



# APPLETON LABORATORY NEWSLETTER

Nos.204/205

July/August 1978

## CLEOPATRA COMES TO SLOUGH

"But how? But how? Give me particulars" - Iras (attendant of the Queen) "Antony and Cleopatra", Act I, Scene II.

Iras' question seemed particularly apposite to many of us who attended discussions over the last couple of years on the other IRAS - the Infra Red Astronomy Satellite: in a large international project, each party invests so much time, money and effort that naturally they want to be sure that the other parties are doing their part correctly, so critical questioning is the order of the day. Certainly this was the case with the UK Tracking Station for IRAS; in the location proposed, and with each change it has been necessary (and rightly so!) to show in detail the advantages of the new location over the old.

Originally it was proposed to make use of the 25m dish aerial at Chilbolton: this had the disadvantages of being relatively remote from Slough (which created problems in getting large volumes of data to the Slough Control Centre), of interfering with the various in-house and university research programmes on the Chilbolton dish, and of being larger than really necessary for reception of IRAS telemetry (a 12m dish would do). Nevertheless, project finances didn't allow us to consider buying another dish, and there seemed to be no choice in the matter; that is, until some of the American participants in IRAS, working at NASA's Jet Propulsion Laboratory in Los Angeles, drew our attention to a NASA 12m dish aerial which had been standing unused for some while, in the Mojave Desert about 150 miles inland from Los Angeles. The Mojave Desert is so littered with NASA tracking stations that you feel they could easily spare one or two, and that is just about the way it is: on the one site they had not one but two 12m aerials, both out of service. Choosing one looked easy: the one was designed to be transportable, is designed for easy disassembly and re-erection, and comes with a couple of road trailers which carry most of the bits and pieces; the other weighs half as much again and, pursuing our Egyptian metaphor, looks almost as permanent as the Pyramids! On the other hand, our chosen aerial needed work on the drive system, whose moving parts might well need quite a lot of attention after being stationary for a few years. We chewed over the pros and cons but in the end the likely disassembly cost of the heavier dish looked so horrendous that we opted for the transportable one.



Our first thought was to locate the dish at Winkfield, making use of the receivers, transmitters and other equipment there, and proposals along these lines were put to the various parties in the project and accepted. However some awkwardness remained: although Winkfield is much closer to Slough than is Chilbolton, it still carries the disadvantages associated with setting up a system on a distinct site - travelling to and fro, the need for more operating staff, carrying magnetic tapes full of IRAS data to Slough for processing, and so on. What eventually changed the situation was our receipt of another gift: this time we acquired a surplus receiver-transmitter from the Madrid STDN station, capable of handling the phase-modulated 2 GHz communications with IRAS. This, combined with the computer facilities of the Slough Control Centre, effectively does the same job as the hardware at Winkfield, and allowed us to plan a Tracking Station located at Ditton Park, with a tracking operations room in C Spur, closely tied in with the satellite control centre.

Formal negotiations with NASA to acquire the transportable dish and with firms to place a contract for its removal to Slough took a little while, but finally the arrangements were made, and Les Martin and Ralph Downton spent some time in the Mojave Desert watching our chosen contractors pull the dish to pieces - which they did very effectively! The pieces were taken to beautiful downtown Burbank for packing, hauled across the USA to New York, and shipped to Greenock - where Les was on hand to make sure they didn't drop it in the water. Finally it was hauled down to Slough and now sits at the end of the road beyond Hut 1 - as most people will now have seen.

What now? In the laconic words of our friends at JPL: "You've got the pieces - all you've got to do is make it work". To make it work, Les Martin will be re-erecting and refurbishing the dish; Ralph Downton will be getting a new drive system fitted; and Tim Bevan will be installing communications hardware on the dish and in C Spur, aided by Hari Shah and Gordon Fleming, the whole thing will be linked with the Control Centre equipment, run by Alan Rogers, Mike James and their colleagues. When IRAS flies, in 1981, it will track two passes per day, receiving  $4.5 \times 10^8$  bits per pass and transmitting new program instructions to IRAS' onboard computer. But all that is some way off. Meanwhile the dish will become part of our lives; perhaps we should give it a name?.....How about Cleo?- after all she was the one who gave Iras her instructions.

Mike Quigley

#### Solent Cruise

The Appleton Laboratory S.C., Solent Cruise, July 2nd - 9th 1978.

Yacht: Matomi, 26ft. 6 berth Westerly Centaur

Skippers: Paul Dickinson, Ken Pavitt

Crew: Julie and Norman Coombes, Geoff Douglas, Charles Wrench, John Wright

Sunday afternoon we boarded the boat, loaded and stowed our gear, and assisted the owner with repairs to certain vital onboard machinery. The crew were shown the ropes, and oilskins donned. When all was ready we motored around Portsmouth harbour, and then stuck our noses out into the strong westerly wind blowing outside. It was both wind and tide against us to Cowes, so more than our noses got wet, and our new oilskins were thoroughly tested.



A quick change into drier clothes in the marina at Cowes allowed us to get to the Cowes Corinthian Y.C. just as last orders were being called. The next morning was spent shopping and writing postcards, before facing the strong wind again after lunch. Few boats were out as it was Force 5/6 gusting 7/8 in the squalls, but I thoroughly enjoyed the beat along to Yarmouth under small jib and well reefed mainsail. The boat gave no trouble, but at least one crew member did arrive at Yarmouth with an empty stomach!

The evening was spent learning the delights of 'killer' darts, and back onboard John attempted some calls with his portable VHF amateur radio, with little success.

Tuesday morning we visited Yarmouth Castle and surveyed another grey windy Solent from its battlements. Another short passage was indicated, so we tripped across to Lymington. Our departure from the mooring piles was interesting due to the proximity of boats on all sides. With co-operation from adjacent boat owners and much passing of ropes we eventually shot out from the middle of the pack at some speed, and left them to tidy up.

Outside the harbour we found the wind quite moderate, so the novices took turns at helming on all the points of sailing, then we motored up to Lymington marina. We found a vacant pontoon close to ADC Accutrac, Clare Francis' Whitbread racer, and disembarked to admire it. However we were hastily recalled to our yacht by the crew of a fishing boat who claimed our berth. They were rather amused by our frenzied getaway to another nearby vacant berth.

After surveying the town we used the facilities of the marina for a shower again, and dined well at the Angel Hotel on huge steaks.

The 0633 shipping forecast the next day promised winds of only Force 4/5, so by 10.30 a.m. we were sailing out past Hurst Castle with many other westbound yachts. The passage to Poole was made in fairly pleasant but grey conditions, enlivened by various military aircraft doing aerobatics, many passing seabirds including Gannets, and an unsuccessful attempt at mackerel fishing. After a brief battle with the tide near Old Harry rocks we cruised up the busy main channel to Poole Quay.

While preparing the evening meal aboard Charles burnt his hand, but first aid followed by a short visit to the local hospital allowed him to continue the voyage without any problems. Geoff joined us here and John left the crew as arranged previously.

On Thursday we sailed back to the Solent via an inshore route to avoid the worst of the tide and see more of the scenery, and under full sail we soon arrived back at our previous berth in Lymington. Once again we repeated the chore of draining the water tank, flushing and refilling, in an attempt to maintain the quality of the onboard water sufficient to provide Civil Service standard tea.

On Friday we saw the first real sunshine of the week and made the most of it by relaxing over a salad lunch moored in the calm of Newtown Creek. In the afternoon we shortened sail and tacked up the Beaulieu River, touching the mud twice as it was near low tide. Motoring further up river we admired the attractive scenery and prolific bird life, curlews, waders and ducks. At Buckler's Hard we shared the mooring piles with a traditional wooden Essex gaff rigger, Sybil of Wivenhoe. A short row ashore in the inflatable dinghy allowed an evening riverside walk followed by refreshment in the nearby hostelry.



About 0440 hrs. the next morning Norman woke us suddenly, saying he had heard noises forward and thought a bow rope had broken. After receiving general expressions of disbelief he looked outside again and repeated his concern. At this the skipper went smartly on deck in his pyjamas followed shortly by the mate and other crew members. A four inch manila warp from Sybil had chafed completely through on the mooring ring, and three vessels were hanging from our small bow line against the full flow of the ebb tide. Sybil's skipper was quickly awakened, and went out in his dinghy to install some jib sheets as a temporary replacement. After half an hour all was secure again so we had a quick brew up and returned to our bunks.

Saturday morning we sailed down the peaceful river to find the Solent busy with racing yachts revelling in the boisterous conditions. One of the leaders in the main race from Cowes split her genoa right across as she passed us. We turned up into Southampton Water for some shelter for lunch, sandwiches eaten underway. Julie's hat provided an interesting diversion by flying overboard, but it was quickly recovered with a practice man overboard drill under sail. We then returned through the varied traffic of ships and yachts to the rapidly filling marina at Cowes. Here we needed to change berth again and it was Ken's turn to turn a few heads with a fast and untidy getaway. Our excuse for these was the powerful 25 bhp engine installed and the fast idling speed used to prevent stalling.

Despite the large flotilla of yachts in port we were able to book a meal at the Royal Corinthian Y.C. for 8 p.m. and dine in style yet again. We all put on the smartest clothes we could find, which included only one blazer, one jacket, and a ships sail tie used as a necktie! However they let us in and gave very good service. Suitably fortified we left Cowes at 2300 hrs. for a night sail to Portsmouth. It was very pleasant with a moderate following wind, light sea, and perfect visibility.

On Sunday, our final morning, we had another brief motor around the harbour before thoroughly cleaning ship.

By the end of the week everyone had got their sea legs and all onboard were having a good time as they conquered the mysteries of the sea and the ship. Quite an adventure for the novice crew, and for at least one novice skipper also!

Ken Pavitt

#### "The Complete Plain Words"

The following abstract is from "The Complete Plain Words" by Sir Ernest Gowers, revised by Sir Bruce Fraser (HMSO 1973).

#### The buzz-phrase generator

I have pointed elsewhere to the baleful influence of American gobbledygook on certain sorts of writing, both academic and official. Defence is a subject which has suffered badly (owing, some say, to the Harvard influence imported by Mr McNamara into the United States Department of Defense). But the phenomenon has not gone uncriticised, even on the other side of the Atlantic. The Canadian Defence Department is credited with the invention of the following 'buzz-phrase generator'.

Column 1

- 0. integrated
- 1. overall
- 2. systematized
- 3. parallel
- 4. functional
- 5. responsive
- 6. optimal
- 7. synchronized
- 8. compatible
- 9. balanced

Column 2

- 0. management
- 1. organizational
- 2. monitored
- 3. reciprocal
- 4. digital
- 5. logistical
- 6. transitional
- 7. incremental
- 8. third-generation
- 9. policy

Column 3

- 0. options
- 1. flexibility
- 2. capability
- 3. mobility
- 4. programming
- 5. concept
- 6. time-phase
- 7. projection
- 8. hardware
- 9. contingency

The procedure is simple. You think of a three-digit number at random and take the corresponding word from each column. Thus, 601 gives you the buzz-phrase 'optimal management flexibility', 095 gives 'integrated policy concept', 352 gives 'parallel logistical capability', and so on. The authors claim that the buzz generator gives its users 'instant expertise on matters pertaining to defence', enabling them to invest anything they write, not with any particular meaning, but with 'that proper ring of decisive, progressive, knowledgeable authority'.

I have seen a British development of this invention which has three columns of no less than sixty lines each and includes not only most of the vogue words mentioned elsewhere in this book but many others too. This may be over-elaborate for practical use, but its compilation speaks well for British civil servants. It is wonderful how slight the difference is between some of the serious writing produced nowadays on defence matters and some of the parodies produced with the aid of the Canadian or British buzz-phrase generator.

Peter Barker  
Don MacKinnon

Staff News

Congratulations to:

Mr W G Allen      now Cfn.I  
Mr A G Richards    "    H.S.O.

Welcome to:

Mrs J Grochulska      Vac.Wkr.  
Mr N Bramley          Vac.Wkr.  
Mrs M Waite            Typist p/time  
Mr C Jones              SCS  
Mr A Clarke             SCS  
Mr N C Roberts        Vac.Wkr.  
Mr C N Roberts        Vac.Wkr.  
Mr D Clarke            Vac.Wkr.  
Miss T Vargas          Vac.Wkr.  
Mr P Johansen          SCS  
Mr R A Leach            SCS  
Mr L W Parker          Vac.Wkr.  
Mr P Bains              SCS  
Mr K Ayers              Vac.Wkr.  
Mr P M Bamford        SCS  
Mr J D Bates            SCS  
Mr T A Austin          SCS  
Mr A Muzlish            Vac.Wkr.



Resignations etc.

Mr J Mason	S/S Lab	Ret.
Mr A C Maroudas	ASO	
Mrs H O'Grady	ASO	P/Ret.
Mr B B Jones	PSO	p/Ret.
Mr R Lupton	SCS	
Mr A F Lee	Craftsman	
Mr D R Pennell	SO	
Miss S Greene	CO	
Mr K V Buchta	SO	
Mr I Jones	SCS	
Mr S Coyne	SCS	

Letter to the Editor

Dear Sir

I am tickled by 'Alert' in the May/June newsletter, especially where it tells us that low initial acquisition costs lead to even higher test/repair costs later. (I wouldn't have thought a survey necessary to discover this!)

I have been on this station for 29 years, and have spent many hours, as have many other people, rescuing stuff bought on lowest tender. And I don't mean only large items such as ionosondes, radars, paramps, or test equipment; many troubles have arisen from items like cheap R.F. connectors which do not fit one another, and so on.

I don't disagree entirely with tendering, but to my mind its only useful function is to force an exploration of the market which should have been done in any case. There is no doubt in my mind that the best buy is the best instrument which will do the job, not necessarily the cheapest, providing that vast amounts of money are not spent on facilities which one does not need. (If it is a general station item this is perhaps justifiable.)

F V Bale

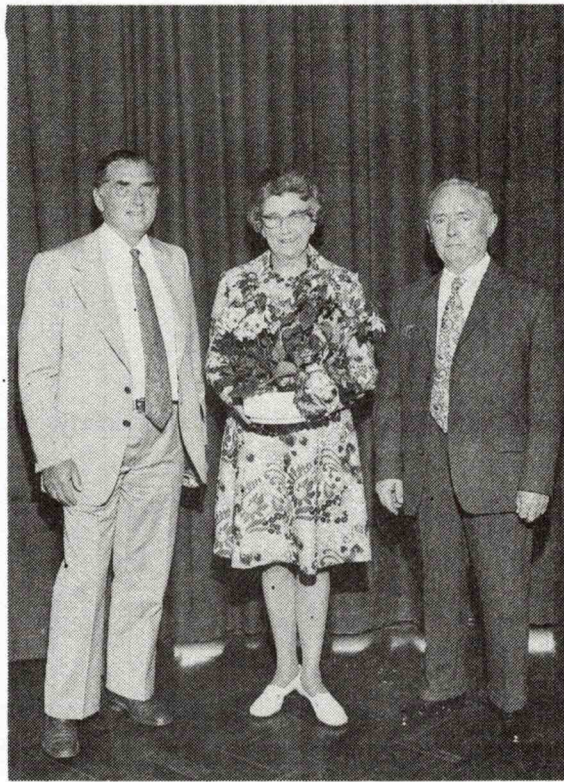
Honorary Degree

Staff are very pleased to learn that a former colleague, Mr W R Piggott, has been awarded the Honorary Degree of Doctor of Science by the University of Sheffield. To commemorate the occasion, a special meeting of ionospheric and magnetospheric scientists was held in his honour at the University.

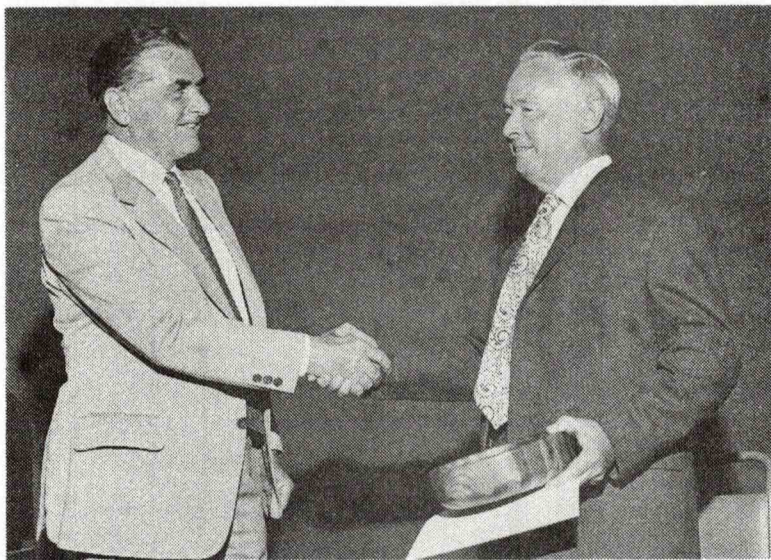
Dr Piggott has a long and distinguished career in ionospheric physics, part of the time in close association with the late Sir Edward Appleton. His role as a wartime scientist was varied and unconventional and he furnished valuable aid in rehabilitating ionospheric research in Germany at the end of hostilities, these services being marked by the award of the O.B.E. Throughout his years at Slough (he joined the staff in 1939) his enthusiastic and imaginative approach to problems, not all of them ionospheric, has influenced many and won him respect and affection not only here but in the International scientific community. We offer our warmest congratulations on this regard having been signified by this mark of distinction.

G Gardiner

Mr. R. James B.E.M.  
Retirement Presentation



Mr. & Mrs. James with the Director



Mr. James receives a commemorative bowl



Retirements

Mr R James B.E.M.

Mr R James recently retired from the Laboratory after some forty-two years service. Ron James is the last of our staff who formed a link with the research era of the mid-thirties. After studies in 'Wireless and High Frequency Engineering' at the old Regent Street Polytechnic he worked for some time in Slough for the McMichael Radio Co and for the Rheostatic Co.

At the start of 1936 he was accepted as an Instrument Maker to the Radio Department of the National Physical Laboratory, our own establishment being, at that time, one of its outstations. This appointment was ratified by Dr Watson-Watt whose pioneering development of British radar had begun some months before.

To be in such a place at such a time meant that Ron became involved in making apparatus for those early 'radiolocation' experiments and, as time passed, an increasing variety of jobs benefited from his skills. Prototype development of predominantly radio apparatus gave way, some twenty years ago, to our space science work and, as the Laboratory's needs have changed, so has he adapted his abilities.

In 1965, the award of the British Empire Medal served to set an official seal on the high esteem in which his colleagues hold him. At the ceremony marking his retirement they were able to make a more personal tribute to him and to Mrs James, with wishes, both formal and informal, for a long and happy retirement.

G G

Eileen Barnes

On Monday 31 July a small group of Eileen's office friends went to see her at the Churchill Hospital Oxford to convey to her your expressions of appreciation and good wishes which were shown in the collection made by Personnel Office to mark her retirement on that day. Eileen has made good progress while she has been in hospital, her second spell there during the last 12 months, and she hopes to be able to return home soon. We were allowed about half an hour with Eileen which was just long enough to hand her a bouquet of flowers, the cash which had been collected, a beautifully inscribed card bearing all the signatures of her friends who had contributed, to take a photograph or two and to hear her read a "Thank you" letter she had just received from the Council's new Secretary Mr Brian Oakley and for us who visited her to wish her well on your behalf.

Eileen came to the Laboratory almost straight from school, in fact as soon as she was well enough after her crippling attack of Polio, in 1955. At first she worked as a typist where she quickly became a very popular young lady not only for the high quality of her work but for the ready manner in which she took her part in all the Laboratory activities. She was never short of an assistant to push her from her car to the pool!! Later on she was promoted to Clerical Officer and moved in to Finance Office where she maintained a consistently high standard of work. In addition and in spite of recurring spells of sick leave, Eileen still managed to take more than the average interest in the "Lab" and for a long time she was a very active member of the CPSA which included a spell as Branch Secretary. But eventually her disability kept her away from work too often and she had to leave on medical retirement terms.



Like many others in the laboratory from storekeepers and scientists and clerks and cooks I am pleased to have had the opportunity to work with Eileen for such a long time and honoured indeed to have had the privilege to make the journey on your behalf to wish her well, to be able to record these thoughts in our Newsletter and thereby provide a public and permanent record of the good wishes we all have for Eileen's future.

R T

Mrs H O'Grady

Mrs Helen O'Grady, who retired a short while ago, joined our Staff in 1961. Although, prior to her appointment here, she held posts of a secretarial kind, her earlier experience was more closely allied to the work at Ditton Park. During the second World War she served in the W.A.A.F., as it then was, as a Radar Operator/Mechanic and, therefore, found technical matters here not completely unfamiliar.

For some time she was attached to our outstation at Winkfield where she played a valuable role in the early days of our commitments to N.A.S.A. In more recent times her work has ranged from the World Data Centre to the Solar Observatory, combined with the varied tasks which fell to her lot as Welfare Officer.

Her many friends on the Staff gathered to wish her well and make known their hopes for a retirement both long and happy.

G G

Letter to the Editor

Dear Friends at Appleton

During my stay at the Laboratory between February and September 1978 I have very much enjoyed and appreciated your kind interest both socially and professionally.

May I offer my good wishes and thanks.

Yurdanur K Tulunay  
Department of Physics  
M.E.T.U.  
Ankara  
Turkey

### Sports Day

This year, fortunately, the SRC SSA (Science Research Council Sports and Social Association) picked a nice day for a change, weather-wise at least. Sports Day was to be on Tuesday, 18 July 1978 at Chiswick from 11.00 onwards. The early morning left one guessing as to what type of day it was going to turn out and knowing the previous history of Sports Day one would have been rightly pessimistic, but wrong. The clouds slowly cleared and just after the start the sun came out and stayed out most of the day.

This year we had a bit of difficulty in organising First Aid as Frank Bennett, due to his previous commitment, was unable to be present but after a lot of reorganising we were able to persuade Bob Smith to take charge of the First Aiders consisting of Tony Lucas, Craig Lewis (Chilbolton) and Betty Bevan' (Tim's wife) whose help we were very glad to obtain as she is a qualified nurse. The team coped admirably with all the usual injuries.

After the formal proceedings were over and we had collected our only trophy, for Tug-of-War, there was still about half-an-hour left to have a bite to eat and get "ready" for the Disco - once again organised by AL. We were a little bit apprehensive about the new disco, but we need not have worried about it. It was great music to dance to but not enough "birds" around. So as usual a lot of blokes had to spend their time hanging on the bar to stop it falling.

A really good day, which we hope would be bettered by Indoor Sports Day on Friday, 20 April 1979. See you there.

Hari Shah

### Bowls

Appleton entered a team of four, Vic Harrison, Alf Haxton, Roy Bailey and Eric Bramley (Skip). We played a 15-end match against Rutherford, which was in fact the semi-final of the knock-out competition. The teams proved to be very evenly matched, but by steady bowling on the part of all our players we gradually drew ahead and were well placed with a lead of four with only two ends left. But a disastrous five against us changed that position, which we were unable to recover at the last end and so finally lost by three shots. However we had all enjoyed a very well contested game, on an excellent green and in perfect weather. Unfortunately we were not able to enter the pairs competition, but have high hopes for next year.

Just for the record Daresbury A won the team of fours event and Rutherford won the pairs.

E N Bramley

### Cricket

The Appleton Laboratory 'A' team consisted of John Kitt, Barry Martin, Charlie Wrench, Vin Patel, Charles Whitlock and Alan Buck.

We were drawn to play against the Rutherford 'B' team in the first round and succeeded in scoring the 37 runs required to beat them, with  $1\frac{1}{2}$  overs and 3 wickets to spare.



Daresbury were our opponents in the next round and a close game was decided when we hit the winning run off the last ball of the last over. This put us into the final against Rutherford 'A'.

In the final we were put in to bat first and managed to amass 62 runs, which we confidently expected to be a winning total. However, it was not to be, and some mighty hitting by Bob Blowfield enabled Rutherford to pass our total with two balls to be bowled. A disappointing result but an extremely enjoyable and closely fought game.

John Kitt

### Cricket

The Appleton 'B' team was drawn against Rutherford 'A', R.G.O. and Swindon Office and was soundly defeated in all three games. With half of the team dragged out of premature retirement the results were not unexpected, but two of the three games were reasonably close. The R.G.O. game, however, proved somewhat embarrassing since our bowlers conceded 96 runs off four 8-ball overs. Must be some sort of record! The team was Peter Davies, Dave Eccles, Chris Jones, Mike Johnson, Nick Myer and Graham Thomas.

Graham Thomas

### Football

The Appleton 'A' team had a good start this year, beating Swindon Office 'A' by 4-0 (Leach 3, Collerton 1). It was as well that we took our chances in this game, as in our second qualifying game versus Daresbury 'C', we missed a couple of fairly easy ones before conceding the only goal of the match midway through the second half. A good goal difference gave us first place in our qualifying group and so we went on to meet Rutherford 'B' in the quarter-final.

We started well in this game and deservedly took the lead, through Leach, but unfortunately relaxed a little, conceding the equaliser almost direct from the kick off. After half-time we were put under a lot of pressure but won the match with a fine passing movement. Pennell, winning the ball with a good challenge in midfield, found Young on the right wing who chipped the ball over to Collerton on the edge of the box who then pushed the ball through for Leach to fire home.

In the semi-final we played Rutherford 'A' in a very competitive game. Our best chance of scoring came when Hall went on a tremendous run down the left wing, crossing the ball to Young whose shot was cleared off the line. In the second half we unfortunately lost our striker, Leach, for 5 minutes with cramp and did well to end the game level (0-0). Rutherford qualified for the final as we had conceded the higher number of corner kicks (3 to their 1).

The 'B' team had their moments!! Bains scoring from 25 yards against Daresbury 'A' in the first game. Their final match against Atlas 'B' provided the best performance, coming back from two goals down to equalise with 2 goals by Parker after fine runs by Bains for the first one and Martin for the second, before finally losing 2-4.

'A' Team Players: Paul Springate, Doug Pennell, Dave Hall,  
Bob Young, Dave Collerton, Bob Leach.

'B' Team Players: Ray Slattery, Martin Fair, Parvin Bains,  
Tony Clarke, Steve Martin, Len Parker.

Bob Young

### 6-a-side Mixed Hockey

This new venture for Sports Day attracted teams from Rutherford, Swindon (2), Appleton, Daresbury and RGO.

Each team (usually of 4 men and 2 women) played every other team once in 10 minute games. The exercise was invigorating though somewhat exhausting, and provided much excitement as Rutherford just pipped Daresbury to the trophy by one point. Although the pitch was more conducive to football than hockey, the standard of play throughout was quite good and there is no doubt that the competitors enjoyed themselves.

The participants were Terry Patterson, Tim Bevan, Hari Shah, Zoffer Yab, Andrew Patterson, Bob Leach, Annette Street, Janet Deviny and Pam Burt. Not everybody played at the same time!

Terry Patterson

### Netball

Only four teams took part in the Netball competition this year: Daresbury, Swindon, Atlas and Appleton.

Appleton's first match was against Atlas in which we were beaten 16 goals to 12. Our next match was against Daresbury within ten minutes of our first game. In this game we were well and truly beaten by 29 goals to 7. Our third game against Swindon we won by 25 goals to 7. When you consider that we only field a netball team once a year and others play during the season in a league we didn't do so bad.

We would like to thank all the 'boys' who turned out to help us to practise.

The team for the Sports was:

Shooter	-	Barbara Rathbone
Goal Attack	-	Pam Burt
Wing Attack	-	Mary Thrift (Capt)
Centre	-	Beth Thomas
Wing Defence	-	Janet Deviny
Goal Defence	-	Andrea Roberts
Goalkeeper	-	Veronica O'Keefe
Reserve	-	Sally Harries

Mary Thrift



### Tennis

Without three of our regular contestants - Elizabeth Horner, Joan Scislowski and Arthur Roberts - we could muster only two pairs in the mixed doubles, though we did provide three pairs for the men's event. As other establishments were also short of mixed pairs, the tournament was restricted to a single section. Changes were also introduced in the scoring system, whereby the unpopular tie-breaker came into force at 4-all. Fortunately, Wimbledon was fresh in the memory of many players and the complicated procedure created few problems apart from time wasting.

In the mixed doubles, Shelagh Akrivos and Richard Smith scored 30 games out of 35 to finish third; Wendy Dane and Jack Moore finished in the middle of the table with 20 games. Our sequence of wins in the men's doubles came to an end when Paul Gardner and Nick Roberts finished second with 35 games out of 40. Director and Richard Brazier, playing together for only the second time, achieved a creditable 33 to finish fourth; Phil Muzlish and Neil Bramley produced surprises galore to collect 26 hard-fought games including rather too many from their Appleton colleagues. No criticism intended here - they enjoyed every minute of the tournament and so, apart from the tie-breaks, did the rest of us. We thank Valerie Bacon of RGO for having organised the tournament so effectively.

Richard Smith

### Tug-of-War

This great event comes toward the end, when most of the other events are either completed or nearing completion.

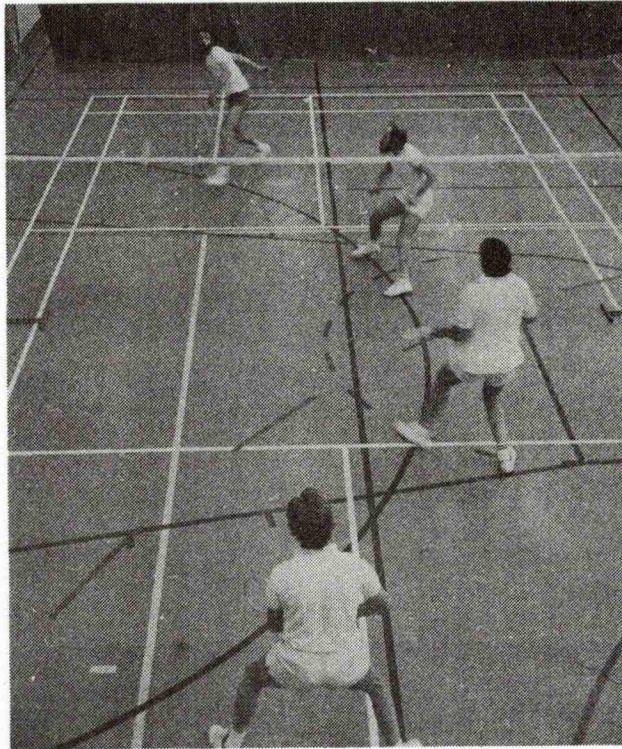
With Sam Crossley, Ian Jones, Alan Buck, Barbara Rathbone, Veronica O'Keefe, Beth Thomas and Andrea Roberts comprising our team it seemed to us that we had a very good chance. And so it proved. You may have rightly concluded that this was an equal opportunity event - equal number of lads and lasses making up the team of 8.

We did not have many problems right from the start, till we came to the final against Swindon. After we won the first pull in the final, it was decided after complaints from the opposition that they were not ready, that pull was disallowed. But we were not disheartened in fact it gave just the push (or should it be pull or heave) we needed. So after three more goes (best of three) we emerged as the winner to receive our beautiful (and only) trophy.

Our appreciation to Peter Hicks for organising AL team as well as the Tug-of-War event.

Hari Shah





Double Action in Badminton Men's Doubles

Spot the racquets competition.

Actors are Alan Smith (facing you) and Gordon Bennett (his best side profile).



What a LEG UP in Volleyball

Watching Mary Thrift doing the LEG UP are Dave Parker, Mike Farman, Alan Smith, John Cathrew and Jim Foster.

Pictures : Linda (Mrs. Alan) Smith

Captions : Hari Shah





#### Sitting Tenant

A thoughtful glance from a pied wagtail which had set up home in the Landrover.

The serving of an eviction order was withheld on receipt of an undertaking from the tenant to quit the property in time for routine maintenance to be carried out.



JULY/AUGUST 1978 REPRINT LIST

- A1210 D.M. Willis  
'The magnetopause: microstructure and interaction with magnetospheric plasma'  
JATP, 1978, Vol. 40, 301-322
- A1288 R. Holdaway  
'A scheme of low powered thermal energy conversion for satellite manoeuvres'  
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