



18 December 1978 – 15 January 1979

# Director's Christmas Message

Just before I sat down to write my Christmas message I read in the newspaper that the Secretary of State had announced increased funding for the Research Councils over the next 4 years. This is indeed very good news, for I am hopeful that some of these additional funds may find their way into the Laboratory to support the new projects which we have started.

The big event in 1978 was, of course, the closure on 6 June of Nimrod, the Mighty Warrior. Nimrod had done a great job for particle physics research in this country over the 14 years it was in operation. The particle physicists now have to carry out all their research abroad. We have the very big responsibility to support them in their work and to ease their difficulties. Many of you have already been involved at CERN and at DESY in installing the equipment for the new experiments and I hear that you have done an outstanding job for the Laboratory, working always to very tight timescales.

The end of the year was marked by the decision to merge the Appleton Laboratory with the Rutherford Laboratory. It is too early to comment on the implications of this but as we move into 1979 there is no doubt that we shall be even more busy rather than less, so have a good holiday with your families over the festive season.

My grateful thanks for all you have done for the Laboratory in 1978,

## INTERNAL EVENTS

### HEP DIVISION

The following dates have been agreed for Meetings in 1979.

Tues 30 January  
Tues 27 March  
Tues 15 May  
Tues 17 July  
Tues 18 September  
Tues 18 December

### Particle Physics Experiments Selection Panel.

*The meetings will normally open with PROPOSAL TALKS in the morning followed by a meeting of the Panel in the afternoon.*

*Any papers submitted to the Panel should reach J J Thresher, preferably 3 weeks, but not later than 2 WEEKS prior to a meeting.*

## Vortex Orbits Venus

The Vortex experiment on the Venus Orbiter, launched last May arrived in orbit round Venus on 4 December. It has been switched on and is looking successful in a similar manner to the Pressure Modulated Radiometer in the SAMS experiment launched in October on Nimbus 7 in Earth Orbit. The experiment is a joint Jet Propulsion Laboratory-Oxford University (Atmospheric Physics) project, and contains a PMR filled with Carbon dioxide to measure the temperature of the outer Venusian atmosphere. This Pressure Modulator was designed and filled at the Rutherford Laboratory - all construction and testing being done by Oxford University. The PMR with its pressure controlled by three settings of its molecular sieve, measures the temperature at heights from 90-150Km above the planets surface. This is above the clouds of Sulphuric acid vapour, where the temperatures are not dissimilar to those high in the Earth's atmosphere (150-200°K).

This piece of hardware is the first from the United Kingdom to operate at such a distance from Earth.

### TRAINING

#### SHORT COURSES

Local colleges are offering the following courses one evening a week for one term.

#### NEWBURY COLLEGE OF FURTHER EDUCATION

"Introduction to Microprocessors" from 10.1.79.

#### THE COLLEGE SWINDON

"Introduction to Microprocessors" from 17.1.79.

#### OXFORD COLLEGE OF FURTHER EDUCATION

"Microprocessors and Industrial Control" from 8.1.79.

Further details can be obtained from the College offering the course.

#### CONFERENCE

IEE. "International Conference on Future Energy Concepts" takes place from 30.1.79 to 1.2.79.

#### ONE DAY COURSE

The Department of Aeronautical and Mechanical Engineering at the UNIVERSITY OF SALFORD are holding a "Bearing Selection and Design" course on 7 Feb 1979.

Further details from the Training Section R20 Ext 6285/266.

## Val Who?

Val Goodwin has left us. After sixteen years at the Rutherford Laboratory, she has deserted us for the National Radiation Protection Board!

Valerie joined RL in July 1962; later, after acquiring audio proficiencies she was the first audio typist at RL to be promoted to secretary. Valerie has worked mainly on the scientific side and will remember her first group leader - Eric Pickup.

She is a keen committee member of the AERE Horticultural Society and has taken prizes in a number of sections at the local Show. Over the years Valerie has organised interesting coach outings both horticultural and cultural which many members of staff, family and friends have enjoyed.

Valerie has a great number of interests from various aspects of lapidary and craft work, to badminton in which she has won shields.

This time last year Valerie visited relatives and friends in South Africa and brought back a new word - DIERE (pronounced dee-rah) - it means "many animals"; what better name to call her newly acquired home, with 11 cats, 7 chickens, 4 ducks, 1 rabbit, 1 nanny goat, a dog, and an aviary of 52 assorted birds - quails, finches, cocka-teils.

At a packed presentation ceremony on Wednesday, 29 November she received a beautiful gold bracelet - a farewell gift from her many friends and colleagues. She leaves us in the sure knowledge that few people can say - who is Valerie Goodwin??



*Dr Valentine shares a joke with Valerie Goodwin when presenting her with her farewell gift.*

### A BIG, BIG THANK YOU from Val Goodwin

I should like to thank all my friends from Rutherford and Atlas Laboratories for my marvellous farewell gift - I would have left sooner if I knew you were going to get me a gate bracelet!!! Joking apart, I am really thrilled with my gift and I shall always wear it - may be viewed at any time at the Typing Centre, NRPB. Sorry if I didn't get around to thanking everybody, but I only had two days in which to do everything, and of course there was no time between 11.30 and 3.00 in the afternoon because of my lunch time commitments!!! You haven't exactly got rid of me though, I shall keep popping up from time to time.

# Chemical Energy Storage

Over the past few years we have all become aware of the problem of dwindling energy resources and familiar with the concept of 'Alternative Energy' - the harnessing of wind and wave power and of solar and chemical energy.

The difficulty associated with these sources is the intermittent nature of their production - the sun does not always shine, nor the wind blow. Here economic storage is the problem. Much energy is at present wasted, the low grade heat from power stations being an example.

Studies at the Rutherford Laboratory into the use of Chemical Systems for the provision of economic energy storage, and the conversion of low grade ambient or waste heat to a temperature suitable for domestic and industrial heating, have achieved both these objectives by means of a two-vessel heat pump.

The principle is that vapour from a water vessel kept at 0-10°C, led through an airless conduit to a vessel containing concentrated sulphuric acid, will be absorbed by the acid. This releases both latent heat and chemical energy, bringing the acid vessel up to 50-100°C.

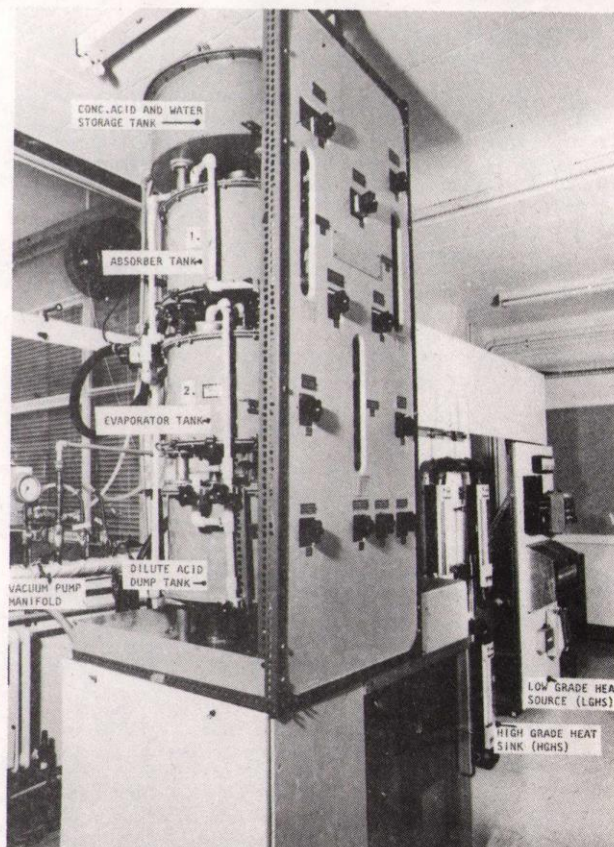
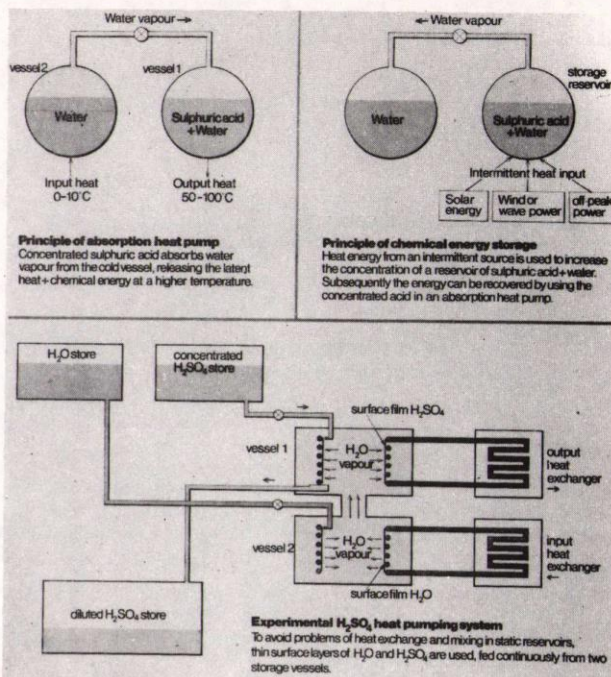
Sulphuric Acid in vessel 1, absorbs water-vapour from vessel 2, cooling the latter and releasing energy at a high temperature in vessel 1. This provides the pumping effect. For energy storage, the now diluted acid is transferred to a storage vessel where it can be subsequently reconcentrated using intermittent energy sources.

A variety of two-component systems are theoretically suitable for output temperatures in the 50°-100°C range. The system water/sulphuric acid has been selected for practical study, as it combines the lowest unit cost with the highest energy storage density (approximately 0.3KW/litre). An experimental heat pump with an output of several kilowatts has been constructed as the first stage of an SRC-funded collaboration between the Open University and the Rutherford Laboratory.

The embodiment of the principle is explained in the schematic diagram above, while the photograph (right) shows the complete system. It comprises the heat pump itself, together with an artificial source of low grade heat (LGHS) designed to maintain vessel 2 at a constant low temperature and a sink (HGHS) for dissipating the high grade heat generated in vessel 1.

A continuous usable power output of 8 kilowatts has been generated at an operating temperature of 75°C in vessel 1 and dissipated in the HGHS, while the inner surface of vessel 2 was being maintained at a constant temperature of 8°C by the LGHS. A higher temperature, 85°C has been obtained at a somewhat lower power output. These results are in good agreement with predictions.

Studies of specific industrial and domestic applications will continue during the next phase of the research programme; these will form the basis of the design of an operational prototype with both energy storage and heat pumping functions.



OVERSEAS  
VISITS

W M Evans to CERN 5-8 January for  
R807 Group meeting.

G E Bassett, R Blatchford, E Collie and S Ballard to  
CERN 3-12 January to work on Muon Drift Chambers.

FILM BADGE  
NOTICE

Period 1, for 1979 commences  
Monday 1 January. Colour strip  
ORANGE for beta-gamma films. Please  
make sure all previous dosimeters have been returned, to  
enable the records to be completed for 1978.

# Christmas Customs

*At Christmas play and make good cheer for Christmas comes but once a year  
(Thomas Tusser 1557)*

In ancient times the 25th December was the shortest day of the year. With less sunlight than on any other day, the pagan sun worshippers built huge fires in the hope that it would give their god the strength to come back to life again. As the daylight hours lengthened, this annual act appeared to have some effect. It was in 1752 with the introduction of the Gregorian calendar in England that the shortest day was moved to December 21st.

Theologians are not certain when Christ was born - it may have been in the summer or in the winter. Early Christians chose to celebrate the birth on December 25th since this was already a special day of celebration. The sun festivals were generally times of rejoicing, and it was not until 601 AD that Pope Gregory forbade the custom of sacrificing animals.

In the Middle Ages, Christmas was a jolly time. There was only a short period during the puritanical reign of Cromwell that feasting was replaced by fasting. When Charles II became king, he returned Christmas to a time of merriment. The Scots disapproved of Charles II and continued the puritan customs. This is why Christmas in Scotland is not the festival that it is in England.

## Trees and Holly

In cold northern countries some people believed that the kind fairies lived in the trees, and they would hang the branches of evergreens over their homes to keep the little people warm during the winter. In the warmer climate of Italy, the Romans used to decorate their houses with trees to honour Saturn - their god of all things that grow. Christians carried on decorating with evergreens and looked for Christian meaning in this custom. The "holly" is known in Scandinavian countries as the "Christ-thorn", and the English word is thought to have come from the word "holy". The fastening of holly wreaths to doors is an old American custom, which (like many other things) has been copied here in the UK.

## Santa

Gifts were given at the New Year even in Roman times. Only the English and German speaking countries have brought forward the gifts to Christmas time. In 1467 the first New Year card was printed, and is on display in the British Museum. Christmas greetings cards as we now know them became popular from about 1900.

In many European countries children receive gifts from Saint Nicholas - who rides all the way from Spain on a horse and leaves presents in shoes or wooden clogs. In North America, gifts are left by someone called Santa Claus who comes from the North Pole. His appearance in red robes with white beard and riding on a sleigh drawn by reindeer first appeared in Harper's Weekly around 1865. Since laced shoes are difficult to fill with gifts, Santa puts his inside stockings hanging by the fireside.

## Eat, Drink and be Merry

Every country celebrates Christmas with its own fare - and the English have quite a reputation for theirs. The Italians have a saying when someone is very busy, that "he has more to do than the ovens in England at Christmas". Probably the largest banquets were held in castles and manor houses during the Middle Ages.

Pork was always popular at Christmas feasts, since the pigs were killed late in November when they had grown fat on acorns and nuts. Peacocks were also fashionable because the feathers could also be useful as decorations. Turkeys were discovered in North America by the Pilgrim Fathers (and the Indians before them) and introduced to the Western World, together with coffee and tobacco around 1600.

## New Year's Day

New Years Day is a time for meeting friends, especially celebrated in Scotland. It is a worldwide custom for a man or boy to enter the house after midnight and wish everyone "A Happy New Year". In Scotland he is called the first-footer - and he must not enter empty handed - it is even considered lucky if he carries a small piece of coal. However beware! A woman first footer is thought to be unlucky!

*(Next Issue: New Year Resolutions!  
Send in your resolutions to the Editor).*

RESTAURANT SHOP  
CLOSURE  
0800 hrs to 1100 hrs only.

On Monday 18 December the  
shop will be open from

AERE RECREATIONAL ASSOCIATION At the AGM on Wednesday and Thursday, 11 and 12 October 1978 it was agreed that the Association subscription would be raised as follows:-

Ordinary Members	- from 30p per month to 39p per month OR from 7p per week to 9p per week.
Adult Family	from £1.50 p.a. to £2 p.a.
Junior Family	from 76p p.a. to £1.00 p.a.
Associate	from £4.02 p.a. to £5.00 p.a. payable in advance, Membership to run from 1 May to 30 April.

All memberships end on 30.4.79 and the renewal fee for Associate and Family Memberships are due in full from 1.5.79.

The revised rates for Ordinary Members will take effect on 1 Jan 79, and from that date the new rate will be deducted automatically unless you notify the Association Secretary and your Pay Office in writing to the contrary.

RUTHERFORD LABORATORY BULLETIN

Deadline for Insertions

1000 hrs Tuesday, 9 January 1979

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