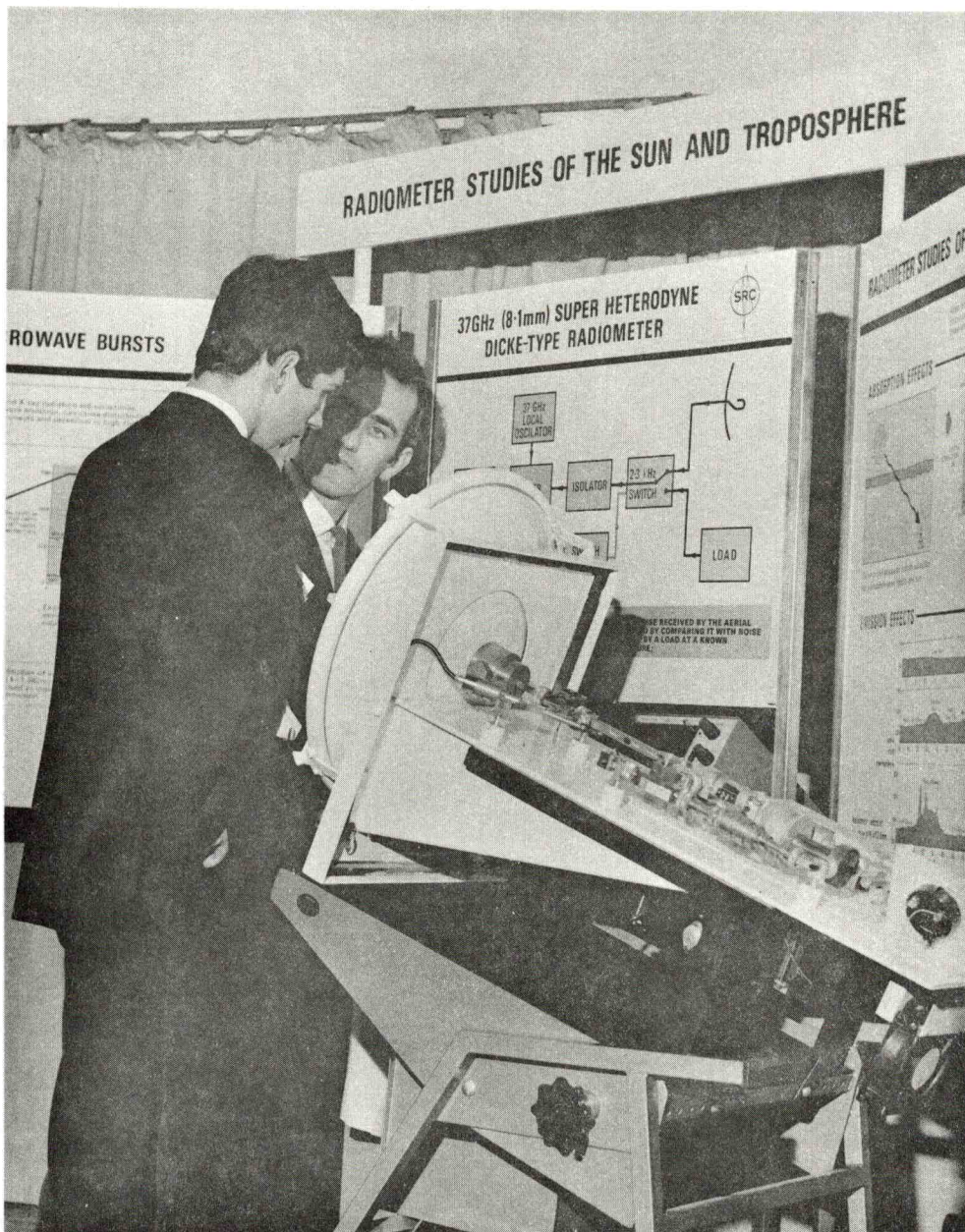


NEWSLETTER

Nos. 111 & 112

August & September 1970



Demonstrating a 37GHz (8.1 m.m) Radiometer at the International Radio Communications Exhibition

LA MER: FIN DE L'HISTOIRE

..... Much to my surprise, the egg-half remained in the place intended, and it was with gaining enthusiasm that I set about the sausage. This was easier than anticipated but as the last mouthful curved gracefully into my slowly oscillating digestive system, I considered, gave Mother nature the benefit of the doubt and, not regretfully threw the remaining egg over the side.

Breakfast over, the members of the crew fit enough to go below washed up (being a poor sailor has its advantages) and those that 'simply couldn't' changed into shorts and waited for the sun to shine. The reward was well worth the wait; by nine the breakfast time clouds had faded away and the entire crew, including the helmsman, were stretched about the deck in places not shadowed by the sails. With the wind dead aft and light at that, one problem had been to keep the sails full, great credit at this time must be paid to Mike, who armed with the boat hook and at great personal sacrifice, anchored the jib in such a way as to outwit the Almighty into giving us an extra half knot or so. The helmsman, using his foot, and Mike integrated quietly into the rigging, we approached Cowes. Now, one point about sailing is the relative nature of wind, tide and intended direction. Our peaceful triumph over nature was to be brought to an abrupt halt when someone realised that wonderful as things were, if drastic changes were not made soon in our direction, we could forget about Cowes altogether! I had in all innocence imagined our chief problem at this late stage would be to avoid the Isle of Wight ferry. Major problem as this was, far more tortuous things lay ahead, 'going about'. To those fortunate enough not to have direct experience of the term, but luckily enough to have spent Sunday on the pier, 'going about' is an abrupt change of direction. The wind and sails begin on one side of the boat and end up on the other, with an associated but indeterminate measure of chaos in between. It looks, and I suppose on reflection is very easy, to the crew however, not used to nautical terms, and far less used to applying large quantities of brawn to a situation it was disaster. Sheets (ropes used to set and tension the sails), sails and people were only three of the things that seemed in the space of a few minutes to go everywhere. Harry, our skipper, visibly paled at this point, but we actually began sailing again on the desired tack without too much loss of headway.

We finished our game of hide and seek with the Isle of Wight ferry, chose a suitable mooring, tied up and prepared to go ashore. In some ways it was just like parking the car, only the 'meter man' came in the guise of the harbour master's assistant and he would have found difficulty in booking us for being on the yellow line, but the outcome was the same - "You cant wait here Sir!" Harry as usual came to the rescue, and this man of many talents, who in just over six hours had turned chaos into a style of crew, also had the uncanny ability to convince every harbour master

on the South Coast that they had been acquaintances, no, almost friends, for years. After explaining that we only wished to remain for a few hours until the tide had turned and had no ideas of collecting front-row seats for the 'round the island' race, the 'traffic warden', satisfied that our intentions were honourable backed his launch away and disappeared towards some distant part of the harbour.

It had been intended that the shore party should include all members of the crew, save Harry and Bob, who agreed to remain to repel boarders should it prove necessary. The eventual party was somewhat smaller, the final decision being tempered by the look of the dinghy. It had just been launched but already water was clearly visible the wrong side of the planking. I had never visited Cowes, and seeing this as an opportunity both to stand on dry land and visit a stationary loo, no matter how bad the town or how wet the dinghy: I wanted to go ashore.

Feeling decidedly antisocial and with a burning desire to keep dry, I elected to row (the dry seat), whilst Mike perched on the transome and Hanne sat in the bows. If getting in the boat was hard, getting out was impossible. We moved gingerly towards the slipway of the yacht club, being careful not to excite too large a standing wave - more than a two inch ripple I am sure would have sent us to the bottom, and hoping that we had not timed our trip to coincide with the arrival or departure of the ferry. At the edge both passengers were about to leap at once, fortunately the upset in equilibrium brought them back to common sense, and kept me from getting soaked to the skin in places that had hitherto remained dry. Needless to say they landed without upset and left me to tie up the dinghy. Sadly, I encountered the same problem 'You can't stop here' was the comment at the slipway. I rowed back to the Margaret and Anne, though a less delicate operation with water six inches from the gunwales, it was impossible to be oblivious to water less than an inch from the lowest part of my anatomy, and sought advice. 'Go to the boat yard next door' came the reply. I wondered whether it would be simpler to get out and swim, but having no rats to indicate the possible destiny of the porous shell separating me from the depths of the harbour, I made for the yard at top speed.

Out of the boat, I felt as a man at a formal dinner party, but dressed in pyjamas (hypothetical supposition). In the yard were men in dungarees, hobnail boots and overalls; in contrast I had no shoes, just swimming shorts and a shirt, not to mention a feeling of conspicuousness and more tangibly a sore foot. The floor was covered with nails. Once through the yard I thought my problems would be over.

Alas, alack, Cowes is not the place to be dressed as I have described, the looks in the supermarket, off licence, and chip shop were not of amazement, but patient sympathy and understanding towards the lunatic fringe of tourists who might mistake Southend on Mud for the Costa del Sol.

Eventually the sojourn was over, we pulled the dinghy out of the water and emptied three-quarters of the Solent back into the place ordained by nature, and went as precariously as we came back to the ship. On board we set about preparing lunch, a salad, expanded somewhat beyond its original intention, since appetites previously on the ebb had turned and shown the faint flicker of the flood. Lettuce, cheese, tomatoes, bread, cucumber and of course beer - one drink that doesn't have to be made with Marvel.

The time between lunch and setting out again, as I recall contained little to amuse, unless you include six people trying to listen to the transistor radio that doubled as a direction finder, trying to use an earpiece (the only loudspeaker), with the volume control full on. It took some minutes 'shushing' before the practice was sensibly discontinued and the radio given to Harry, who went into the forward cabin (a cupboard slightly bigger than my bunk - containing two bunks) to assimilate the shipping forecast. It was almost on three as we started the outboard, waved out last farewells, pulled away from the mooring, bit on the wind and cruised out into the Solent.

Once outside the harbour the wind caught us quite hard. We had to go against the last of the tide, and stay close hauled. The force three to four whisked us along from one bank of the Solent to the other in a matter of minutes. Not exactly the direction in which we wished to go, but the speed was unbelievable. To say 'from one bank to the other' was obviously not strictly accurate, we had come outside the harbour and set off towards a large black conical buoy - visible on the chart - that marked the main channel. Faith in the chart was eventually restored, as through the spray the rust and dirt covered object, resembling more a surrealist birdcage than an aid to navigation, came into view. It was time to go about. With the chaos of the morning uppermost in our minds, and the mighty wind thrashing us through the water, a trial of nerves, not skill or strength was about to ensue. The first attempt is best described as a Grade A failure. Sheets tangled everywhere, sails fouled the shrouds and the traveller that secured the mainsheet stuck firmly in its runway: our craft backwards, our thoughts heavenwards, even the imperturbable Harry grimaced with the strain. The Margaret and Anne, apparently disgusted with the bunch of incompetents that constituted her crew, took the matter into her own hands, and unresponsive to our intentions shook herself, and with a loud and heavy thud settled to the previous tack.

The ordeal was by no means over, she had shifted into a position of attack, now we were moving as a Knight at the joust, ready to dismember the outsized birdcage. Any moment now, I thought, 'Abandon ship'. But no, sailors are made of sterner stuff (even RSRS ones), and Harry bellowed again 'Ready About'.

At last we were ready; the mental picture of the Solent Chart devoid of the customary navigational aids vanished from me and once again we were heaving and tugging, but this time with some measure of coordination, to ease chez-nous in the opposite and intended direction. The obstacle encountered and well beaten it was time to investigate more thoroughly our direction, undoubtedly across the Solent. Miserably we realised that it was straight into Cowes: all the effort of the last half hour had been completely obliterated by the wind and tide. Half-way across the channel we went about again, started the outboard and ploughed through the waves to reach (admittedly in half the time) the same 'cage' as before. Three times in all we met the same battered buoy, but on the third encounter a change of tide meant that we had gained at least fifty feet and were winning the way slowly but surely towards our destination.

As the tide slackened our progress towards Yarmouth became better and better. The only comparatively minor incident was when the dinghy painter fell over the side and seized up the outboard, although being held by my feet from one of the floats and dragged almost through the water, trying with others to undo the knotted mess that surrounded the screw, was one of the more exciting of human experiences. But fate was kind, we cleared the trouble with time to spare, and soon we had stowed the sails and were neatly berthed in Yarmouth harbour, deciding the nature of supper.

To our surprise, planning the supper provided the key to one of the more intriguing mysteries of the weekend. With apologies I again refer to the heads. Prior to that evening we had tried to discover the origin of a peculiar smell that seemed to intrude into every part of the forward section of the boat. We had blamed in turn, the heads, the bilges, the disinfectant, the soap, and even suggested Bill's feet, but alack the source could not be found. In preparation for supper we came across Sunday's lunch, left any longer it would have come across us - sixteen pork fillets in a hot confined space slowly fermenting provide a reasonable alternative to hydrogen sulphide.

We were very tired and the galley was not hard put to satisfy our exhausted appetites, coupled with the fact that the afternoon's ride had also left the weaker stomachs in a rather confused state. Washing up, to the Pub, and back to bed, happened very quickly and for that reason will take no further space here.

I recall Sunday morning vividly. It was almost seven thirty, the sun was not beaming brightly, no one was up, and despite a night of near subconscious sleep, my bunk seemed as hard and vicious as it had the night before. I opened first one eye then the other, grunted 'Good Morning' and waited - no reaction. Though by now accustomed to the smell of Calor gas, even at that hour, I was in no doubt who slept closest to the stove. Slowly I eased my buckled frame out onto the galley floor filled the kettle and after lighting the gas slowly summed up the effort to bellow to the sleeping huddles 'It's morning'.

This activity had the desired effect; even the clouds took fright and let a little more sun come through, and the sleeping bags extended out hands to grab the deep brown tea, by now brewed and distributed in assorted mugs. My efforts at tea making normally leave much to be desired, but especially so that morning you include the lumps of Marvel that floated like dried peas on the muddy liquid that filled the cups. The result was instantaneous, the crew were everywhere, anxious at any cost to be up and dressed and prevent me doing similar injury to the sausage, bacon and egg set aside for breakfast. The sudden rush of activity prompted me to go on deck. Here a high level conference was developing between the Skipper and Bill, should we go around the island? The final decision was left to Bill; Harry had explained the wind, tide and weather were just right but it might get a little rough.

William, a glutton for punishment, leapt at the chance and we set sail and rolling gently ventured into the unknown. Breakfast was more usual that morning, everyone tempted by the smell of fine cooking, and close to starvation after the efforts of the day before, filled themselves with sausage, bacon, egg, bread and lashings of sauce. After breakfast the wind freshened and the journey began to get more interesting, but perhaps a little more uncomfortable. It was at this point that one of the mast stays gave way at its anchorage to the deck. Bob and I scrambled forward, Bob reaching the stay, myself reaching the bow of the leeward hull just in time to waste a good breakfast over the side. Acting on the philosophy that once physically sick, mal-de-mer can be forgotten. I threw myself deeper into the task of sailing the boat. On reflection it would have been simpler and considerably less painful to fling myself into the sea. The wind became stronger, the waves higher, and the shore began oscillating even more violently. Oh to be on dry land again

Because of Mr. Lepine's incapacity to keep food in his stomach on a light swell, I have been asked to continue this narrative.

The propagation of our boat now resembled that of a five legged crab. This was due to the fact that the tide had turned and was now running with us down towards St. Catherine's Point, the southernmost tip of the Isle of Wight. Combined with a good breeze, slightly off our stern, a good swell was rolling with us towards our objective. One by one I noticed faces going from red to grey to white and finally settling to a steady pale green. Mike was the first to give in, and like a true gentleman and sailor unburdened himself over the lee gunwale. I think this was when Chunky decided that perhaps he shouldn't have eaten his breakfast because he decided to lie down on a cockpit seat and enjoy the view of the clouds. He also discovered that seasick tablets should be taken before you feel queasy, rather than after, as the Avamine that he took did nothing to ease the situation. The rest of the crew appeared to be revelling in the fine weather, and the turn of speed that we put on as we rounded St. Catherine's Point. I did once notice that Bob was wondering what to do with himself, but I think he got over it when Harry suggested that perhaps some food would be in good order. Unfortunately, Chunky did not appear to agree with this, and disappeared down below where he bedded himself down in the forward cabin with his eyes and ears tightly closed!

We found that sea water was a good idea for boiling potatoes in, since it was ready salted, although we did keep a lookout for oil slicks.

Round about this time, all of the crew who were able, took a turn at the helm and discovered that due to the sea rolling crab-wise underneath us, in order to steer a straight course, it was necessary to spin the wheel first hard to port and then hard to starboard. This was where I think a tiller, rather than a wheel, would have been less tiring. We all managed to get the hang of it, especially Hanne who excelled us all. After a good salad lunch we all felt much better, with the possible exceptions of Mike, who could only eat some lettuce, and Chunky who rolled his eyes and declared that he would have some fresh air!

We were now approaching Hayling Island, having rounded Bembridge Ledge just before lunch, and we found that we had timed the tide absolutely correctly. Unfortunately, it appeared that most of the South Coast sailing fraternity were also taking advantage of the wind and good weather. This made beaching a hazardous operation, but by using the outboard at maximum revs we managed to avoid being sliced in two by racing dinghies and water skiers. We beached the

boat, possible because of a beach of sand, and a rising tide. It was necessary to drop Chunky and Hanne off here because their car was parked at the sailing club, and when Chunky jumped off the bows into "six" inches of water, he found it to be more like two and a half feet (wet trousers again!). Having disembarked the pair, we agreed to regroup at Birdham Pool, and hoisting sail we set off on the last leg up Chichester Harbour. A few spots of rain sent us all scurrying below for our anoraks. but it proved to be a false alarm and we were soon working hard clearing up the boat ready for mooring and disembarking. We were the first of a line of boats making their way up to the moorings in the higher reaches of the harbour, and unfortunately we managed to run one of our hulls aground on the mud at the approaches to the lock, which was our access to the artificial harbour where the boat was to be moored. We were soon afloat again, and with the assistance of Hanne and Chunky who had driven round from Hayling by road, we eventually, amid much confusion of boats, managed to get into the harbour.

Holidays are wonderful - there is either pleasure away or relief in return -
I wonder

Finis

D. R. Lepine
W. Corbett Singleton

*The editor apologises for a mistranslation of the original title 'Sur La Mere' - it should, of course, be 'On horseback.

Station News

The Director, who is President of the Radio Society of Great Britain, accompanied Major-General J. E. Anderson, C.B.E., Assistant Chief of Defence Staff (Signals), at the opening of the International Radio Communication Exhibition which was held in London recently.

Among the many displays, which included those of the Armed Services and the Ministry of Posts and Telecommunications, R.S.R.S. occupied a prominent position. All who contributed to our exhibits will be glad to learn that many appreciative comments have been received.

Messrs. J. A. Lane, M. P. M. Hall and Dr. P. G. Davies attended the Technical Symposium on Tropospheric Radiowave Propagation, organised by the Electromagnetic wave propagation committee of A.G.A.R.D. which was held in Dusseldorf from 31st August to 4th September.

Dr. L. Thomas presented a paper entitled 'Ionospheric Implications During Disturbed Conditions', to an Advanced Study Institute conference on 'Aurora and Airglow 1970' which was held at Kingston, Ontario from August 3rd - 14th.

Staff News

Congratulations to:-

Valerie and David Eccles, on the birth of their daughter, Tracey, on July 27th.

Persida and Toni Lucas, on the birth of their daughter, Suzanah, on July 27th.

John and Hazel Norbury, on the birth of their son, James Kenneth, on 7th August.

Mrs. E. A. Thomas	now C.O.
Mrs. B. A. Lewington	" Photoprinter I
Mrs. J. Taylor	" Photoprinter I

Welcome to:

D. Roberts	Sandwich Course Student
Miss Y. Dias	Scientific Assistant
B. L. Gostlow	Vacation Worker (Chilbolton)
W. R. Hare	Vacation Worker
P. J. Smith	Sandwich Course Student
M. C. Thomas	Vacation Worker
P. J. Cuthbert	Sandwich Course Student
Miss L. Taylor	Sandwich Course Student
Miss V. A. Mace	Machine Operator (Casual)
H. J. Eeles	Vacation Worker

R. Petchey	Vacation Worker
Miss M. J. Day	Vacation Worker
Miss B. A. Kroczak	Vacation Worker
D. C. B. Whittet	Vacation Worker
A. Peake	Experimental Officer (3 year Contract - Falkland Islands)
Miss C. I. Doody	Canteen Assistant (Casual)
R. Thomas	Skilled Labourer
S. N. Thomas	Labourer
Miss H. Mason	Vacation Worker
T. Bagnall	Scientific Assistant
Mrs. G. M. Clark	Clerical Officer (P/T)
F. J. Ford	Asst. Mechanic (Local recruit Falkland Is.)

Resignations

R. G. Maby	Sandwich Course Student
Mrs. J. M. Briggs	P/T Clerk-Typist, Singapore
M. T. Narayanan	Handyman, Singapore
N. Malone	Skilled Labourer
M. E. Waite	Sandwich Course Student
J. C. Rendall	Experimental Officer (returned to MOD after tour in Falklands)
F. W. Stainer	Experimental Officer (returned to MinTech after tour in Falklands)

R. Petchey	Vacation Worker
Miss M. J. Day	Vacation Worker
Miss C. I. Doody	Canteen Asst. (Casual)
M. C. Thomas	Vacation Worker
P. G. L. Thomas	Sandwich Course Student
M. J. McAndrew	Vacation Worker (Chilbolton)
B. L. Gostlow	Vacation Worker (Chilbolton)
R. Thomas	S/Labourer
C. Strevens	Asst. Experimental Officer

Other Changes

T. J. Bevan	A.E.O. Returned from Singapore
G. L. Mollet	P/T C.O. Commenced full-time
B. Y. M. Moosajee	A.E.O. Transferred from Div. 3 to Div. 5
A. Peake	A.E.O. Completed tour in Falkland Islands
M. D. James	E.O. Transferred from Div. 4 to Div. 1
Mrs. D. Baldwin	P/T Clerical Officer transferred from Accounts to Office Services

G. L. Mollet Clerical Officer transferred from Office Services to
Accounts
K. Feldmesser Experimental Officer transferred from Div. 1 to Div. 2
Mrs. J. M. Cobb P/T Clerical Asst. transferred from Div. 1 to Admin.

Sports and Social Club News

A darts match against the Westminster Bank team has been arranged. It will take place 'at home' on August 27th.

An away match against Slough Town Hall will take place in September.

Volunteers (especially ladies) for the darts team are needed. Names can be added to the list on the notice board.

The Christmas Dance will be held this year on December 12th, from 8-11.45 p.m. Music will be provided by 'The Clubmen'.

Wine Circle

A continuous ordering system has now been implemented. This means that an order can be sent to our supplier as soon as sufficient orders to fulfil the conditions of our discount have been received. Members who wish to place orders should contact Mrs. Doreen Baldwin.

The committee would appreciate any offers of wine which could be used at the proposed Wine and Cheese lunch party. (Anonymity will be preserved if the member so desires).

The committee would like to remind members that a limited stock of useful items such as, corks, beer caps, foils, labels and fermentation traps, is held for their convenience. Corking, capping and capsular machines, an hydrometer and a vinometer are available on loan.

Frank Bennett

Cricket

21 July v. ICI Stoke Poges (away) RSRS lost by 43 runs

ICI 101-9 (Davies 3-44; Dunford 3-16)

RSRS 58 (Davies 16)

23 July v. ACO (away) RSRS lost by 2 wickets

RSRS 82-6 (Davies 31 n.o.; G. Thomas 35)

ACO 84-8

30 July v. Clewer Manor (home) RSRS lost by 4 wickets

RSRS 86-6 (Fullom 36; Moosajee 48)

Clewer Manor 87-6

6 Aug. v. ICI Stoke Poges (home) RSRS lost by 34 runs

ICI 82-8

RSRS (Martin 18)

Our playing record does not improve, and there can be little excuse for some of our inept displays. However, the matches against ACO and Clewer Manor both produced exciting finishes, with the winning runs being scored in the last over in each case. The ACO result might even have been reversed had we managed to hold a few more catches. As far as the two ICI matches are concerned, perhaps we can console ourselves in the fact their opening bowler is an ICI first team player - that's my excuse anyway.

Graham Thomas

Table-Tennis

A team has been entered in the Slough & District Table Tennis League following last year's successful season. The team finished third in the 4th Division and has been promoted to the 3rd Division.

It is hoped that the table will be resurfaced in time for the start of the season. As this takes 3 weeks, lunch-time players must accept apologies for the loss of an amenity in the bar until the table is back.

P. Muzlish
Hon. Sec.

Motor Club

In response to popular demand the Motor Club intends to hold once again a dinner at the White Hart Hotel, Sonning. This will be one of the bawdy Elizabethan evenings which a group of members enjoyed so much some time ago, bringing to light forgotten menus, wines and songs. Possible dates are Fridays 16th or 23rd October at a cost of 2 guineas per head. Will those interested please contact E. Golton.

The Motor Club continues to keep a stock of Royal Snowdrift oil, the most popular pack remaining a 5 gallon drum of 20W50 multigrade at 67/10d. The 2 gallon drums will cease shortly, Snowdrift inform us, but will be replaced by a pack of 2 - 1 gallon tins.

The service ramp appears to be in regular use, but a few members are leaving the site in rather a mess. Please make sure you tidy up all tins, filters, exhaust pipes etc. and leave the area as you would wish to find it.

News of Former Staff

Members of R.S.R.S. will be pleased to learn that Dr. Rodney Challinor has been awarded the Pawsey Medal of the Australian Academy of Science for his distinguished research in physics.

Dr. Challinor spent some time at this Station before going to his present post at the University of Toronto.

Obituary

Mr. A. E. Ives

We regret to record the death of Mr. A. E. Ives on 25th August 1970 at the age of 59.

Much of Albert Ives' early career was spent soldiering. He joined the army as a youth, the engagement lasting until just before the Second World War, at which time he rejoined the colours. Some years of his subsequent service were passed as a Prisoner-of-War in Germany, and in 1945 he continued in Government service as a civilian. He joined R.S.R.S. in 1961.

In some ways the virtues of a military upbringing left their mark; he seemed to have an encyclopaedic knowledge of the regulations relating to his work - and of possible means to circumvent them. He was a fair man, not afraid of taking an unpopular line if his integrity demanded it, but, on occasion, making good use of the soldier's maxim that regulations are for the guidance of wise men.

To his wife and family we offer our deepest sympathy.

Letter to the Outstations

Dear Colleagues

You see from the cover that on this occasion the Newsletter is attempting to achieve, if not trinity, at least duality in unity. August and September issues combine in an attempt to offset all the various problems of supply, staff leave etc., which beset production in the Summer Season. Anyway here it is, both.

Looking back an issue or so the name of Mr. A. G. Wilson will be found among the retirements. Known most recently for his work on design and construction of experimental rocket payloads - he received the M.B.E. in 1966 - 'Arch' Wilson's work here dates back more than forty years. During that time he was given charge of the workshops and made valuable contributions to the instrumentation of the pioneer radar installations. In 1955 he left Ditton Park for a spell in industry, returning a few years later to apply his undoubted talents to space experimentation. We all wish him well for the future.

/Lunch-time

Lunch-time strollers the other day were grateful to Slough Corporation for a twenty-minute happening based on a truck, a crane, a decomposing motor-car and two directors of entertainment disguised as council workmen. As with any good art-work, analysis destroys the essence of the thing; to recount in pedestrian prose the lifting, dropping-from-a-great height, sliding and bursting asunder, gives no feel of the pleasure given to spectators. It was something like hole-in-the-road watching with added joys of random happening, each operative doing his thing, yet, somehow both exhibiting an underlying unity of purpose, eventually achieved. An epitome of man's struggle? brutish, uncertain, yet having direction - to the dust-heap. Why pleasure then? perhaps it was the sight of others making a muck of things as well as

Yours sincerely

The Editor

REPRINT LIST AUGUST/SEPTEMBER 1970

- J. A. Lane Radar Echoes from Clear Air in Relation
to Refractive Index Variations in the
Troposphere
I.E.E. 1970, Vol 117, 1230-1231
- M. C. W. Sandford Laser Radar Measurements of the
A. J. Gibson Atmospheric Sodium Layer
J.A.T.P. 1970, Vol 32, 1423-1430
- G. R. Thomas ESRO 1 Satellite Observations of
P. A. Smith & 45-450 keV Electrons during the period
R. D. Dalziel 24th February - 3rd March 1969
ESRO Con Proceedings at Nordwijk
September 16-19 1969
- H. Rishbeth Eclipse effects in the Ionosphere
Nature 1970, Vol 226, 1099-1100
- L. Thomas F-Region Disturbances associated
with Major Magnetic Storms
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Internal Memoranda

- IM 336 Thomas, L. The Lower Ionosphere and Radio Wave Propagation