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HARLEQUIN

Vol. XXI

AUTUMN 1966

No. 3 (56)

Leisure Magazine of the United Kingdom Atomic Energy Research Group
and Associated Organisations

*in this
issue*

Editor

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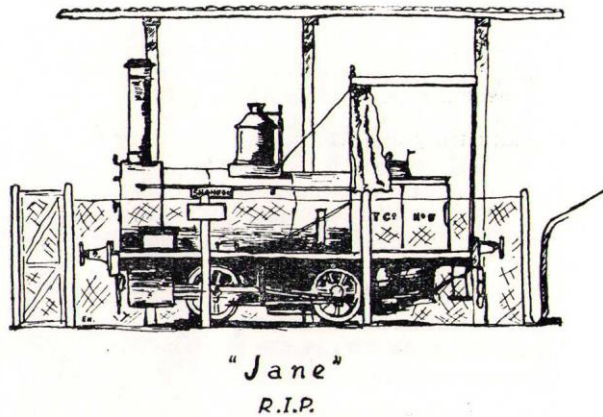
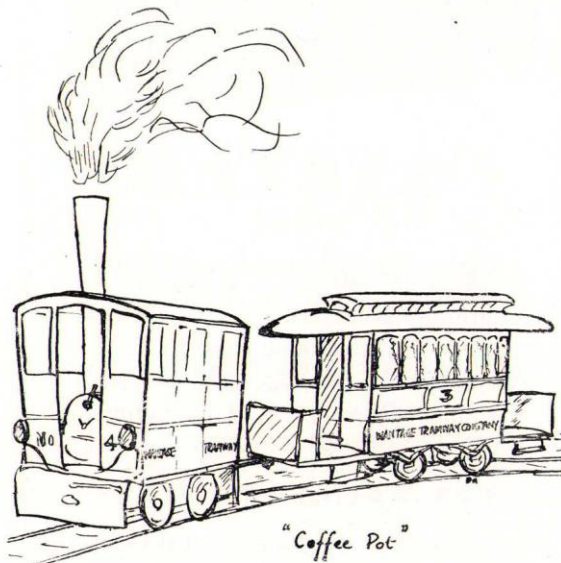
Treasurer

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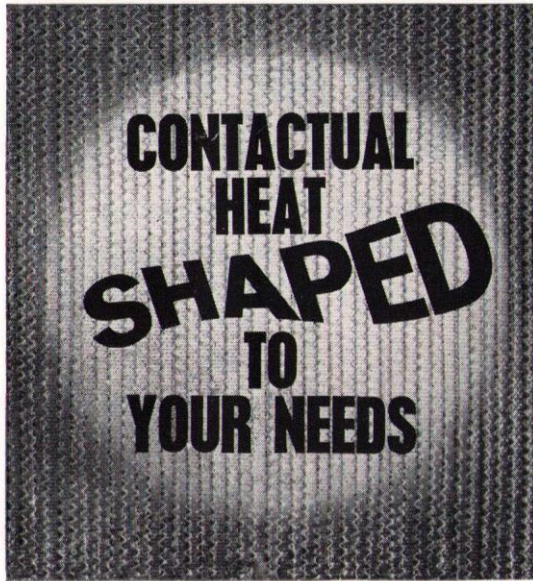
DR. R. B. JACOBI

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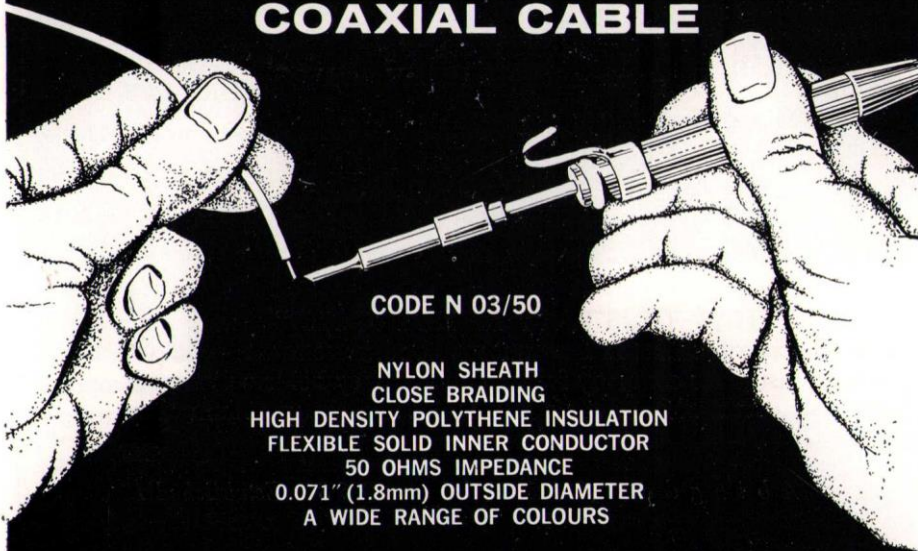
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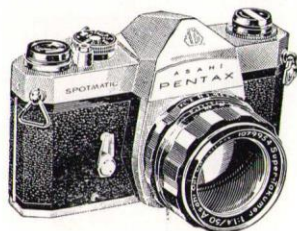
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EDITORIAL

The current phase of squeeze and freeze will have caused some re-thinking.

For our part we look back to a period when our writing of articles and our editing were for journals of the then flourishing motor-car industry, where the sense of purpose to be sought in one's work centred round one unified product, THE AUTOMOBILE, and not round that nebulous entity the nucleus.

Today, while the promise of the motor-car industry has been shattered, the hopes of nuclear research have begun to be realised. The sight of visible products coming off a production line, even when they can be converted into hard cash elsewhere, should not distract us from the need for a source of power by which 3,400 million people today, 4,000 millions by 1980 and 7,000 million by the year 2000 must somehow exist. The repercussions of this population growth, in both danger and opportunity, are the greatest challenge.

Despite the prestige given by the payroll tax to the manufacturing industries, need the Research Group feel inferior? It is true our research work must be financed by a profit made somewhere else, but does it cost too much in terms of the results obtained?

We should ponder the words of M. G. N. Hines in "Financing High Energy Physics": *The whole of scientific knowledge, on which western civilisation is based, and which is the essential key to industrial and social progress, has cost less than one year's growth in the production it has made possible.*

Certainly the present period should make us all cost-conscious. For "Harlequin" it is found that the income for the past year has risen by five per cent, but expenditure has risen by six!

If there is to be any real hope of keeping up with the cost of living, we must also discover the secret of perpetual motion!

PIONEERING IS THEIR BUSINESS

INSIDE STORY

The face of W.R.L. is mellowing a little. Once past the assortment of mechanical diggers that are turning the perimeter track into a country road, you can see it. Green lawns roll where once there were aircraft dispersal points: red and yellow roses flourish in well-tended beds. House martins nest under the eaves of the brick-filled concrete buildings and the cedar-wood labs that house the Isotope School and part of the Radiation Branch already make some show of blending with their surroundings.

The lab still keeps its links with the past — one of its members dug up an Anglo-Saxon in his garden this year, but that is another story. The Wantage Flyer — the steam train which once linked Wantage town with its railway station — has found temporary haven on the site. A suitable resting place, for its driver works there now and keeps an affectionate eye on his old charge.

But if W.R.L. should seem to be lapsing into a gentle complacency, the impression would be misleading. Steel forgings and surgical dressings, electric power and enzymes, harbours and hypodermics, coal ash and chemical analysis, weevils and water supplies are the 'cabbages and kings' of its daily conversation.

Two ancient thatched huts that look like relics from the Middle Ages were air-raid shelters with turf roofs when the site was a wartime aerodrome. But when W.R.L. moved in, they were converted to constant temperature rooms for rearing grain weevils. This pro-

ject, now successfully completed, gave the essential figures for designing gamma ray plants like the one now being built for grain disinfestation in Turkey. The thatch — just to stop the rain-water from dripping on the weevils!

The hangars are still there, of course. One of them houses the Package Irradiation Plant, better known locally as PIP, where five tons a week of medical supplies are sterilized. Twenty-four hours a day the packages in their plywood boxes pass slowly through the concrete-shielded cell, to pass its three hundred thousand curies of cobalt-60 (equivalent to about half a ton of radium): and in the packages hypodermic syringes, surgical dressings, surgeons' gloves, scalpels and other surgical appliances, ready sealed in their germ-proof containers, are sterilized ready for immediate use.

This method of sterilization, which has produced a minor revolution in cold-sterilized surgical appliances, was pioneered by the Laboratory, and PIP was built as an act of faith seven years ago, to allow manufacturers to gain experience with it (as described in "Harlequin" Winter 1960). In this it has served its purpose to the extent that four commercial plants are now operating in Britain, as well as several British-built ones overseas, but PIP continues, on a strictly commercial basis, to work for the benefit of still further users. The British Army is one of our biggest customers, for most of its medical dressings are sterilized in



PIP.

Sometimes a favoured visitor is allowed inside the concrete cell. The movement of the packages is stopped and the radioactive source in its frame is lowered to a safe position at the bottom of its twenty-foot water pool before the key can be extracted to open the 18-ton door, which is the only way into the irradiation room. The operator goes first with a radiation monitor to ensure that all is well, though of course nothing has been made radioactive by the radiations, and only the blue glow of the Cerenkov radiation in the water shows the controlled power of the submerged radioactive source. The air is still acrid with the smell of ozone, produced in the air whilst the source was exposed (the chemists will tell you that ozone itself is odourless, of course, but the impression is unmistakable). The operator is the last to leave, and before he goes he must pull a switch at the far side of the room, or the source cannot be raised even when the door is closed. This is to ensure that no-one can be left inside, and is typical of the simple but effective interlock systems which ensure the safety of all the big sources at W.R.L. We believe they are fool-proof. Nothing is left to chance; there is even a life-belt at the side of the water pool.

The biologists are still optimistic about the irradiation of food, especially to eliminate food-poisoning bacteria. Evidence of the wholesomeness of irradiated food is supplied

by hundreds of healthy rats and mice which live on it throughout their life-span. These pampered animals live in temperature-controlled quarters so clean that we have to dress up to go in and see them. I hear they are fed on sponge cakes, too.

Fields and greenhouses full of strange mutated flowers and vegetables were once a special curiosity of the site. Now the genetics team which crossed turnip and cabbage to produce that highly edible monster, the 'turbage', has turned its attention to the effects of radiation on cells and cytoplasm, and their subjects grow in test tubes.

Another team is working out the structure of enzymes with the help of radioactive tracers. If the structure of creatine phosphotransferase seems far from the realities of everyday life, it is a sobering thought that Samson wouldn't have got far without it. There is good hope that these studies may help the doctors to understand that paralysing disease, muscular dystrophy.

The radiation chemists say they can harden paints in less than a second with an electron beam. There's a big job for them if they can do it cheaply, and a 30-kilowatt unit is being built to demonstrate this on a scale that industry can appreciate. The first trials will be on painted hard board, but they hope eventually to coat sheet steel at hundreds of feet a minute. This is only one of the many radia-

tion-induced chemical processes which are being studied here, always with an eye on commercial possibilities.

Meanwhile the radiochemists are using radioactive tracers to unravel the problems of electroplating and corrosion, and studying the structure of alloys by autoradiography with a new kind of photographic film they have developed from scratch. Why do boron steels behave as they do in forging and welding? And how can they be better controlled? These are some of the problems the work is helping to solve.

In the same building, another team of chemists and physicists is trying to keep pace with the orders for activation analysis. They use the Harwell reactors to radioactivate their samples, of course, and this represents one of our many close contacts with Harwell. However there is also a neutron generator on site—the sort of equipment which some industrial firms could afford to buy and which, like PIP, they are encouraged to try for themselves. We have been offering a full commercial service in activation analysis for just over a year, to test the demand, and the specimens

which are now flooding in include anything from steel and aluminium to fertilisers and meat pies.

At the other end of the site, two green 4-inch water-pipes flank the road down to the canteen. These are used to test methods for measuring water flow, now adopted by the C.E.G.B. on a much larger scale for measurements in the big cooling water ducts that serve their power stations. We hope the hydroelectric stations will soon be using the same techniques on an even larger scale.

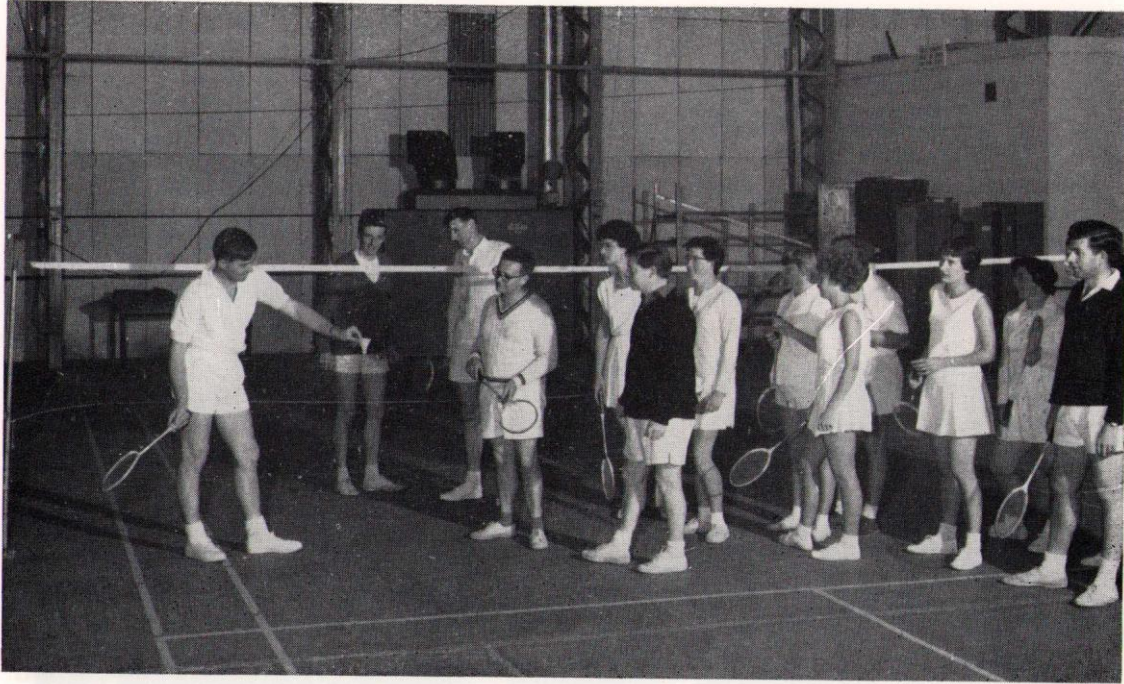
And in a nearby lab a new gauge is being developed to measure the ash content of coal for the National Coal Board. This is another development for which a great future is forecast to keep a continual check on the ash content as the coal leaves the mine or the washery.

Here, too, the measurements group develops the new detectors and methods which could make possible the next breakthrough on the industrial front.

It is a feature of W.R.L. that all of its activities are outward-looking towards the needs of medicine, of industry and of public works; so it is not surprising that its members often

At work — outside the irradiation cells.





At leisure — on the court for badminton.

find themselves on duty far from home. The water flow methods had to be tested at the power stations, and there is more to be done in measuring river flow and the movements and storage of water underground. The geological version of one gauge had to be tested in a tin mine, and the ash gauges at coal washeries.

At the time of writing this article one team was helping to commission a new power station, by testing the efficiency of the big cooling water pumps. Another had just returned from 'sailing up the Clyde' — not for its health, but in an investigation of siltation processes. Tests like these have already helped to improve dredging operations in the Thames and the Forth harbour areas and have dramatically reduced the costs.

There are plenty of visitors to the laboratory too — five or six hundred a year. They come mainly from industry to discuss their own problems with the advisory service, or to take advantage of the experimental service which is provided against payment by the customer. Some stay for periods ranging from a few days to a few months, working with our own teams on special projects. And there is always the floating population of students at the Isotope

School, which just recently enrolled its 4,000th student.

For information of unscheduled visitors, 'Boy' the alsatian still roams the site at nights — they say he's had two firemen already. He could be a great police dog if only he could be taught to let go.

Nine miles from Harwell is near enough to keep in touch with friends and colleagues there, but far enough to give some individuality to the site, in keeping with its rather special aims. They are even developing their own idiosyncrasies — too early to call them traditions as yet. These include a particularly murderous form of "cricket" in which there are no scores — survival is the only aim — and the annual Christmas party. This dinner, in the gaily decorated canteen and social club, (you'd hardly guess they were converted Nissen huts) is pleasant, but it is the 'cabaret' which follows which is so much a feature of Wantage. Entirely an affair of local talent, it is mixed in style, but high in spirits. Even the B.B.C. unwittingly adopted one of its hit lines, aptly enough called "It's all been done before". No-one is safe from the lash of its scurrilous wit, which the 'victims' enjoy as much as the

others, especially the winner of the 4-foot wooden spoon for 'stirring' services during the year. Perhaps the songs are the most effective — they should be, for the site boasts a choir which was top of its class in the North Berks Festival (S.O.S. — more female voices needed).

Two hundred is a good number for a pioneering site, and pioneering is their business. The total strength is not much more than that,

including all the site services. At least they all know one another — a happy state which it is difficult to achieve in a large establishment. Through all the day-to-day frustrations and triumphs, there is a sense of purpose about the site, for it has a lot to contribute in this technological age.

"Diversification?" I overheard in the canteen, "We've been doing it for years!"



W.R.L. VETERANS

(20 years' service in Atomic Energy)

Standing — L to R: R. T. Rogers (Scientific Services, Engineering), S. G. J. Richings (I.R.D.), F. W. Broderick (Divisional Stores), E. A. Weatherall (I.R.D.), J. Charles (I.R.D.).

Seated — L to R: J. L. Putman (I.R.D.), Miss O. M. Parrott (I.R.D.), B. S. Smith (I.R.D.).

Not available for photograph: Mrs. A. M. Ball (I.R.D.), and A. Mayo (Engineering Maintenance).



THE OTHER GAME AT HARWELL

The A.E.R.E. team line-up at Saclay.

Some two years ago an article with the subtitle "The Saga of Harwell Football" appeared in "Harlequin." However, it turned out on reading it that it was concerned with only one type of football, namely that with the peculiar round-shaped ball. The other kind of football with the sensible-shaped ball, usually called Rugby Union Football, never got a mention. However, on re-reading the article much of it might well have been written about the A.E.R.E. Rugby Football Club. The sharp variations in fortune from season to season, the need to strengthen various positions, the welcome always there for new players, the consistency of most of the opponents, and the curious nature of the changing accommodation in the early days are all as pertinent to the Rugby Club as to the Soccer Club.

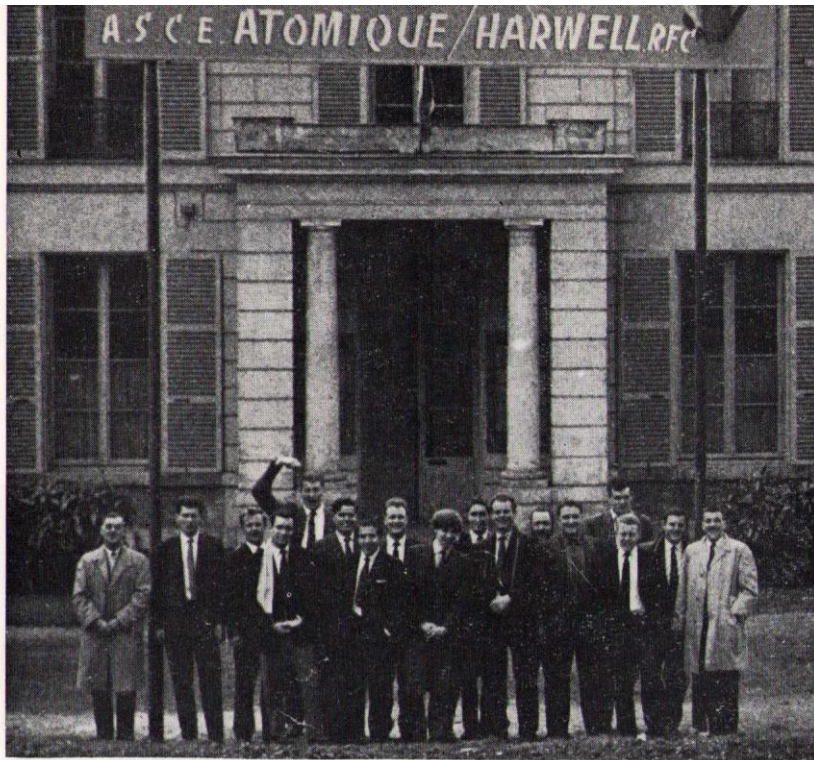
The A.E.R.E. Rugby Club was started in the way most Clubs have started, namely by an exhortation in the "A.E.R.E. News" (dated 10th April, 1947) commanding those interested to attend a meeting. This and many subsequent notices and directions were signed "R.F.J." and he was duly elected as first secretary of the Club. One of his early acts was to include in the "News" an appeal for 100 clothing coupons so that a set of shirts could be bought in order that play might commence. Play duly did commence on 27th September, 1947, against Oxford Exiles Extra 'A'. More accurately they helped to make up something near the correct number for two teams, because — as all "coarse" rugby players know

— the "Extra 'A'" never turns up with 15 men, and this occasion was no exception. However, by sharing out the players a game of 14 each side was played and the team with the majority of A.E.R.E. players won by 36 points to 3.

This proved to be the only success for some time, and some of the scores (which it would be unfair to reproduce) read more like cricket scores. However, despite this, the Club rapidly found its feet, and by the end of the 1947/1948 season bravely entered the Civil Service Rugby Cup Competition, and though losing the only match were not disgraced. Subsequently, the Club played in this competition each year and reached the final in April 1953, losing narrowly to R.A.E. Farnborough, strangely enough within a few days of the Soccer Club's reaching their one and only cup final. On the formation of the Authority in 1954 the Club then ceased to be eligible for the competition.

By this time the Club had become well established and was running two teams regularly and sometimes three. The playing standard was then as high as it has ever been, and John Morrison was playing regularly for Berkshire. He was later followed as a Berkshire player by John Roberts and Jack Cameron and recently by Eddie Athey and Ray Coulthard the present Club captain.

One of the early innovations introduced into the Club programme was the annual seven-a-side competition, held at the end of the season and which was started in 1950. The trophy



A.E.R.E. RUGBY CLUB FIRST VISIT TO SACLAY.

C.E.N. SACLAY 3 pts., A.E.R.E. HARWELL 3 pts.

The members of the team were:- Summers, Connor, Morrilee, Athey, Cunningham-Hicks, Howey, Auty, Baker, Dimond, Mendham, Harvey, Screech, Spittle, Crawford, Freeman, and Crompton.

is a well-worn pint pot presented by Hugh Roskell and known as the "Roskell Pint." The teams which compete are supposedly from Divisions or at least well defined sections, but on the day there are often many raised eyebrows when people realise how liberally this definition can be interpreted. This probably all goes back to the first competition when a team which appears in the list as "O and S's" was appropriately captained by Hugh. It would be unforgivable at this stage not to mention that he will be remembered as one of the finest sights on our field. To see Hugh leading his men — usually from well behind — was something to remember. Despite the distance between him and the rest of his pack, his well-known brand of colourful language was always audible to them, even against the considerable wind usually present on the second team pitch.

With the starting up of the Winfrith Establishment the Club suffered a temporary setback, as it happened that many of the established players left to go there. This proved to be quite a decisive break in the Club's history and it took several seasons before it settled down again. However, the present pattern of a full fixture list for three teams is not now difficult to maintain.

A further innovation in the fixture list was introduced in 1963 when we were invited by the Saclay Rugby Club to take a team to Paris to play them. Harwell drew the game and the idea was so popular that we invited them here the next year but lost this time. Both last year when we again went there (returning without our captain who claimed he had trouble finding his passport) and this year when they came here, our respective second teams have also played each other and it is pleasant to record that this year we won at last. Despite the great popularity of this fixture, it looks, however, as if it will have to be dropped as it has involved the Club in the expenditure of about £400 on each occasion.

In an article such as this it is very difficult to know which names to mention, particularly as the Club has always tried to include as many of its members as possible in helping to run its affairs. The Club, however, owes a great deal to "R.F.J." — Bob Jackson — who contributed so much in its early years, and to Hugh Roskell after him. One of the many who went to Winfrith, Peter Gates, also contributed a great deal both as player, officer and subsequently as a referee. Mention of referees will



A. C. FOX (CHEM.).

The winning A.E.R.E. team in action against Saclay at Harwell this year.

remind all past and present members of the Club of the services Bill Crompton gave in this capacity and subsequently as "manager" of the third team and still as a selector. Captains have been numerous and in addition to those already named, mention should be made of Olly Plail, Frank Williams, Malcolm Adams, Ken Allen, Eddie Relph and Bob Crawford. Nor must the Club's newest life member be forgotten — Bill Baker was elected this year and is quick to point out that he is the only life member to be appointed whilst still playing. It has even been said that before he gives up playing Bill will one day

pick the ball up and kick it, though after all these years many are beginning to doubt his ability to do this. Finally, perhaps one should mention Jim Dix, not especially because he is the senior player, but because of the almost unique experience in rugby of his having played on the same side as his son. Some of the players of the earlier years are now seeing their own sons play for the Club, but the thought of actually playing themselves just makes them ache all over. It is, however, encouraging to know that a new, ready made source of players is coming available for the future. ★



A. C. FOX (CHEM.).

NOT A CASE FOR SCOTLAND YARD

R. L. OTLET (W.R.L.).

Who's afraid of skeletons? Not Elizabeth Otlet (right) nor Michael Otlet (centre) nor their friends.

On the opposite page: The death weapon — a spearhead lying with its tip behind the spinal column.

It might well come as a shock to many people to learn, shortly after moving into their new home, that the garden was the site of an Anglo Saxon cemetery and that several graves had been unearthed just a few yards from their new bedroom window.

The shock came not long after moving into our bungalow at Harwell in November, 1961. I was gardening one weekend when I was greeted by my new neighbour Freddie Foxon (until recently on the Engineering staff of H7). "Found any bones?" he enquired, cheerfully. "Yes, lots," I replied, thinking of all the meat bones left behind by the previous owner's dog; and I watched Freddie's face change.

He was then the first to tell me of the happenings, some five years earlier, when workmen, digging the drainage trenches, stumbled on human remains and grave goods, later to be identified as of Anglo Saxon origin.

To support his story, Fred produced a copy of "Harlequin", published in 1957, in which an article described the finds.

Even so, I never expected to discover a skeleton in the garden, as the article referred to firmly stated that after the first find the garden had been "systematically excavated". Six skeletons in all had been uncovered, and the implication was that no more were left in the garden. However, I now learn from the write up of the finds in OXONIENSIA VOL XXI, 1956, that the systematic excavation amounted to a series of test uncoverings which left a good deal of the garden unexplored. Nevertheless, the diggers very nearly found the now infamous skeleton, which we inevitably nicknamed "Fred". Him I discovered this Whitsun, 10 years later.

How was he found? I had to confess to nearly all the 2,000 visitors who came to see

him, and to the two Wantage R.D.C. representatives who came in their official capacities to enquire why a 2-foot trench leading from the septic tank was being dug, that we had been suffering the ultimate disgrace of having trouble with our drains. I had hoped to cure the trouble by quietly and inconspicuously digging an improved water outlet laid drain, and incidentally burying a pile of unwanted building rubble at the same time.

I thought the ground was becoming a little soft at the end of the trench. I was glad of it, as the day was hot and pick-axing my way through solid chalk was no mean task. Fred Foxon and his skeletons were not in my thoughts. Being often blinded by science from my colleagues of the Geological Tracers Group at W.R.L. I dismissed the softening as a structural phenomenon. Then with a spadeful of soil I dug up some small bones. At first I thought these merely more dog's bones, but with the next spadeful came a femoral ball point, a good 2" in diameter, plus devious pieces of the pelvic assembly. Remembering the parts of skeletons my medical student brother sometimes left around our house in years gone by, I realised that the bones were human. (My father used to think it very amusing to open the front door to visitors concealing his hand up his sleeve whilst offering to shake hands with the callers with the limp remains of a genuine skeleton hand which dangled out of his sleeve. I shall never know why no-one ever passed out on the spot!)

I got in touch with the Ashmolean Museum, where the other grave goods are on exhibition, and that evening Mr. Brown from the museum, helped by my neighbour John Flaxman, began to dig with me, encouraged by an admiring group of excited children from both families.

The first evening's dig was certainly for John and me most exciting. Neither of us had ever done a "dig" before, but here we were with a skeleton all to ourselves and private, expert tuition on hand to excavate it.

Mr. Brown told us to expect the body to be lying approximately east-west with the head to the west. He lay on the ground at what he thought was about the right angle, whilst we chopped the turf around him to mark the trench we were to dig.

When we were about one spit down, and the chalk layer began to show, it was fairly obvious that our nearly east-west line was wrong, the softer edge of the previously dug chalk



N. W. HORSBOROUGH (Active Handling)*
*the photographer, not the victim!

showing itself on a more N.E.—S.W. line. A line not so far from a "head to the setting sun" principle for the time of year at which we were digging (early June). Adjustments were made to the grave's edge and then, proceeding more carefully with hand trowels from that depth onwards, we found the top of the skull, quite orange in colour and having the same "orange peel" texture.

Soon my trowel struck something hard and metallic. Mr. Brown had told us to expect something like this. He said that we might find a spear head on the right hand side of the body, possibly a shield boss over the chest or a knife at some position around the waist.

The best finds were often with the women's skeletons. A woman was often to be found with a knife — for doing culinary chores — and sometimes with bracelets and brooches and other adornments which it was thought she might need for the next world.

The position of this metallic object was immediately interesting and the interest intensified as, digging lower, the spinal column and ribs were unearthed. We realised that the object was a spearhead lying with its tip actually behind the spinal column. The rib cage had collapsed on each side of the body, and the spear was on top of the pile of collapsed ribs on the right. It seems likely, therefore, that the spear had been thrust into the chest with a frontal blow, just right of centre and had slipped over to the side, following the

movement of the collapsing ribs. The pressure of the soil may also have pushed it deeper into the body, explaining how the tip came to be under the spinal column. Had the tip been on top of the column it could have been argued that the spear had merely been placed on the dead man's chest when he was buried. In the position we found it, however, it seemed more likely that the spear was the death weapon.

It was particularly exciting to learn from Mr. Brown that as far as he knew a skeleton with a spear left in it was a unique find.

We didn't get much further that evening except to expose the lower jaw bone which had slipped away from the skull to give the skeleton a very long, sinister look, as if it were still shouting from the pain of the thrust in spear. We were told that it was quite normal to find the lower jaw thus removed.

It took my neighbour and me another two days of careful picking with trowels and dusting with paint brushes before the skeleton was fully exposed. All the time we hoped to find a clue to what kind of man he might have been and how he met his end, but nothing else came to light — not the slightest trace of clothing, belts, buckles, clips or knives.

The next afternoon the activity in the "hole" attracted the attention of a farm worker who was working in the adjacent field. When I told him what I had found, he was impressed to think of the many times the skeleton had been ploughed over, but never quite deeply enough to bring it up. (Its depth had been about two feet). Then with a cheery, "Well, he's certainly dead, all right," he went back to his work. Little did we know how many more visitors were to follow him! Exactly how the news spread we never really knew, but the first organised party hailed from the Crispin Inn at the direct instigation of the gentleman on the plough, and then the stream of people was endless.

It seemed only fair, however, that the people in the village and surrounding areas should see what was more their history than our possession. We were very impressed with the older villagers who struggled up our 50 yards long, 1 in 5 driveway, often helped on either side by willing hands, and all to see this little bit of old Harwell. One old lady whispered to my wife in confidence, "You know, my dear, I did my courting here more than 40 years ago, on that spot. I wouldn't have enjoyed it up here in the moonlight half as much if I had known that skeleton was underneath me!"



A group of visitors give their views at the grave's edge.

The weather was gloriously fine, and being June, it was light until 10 o'clock. The last people arrived just after 10 o'clock, and brought their own torches. At the other end of the clock, the first visitors came just after 6 a.m., on their way either to or from work. These crept quietly into the garden, in case we were still asleep, I suppose, removed the tarpaulin and replaced it exactly, before going away again.

American visitors came and enthused. One gentleman told us very seriously that had this been the States we could have "made a mint of money" from our find. I'm sure, had we given the word, he would have set himself up as our business manager.

An American teenager, after listening politely to my explanation of why I was digging a trench in that precise spot, turned to her mother and asked in a stage whisper, "Mom! What's a septic tank, for heaven's sake?" How uncivilised we felt!

Once I wondered what we were in for when a dozen motor bikes arrived at the top of the driveway. But I needn't have worried, the leather-jacketed "ton-up" boys were as interested as anyone and their behaviour was impeccable. Full marks too, to the Secondary School master who brought up a load of 14—15 year old boys, on their way home from their own dig at Brightwell-cum-Sotwell. The boys certainly knew their Anglo Saxon history! Some faces we saw time and again, as the enthusiasts organised their own parties and acted as guides.

A few visitors at this time came from other motives than to look at the skeleton.

The Thames Valley Water Board man, when asked if he had come to see the skeleton, said he had enough trouble with live people without bothering about the dead ones. Some one was using more than their share of water and was our pressure low?

My wife enquired of one lady if she were interested in archaeology, to which she replied, "To be quite honest, my dear, no, but my sister told me what a lovely view you had from your garden, so I came to see it."

There appeared at the door one afternoon a British Railways fireman, straight from work. He hadn't come to see the skeleton either. Someone had told him there was a picture of a Talylyn Railway Narrow Gauge Locomotive in our hall and would we mind very much if he looked at it.

John Flaxman, my wife and I took it in turns to greet and talk to the visitors, answering their questions as best we could. None of us was an archaeological scholar, and before this happened knew very little of the Anglo Saxon period. Our knowledge was increased by Mr. Brown during the dig and by some learned visitors in later days.

I gather that from the depth of the grave, the placing of the skeleton (his head on a pillow of stones and facing approximately east-west) and from the type of spearhead, it seemed likely that "Fred" was a contemporary of the six other skeletons found earlier. Their grave goods had enabled a date prediction to be made of about 550—650 A.D. The burials were pagan, and, as conversion to Christianity was almost complete by 700 A.D., the earlier date of about 550 A.D. seems more probable.

Two doctors who came thought the skeleton was that of a young man in his early or middle twenties. The skeleton measured 5'9" and, allowing for the compression and distortion of the spinal column, he may have been anything up to 6' tall. The size and formation of his bones and the quality of his teeth, all present except for some wisdom teeth, showed him to be well fed. A dentist and a dental technician confirmed that the teeth were in good condition, but well worn down. It was explained that the diet of the time was to blame: the coarsely ground flour still contained some husks and grit from the stone crushers and meat cooked on open hearths often contained wood ash.

We may never know why this clearly hand-

some young fellow came to meet his end so prematurely some 14 hundred years ago. Many suggestions were forthcoming from the visitors: perhaps he was a peasant who exceeded his privileges with the Nobleman's lady, but he was very well fed for a peasant so perhaps he was a common thief and this was his punishment when caught. Mr. Brown was less dramatic in his guesses: he explained that it was well known that the Saxons quite frequently quarrelled amongst themselves; in the laws of the time it was written down what should happen if a man killed his brother, and that may well have been what happened here.

Whatever the truth of the matter, at least someone had thought enough of him to carry him up to the top of the hill and give him the full rites of burial, even though they may not have thought enough of him to bury with him treasured possessions for the next world. They surely could not have guessed that the next world for him was to be some fourteen hundred years later, nor of the interest he would arouse.

Quite soon after the uncovering there were signs that the bones would deteriorate rapidly if left just as they were exposed to air.

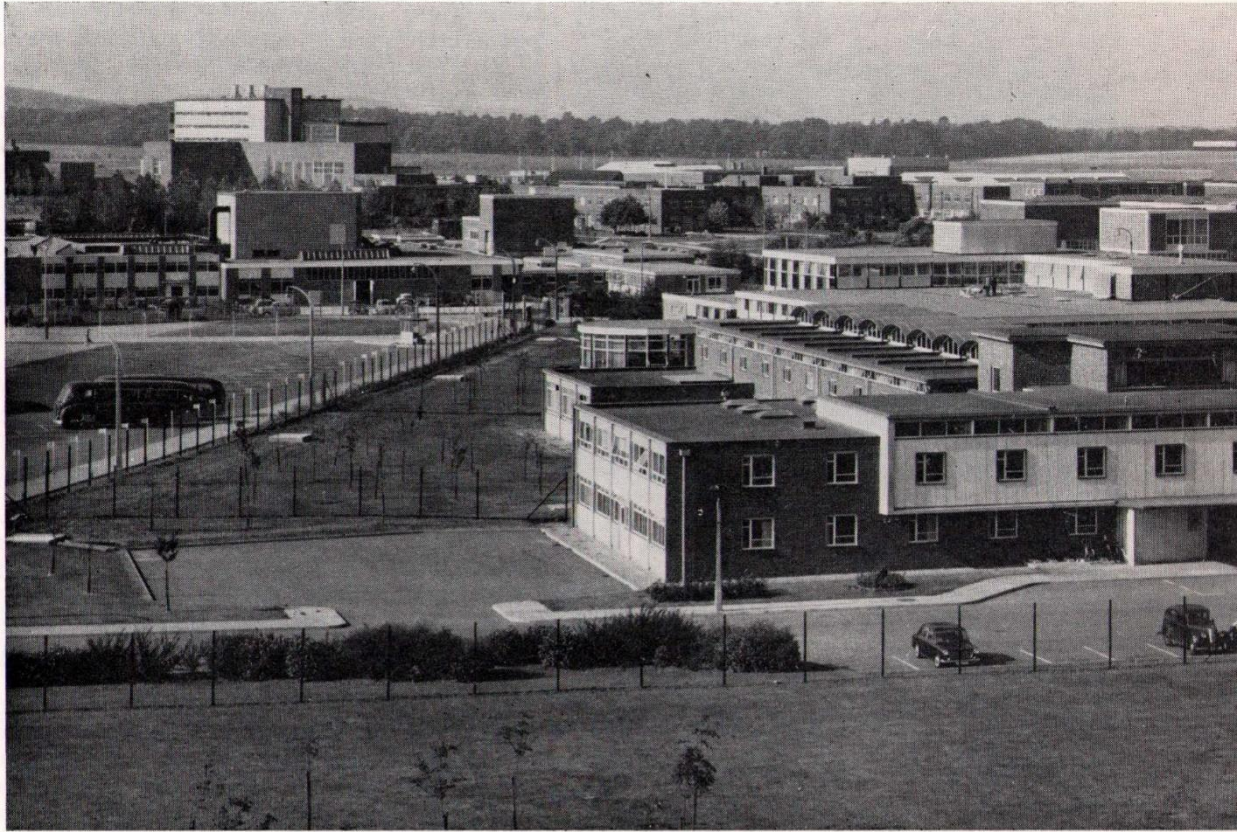
The Ashmolean Museum said they wished to preserve only the spearhead, and would add it to the previous collection. A spearhead on its own seemed very dull compared with one embedded in a skeleton, and many people were surprised and disappointed that this unique find was not to be exhibited whole somewhere. I had heard that Reading Museum was disappointed to hear that a North Berks find was being exported to an Oxfordshire Museum, and when I asked Mr. Gwatkin, the Director, if he would like the skeleton he was delighted to have it, and promised to exhibit it whole with a replica of the spearhead in place. The original spearhead was to go to the Ashmolean, as first arranged.

When the negotiations were complete the roadmen working on the road improvements on the A.34 at the bottom of our lane kindly nailed a notice to a convenient telegraph pole to say the skeleton was no longer on view.

One day, nearly three weeks after its discovery, my wife arrived home to find the skeleton gone; moved unceremoniously to Reading in the boot of the Archaeologist's car.

Ridiculous as it may seem, the sight of the empty grave made us quite sad.

We felt we had lost an old friend, and life seemed quiet without all the visitors. We wouldn't have missed those hectic weeks for anything! ★



The Harwell Library and Information Services



The Main Library, seen here from the Tandem Generator, occupies the whole of the first floor and part of the ground floor of Building 465. Its services are supplemented by those of the Divisional Libraries, of which there is at least one in each major Division.

- Each minute of the day and night, two significant scientific papers are published, making an addition of over a million each year.
- The key to the future is in the hands of those for whom the growing flood of fact can be kept under control — and then used.
- In this new series we shall look at some of the libraries to which “Harlequin” readers have access.

A good technical library must be able to provide its users with the scientific literature of the world.

To furnish such a service for a pioneering and far-ranging establishment such as Harwell is no easy task. It might be likened to firing a rocket at Venus, but a Venus probe has the advantage in that planets and their orbits can be predicted. Anticipating the requirements of a physicist who at the moment doesn't know them himself tends to be difficult. “Harlequin” saw how the library staff accept the challenge and look ahead hoping that when the questions come they're in the right place with the right materials, references and answers.

Apart from its own extensive collection of over 400,000 reports, books and bound volumes of periodicals, Harwell has at its disposal, through various interlending schemes, virtually all those of the major scientific libraries of Great Britain. Almost any unclassified report from the countries of the West can be obtained, and many classified ones as well. On-the-spot translations from all major languages can be given, including Russian and even Japanese.

Today the world output of scientific and technical literature is prodigious. It is estimated that the volume doubles itself approximately every ten years. Not all of it is of high quality or novel, of course, yet by its vastness it is formidable.

It is essential that organisations responsible for research and development should have the fullest access to this reservoir of data. Without this access

this access they risk missing new ideas, duplicating work unnecessarily, and overlooking possible improved modifications.

The Library and Information Services are available to all A.E.R.E. staff and, to a large extent, to attached staff and to members of S.R.C. and M.R.C. Most of the books to be read, or to be taken out on loan, are of specialized scientific or technical interest, but the Library also has a good collection of general reference books, such as atlases, dictionaries, encyclopaedias and timetables, as well as popular histories of the development of nuclear energy.

For the young reader who thinks of asking Father to bring home a copy of “Alice in Wonderland” we finish with a note of disenchantment: this is not on the shelves, but, if the Research Group programme ever requires it, the Library will get it!

Further pictures overleaf ▶



The Librarian, Mr. C. W. J. Wilson.

TOP RIGHT:

The Information Office with its array of card-index cabinets containing report abstracts and a guide of many of the reports held in the Library.

TOP LEFT:

The Enquiry Desk outside the Reading Room. With its modern furniture and excellent lighting, the Reading Room invites readers to its quiet alcoves. It is normally open from 8.30 a.m. to 6.30 p.m. Monday to Friday.

FOLLOWING IN THIS SERIES:

The Libraries of Culham and Rutherford Laboratories.

Surrounded by dictionaries and reference books in many languages, Rosemary Slingo works on a Euratom report in the Translations Office.





He walked into the Rutherford Rotunda . . . but the people he found were "out of this world."

THE SURVIVOR



H. WROE (RUTHERFORD LAB.)

His experiments had gone badly all morning and he decided to go over for lunch. Perhaps things would go better after a break—in any case it was one-thirty and unless he went soon they would have finished serving. He tried to put his work out of his mind as he walked across the car park towards the restaurant building, but it was impossible and the experiment seemed to go on in his head, so that it was only at the edge of his mind that he was aware of the pale October sunshine, the cold blue sky and the hint of fog over the downs. The thought that it could all vanish was not in his mind at all.

“What can I get you Sir?”

He found himself standing at the lunch counter with a tray in his hand. Glancing up at the menu board with its black plastic lettering, he read the ‘menu for Friday, October 21st, 1966’ and ordered his meal. As he walked through the swing doors into the Rotunda, a dizziness came over him. The wood block floor seemed suddenly unstable under his feet, as if it had become a thin membrane floating on a heavy liquid. The feeling passed in a moment, and he looked round at the tables in the hope of finding a colleague to lunch with, but there were few people present and he saw no familiar faces. He went over to a table on the outside of the circular room and sat down with his back to the glass wall. Looking across the room, he could see through the opposite windows that the Ridge-way was obscured now by thick fog.

It was the first time he had really noticed

the fog. It had a curiously opaque quality and it was rolling down towards the Laboratory buildings like a tidal wave of grey vapour. As he finished his soup and pushed the plate away, he glanced up again and was astonished to see the swift advance of the fog which was now billowing round the glass walls of the Rotunda. In a few more seconds the familiar views were completely blotted out and the fog pressed up against every pane of glass, creating a weird grey light in the room. Nobody else seemed to be taking any notice of the extraordinary effect and he turned to the next table to comment. It was then that he observed something about his fellow diners which triggered the first spurt of fear. It wasn't that there were none of his friends present which alarmed him, but that the others were all complete strangers, people that he had never seen in his life before! Their dress was odd for another thing. He was used to seeing foreign dress—the staff of the Lab. were pretty international those days—but these people were out of this world. There was a general movement among them and he saw that someone had opened the emergency exit. Then they all walked out into the fog and he was left alone. He went to the swing doors which connected with the serving counters, so as to find the manager or at least some of the restaurant staff, who could tell him what on earth was going on. Perhaps they were shooting a film at the Lab.—it had been done several times before—but nobody had mentioned it, which was unusual.

When he reached the swing doors, he found them locked with some sort of metal shutters behind them. He had the insane idea that they hadn't been opened for a long time, though he had walked through them not five minutes before. Running across to the emergency exit, he plunged out into the fog. If this was some sort of joke it was a pretty elaborate one. The fog was clearing as quickly as it had come and in a few strides he was out into the autumn sunshine again.

It was no joke.

He saw that Harwell had vanished. There were no chimneys, no Van de Graaf building, no Dido and Pluto, no fences. The Rutherford Lab. had also gone. There was a slight rise in the ground where the mound should have been, but nothing remained of the Lab. apart from that. That and the restaurant building of course. He turned back to the Rotunda, his one link with sanity, but even that was changed, the circular part only remaining. He went up to the pillars which supported the roof and touched one of them to reassure himself of their existence and the concrete crumbled to a powder under his fingers. It was real, but it had the look of an old building, even an ancient one! There was green moss on the concrete and the roof had been patched up with some unfamiliar material. It seemed to be the only building in sight. As far as he could see on all sides there was nothing but short green turf dotted with trees. It was like a huge well-kept park — there were no roads, no hedges, no cars or litter or people. But what had happened to those people at lunch? His mental question was answered at once when a shadow passed by him. Looking up into the cloudless sky he saw a silvery flying machine rise vertically into the clear air and move off towards London at great speed. He had the queer feeling that they had been to lunch at the restaurant in the same way that he might have gone out to lunch at an old pub in one of the nearby villages.

As the machine vanished into the distance, his eyes fell on an object about a hundred yards away — it was a post about five feet high — of course! — the Ordnance Survey Point! At once he recognised the concrete pillar with the bronze plaque on top and sprinted towards it. Hauling himself to the top, he read the inscription and then slithered down to crouch at the bottom, trembling in every limb, as if he had received a violent electric shock.

The inscription read 'Ordnance Survey June 2175'.

He felt like a sailor whose ship had been torpedoed — a sudden shattering event — a period of confusion and shock — then the slow realisation of his appalling position. He was the sole survivor of a whole race, adrift over 200 years from home!

What had happened was beyond him, but he had a queer feeling that it had to do with his own experiments. The accelerator was now producing intense beams of the new Q particles which he'd discovered, though their properties were not well understood — understatement of the century, he thought. The shielding round the accelerator was supposed to be adequate, but could he be absolutely sure? Had his perception of time been greatly accelerated as he'd entered the restaurant? He'd been searching for a new type of interaction for months — could this be an unexpected result? — but a macroscopic effect of this magnitude! — or was it — His head spun and he gave up.

A shipwrecked sailor could at least hope for rescue, but he had no such hope. He walked back to the Rotunda, the one slender link with his own time. His earlier notion of metal shutters on the outside of the swing doors proved to be correct. He stood on the lush turf and examined the sheets of light-coloured metal. He beat on them with his fists and showers of white powder came away — they were thin and badly corroded. He began to charge one with his shoulder, in a mounting frenzy of despair, until it split with a noise like thunder and he burst through.

Some of his colleagues were sitting at a nearby table. They looked up in surprise as he staggered in.

"Hello George, what on earth is the matter with you?"

He felt dizzy and stared round without answering. Everything was normal! Outside, the terrible, green, empty, silent landscape had gone and all the familiar landmarks were visible again. His brain readjusted at high speed as he walked shakily over to join his friends — the whole thing must have been an hallucination — been overworking perhaps — better take it easy — say nothing about it, that's the best line — keep quiet.

"Let me get you a drink, George, you look terrible. Where have you been, man?"

"Been?" he said, too quickly, "I haven't been anywhere in particular."

"What's all that white powder on your clothes?" ★

IN RETROSPECT

By SIR FRANCIS SIMON

Following our review in the last issue of "Harlequin" of "A Prophet in Two Countries", several readers have tried to obtain the early "Harlequin" for which he wrote and which was quoted in the biography. Underlying the satire, which we reproduce from "Harlequin" 1952, was his strongly held belief that mental and moral progress were dragging behind the rapid advance of science.

When most of the inhabitants of the Earth were killed in the atomic catastrophe a small group of islanders in the Pacific escaped destruction. By 2500 A.D. they had multiplied and developed sufficiently to form a flourishing community at about the level of civilization which we had in the year 1900. They had, of course, tried to explore the rest of the world, particularly in order to find out about the great catastrophe, but they had been prevented from doing this by the radio-activity still lingering about. At last they had found a way of protecting themselves against these hazards and an expedition had been sent out to look for relics of the former civilization. The only things they could discover, however, were a number of copies of a popular newspaper preserved by some freak of chance.

The archaeologists set to work feverishly to try to decipher them. This was not an easy task; after all, the deciphering of an unknown language can only be undertaken on the assumption that what is written down makes some sense, and from this point of view their find was not a very lucky one. For instance, when still struggling with the first sentences, they saw a picture of a lady shouting "Four times more lather". How could they know that this only meant four times more lather than that from an undisclosed substance, the only characteristic of which was that it produced four times less lather! (Incidentally the



"OXFORD MAIL"
Sir Francis (centre) at an engineering conference with Sir John Cockcroft and Lord Cherwell.

stuff was also kinder to her hands, 2.7 times).

There was one thing, however, which made their task very much easier: the frequent cartoon drawings in advertisements and text. People's mouths sprouted sausage-like growths on which thoughts or statements were inscribed. It was not difficult to find out that these thoughts were of a highly primitive character, so primitive, indeed, that our islanders believed that they had come across a children's primer. When however, they noticed the prevalence of sexual matters they had to give up this idea and their second guess was that these papers must have been written for the feeble minded, probably for inmates of a home.

Indeed this explanation had much to commend itself. First of all it was clear that there must have existed people of higher intelligence — if for no other reason than that so thorough a destruction could only have been produced by people of great ingenuity. Also, the highly complicated machinery which they admired in pictures of destroyed aeroplanes could obviously not have been built by lunatics.

It was clear that the papers could not have been written for people of this kind. Who other than the feeble-minded would have been

Soon after the Reichstag Fire, Simon was determined to leave Nazi Germany. Because of the various contacts he had had with Lindemann (Lord Cherwell) and the interest shown in his work, he regarded Oxford as his first goal. Since there was the fear of letters being opened by the Nazis, a code was used in the negotiations. In this code Simon was referred to as the "high pressure compressor", while the working pressures in atmospheres indicated the annual stipend in pounds sterling. His biography records that "H. London for whom Simon was also trying to make arrangements wistfully hoped that he could perhaps be referred to as the 'vacuum pump'." Dr. Heinz London, now an F.R.S. and a world authority on low temperature physics, who this year completed his 20th year at Harwell, has paid tribute to the author as his "scientific father."

satisfied with this hash of trivial news and exhortations to buy this or that pill? Who in his senses could have believed that some tablets would transform these rather murky looking individuals into the most successful and beautiful specimens? Surely only a half-wit could be impressed by a statement from "Nurse A. C. from B.", certifying that X pills — so unaccountably overlooked by the medical profession — had relieved "that" killing pain and made "another woman" of her and that sheer gratitude compelled her to announce this to her fellow-sufferers.

But what about the people who had written these papers? At first it was believed that they must have also been inmates of the home. They had to abandon this idea however, when a bright young man, working for a higher degree, studied in some detail one of the advertisements which boldly announced a preparation able to destroy all smells whatever their nature. By pure reasoning, he found out that the only explanation could be that the preparation contained a volatile compound, able to paralyse the olfactory organ. When he studied the advertisement again very carefully, many phrases in it convinced him that his interpretation was right. It was a brilliant piece of work and he received his Ph.D. in record time. He naturally concluded that the papers could not have been entirely written by lunatics.

There were also a number of other factors pointing in the same direction, but before they could discuss this further the archaeologists made another discovery which upset all their previous speculations. They found a few issues of another paper. True, its contents were hardly distinguishable from those of the first, but included circulation figures of all the daily papers. They saw with stunned surprise that the two newspapers were among the most widely read of all papers: many millions were in circulation! As they were assured by their economists that such a large number of people could not possibly have been kept in homes, they were forced to assume that newspapers of this type were actually read by the great

majority of the people and seemed to have satisfied their needs. The archaeologists went back to discover copies of some of the papers with smaller circulation figures which might have been read by the intelligent part of the population. As, however, all their endeavours were in vain, they settled down to analyse the available material in more detail as, of course, with the changed outlook this was a matter of much greater importance.

In spite of all their work they were unable to form a reasonable picture of the state of the world before the catastrophe. Most of the coherent accounts which were more than fragmentary dealt with the proceedings of criminal or divorce courts, or with the actions of a small class of people who lived in one place — Hollywood. These last were accorded the veneration appropriate to demi-gods and seemed to have represented the current ideal of mankind in respect of looks and inanity; their most trivial activities were reported in great detail. A similar veneration was accorded to a class of people, also smallish in size, who earned their living by pushing balls around, either with sticks or with parts of their bodies — including the head. It is true there were a few notes concerning what had at the time been called politics, but they were written in a highly emotional style, furiously attacking people who held different opinions and never admitting a mistake — quite useless therefore, except from the psychological point of view!

There was one point which puzzled our islanders a great deal: what had these people been doing all day? The men may have gone to work, but the women? If the advertisements were to be believed, there was little work to be done in the homes. Washing obviously was done in a "jiffy". The food problem seemed to have been solved very simply — mixing some powder with water gave a most nourishing meal for which the "kiddies" had been craving. You could even taste "that good richness" of this or that (most probably seaweed).

What *had* they been doing? Certainly there were no signs of any mental activity. One of

the candidates who was jealous of his colleague's success with the anti-smell preparation produced a highly original solution. He quite rightly concluded that most of the wonder pills were in actual fact only laxatives. Now if some person wanted to become super perfect — and who would not? — and took a few different pills at the same time — might this not provide an explanation of how and where they were spending their time? This solution seemed a bit far fetched, even to his Professor, but he got his Ph.D. all right. (Some people may be surprised at the emphasis on the more bodily aspects of humanity, but we must not forget that our islanders had only the popular press on which to base their speculations.)

After a few years they despaired of forming any reasonable picture of the world before the atomic destruction. They had of course wanted to know what had caused the catastrophe. There seemed to have existed a hostile and powerful group of people living behind an iron curtain who were not as freedom-loving as our newspaper readers, but there was hardly any factual information available about them. Finally, they decided that this could not really

have been very important. The non-freedom-loving group had probably cultivated only a different brand of stupidity, and on the whole one group could not have been much more intelligent than the other, or it would probably have survived. So their final verdict was that the people inhabiting the Earth some 500 years earlier may have been very friendly people, they may have loved their "kiddies" and perhaps even their wives or husbands, but most of them — whether freedom loving or not — had been intolerably stupid. The details of the mechanism which had triggered the catastrophe did not really matter very much. A civilization at the state of technical development which had obviously been reached could simply not have been in a stable state if the great majority of the people had been at such a low intellectual level.

Our islanders, of course, realized that their deductions rested on a rather slender basis; as, however, there was no other evidence it was unfortunately this — of course quite untrue — picture of our civilization and its fall which went down in the Annals of History.

F.E.S.

BELIEFS OF BYGONE BERKSHIRE

KEITH B. POOLE



In spite of the incredible advance by medical science in the last century, there are still Berkshire people who implicitly believe in, and use, the ancient cures and remedies culled down from old books or passing gypsies, or just handed down through the family.

It is a long time indeed since the days of the doctor on horseback, with his little bag containing tins of leeches and a few bleeding knives — these being the cure for most or all ailments!

Those who could not afford the doctor would go to the village or town "Jack-of-all trades," or the surgeon-barber, for the cutting of corns, bleeding, blistering, and extraction of teeth. On market days or at the fairs there was always an itinerant "dentist" assisted by a man banging a drum or blowing a trumpet to drown the yells of the patient whose tooth was being drawn.

A celebrated Berkshire "quack" was Isaac Factotem of Reading, who specialised in surgery and midwifery. John Briggs of Hurley removed "motes" from eyes and cured "the itch." William Savoury of Brightwalton specialised in pills and fever powders, salts and cephalic snuff. There were other curious "cures," such as Daffy's Elixir, double-distilled lavender, Hungary water, Rochford drops, and Eaton's Styptic.

One of the commonest ailments of these times was sore eyes. Since Berkshire is particularly rich in medicinal waters, it was not very difficult to concoct some sort of cure, by bottling spring water under a fanciful name.

Ye Ancient Ladye Well at Speen was reputed to have highly curative powers. At Finchampstead there was a stream which contained iron, and people would bring their bottles and medicine chests from all over the country to fill them here. Another curative spring was at Appleford, and a supposed physic well at Bablock Hythe.

The Black Jack spring near Kingston Lisle was also renowned, for curing sore eyes and rheumatism. Sunninghill Sunningwell and the renowned St. Leonard's Well at Clewer were well-known for various remedies, and constantly visited. In Winkfield Park there was actually a Spa where wealthy people went to be cured; and at Frilsham, a well which, until quite recently, never ran dry, the water of which was particularly good for sore eyes.

In addition to these natural remedies, there were the countless curious and varied patent medicines sold by the pedlars, "quacks," or "Jacks-of-all-trades." Bucklebury had an itinerant herbalist called "Old John," who

went on his travels all over Berkshire and as far even as London, selling white lily-root ointment for "gatherings," tansy tea for rheumatism, and marshmallow poultices for cuts and wounds. He would also cure warts by cutting slits in alders, or boring holes in walnut leaves, putting them down a deep well and telling the people that when all these decayed the warts would disappear.

In Drayton they cured whooping cough by placing a few white hairs from the chest of a donkey on the patient; and in Milton they tackled the same complaint by grinding a thunderstone to powder and mixing it with milk.

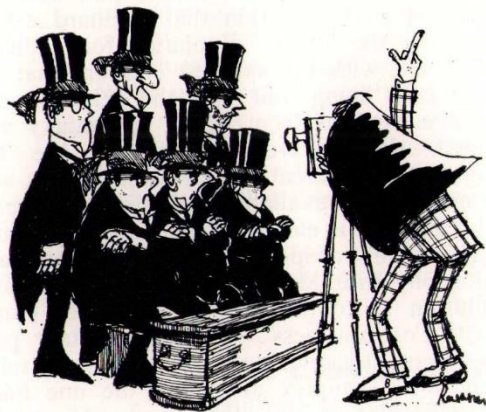
Padworth had a reputation for curing chilblains and coughs, strangely at variance, with Good Friday bread and an infusion of hairs from a donkey's tail. Cobwebs were used almost universally for wounds; it is truly astonishing that more people did not die from the complete lack of any form of antiseptic or disinfectant.

Stratfield Mortimer specialised in rabies, which they attempted to cure by a mixture of rue, garlic, Venice treacle, pewter scrapings, and strong ale; this evil concoction to be taken within nine days of being bitten — surely more likely to kill the patient, than the actual bite of the mad dog. An almost more unbelievable remedy came from Milton, where shingles were treated with the verdigris scraped from church bells!

Such drastic measures seem to us today to be incredible, yet all were implicitly believed in, and even taken by highly-educated people. It is easy to see how the "quacks" could become so prosperous, for the basis of all these cures was simple faith and trust.

Many of the "Jacks-of-all-trades" and "quacks" did not only confine themselves to patent medicines, but in some cases varied their interests and talents by teaching dancing, fencing, grammar, the Jews-harp, shaving, haircutting, deportment; "joggraphy," wig-making; selling mousetraps, gingerbreads, sausages, stationery-ware and garden things. Isaac Factotem of Reading added to all or most of these by promising "cures for all other outlandish things too tedious to mention."

In spite of these supposed cures and remedies, perhaps even because of them, statistics go to prove that the people of those days lived much longer than we do; though there would seem to be no real incentive to-day to prescribe donkey-hairs and church-bell verdigris for prolongation of life.



Teilhard de Chardin was a French Jesuit and palaeontologist who foresaw that a combination of science and Christianity must be achieved for the future potential of mankind to be realised. His unorthodox views brought him into conflict with the Vatican early in his life and he was forbidden to teach or publish any of his ideas. After distinguished service in the 1914-18 war much of his life was spent studying prehistoric man in China, his most famous discovery being 'Peking Man'. Following his death in 1955, a group of his friends began publishing his books and letters, several of which have been translated into English. His ideas have become a popular subject for discussion, and are being studied by both Christians and agnostics. Local groups have been started at Wantage and Abingdon. A lunch-time meeting to be announced in "A.E.R.E. News" will use this article as the basis for discussion.

HOPE FOR THE FUTURE?

DR. T. E. PEACOCK

Teilhard was a man of unusual genius, for not only was he one of the outstanding palaeontologists of the first half of the twentieth century but he was a theologian and prophet of great vision. It was his unity of outlook — his vision of the future of man from reflection on his scientific work and his theological belief in the ultimate goodness of man — which marks him off as one of the greatest thinkers of our century. Teilhard was an optimist, he was an optimist in man's future in spite of the background of meaninglessness, hopelessness and despair of French existentialism of the thirties. He was an optimist in spite of the horrors of what man can do to man as he saw it in the trenches during the First World War.

If Teilhard does not say much about the theology of death and judgment, it is not because he rejected these things but because he accepted them. It was his greatest wish to die on Easter Day, a wish that was granted when he died following a heart attack on Easter Day 1955. Teilhard was not concerned with preaching 'pie in the sky when you die', for he saw that man's future on this planet was of more immediate consequence, because for so long it had been ignored. Teilhard has rightly been called 'the prophet of the future', for such he was. He had no time for those who advocated that the earth and man's future on the earth are without meaning. He wrote in 1939, as the war clouds gathered over Europe and as war

was waged around him in China, "Is the Universe utterly pointless, or are we to accept that it has a meaning, a future, a purpose? On this fundamental question Mankind is already virtually divided into two camps of those who deny that there is any significance or value in the state of Being, and therefore no Progress; and those, on the other hand, who believe in the possibility and rewards of a higher state of consciousness. For the first only one attitude is possible: a refusal to go further; desertion which is equivalent to turning back. For these no further problem arises, since they are lodged in incoherence and disintegration". Clearly Teilhard did not belong to this camp.

Man's future is bound up with the whole evolutionary process and is part of it. It was from a study of man's ultimate past and the course of past evolution that Teilhard extrapolated to the future. Evolution for Teilhard started not with the simplest creature that we would call 'living' but with the primeval elementary particles from which our galaxy was created. If Teilhard is wedded to the 'big bang' theory of creation it is because this was the only theory available until the latter years of his life. It is easy, and in many ways more satisfying, to transpose Teilhard's evolutionary philosophy into ideas of continuous creation. Evolution is controlled by a 'Law of Complexity-Consciousness'. The elementary particles come together to form atoms. Atoms form more complex atoms on the one hand and molecules on the other hand. The mole-



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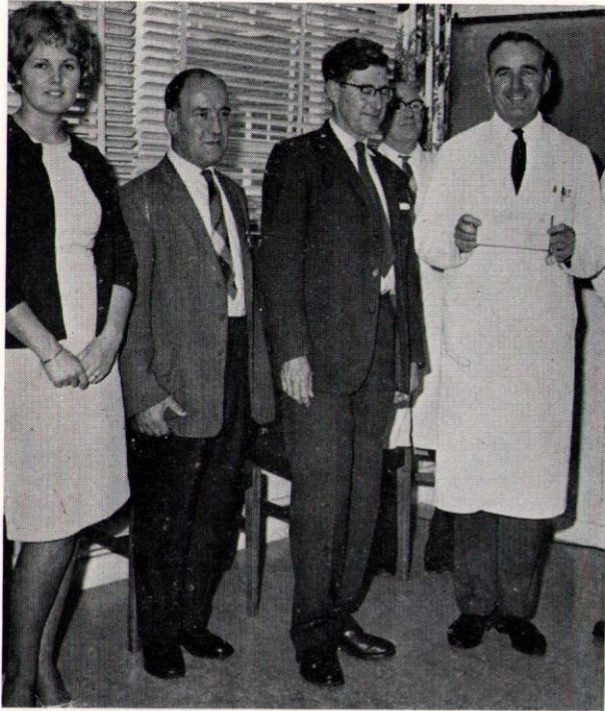
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cules grow more complex until finally something new appears. At a certain stage in complexification life appears. This stage we would now identify with the nucleic acids. The appearance of life can be considered as something that was there from the start. Just as the energy released in the fission of ^{235}U is in each uranium atom yet is only released when the mass exceeds the critical size, so life emerges only when the molecular complexity reaches a critical level. At this point we run through the whole of the conventional process of evolution until finally another critical point is reached. It is at this point that reflective thought appears and with it we have the emergence of man. With man we enter what Teilhard calls the noosphere, the thinking envelope which surrounds the planet. Teilhard's total picture of creation up to the emergence of man certainly follows the sequence which most scientists accept today. In particular it avoids the discontinuity between non-living and living matter.

So man reaches his present state. What is his future at this point in evolution? Man now stands at the crossroads. A choice faces him, and his choice will affect the whole future course of man on this planet. Teilhard poses the question in this way. "The immense social disturbances which today so trouble the world appear to signify that mankind in its turn has reached the stage, common to every species, when it must of biological necessity undergo the coordination of its elements. In our time mankind seems to be approaching its critical point of social organization. But man is not an insect. Nothing is more pathetic than the total and blind devotion of an ant to its ant-hill; and to us nothing could be more deplorable. The ant toils without respite until it dies of exhaustion in a state of complete self-detachment whose absolute nature and 'faceless' purpose are precisely what we find repugnant. Are we also to sink irresistibly, victims of an inevitable process of organic determinism, into a state in which our individual personality is wholly destroyed? The thing is inconceivable²". Teilhard saw perhaps more clearly than George Orwell the horrors of the 1984 society. If the totalitarian society of 1984 is to be avoided and yet man is to become socialized (as he must if overpopulation and diminishing resources are not to spell doom), how is there any other way and what is it? Teilhard sees this as coming about through love. The love of God, the force which pushes forward the evolutionary pro-

cess, is the key to man's future socialization in which all will live for others but in which each will retain his own personality. Teilhard put it like this, "Thus socialization, whose hour seems to have sounded for mankind, does not by any means signify the ending of the era of the individual upon earth, but far more its beginning . . . With love omitted there is truly nothing ahead of us except the forbidding prospect of standardization and enslavement — the doom of ants and termites. It is through love and within love that we must look for the deepening of our deepest self, in the life-giving coming together of mankind. Love is the free and imaginative outpouring of the spirit over all unexplored paths³".

This socialization is not, however, to come about through the drive and power of any one nation or race. The super race is just as much a dead end in the process of socialization as the ego-centric individualized person. "Less theoretical and less extreme, but all the more insidious, is another doctrine of progress by isolation which at this very moment is fascinating large sections of mankind — the doctrine of the selection and election of races⁴" (written about 1939). Later in the 'Phenomenon of Man' Teilhard wrote, "The outcome of the world, the gates of the future, the entry into the super human — these are not thrown open to a few of the privileged nor to one chosen people to the exclusion of all others. They will open to an advance of all together, in a direction in which all together can join and find completion in a spiritual renovation of the earth, a renovation whose physical degree of reality we must now consider⁵". Socialization can lead to dead ends and Teilhard did not underestimate the difficulties, "At no previous period of history has mankind been so well equipped nor made such efforts to reduce its multitudes to order. We have mass movements — no longer the hordes streaming down from the forests of the north or the steppes of Asia, but the million scientifically assembled. The million in rank and file on the parade ground; the million standardized in the factory; the million motorized — and all ending up with Communism and National Socialism and the most ghastly fetters. So we get the crystal instead of the cell, the ant-hill instead of brotherhood⁶".

The building of nations and empires may be an important step to this socialization but now they must give way to total planetization. Teilhard's political world-view is nothing short

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of world government according to the Divine will. "The age of nations is past. The task before us now, if we would not perish, is to shake off our ancient prejudices and to build the earth", wrote Teilhard in 1936.

Man holds his destiny in his own hands. This is the meaning of freewill. Man is faced with a completely free choice. Teilhard faces squarely the fact that evolution enters into dead-ends and loops back upon itself; yet in spite of this the march of evolution goes on, even if it is halted by these temporary wrong choices. Man's future lies solely in the unity of the whole of mankind; nothing less will do. "Gloriously situated by life at this critical point in the evolution of mankind, what ought we to do? We hold earth's future in our hands. What shall we decide? In my view the road to be followed is clearly revealed by the teaching of all that is past. We can progress only by uniting"⁸ Teilhard wrote in 1941.

The races may be a product of an evolutionary divergence but Teilhard is convinced that the time for convergence has now arrived. He speaks of it in this way, "This divergence gives place to, and becomes subordinate to, a movement of convergence in which races, peoples and nations consolidate one another and complete one another by mutual fecundation"⁹.

The forces and prejudices which resist socialization themselves are unwitting stepping-stones to the ultimate goal. "The more we seek to thrust each other away, the more do we interpenetrate"¹⁰. Nothing in the end will prevent this great event of socialization taking place.

Some of us see in Teilhard's vision of socialization an expression of the writings of the great English theologians of the 19th Century, Maurice, Westcott and Gore, and in this century of Temple and Evans. One thing, however, we must make clear is that Teilhard did not link his vision of the socialized earth with any political creed or system. Socialism and Christian Socialism may be one possibility, but Teilhard did not lay down the way. He was nevertheless convinced that socialization was to be; it was to be because of what we learn from the past; it was from a deep Christian commitment that he saw the visible unity of the whole people of God. Convergence and unity are ultimates to which mankind strives.

It is significant to note that one state has based its system on Teilhardian principles. This is the newly-emergent African state of Senghor. It may be noted that little is heard

of this state in an otherwise turbulent Africa. Have Teilhardian ideas succeeded when someone has been willing to try them? The writings of Teilhard are a bridge across which dialogue can occur between Christianity and Marxism on the one hand and atheistic humanism on the other. The German 'Paulus Gessellschaft' for the past two years has been organizing such dialogue, when Christian theologians, Marxist philosophers and humanists have met at their conferences and taken part in such dialogue. These are some of the practical consequences of the Teilhardian vision, but the vision as a whole will have to wait for its consummation; yet we must act now before it is too late.

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- ¹ The Future of Man, Collins, p42.
- ² Ibid, p39.
- ³ Ibid, p54.
- ⁴ The Phenomenon of Man, Collins, p238.
- ⁵ Ibid, p244.
- ⁶ Ibid, p256.
- ⁷ Building the Earth. Editions du Seuil, Paris 1958, p60.
- ⁸ The Future of Man, p74.
- ⁹ The Phenomenon of Man, p242.
- ¹⁰ The Future of Man, p127.

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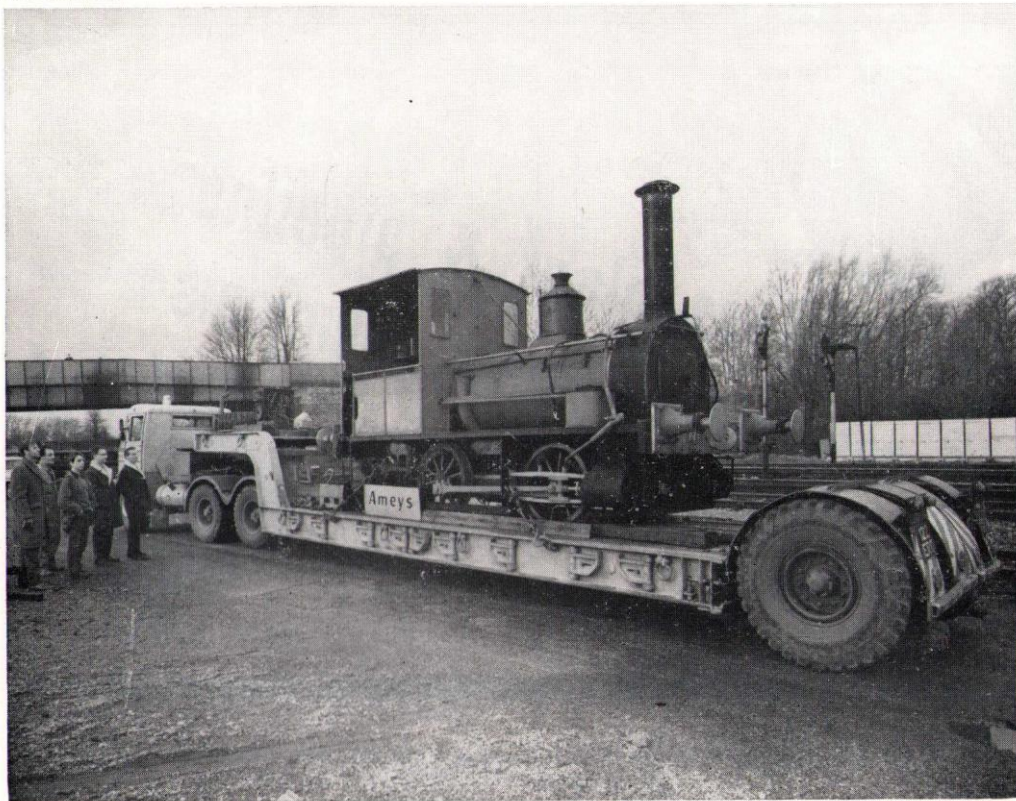
JANE-ON THE ROAD AGAIN



Jane, officially Engine No. 5 of the Wantage Tramway Co., one of the last team tramways to operate in this country, on the road again over part of her former route between Wantage Road Station and Wantage, Berks. This time she was at the receiving end of a lift.

The Wantage Tramway was one of the most picturesque of its kind, and its gay passenger carriages with stained glass panels operated until 1925. After this date only goods were carried. No. 5, a George England well tank engine was bought for £350 by the tramway company from the L & NW Railway in 1878 where it had been serving as a shunting engine in the Crewe works. It operated along the 2½ mile roadside track until the company was wound up in 1946 and was then purchased by the GWR for £100, repainted and given a place of honour on the platform at Wantage Road Station. The Wantage Urban Council will have the engine restored and find a site for her in the town. In the meantime Jane resides at the Wantage Research Laboratory.

Jack Vincent, a former driver of Engine No. 5, now working for the U.K.A.E.A., clocked Jane out on her last journey.





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R. GROVES — D. HITCHCOX

*another group photograph of the 1946 Engineering Division will be taken on Friday, 11th
November for those who missed this one — see 'A.E.R.E. News', 10th November.

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