

R. S. R. S.

Newsletter

No. 61

May 1966

A Message from the Director

I welcome this early opportunity to extend my best wishes to each and every member of the staff, here at Datchet and at all the outstations. In so doing I want to say how pleased I am to be back at R.S.R.S. I found my experience at the British Embassy in Washington both stimulating and valuable and indeed one that I would not have missed for anything, but I am now looking forward very much to being involved once again in the Station's programme of research.

This programme, already well-developed by Mr. Ratcliffe, is a very good one and together with the possibilities for interesting new ventures which exist, it should keep us all enthusiastically busy for a long time.

I am very glad to recognise many old friends and faces on my return; but I find too that the past two years have seen considerable changes and there are many new members of the staff whom I shall want to get to know. This I intend to do as soon as possible, as I steadily pick up the threads once more.

J. A. Saxton

Mr. De la Rue's Expedition

The annular solar eclipse of the 20th May has been the subject of observations made by members of staff of R.S.R.S who have gone to Greece for that purpose. Perhaps on their return it will be possible to persuade one of their number to give an account of the trials and tribulations of an eclipse expedition. It may make an interesting comparison with the efforts of a party which set forth to Spain to photograph the total solar eclipse of 1860.

The application of photography to scientific purposes was already under way by the mid-nineteenth century. In 1851 one of the features of the Great Exhibition was a display of a daguerreotype of the moon by G. P. Bond and in the same year a daguerreotype of an eclipse had been taken by Busch of Königsberg. This picture, though marking an advance in solar studies, gave very indifferent definition of the prominences visible during totality.

These early photographs attracted the attention of a Mr. Warren De la Rue, son of the founder of the well known firm, who managed to bring a professional approach to the problems of both running the family business and to scientific research. The idea of astronomical photography with improved methods led him to attempt and succeed in obtaining pictures of the moon using the then faster, but somewhat messy system known as the wet-plate Collodion process, a method which required that the photographic plate be exposed whilst still wet.

From lunar subjects De la Rue turned his attention to solar studies and he devised his photoheliograph with which daily photographs of the sun's surface were made at Kew Observatory, near Richmond. The path of totality for the eclipse of 1860, on July 18th, passed through Spain and it was decided to attempt to photograph it with the Kew photoheliograph. The expedition to be in charge of the instrument's designer, Mr. De la Rue.

The task was not an easy one. Leaving out the chance of cloudiness, a risk shared by eclipse expeditions in any age, there were other factors to consider. Preliminary tests showed that the instrument would probably perform well enough provided that the emulsion and wetness of the photographic plate was not seriously modified by the climate of Spain in mid-July, but this could not be relied upon. The system demanded that the plates be prepared just before use, so one necessity would be to provide a combined dark-room and observatory which could be quickly transported and re-assembled at the observing site, somehow too it must be kept cool.

The problem was overcome by making a two-roomed building of numbered segments which could be bolted together speedily. The observing room had no roof but when not in use a canvas sheet was rolled over it. When in operation this sheet rolled back over the top of the dark room compartment and was

thoroughly soaked with water. This had the effect of converting the darkroom into the interior of a gigantic wet-bulb and thereby reduced the temperature very considerably.

The expedition carried with them, apart from the astronomical accessories which might be required, a considerable number of chemicals:- collodion, pyrogallic acid, hyposulphite of soda nitrate of silver, three bottles of varnish, four ounces of tripoli, whatever that may have been, and a set of scales and an ounce measure. In addition are listed, among the miscellaneous items, engineers and carpenter's tools, distilled water to the weight of 139 lb, lanterns, lamp oil, spirit lamp and spirits of wine. Finally included was a small stove and kettle for boiling water.

Preparations for the expedition were begun end of January 1860 and the staff employed, apart from De la Rue himself, were Mr. Beckley of the Kew Observatory, Mr. Renolds, photographer, and two others, Mr. Downes and Mr. Beck. The apparatus and supplies went to Plymouth in the beginning of July and they set sail on the 7th, reaching Spain on the 9th. The site chosen was a village called Rivabellosa, 70 miles from Bilbao and, in those days at any rate, was only accessible through a pass which was stated to be difficult for the transmission of heavy baggage.

On the evening of the 10th they left Bilbao and arrived at the village the following day. The instruments reached them the day after that. A suitable site was found for erecting the photoheliograph, it turned out to be a thrashing floor, belonging to a farm, this being a hard surface about 60 ft. across. They had barely selected the site and commenced to set up their apparatus when they learned that the harvest had begun and that the proprietor intended to use the floor the following day. However, with the help of one, Don Simon, surveyor to the local railway, negotiations were undertaken for the hire of the thrashing floor and it happened that, when the farmer realised the purpose to which his property was to be put, he was only too willing to allow them to use it without any charge at all.

A further member of the party, Mr. Clark, joined them at this stage. He served them mainly as an interpreter and was of great value in explaining to the local people the purpose of the visit of these Englishmen to their village. It is greatly to the credit of the villagers, once they realised what was going on, they were glad to help in any manner possible.

The station being assembled and all being ready, a number of trial photographs were taken and appeared to be successful. Photographs* were also taken of the observatory and the party working in it; we see De la Rue and Beckley standing by the heliograph looking at the chronometer, the photographer, dark slide ready, about to plunge it in to the camera and a figure with a lighted taper in his right hand standing a little in the background. This

was Mr. Clark and his purpose was to burn through a thin piece of thread which would release the shutter on the machine, a method of action thought most likely to minimise vibration.

All was now ready and there was nothing more to do except to await the moment of the eclipse. This duly arrived and, in the words of De la Rue, "Upwards of forty photographs were taken, a little before and a little after the moment of totality, two being actually taken during totality and on these it was possible to observe the luminous prominences with considerable precision". This important moment in the eclipse impressed de la Rue considerably, he said that he wished he had not encumbered himself with apparatus and vowed that if a future opportunity ever occurred he would give up all idea of making astronomical observations and just enjoy the spectacle which could be seen by a bystander.

The moment was not without other excitements also, for it seems that one of the Spanish helpers had been shown how to smoke glass, in order that he might see the eclipse better by looking through it. Finding a method using a 'wax lucifer match', he became inundated with demands for filters from other onlookers and, becoming excited by this, he threw matches in all directions eventually setting fire to standing corn. A few minutes were lost while members of the expedition rushed around in an attempt to put out the blaze, which was fortunately soon done.

Despite all these mishaps, however, the great moment had come, passed, and been successfully recorded by the photoheliograph and the members of the expedition could feel well satisfied with the result. Further photographs of the sun were taken on the two days following and then the instruments and the observatory were taken down and packed. On the 28th of July the party and apparatus landed at Portsmouth and all was now over as far as the field work was concerned.

For De la Rue, however, things had only just begun. He had the negatives but he had no proper prints and had a great deal to do with the analysis of the results obtained. It is an interesting reminder of the state of photography at that time that his prints had to be made using direct sunlight and he was delayed a considerable time since the summer of 1860, so far as England was concerned, was remarkably dull and wet. It was approaching winter before he really got very far with his photographs. The work, however, was well worth the trouble. Really good photographs of solar prominences had been obtained and for De la Rue himself, it earned him the Gold Medal of the Royal Astronomical Society and the Royal Medal from the Royal Society. The totality photographs formed part of his Bakerian lecture in 1862.

Their adventures over, the heliograph and Mr. Beckley returned to Kew

Observatory, De la Rue and Reynolds, now his full-time photographer employed at the private observatory at Cranford, resumed their work in England and the rest of them no doubt returned to their various occupations. What remains? De la Rue died in 1889, having given up active astronomy some years earlier. Of Reynolds we know nothing, save that he was a good photographer - the evidence remains to this day in the form of the eclipse pictures which he took. Beckley remained at Kew and did valuable work in instrument design and manufacture; a tablet to his memory exists in the observatory. He made good apparatus which lasted, (the author worked with some of them still in use at Kew some ten years ago). The heliograph now exists in the Science Museum where all may see it. It looks much as it did and doubtless some of the scars it shows were honourably acquired during that eclipse expedition over a century ago.

G. W. Gardiner

*It is hoped to display a few photographs of the expedition

STAFF NEWS

Congratulations to:

Dr and Mrs J. E. Geisler on the birth of their daughter
Mr. and Mrs D. Thorpe on the birth of their daughter
Mr. R. James now Charge Hand
Mrs B. Nutley now Messenger

Welcome to:

Mr. B. M. James	Instrument maker
" R. W. Monk	Sandwich Course Student
" J. E. Newbury	Scientific Assistant
" J. C. T. Young	Assistant Experimental Officer
" F. Peacock	T/Part-time clerical assistant
" W. H. J. Davis	Part-time Labourer/Messenger
Mrs E. J. O'Connell	T/Clerical Assistant
Mrs M. W. Stratta	T/Clerical Assistant
Mrs I. M. Moorat	Part-time Clerk/Typist (Singapore)
E. J. Chicken	T/Labourer/Mechanic (Chilbolton)

Resignations:

Mr. E. J. Cornwell	Craftsman welder
M. I. Oduah	T/Scientific Officer

SPORTS AND SOCIAL CLUB

Twenty three members attended the Annual General Meeting held in the canteen on Thursday 28th April.

The committee report and the financial report were adopted after a question on the estimates for tennis and a slight modification to the assets and liabilities statement. The Chairman then declared the new committee members elected.

The seven amendments to the club rules were carried. In the main these amendments clarify the position of sections and section representatives. Copies of the new rules will be available shortly.

After some discussion the proposed general reduction of the tennis subscription was withdrawn, but the reduced rates for under 21's, married couples and families, were carried.

The arrangements for the Smith-Rose Cup, and facilities for the outstations were among the other items discussed. Some concern was expressed about losses of equipment and lack of security, the more so in view of the recent loss from the sweet shop.

Officers and committee members for the year 1966-67 are:-

Chairman	Martin Hall
Vice Chairman	Eric Dunford
Secretary	Barbara Greenfield
Treasurer	Veronica Lovell
Minutes Secretary	Clare Seabrook
	Peter Bradley
	Margaret Powell
	Ken Slater

One member has been coopted for a period of one year:

Janet Willsher

Dr. Smith-Rose has most generously presented the club with a cheque to pay for the cabinet containing the Smith-Rose Cup, and the committee have expressed to him how grateful we all are for his gift.

Veronica Lovell

CAMERA CLUB

The Club's plans for the year were discussed at the A.G.M. on 9th May 1966. They include the purchase of more darkroom equipment, resumption of the popular colour-slide shows in the autumn; and a black-and-white print exhibition in the winter. Possible destinations for the summer outing were discussed; watch for announcements. Mr. Newman continues in office as President, Henry Rishbeth as Secretary and Paul Dickinson as Treasurer.

Henry Rishbeth

BRIDGE CLUB

The D.S.I.R. Bridge Cup is now competed for by ex-D.S.I.R. Stations and the Tournament was held at Warren Spring Laboratory, Stevenage on Sunday 8th May. Ten teams of four took part and R.S.R.S. team A won the Tournament with +74 I.M.P.'s. Warren Spring A were second with +39 I.M.P.'s and the Road Research Laboratory third.

Team A were Dr. and Mrs. Bain

Mr. and Mrs. Gordon-Smith

R.S.R.S. Team B were placed seventh with -15 I.M.P.'s - they were

Dr. Dickinson and Mr. Zavody

Dr. and Mrs. Fooks

The cup will now spend the next year at R.S.R.S., I hope in a suitably prominent position, until we organize the next Tournament.

The last club evening of the season was held on April 15th with nine players each playing three hands with each other player. Two more matches in the N.P.L. Inter-divisional League have been played; on April 19th. Mr. Chaudhary and Mr. Pratt and Mr. and Mrs Gordon-Smith were placed second and on May 3rd Dr. and Mrs. Bain and Mr. and Mrs. Gordon-Smith were placed fourth.

On April 22nd, R.S.R.S. played N.P.L. at Teddington and were defeated by 84 I.M.P.'s - our team was

Dr. Dickinson and Mr. Pratt

Dr. and Mrs. Fooks

Mr. and Mrs. Gordon-Smith

Mr. and Mrs. Nicolson

I.C.I. invited us for April 28th and six people played in comparative luxury --

Dr. Bowman and Mr. Chaudhary

Drs. Dickinson and Dunford

Mr. Sandford and Mr. Gibson

They won the evening - by 1 I.M.P.

The wine and cheese party seemed to go very well on May 7th - fifteen people came and a bridge four was soon established.

The last match in the N.P.L. Interdivisional League was played on May 17th and R.S.R.S. were placed second, represented by Dr. and Mrs. Bain and Mr. and Mrs. Gordon-Smith. In the overall placing R.S.R.S. were placed second and I should like to thank all those who have made the trek to N.P.L. to play for R.S.R.S. this season.

Jean Fooks

TENNIS

Some reductions in the annual subscription rates were agreed to at the A.G.M. of the Sports and Social Club on 28th April. A member under 21 at the start of the season will now pay £1, a married couple £3 and an associate member, who has a full member relative, £1. A full member will continue to pay £2.

As in previous years, the club evening will be Wednesday and match practice for the stronger players on Monday. At other times the court can be booked by signing the booking sheet on the notice board outside the library. Please book early to save disappointment: last week three couples wanted to play at the same time!

Apart from the faded lines, which are to be revived shortly, the court is in good condition. A new nylon net has been fitted and we are hoping to sink that sub-standard net post (a scapegoat for many a double fault) to the correct level.

We have a large stock of used tennis balls for sale at 6d each. Anyone interested, is asked to contact me in Spur C.

R. W. Smith

UNDER THE OUTSTATIONS

Dear Colleagues,

At the risk of sounding like a proclamation in the Gazette may I say that we, severally, editorially and inclusively, are pleased to welcome Dr. Saxton once more to Ditton Park. The inclusive bit meaning that your editor has taken it upon himself to voice your feelings as well. You will see from the message on the front page that R.S.R.S. is to continue to work with characteristic enterprise.

Talking of enterprises of great pith and moment, the Station has at present two groups working overseas, apart from our regular outstations. In Greece for the solar eclipse are Dr. J. and Mr. A. Hall who are measuring Lyman Alpha emission from the sun with rocket borne equipment, while Dr. Croom and Mr. Powell will be observing solar radio emission at 4 and 13 m.m. throughout the period. In U.S.A. Messrs. Lane, Fowler and Champion are cooperating with U.S. scientists in micro-wave refractometer and tropospheric radar experiments at Wallops Island.

'Tis not in mortals to command success, but surely they too will do more - deserve it. With luck, as well, they'll provide newsletter articles for

Yours sincerely,

The Editor