. Among the early customers was the "Showman" who purchased dynamos at £1 per ampere. These dynamos were specially painted and illuminated for mounting on the front of the Showman's traction engine and belt-driven from the engine flywheel.

In 1934, in consequence of the greatly increased rate of taxation, it had become uneconomical for travelling showmen to continue to use the steam traction engine with the dynamo mounted on the front which had been a familiar sight in every fairground. To get over this difficulty, Mr Jacob Studt Junior, a well-known showman who had always been one of the first to adopt new ideas, introduced another method of generating power (photograph). Instead of a steam tractor, he used a Scammell lorry with the largest dynamo then supplied to showmen, mounted on the bed of the lorry and chain-driven from the engine. The lorry was also chain-driven, the drive being taken from the rear wheels and transferred to the dynamo when on the fairground. This dynamo had an output of 33kW at a low speed of 200 rev/min and weighed 31 tonnes. Being mounted over the rear wheels, the extra weight furnished the lorry with sufficient road-gripping force to enable the usual train of caravans to be drawn along the roads.

Among the early activities of Mawdsley's sprang the following records:

- The highest speed DC motor 18.6kW (25HP) 10000 rev/min
- The lightest weight DC motor 160kW (215HP) (8.9cwt)
- The lightest weight dynamo 356kW (477HP) (14cwt)
- A DC dynamometer 298kW (400HP) 6000 rev/min

In addition to motors and dynamos, Mawdsley's produced patent A.D.C arc-welding sets which were believed to be the best arc-welding systems then in existence with an extraordinarily smooth output. These welders were built in single and multi-operator sets, both engine and electric motor driven and stationary or portable weatherproof designs.

In the early days, Mawdsley's machine shop utilised a line shafting belt system for driving the machine tools. The stamping shop had hand-fed slotting, blanking end notching machines. Armature cores were built up and statically balanced; the hand-made commutators were then shrunk on before passing to the armature shop for winding, connecting and soldering. Commutators were then turned and undercut, the undercutting being done by hand by apprentices. Dipping and stoving then followed and after balancing, they were ready for assembly.

Assembly of the components was the work of the fitting shop, the component parts having been made ready by sub-assemblers; hand-tapping was not favoured by apprentices who, in those days, were sent home for a day for breaking a tap unless they were able to coax the blacksmith to extract the broken tap - and this was not easy. After assembly, the machines were taken to test. The test bed consisted of belt-driven test benches; small motors were direct coupled and loaded by means of resistance banks. High speed machines were Hopkinson tested. The only protection was the main circuit-breaker which shut everything down in the event of a fault. This included Rivers House which was supplied by the same transformer and a shutdown could happen at night in the middle of a bridge party causing quite a stir. A side line on the test bed was the charging of wireless accumulators.

All goods were transported to and from the Dursley L.M.S. station by a horse-drawn dray. The engine at the station was known as the "Dursley Donkey" and it travelled between Dursley and Coaley Junction which was on the main Bristol-Gloucester railway line.

Under Mr. Mawdsley's direction, the Company grew rapidly and supplied many large specialised generators and motors to Government departments, railways, Electric Light and other companies. Trading became difficult during the depression and Mr. Mawdsley retired in 1934. The Company was taken over by a small group, the Southern Areas Electric Corporation Ltd., and Mr. A.H. Topham became Managing Director. Under his direction, the Company began to broaden its activities and range of products, particularly in the marine world and the Admiralty.

The shipbuilding industry began to recover and in 1937, Mawdsley's exhibited at the Welding Exhibition at Olympia. In 1938 they received their first orders from R.A. Lister for searchlight generators followed by alternators for mobile radar supplies and mobile lighting plants. During World War II, Mawdsley's supplied over 15000 of these generators and alternators.

During World War II, the Company undertook an increasing load of specialised work requiring new buildings; the building on the site of the present armature shop was built in 1940. In particular, the Company worked closely with the Admiralty at Bath, working on many secret projects, not the least of which was the degaussing of ships. For this Mawdsley's designed and manufactured overnight, early in 1940, special Ford engine-driven generating sets. As a result of these efforts and many others, Mr. Topham, the Managing Director, was awarded the CBE and other members of the staff received MBE's and BEM's.

In 1940, Mr. Topham formed the Mawdsley's Home Guard platoon which was made up of employees with Mr. Topham as Commanding Officer. They were trained by ex-regular NCO's and much help was also given by other regular army units stationed in the area. Many had sore feet following route marches! Rifle practice was held with live ammunition at 250 and 500 yards and practice with live hand grenades! In 1941 Queen Mary visited the factory and the Home Guard Platoon formed a Guard of Honour which was inspected by Her Majesty.

In 1943, the developing of a compensated alternator commenced and came into production in 1945. The machine had an inherent regulation of ±2½% at any load and any power factor; no automatic voltage regulator was required. This was at the time, when there were increasing sales in the medium power range of alternators. This was a period when new products were being added to the Company's range, so that 1949 saw the introduction of a range of totally enclosed fan-cooled motors.

In 1953, the new components shop was built and Phase II of the reorganisation and rebuilding of the armature shop was completed in 1957 which have not only been functionally designed around the process as a result of close partnership between architect and engineers, but are also architecturally beautiful and harmonise well with the Cotswold country. Mr. Field, Management Consultant, taking a very active part in this work.

The components shop runs parallel with and is on a site cut out of the hillside and at right angles to this is the assembly shop with the Caswell Stream and the mill pond. The component is about 320 feet long, having one large open manufacturing bay 80 feet wide in which there are no stanchions to restrict plant layout and one large stores bay 40 feet wide. This bay houses materials adjacent to the departments using them and is equipped with cutting machines for breaking down materials from bulk to unit size.

The unusually wide span bays are obtained by using the monitor type roof construction which, in addition to providing a large floor space uninterrupted by supports, gives high and uniform natural lighting, low heat loss and ample crane facilities. This building houses the following departments: welding, sheet metal, press machines, tool room and apprentice training facilities.

The assembly shop is 390 feet long and 130 feet wide. It incorporates the war-time machine shop (a north-light roof construction) and new buildings utilising the monitor-type roof cleverly modified and varied to meet production layout requirements. The new buildings again provide wide shops for fitting and assembly, testing, painting, packing and storing of complete machines and for the experimental department.

The two main shops are linked by a building housing the boiler house, pattern shop, stores and garage. There is a one-way production flow through the component shop from the east and into the assembly stores which is fed also by a separate "goods receiving" entrance. From there, it passes from north to south in the assembly shop to the despatch department which discharges on to the main perimeter roadway.

This layout and design of buildings reduces transport and handling to a minimum, provides liberal handling and storing facilities, light airy conditions and greatly simplifies supervision.

In early 1948, Mawdsley's purchased a factory at Honiton for the manufacture of the new range of T.E.F.C. AC motors. It was at this time that the Company broke into the machine tool market and also the geared motor and conveyor markets, developing our small end of the AC motor range.

In 1959, Mr. A.W. Field was appointed Managing Director. Mawdsley's range of products up to this date had basically been medium size rotating electrical machines including DC and AC motors, industrial and marine alternators, lift motors including special AC tandem motor designs, inverted rotary converters and dynamometers.

In 1961, Mr. G. Davies and Mr. M.W. Jones were appointed to the Southern Areas Board, Mr. Davies as Director and Mr. Jones as Technical Director. The Honiton factory closed in 1964 when capacity became available at Dursley. At this stage of the Company's history, several notable products were developed, namely:

- Mawdomatic equipment with automatic excitation control for dock side and mounted cranes.
- Torque reaction electro-dynamometers with remote indication.
- Multi-contact governors for accurate speed holding.
- Variable speed alternator drives for vehicles, these were also driven while in motion from the gearbox power take-off.
- AC stop clutch brake motor.
- Synchronous reluctance "Syncage" AC motors.

With this extension of activities, the Company gained a reputation of being "Specialists in Specialists".

The AC stop clutch brake motor was developed for the car industry. The Austin Motor Co. Ltd., required an AC machine which could be stopped accurately and consistently as close as possible to the drilling surface for deep hole drilling on their transfer machines. Mawdsley's achieved this

with the AC stop clutch brake motor. This is essentially an AC cage motor, the motor of which is free to move axially within the stator, sliding on roller bearings. A conical brake and clutch unit is built into the driving end of the machine so that when the motor is switched on, the magnetic field attracts the rotor towards the drive end engaging the clutch and disengaging the brake while simultaneously running up to speed. When the supply is switched off, the magnetic field collapses and the brake spring pushes the friction lining carrier into the conical brake ring freeing the motor clutch from the lining carrier. This allows the rotor to come to rest independently without imposing its inertia on the brake, permitting the output shaft to be stopped rapidly and consistently.

Mr. G. Davies retired on 31st December 1964 and Mr. R. Flack, who joined the Company as Sales Engineer on 1st May 1958 became Sales Manager. Mr. G. Davies was Consultant up to 30th June 1967.

In the Educational Field, the generalised machine and later the student's demonstration set were developed for teaching generalised machine theory of electrical machines and the multi-form generalised machine for research purposes. These equipments found markets in universities and technical colleges all over the UK and overseas. Mr. R. Flack joined the Board of Directors on 27th April 1966.

Electronics for the control of motors and alternators were now becoming a necessity and Mawdsley's established its Electronics Division in 1961. The Company became part of the Adwest Group in February 1963 and from that time on has benefited from the guidance of its chairman, Mr. F.V. Waller, together with the greater financial resources of the group. Mr. Field retired at the end of 1969.

Mr. Field's Retirement 1969/70

Mr. Field took a short-term post as Management Consultant at Mawdsley's soon after the Second World War and stayed 25 years. He retired on the 31st December 1969 and continued as a director on the Adwest board until 1st January 1967. On his retirement, presentations were made on behalf of staff and factory personnel and Mr. Waller, Adwest's Chairman, said, "Mr. Field joined Mawdsley's on a permanent basis as General Manager in 1948. He became a director in 1957 and Managing Director 2 years later. During these years he changed Mawdsley's from a Company engaged in the marine field to a competitive firm in the industrial field now covering a far wider range of products. Instead of manufacturing rotating electrical machines only, the Company makes the entire control systems and, in Mr. Field's term of office, the turnover increased four-fold. He always showed parental interest in the welfare of employees and this earned him the nickname of `Father Field` throughout the organisation".

Mr. Field was responsible for the rebuilding of the new component shops in 1953 and Phase II of the reorganisation and rebuilding of the armature shop completed in 1957.

1970/1984

Mr. J.E. Drinkwater became Managing Director and Mr. R.F. Flack, Deputy General Manager and Marketing Director.

The Electronics Divisions activities included the manufacture of a range of flowmeters and also the control engineering field as applied to industrial drives. The flowmeter was known as the Mawdsley's Emflux Flowmeter and it was specially developed for use in industrial and process control systems. The division entered the control engineering field particularly related to

industrial drives. A range of liquid and Mawdaspeed air-cooled eddy current couplings were manufactured, the liquid cooled couplings being made under licence to Louis Allis of the USA. The Company also considered manufacturing static inverters under licence from Louis Allis but this project was not proceeded with and development of the thyristor drive took priority.

In 1970, the Mawdostat Thyristor Drive was marketed which was used on many engineering drive schemes, one of which was Pilkingtons continuous float glass production line and automatic cutters synchronised. The system comprised the DC motor and thyristor controller synchronised.

Other engineering drive schemes using the Mawdostat Thyristor Drive include:

- Precision Balancing - Dronsfield Bros.
- Wire & Tube Drawing - Marshall Richards Barcro
- Bunching Fine Wires - Trafalgar Engineering
- Steel Strip Slitting Lines - Redman B. & K.
- Rolling Mills - Enfield Rolling Mills
- One Brushing Plant - Wheal Jane Mine Truro
- Textile Machinery - Platt International
- Gear Box Test Rigs - British Leyland (Triumph)

Mr. N. W. Jones MBE, Technical Director, retired in March 1970 after over 50 years with the Company and Mr. K. Nicol was appointed in his place.

Mr. A.H. Topham CBE, who from 1934-1959 was Managing Director, died on 31st August 1970 aged 74. Mr. Topham succeeded in broadening the Company's product basis at a difficult period for the industry. He was awarded the CBE after the war for services in supplying equipment for the armed forces including the design of generators for degaussing equipment.

In 1971, Mawdsley's sold its interest in Electro-Magnetic Flowmeters utilising the Mawdsley Trade Mark as a company name - Emflux Co. Ltd. It was also the year a £200000 office block was opened by Mr. Frank Waller, Chairman of the firm and of Adwest Group who said it would help the company greatly when Britain entered the Common Market. The block will free the former office space for production at the factory which employs 550 people. Dursley Rural District Council Chairman, Councillor Clifford Hill, praised the part Mawdsley's had played in Dursley's history and the service rendered. He congratulated the Company on the way the office block blended with the countryside. At the lunch which followed the opening of the block, Mr. Anthony Kershaw, MP for the Stroud Division and Parliamentary Under Secretary for State, Foreign and Commonwealth Office, responded to the toast on behalf of the guests. This was followed by a tour of the works and offices. (Note: for any further information, see Scope 1971, News Letter and photographs).

A drop in orders forced the Company in July 1971 to impose an overtime ban as a result of the reduced home market for capital equipment. As a result, one of the Company's large customers had been forced to defer deliveries resulting in Mawdsley's having to restrict overtime for the present but believed the orders would resume their previous buoyant level by the end of the year. Increased pressure in export business helped to compensate for the reduced home market. Orders had been received from Australia, Thailand, Norway and Rumania.

Mr. G.A. Warren was appointed Financial Director in 1971.

In 1971, 300 workers walked out due to overtime rates during the power crisis.

Following activity on the export front seemed to be particularly biased towards educational markets and visits had been made to the works from countries as far apart as Mexico and Korea. This photograph illustrates Educational products packed ready for shipment to Malaysia. Participation at the Russian Electro '72 Exhibition showed considerable interest in our educational products.

In 1973, Mr. L. Furniss was appointed General Works Manager.

Launch of the Matador Packaged Thyristor Drive Systems

Over the past months it has become evident to Mawdsley's that the requirements of the variable speed drive market were changing. Because of this increasing tempo of industry, many customers were no longer prepared to wait several months whilst we designed and manufactured a drive to suit their special requirement or suffer the attendant risk of delivery dates not being kept to customers modifications or queuing within our own organisation.

Furthermore, costs were increasing, which meant higher selling prices for specially-designed drives, which was out of keeping in the present market situation.

In addition, with our entry into the Common Market, it was necessary for us to offer in a market now twice the size of the UK, a drive system that could be offered complete at the point of sale and not subject to the various communications problems, both technical and language, which would occur between Dursley and say, Munich.

We therefore set out our objectives for a range of packaged variable speed thyristor drives as follows:

a) The range should have minimal variations in design, to enable quantity production to be used and hence keep costs to a minimum.
b) The range should embody all our drive experience in design and manufacture, have the latest electronic techniques and components, be of high quality and proved reliability.
c) The drives should be suitable for use without nn1ification in home and overseas markets.
d) They should be easy to commission and services.
e) All technical and applicational information should be contained in a manual to enable applicational decisions to be made at the point of sale and quotations made on the spot.
f) They should be available ex-stock to meet revised market requirements.
g) A brand name should be used which meant the same and could be pronounced the same in the major languages of the world.

The results of an analysis of the types of thyristor drives supplied by the company over the past 12 years indicated that a large proportion of the applications could be met by a standard drive system and that this coverage could be further extended by offering a number of optional extras. Predominantly the requirement was for drives in the 10-100 HP range, or in these Common Market days, 7.5-75kW.

The design effort was led by Tony Kay, backed by Ken Briggs and Ron Pontefract & the Electronics D.O. for the controller and Stan Noad, ably supported by Geoff Kelham & the Main D.O. on the machine side. This team was able to call on their company's accumulated years of experience and by incorporating several of the successful technical features, previously used on their "specials", came up with a range of 10 quality drives, which it is thought will satisfy customers in most home and export markets.

By January this year, thanks to an all-out effort by Works personnel, several units were already "on the shelf". Mawdsley's area sales executives had gone back to school at Dursley, where they learned from Bill Grant and Colin Parker, applications and quoting techniques, using the specially-prepared sales engineering manual, and a special teach-in had been held for export agents on similar lines.

The Matador launch was made in February and mounted in four parts; a press conference in London on the 7th, attended by representatives from over 30 journals, a series of six one-day exhibitions at major UK centres between 8th February and 1st March, an advertising campaign in relevant media and a direct mail shot to potential users throughout industry.

Backed up by the local area sales executives, the exhibitions were particularly successful and Mervyn Norris of the Electronics Works did a first class job in transporting equipment to the right places (including Newcastle and Glasgow) at the right time and in the right condition.

Doubtless the real potential of the new range will only become evident much later in the year but, in the meantime, Mawdsley's are taking the launch one stage further by exhibiting Matador at Hanover Fair from 26th April to 4th May, which will enable them to seriously tackle common market prospects with their agents.

What is certain is that Mawdsley's now have a first-class product, high quality and reliability, ex-stock delivery and point of sale quotations at a competitive price, which must place them in the forefront of drive manufacturers at home and overseas.

P.S. For the technically-minded, the drives are in kW (HP) steps, which conform to I.E.C. specifications, all thyristor stacks are fully-controlled (to minimise harmonics on the mains supply), have a standard voltage range of 380V-440V, 50Hz, 3-wire, a speed range of 20:1 with continuous operation over that range. Adjustable acceleration rate and tacho feedback give the drive system an accuracy of ±0.05% with a 10% load change.

In March 1974, Mawdsley's redesigned their DC range into a metric format and introduced a new range of metric DC motors. Also minor and major additions to the highly successful Matador range and packaged drives were introduced as was an educational thyristor drive.

Mr. W. L. Furniss was appointed Works Director in May 1974.

Enfield Automotive Ltd., at Cowes on the Isle of Wight introduced the first battery powered car to go into mass production and received its public launch in Portsmouth in September 1975. The electric car is powered by a Mawdsley 8HP 2800RPM DC motor and is capable of speeds up to approximately 40 mph and has a range of 55 miles depending on traffic conditions. The motor is series wound suitable for series or parallel connection to ensure smooth acceleration and is 85% efficient. The power for the motor is supplied by a 48 volt battery. The car is available in three versions. While one of these cars was being listed by the South Western Electricity Board, Prince Charles had a drive in the car at RAF St. Mawgan, Cornwall during a one day visit to the station and his main interest was in the anti-pollution. He became interested and was borrowing one for a week or two to commute between Buckingham Palace and the Royal Naval College, Greenwich.

Mawdsley's won a £1M contract for motor alternator sets for use with computers. The sets are driven by the Mawdsley syncage AC rotors which were developed in 1965 in conjunction with Bristol Nylon Spinners (BNS) for driving multi-spindle spinning machines at synchronous

speed. The space for the motor on these spinning machines was so restricted that a block of wood had to be carved to fit the space available and then a syncage rotor made within these limits which, in the event, turned out to be, in this case, a "square" frame syncage AC motor with a pull-in torque capability at full load against an inertia of 60 times its own rotor inertia.

It was in 1974 that we designed a range of laminated DC motors to meet the requirements of the supply from thyristor equipment.

Mr. D. Mirams was appointed Factory Manager in December 1974.

In 1975, Stothert & Pitt Ltd win a £500000 contract to supply dockside crane equipment for Saudi Arabia using our Mawdomatic equipment.

Also in 1975, a Noise & Vibration Test House was built at a cost of approximately £45000 for testing MOD(N) machines.

A factory was opened at Pensnett Brierley, West Midlands in 1976 for the manufacture of laminated DC motors for battery traction equipment, i.e. fork lift trucks etc.

Also in 1976, a development laboratory at Barrow-on-Soar, Loughborough, Leicestershire to widen the scope of the Company's electronic work.

70 years on - an open day was held on Saturday 11th June 1977 to commemorate Her Majesty's Silver Jubilee and the 70th Anniversary of the founding of Mawdsley's Ltd., and now employing over 600.

Open Day

Mawdsley's Ltd. proved the star attraction for local residents of Dursley, Gloucestershire when they opened their doors to the general public. Despite pouring rain, over 2000 people took the opportunity to tour the premises specially opened to mark the Silver Jubilee as well as the Company's own 70th Anniversary.

Employees of Mawdsley's, their families and friends were invited along with the public to join in the celebrations and find out more about the Company. There was plenty to keep the visitors occupied and something of interest for everyone.

The factory and offices were open for inspection and this was a chance to see Mawdsley's range of electrical equipment in various stages of manufacture. The finished products were displayed in a special exhibition which highlighted the technical changes that have taken place over the 70 years of the company's history. Staff were on hand at strategic points to answer any queries.

Main attraction of the afternoon was the magnificent 1925 traction engine, Lord Nelson. This was complete with a resplendent Mawdsley generator mounted at the front delivering 300 amps of electricity at 110 volts. The original cost of the engine was £300 - or a pound an amp as it was in those days. Working from Lord Nelson was the fairground organ Lady Hamilton which provided lively music at one end of the factory complex.

Stinchcombe Silver Band, well protected under canvas, played at one end of the refreshment tent while, at the other, nearly 2000 visitors passed through to partake of their complimentary tea. A huge air cushion, roundabout and donkey rides provided amusement for the children and gas filled balloons added to the excitement of the day for them.

The many and varied talents of Mawdsley's employees were apparent at the popular Handicrafts and Hobbies Exhibition. The work presented included oil and water paintings, soft toys, pottery, crochet-work, wood turning and craft work of all descriptions. Also on display was a beautiful grandfather clock completely hand-made by the late Technical Director, Mr. N. W. Jones. Impressive collections of coins, spoons, dolls and model railways completed the display.

A special Jubilee tree planted by the Managing Director, Mr. J. E. Drinkwater, commemorated not only an enjoyable day but also a successful history spanning 70 years.

Mawdsley's was the first Adwest Company to participate in the "Young Enterprise" scheme. Originally conceived in the USA, the project offered a link between school and industry by providing young people with the opportunity of learning about the organisation, management and operation of a business by running their own miniature company. Volunteers were drawn from local schools and from the ranks of young people within the company itself. They were assisted by advisers from management level within the company or outside who could offer advice in the essential areas of accounting, production and marketing while helping in the selection of a name and choice of product to manufacture. Everything was kept on a totally realistic level, thus allowing the young participants to experience the challenges, decisions and problems which constitute industrial life.

The firm staged a one day exhibition throughout the country in October and November 1977 demonstrating Matador Package Variable Speed Drive Systems which were full metric.

For the first time, the Company produced a range of Static Stabilised AC Power Supplies and a 15kVA unit was exhibited at Electrix 1978 held at the National Exhibition Centre, Birmingham.

In June 1978, it was announced that Mawdsley's were making 65 people redundant and ceasing the training school. The redundancies would take effect at the end of July and would be the largest the Company had ever been forced to make. The total number employed was 550. This cutback was caused by the continuing world-wide economic recession.

Mr. R. Flack left the Company on 31st December 1978.

An extension to the test bed was carried out in 1979. This was built for testing larger machines, i.e. up to 1000kW DC and 1000kVA alternators.

Mr. P.R. Holroyd joined the Company on 2nd July 1979 as Sales Director.

In 1980, due to the continuing world-wide recession, the Company had to restrict its activities, this included closing Pensnett and Barrow-on-Soar factories.

During this year square frame DC motors were introduced into Mawdsley's range of products. These machines developing greatly increased outputs per frame size.
Mr. Nicol, Technical Director, left the Company in December 1980 and was succeeded by Mr. Farrar in January 1981. Mr. Drinkwater also left the Company in January and was succeeded as Managing Director by Mr. L. Furniss and Mr. W.E. Jones joined the Board.
In April, 40 redundancies were made and a further 50 in October.

Mr.D. B. Manning was appointed Sales Director in November 1981.

A range of square frame DC motors was marketed by Mawdsley's in 1982. Standby Power Systems Ltd., manufacturers of uninterruptible power supply systems and lighting equipment were taken over by Mawdsley's and ceased trading as Standby Power in 1982 and from then on Mawdsley's have supplied the following uninterruptible power supply systems and power supply equipment's.

1.	BBC Lime Grove Studios	-	25kVA UPS installation.
2.	Tower of London	-	5kVA UPS Installation
3.	Las Palmas Observatory	-	3.5kVA Static UPS Powers Telescope
4.	Containerise Power Supplies	-	400V, 235kVA Integ Rotary Sets for the Ministry of Defence.
5.	Brae "B" Production Platform	-	150kVA and 40kVA Rotary UPS Equipment. First Gas Condensate field in North Sea for Marathon Oil.
6.	Bulmers, The Cidermakers	-	75kVA UPS Systems Power Computers.
7.	Inland Revenue Processing Centres	-	120kVA Load Isolation Sets.
8.	Mercury Network Operation Centre	-	2 x 40kVA Rotary UPS Systems.
9.	Computerised Editorial System	-	Powered by MG Sets.
10.	Bank of England New Operations	-	Computer UPS Systems 72kVA and 7.5kVA.

Also:

1. Table Mountain Cable Car 108kW DC Standby Drive was supplied for the winding engine operating the famous Table Mountain Cable Car System just outside Capetown, South Africa.
2. The PM6 paper making machine at Bowaters new Thames Mill, commissioned in mid 84 involved a new Allen Bradley 18 section drive system and included DC thyristor converters with a total capacity of 9690kW Mawdsley DC motors.
3. Blackpool Borough Council was replacing its 13 single decker tramcars with a new design having greater passenger capacity. Each bogie was powered by a 560V, 42.5kW traction motor.

In 1983, Mawdsley's exhibited at the Middle Fast Electricity and Electronic Exhibition in Jeddah.

An order was received for alternators ranging from 180kW to 600kW worth £500000 from Gilbert Gilkes & Gordon for Philippines Hydro-Electric Power Plants located in various islands of the Republic. Twelve 12.5kVA alternators on diesel engine generating sets were supplied as power sources on Trinity House unattended light vessels and large automatic navigational buoys (Lanbys). The BBC had just installed a 25kVA rotary uninterruptible power supply for computer systems used to assist in the production of its Breakfast TV and other programmes at Lime Grove Studios.

Expansion of overseas representation involving the appointment of a number of new agents, Australia, New Zealand and Saudi Arabia, also agents dealing specifically with defence products for the Australian Navy and US Army and Air Force. The Company had also supplied six 60kW Matador Variable Speed Thyristor Systems for three fast patrol craft for the Sultan of Oman's Navy.

Mr. J. S. Tyrrell was appointed Technical Director replacing Dr. Farrar.

In 1984, the Company received their first major order for the US Navy for 150HP AC motors which powered us aircraft carrier catapults.

In 1985, Mawdsley's received orders for over 60 squirrel cage induction motors for MOD Support Vessel Sir Galahad which replaced the ship of the same name sunk in the Falklands War. The range from 1-165kW and were TEFC designed to withstand a shock loading of 70G and were mostly vertical mounting.

A Special Projects section was set up to handle composite and turnkey projects in the UK and overseas markets.

In 1986, the Company had received several large orders for DC motors for paper making machines operated by Allen Bradley thyristor converters.

Mawdsley's extended their alternator range up to 2000kVA having purchased the designs, patterns, tools and rights of the BRF range of brushless alternators from Electric Construction (Hawker Siddeley Group) which ceased trading. An order for specially designed DC motors for compressor drives on British Railway Locomotives was received.

An order for Computer Equipment worth £250000 was received from Colston Ltd, Bristol for a local firm comprising:

1. 500kVA rotary uninterruptible power supply system.
2. 2 x 40kVA frequency chargers and control gear.
3. Main switchboard.
4. 750kVA standby diesel generating set for long term back-up housed in a weatherproof acoustic canopy complete with 3 power distribution units.

In 1987, due to the slow recovery of trade in the world, the firm had to make further redundancies of 30 in March. The total number of employees was now 230.

The product range of Mawdsley's is now (1984):

DC Machines

- Industrial DC motors and generators, 1 to 2250kW.

MG Sets

- An extensive range of sets up to 1000kW and 1100Hz.

Traction motors

- Commercial and industrial vehicle battery traction motors.
- Rail traction motors and auxiliaries.

Alternators

- Brushless rotating field alternators 15-2500kVA.
- Specialist high frequency, high and low speed machines.
- Machines for turbine and marine applications.

UPS and Power Conditioning

- Rotary and Static UPS, power conditioning equipment and frequency changers up to 2. 0mVA.
- Static single and three phase inverters for UPS and frequency changing application.
- Unit construction synchronous and low slip cage motor driven converters.
- Bedplate mounted AC and DC motor driven converters.
- Silenced frequency changers (400Hz) and load isolators.

Defence Equipment (approved to DEF 05-21 and MIL 17060E)

- Specialist rotating machines and generator sets both AC and DC for fighting ship duties.
  Low noise and vibration (to DGS 2088)
  MCMV and minimum magnetic signature.
  High shock up to 320G (NSSl of BR302l)
- Ground power supply, UPS, power conditioning and frequency changing equipment.

Static Power Converting Equipment

- Thyristor regulators
- AC/DC rectifiers
- Central battery systems
- Testing and monitoring equipment
- Variable speed AC inverters

Diesel/Petrol Engine Driven Generating Sets

- Industrial/Marine/Defence applications up to 1MVA

Cryogenic Tanker Unloading Systems

Turnkey Electrical Packages

Since making these redundancies, there has been an improvement in the order intake in both rotating machines and UPS and power conditioning equipment.

Mr Mawdsley's 1902 Patent (No.6666) was a method of using one coil to take the place of 2 coils in a 2 pole DC motor. In a normal machine, a 2 pole motor would have 2 shunt coils, one wound round each pole to give the necessary North and South poles. In the patent, the coil was bent at 90° to lie in front (DE) of the North pole, the two coil sides passed between the poles of the motor and then bent at 90° to be in front of the South pole at the C.E. This gives the same magnetic effect as two coils.

The disadvantages are that there is quite a bit of leakage and had there been interpoles (as have more modern machines), the coil would have tended to interfere (magnetically) with the interpoles commutating ability. However, in 1902 when interpoles were not often used and when magnetic materials were not highly saturated, it would have been a simple method of producing 2 poles.

Courtesy – Mawdsley's Ltd, 2002