



magazine

May - June 1967



Mill of a thousand secrets

ON ONE of the loveliest reaches of the Thames – far removed from the noisy clatter and grime of tube mills – stands the Mill at Whitchurch, Oxon, headquarters of TI's hush-hush Product Development Unit.

It is only on rare occasions, such as the unveiling of the TI electric car in London recently, that the covers are slightly lifted to reveal some of the highly secret work carried out there.

The Mill is a delightful old rambling building which straddles the river to its own private island. In parts it is 400 years old and a mill has been on the same spot since the days of the Domesday Book.

The mill stream below it boasts some of the best pike fishing in the Thames. One 24-pound monster was taken out some time ago and another is believed to be there now. Trout are also plentiful.

The old mill wheel has gone. But an iron wheel which replaced it before the first world war is still in position. It was used until 1937 to generate electricity for most of the Pangbourne area.

The sleepy, dreamlike atmosphere of the Mill as seen from the nearby toll bridge can be misleading, however. Come inside and you find a compact, highly skilled team at work translating often revolutionary ideas into practical products.

The fourteen-men-and-a-woman unit combine between them a large variety of skills, capable of turning out in their tiny workshops scale models and even prototypes. The electric car which took everyone by surprise is just one example.

Leader of the team and chief ideas man is John Dolphin, 59-year old inventor with a remarkable list of achievements and hundreds of patents to his name.

As commanding officer of the Inter-Services Re-



search Station at Welwyn during the war he was responsible among other things for the Welbike, a collapsible high-speed scooter used by parachutists.

But perhaps his unit's most successful wartime invention was the Sleeping Beauty, a one-man submersible canoe which carried six Limpet mines only fourteen inches long – small enough to go in a mac pocket. The operator clamped these on the hull of enemy ships and made off again as fast as he could. Sleeping Beauties with their 3½lb of plastic explosive destroyed all Japanese shipping in Singapore on two occasions.

Since the war he has been Chief Engineer at Aldermaston at the time of Britain's first atomic bomb tests – for which he received the CBE – and Engineer-in-Chief of Atomic Energy Authority research group.

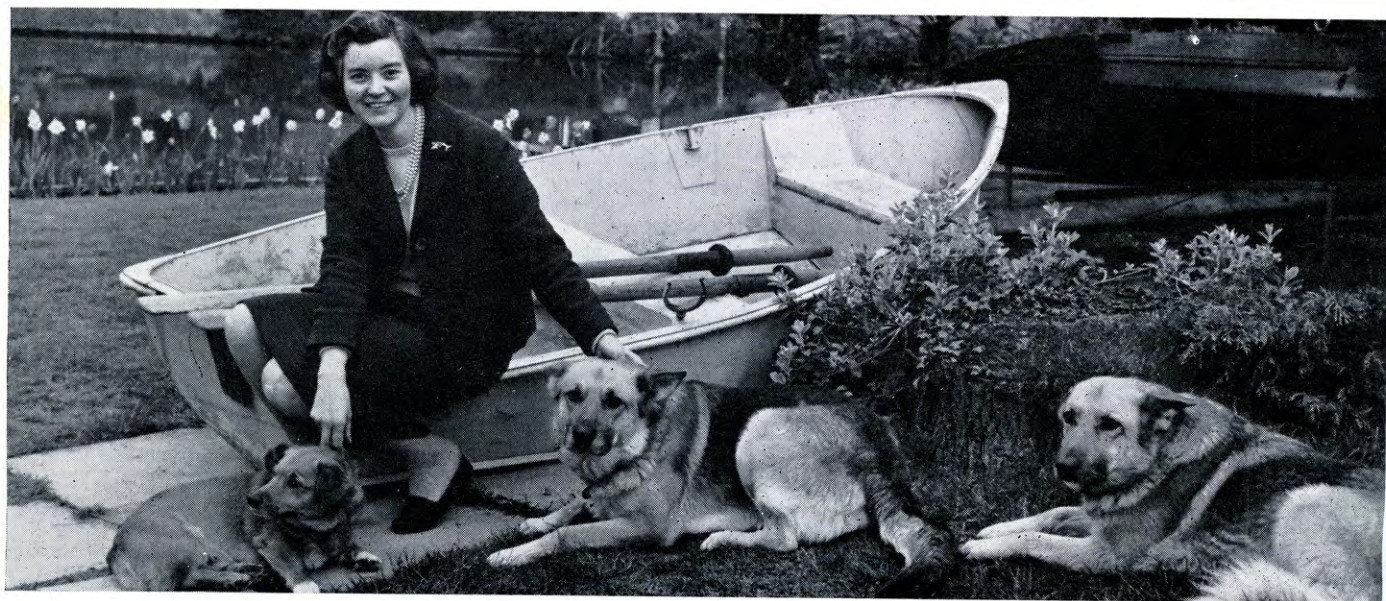
It is he who generally has the brainwave, often roughly jotted down on the back of an envelope. This he passes on to Ivor Kent, a chartered mechanical and production engineer who has been his assistant for the past 15 years.

His job is to turn the idea into a design. "Some form of catalyst happens between us," says Mr Kent. "Things flow from one to the other which I can put down. It's difficult to explain, but it works very well."

When he has produced a schematic layout or possibly coloured renderings which indicate the finished product and its capabilities, the idea is submitted to the 'customer' – the TI company which might be interested in producing it. Several alternative submissions may be made for comment and criticism.

If the idea is received favourably a scale model – or possibly a working model – is made. Or, if it is a comparatively small item, a prototype is built.

The unit's only woman member is Pamela Brewer, a technically trained secretary, seen here with Alsatisans Kit and Luke and corgi Teddy





Director of the Product Development Unit John Dolphin with the unit's latest 'baby', the TI electric car. At the wheel: J.D.'s assistant, Ivor Kent

This is where two highly skilled technicians take over: Eric Preston, who has a wealth of high precision work experience from hydraulics to watch-making, and Alan Dimmack, a development engineer who prefers the medium-sized job.

Preliminary testing is then undertaken and the next stage is again submitted to the company. If it requires further development, improved models or prototypes are built. Two key men who often come in at this stage are Jim Oates, an industrial model-maker who can present, in wood, models which look just like metal so that the visual appeal can be quickly assessed, and John Frayling, a stylist with a sound appreciation of the problems of turning a design into metal.

Other members of the team join in the effort – not least the apprentices, some of whom are TI student apprentices who spend six months with the unit as part of their training. One of the latest recruits to the unit, Richard Carmichael, chose to go there after getting his B.Sc. with first class honours in mechanical engineering at the City University, London, because he had had such a spell earlier.

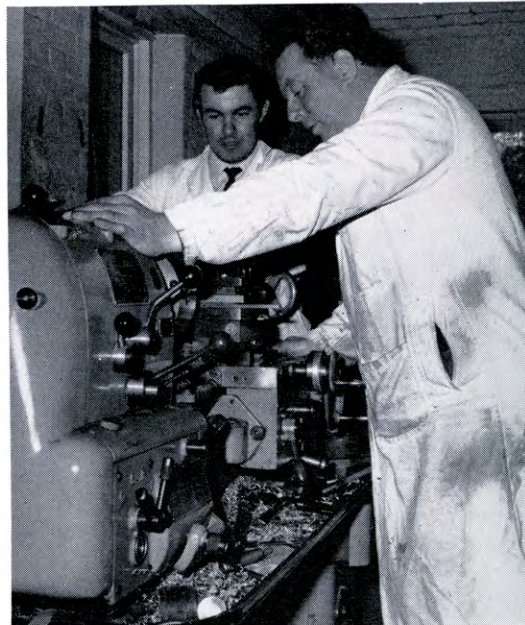
The unit continues development until the company is satisfied or decides that it is no longer interested. Then the idea may be offered to another TI company, and finally to an outside firm. Patents are taken out at an early stage wherever this is possible and in the three years the unit has been active in the Group they have amassed more than 60 patents in this country and abroad.

Once an idea is accepted by a company the unit pulls out.

Much of the unit's work must, of course, remain secret until it reaches the production stage, and so little can be said about a mass of projects now in the pipeline. But the record of projects which have come off the secret list is impressive enough.

For Raleigh it includes the world's first compact folding bicycle, a range of toys from pedal go-karts and stilts to the Dolphin – named after the fish, not the man! – range of appliances, and the Red Admiral bicycle.

For British Aluminium there are motor-car radiator grilles, for Fords (Finsbury) styling work on an automatic temperature controller for furnaces, for Loewy Robertson re-designing of a wire drawing machine, and for Accles & Pollock assistance with the layout of the VE honing shop.



Development engineer Alan Dimmack, watched by apprentice Alastair McEnhill, turning an axle for a container trolley on the workshop lathe

Simplex-GE have benefited from the design of a module system which has gone into their new range of switchgear, Pel have had an office executive suite made of aluminium tube and wood finish, and New Conveyor have received help with mechanical handling equipment.

But as far as the public is concerned the unit made its biggest splash with a product for which TI have no production plans – the electric car. When it made its debut at a demonstration organised by the Institution of Electrical Engineers it was hailed as the most promising on show.



The wheel, here being adjusted by Eric Preston, is part of a Tree Yo Yo exercising machine developed at the Mill. It has been patented but there are no immediate plans for marketing it

The present version, the Mark II, has achieved a consistent range on one charge of more than 50 miles at an average speed of 25 mph and a range of 30 miles under heavy traffic conditions involving 176 stops and starts. Under these conditions the acceleration is good enough to maintain place in traffic stream.



One of the key men of the unit is stylist John Frayling, seen airbrushing an early design drawing of the electric car. Some of his spare-time designs have been incorporated in Lotus cars

The project which was originally started for possible production by companies within the Group will not be wasted, however. Under the policy of offering developments to outside firms, the know-how and design work for further development of this promising project will probably be sold to someone interested in going into production.
