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R.S.R.S. Newsletter

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Hellenic Heliokymometry*

Last May Dr. Croom and I took about 1 ton of equipment to Athens to monitor solar radiation at 19 Gc/s during the total eclipse. The main source of interest in eclipses for both optical and radio astronomers is the high resolution obtainable with comparatively modest apparatus. During a total eclipse the moon covers the sun at a rate of about one second of arc every three seconds of time. Hence with an apparatus having a time constant of six seconds one can obtain a resolution of two seconds of arc, a figure which under normal circumstances could only be achieved with an aerial several times the size of the Jodrell bank dish or with a cross-type interferometer whose arms were over a mile long. A study of the variation of the total solar noise signal as the moon gradually covers and uncovers the sun can provide information on the distribution of radio sources across the solar disc.

We had an entertaining trip to Athens; by Comet over the Alps, down the west coast of Italy and along the Gulf of Corinth, watching the earth below change from a lush wet green to take on a hard barren brownish red appearance. After assuring the authorities that I could not possibly be a smallpox carrier and checking that our freight had arrived we made our way along baked up dusty roads to our Hotel. Situated on a small promontory jutting out into the Aegean the hotel gave very pleasant views in all directions, if you liked sea. We settled into our very comfortable room saying "It makes one feel almost guilty doesn't it coming away to a hot sunny place like this with the wife left at home to look after the Kids and do the chores(?) but you get over it!" Having made arrangements to collect our equipment the next day we had a very ample meal, went for a swim at 11.00 p.m. in warm bouyant water, and turned in.

When we arrived next morning at the office of our Greek contact we were told "Yes Gentlemen we have a sight for you as arranged but there are difficulties, no electricity. Now we could send you to an island only fifty miles away to the north east or there is another island only seventeen miles away to the south west or you could go to Karistos with the E.S.R.O. group or you could scrounge power from the Italian group in the hills by your hotel and live there in tents." "Tents?!" "You know, a little canvas house." In spite of repeated assurances that it was "a very good possibility" we decided to avoid the dangers and delays to transporting our one ton of equipment to remote islands. As we had already been warned of the pot holed tracks leading to the half built hotel at Karistos we went straight to the Italians, to beg. "Sorry, we turn on the fire and the light she goes dark!" Back at our hotel we considered our not too promising situation and decided to make a slight compromise by moving 1 km. away from the eclipse line and making our observations from one of the bungalows attached to the hotel. We asked the hotel manager for permission to set up a small radio telescope on the patio of one of his bungalows (saying radio fairly fast) and were told that the hotel was at our service. (Later, when we left, he asked whether our equipment was all packed away in our suit cases.)

We returned to the Athens observatory for help with the customs and were taken to a building within the Airport grounds which looked like a large, ill kept, ill ventilated barn. Inside, one half was filled with a haphazard pile of packages reaching the ceiling and being crawled over by several old men sweating copiously and muttering "Paris, London, Nancy". The other half of the room was filled with hot, tired, argumentative, milling Greeks. No attempt had been made to keep Greeks separate from packages. We dodge along the length of this tatty bedlam at least twenty times before we agreed to open all our eight packing cases and show each piece of equipment. In the absence of a fork lift truck one small and, significantly, three figured Greek unloaded and opened all our cases, one of which weighed 3 cwts. We delved amongst the wood-wool for an hour in the mid-day sun. By the time we had repacked, loaded the lorry, unloaded and unpacked at the hotel we were beginning to wonder whether we shouldn't be better off working in the cold rain of England.

We moved to a bungalow close to the main hotel, set up the electronic equipment at the foot of one of the beds and, much to our neighbours delight, set the aerial on the patio. The hotel electrician came to see what we were up to and watched in open-mouthed disbelief as we connected the power cables from everything to a very large heavy equipment and then fed this from the bedside lamp socket. With a calmness quite untypical of his countrymen he swathed the mains fuses with copper wire and left. Thanks to the packing expertise of Mr. Savage and Mr. Coles nothing had suffered from the journey and in a couple of days, after only minor troubles, we were fully operational and it was raining. As we couldn't safely operate in heavy rain we covered

everything with polythene and took to the hills to visit other groups of scientists.

The Italian group from the Florence observatory had brought 17 tons of optical equipment and one ton of radio equipment, they had laid concrete bases, built hardboard walls all around to shelter them from the wind and set up an optical spectroscope having 18 feet long arms. As they showed us round in the rain under a leaden sky they explained that their primary interest was in the 0.7 secs of totality and any whisp of cloud at that time would be fatal to the majority of the project. With characteristic thoroughness the Dutch group had reserved their site the year before and constructed a light-tight shed in which they housed an optical spectrograph. Behind their site was a string of twenty or so tents each containing, so they told us, a fanatical Dutch amateur astronomer with a telescope. They had already been living in tents for a month when we arrived! John Hargreaves, late of R.S.R.S., was working on the hillside from a small caravan, erecting a high frequency riometer aerial while he impatiently waited for a large part of his equipment, which had got lost on the journey. The Americans were of course there in force with a self-contained, transportable system for monitoring eclipses at 9 Gc/s, 5 Gc/s, 3 Gc/s and 1 Gc/s. As we made our way back to the hotel we were pleased to reflect that in spite of our inexperience of eclipse work and hurried preparations we seemed to be doing as well as everyone else.

As eclipse day approached we settled into a routine which, for at least two hours a day allowed one person to watch over the equipment whilst the other went swimming and watched over the lithe, bronze, mini-bikinied creatures that frequent the beaches in those latitudes. It soon became evident that the main hazard to our observations would be the curiosity of our room maids and neighbours; accordingly we mounted a theodolite in a position where it could be either trained on the beaches or used to project an image of the sun onto a small screen. This proved a great success and only occasionally did we have to shoo away an eager amateur.

Having been so busy with our own equipment we hadn't given much thought to other eclipse effects and were quite surprised to see that each small gap between the leaves of the surrounding bushes produced a pin-hole camera image of the half eclipsed sun in the bushes shadow and that it didn't get dark in the same way as it does every evening but, due to the sun's different elevation, the dying light took on an eerie brownish tinge.

After three hours of tensely waiting for the apparatus to go wrong we had obtained as good an eclipse curve as our system could give. That afternoon all nationalities met in the Americans bungalow and partook copiously of burbon and nuts while they described their complete successes.

We packed up the next day and dumped all our equipment at Athens airport. Everything got back safely except three copies of 'Playboy' left on top of one of the cases which a customs officer with an eye for James Bond's girls must have confiscated as illegal traffic.

J. Powell

* The title was largely constructed by the editor, so don't blame me.

J.P.

ANSWERS TO LAST MONTH'S PROBLEMS

1. The cork costs $\frac{1}{2}$d. The bottle costs 1s. $-\frac{1}{2}$d.

2. There is as much water in the milk as there is milk in the water.

3. No answer can be given to a problem involving the reasoning of the female mind!

4. 36π. One solution is as follows. The problem would not have been set unless it had a unique solution. This implies that the size of the hole does not affect the answer even when the radius of the hole is reduced to zero. Therefore the remaining volume must be that of a sphere of diameter six inches, i.e. 36π.

5. So far as is known no one has yet constructed a map requiring the use of five colours. It is suspected that four colours are sufficient but the best result that has been proved is that five are sufficient.

6. Proofs exist that the equation $x^n + y^n = z^n$ has no solution where n has any value smaller than 269 (except 2). Over 300 years ago Pierre Fermat, a French mathematician, reported that he had discovered a proof that the equation has no solution where n is greater than 2. Fermat's proof has never been found and so far no one has been able to construct such a proof. There is a suspicion that Fermat himself either did not have a proof or made a mistake in it.

7. The obvious starting point is the North Pole. The less obvious answer is an infinite number of starting points in the southern hemisphere. These starting points are anywhere on a circle of radius about $1 + \frac{1}{2}\pi$ miles centred on the South Pole. After walking one mile south a walk of one mile east would take one around the Pole exactly once. A walk of one mile north would bring one back to ones original starting point. Starting from circles of radius $1 + \frac{1}{4}\pi$, $1 + 1/6\pi$ etc. miles one could walk twice, three times etc. around the Pole.

8. The prisoner would ask either guard, 'Which door would the other guard tell me to escape through?' He would then leave the cell by the door the guard did not indicate.

9. It is not possible to cover the squares of the chess board with the dominoes. The squares removed from the board are of the same colour. Their removal leaves the board with two more squares of one colour than of the other. Each domino covers two squares of opposite colour as only opposite colours are adjacent. After 60 squares of the chess board have been covered by 30 dominoes two squares of the same colour are left uncovered. As these cannot be adjacent they cannot be covered by the last domino.

M. C.

STAFF NEWS

Congratulations to:

Frank Bennett on his engagement to Miss Jane Sadler

David Eccles on his marriage to Miss Valerie Bolton

Welcome to:

Mr. J. A. Smith		T/S.A.
Mrs. C. Greene		S.O.
Miss C. Robins		S.A.
Mr. G. L. Lim	(Singapore)	Tech. Officer

Resignations:

Mrs. C. Kervin	T/S.O.
Mrs. E. C. Butler	T/Cleaner
Mr. J. Garrett	A.E.O.
Mr. J. K. Stay	T/S.A.

Transfer:

Miss A. J. Jones (A.E.O.)	To G.C.H.Q. Cheltenham

SPORTS AND SOCIAL CLUB

Dinner/Dance on Monkey Island

A party of some ten people graced the table at the Monkey Island Hotel on the evening of Friday the 5th August. This was an event the weather could not ruin and we dined and danced in splendour overlooking, almost perched over, the floodlit river. Some of our number indulged in phonetic activity to the accompaniment of definitely non Palm Court type music while others gently recovered from the considerable quantity of food placed before us. To the credit and thankfulness of all concerned no one managed to fall into the river from the rather rickety bridge as we departed well wined and dined in the early hours.

E. Dunford

A.C.O. Sports Evening

The annual sports evening with A.C.O. was rather marred this year by rain which washed out the cricket match. Some tennis was possible and all the indoor games were well supported. The bar did a roaring trade and the Sandwiches and Cakes prepared by Misses Greenfield and Seabrook were much appreciated. A return match will take place towards the end of this month.

K. Slater

TENNIS

Starting on Thursday 18th August there will be a second Club evening.

Mondays	-	Match Practice
Wednesdays	-	Club Night
Thursdays	-	Club Night

V. M. Lovell

CAMERA CLUB

A party of members and guests explored parts of London on 6th August 1966. Starting from Little Venice, they travelled by canal boat to the Zoo. After a two hour visit, the party were more then ready for their lunch at the International Student Centre in Park Crescent. In steadily worsening weather, the party ascended the Post Office Tower, after queueing for 'only' ¾ hour. There was an excellent view of London, but the distant hills were not visible through the rain. Finally, members ventured even further into space at the Planetarium.

Henry Rishbeth

LETTER TO THE OUTSTATIONS

Dear Colleagues,

There are, no doubt, great patterns of policy behind the recent outbreak of building at Ditton Park. Viewed from the ground, so to speak, we interpret the happenings in much the same way as Neanderthal man musing on an eclipse. Something different is happening and we hope it will be for the general good.

In fact a new, large, wooden hut is taking form at the back of B and C spur; the men from M.P.B.W. have taken over the Library to install new shelves and, one day, a Surveyor was seen surveying. No doubt, provided we get the administrative ritual right, it will be manifest that behind all these doings the one intent is all for our delight.

Abating delight somewhat, you will see that among the resignations are Christine Kervin and Audrey Jones. We wish them well for the future. We shall, all of us, miss their quiet charm, particularly those as susceptible to the Sex as,

Yours sincerely,

The Editor