

Remember Remember at the SNS

In a short ceremony, on Monday morning, November 5th Dr Geoff Manning cut the first lump of concrete from the floor of Hall 3, towards the construction of the SNS Target Station Plinth. Though quick to learn the skills of operating a pneumatic drill he was at one point in need of rather special assistance from a certain black-cloaked guy, famous for his explosive antics of an earlier era.

On the face of it, the digging of a hole is not the hottest news to have hit the pages of the *Bulletin* - but this hole is supremely symbolic of the gathering impetus (after months of detailed planning) towards the physical appearance on the ground of the Spallation Neutron Source.

Target Station

The target station plinth serves several purposes. It acts as a foundation for the massive super-structure which will contain some 6000 tons of iron and concrete and provides a massive shield against "groundshine" - the back scattering of neutrons towards the instruments which would cause unwanted background. It also allows the use of parts of the existing service trenches in Hall 3 to be used as shielded caverns to house equipment and special experiments. The hole will eventually be 12 metres x 17 metres x 3 metres deep, and will have a reinforced concrete tank filled with a sandwich of concrete and iron taken from the old Nimrod magnet sectors.

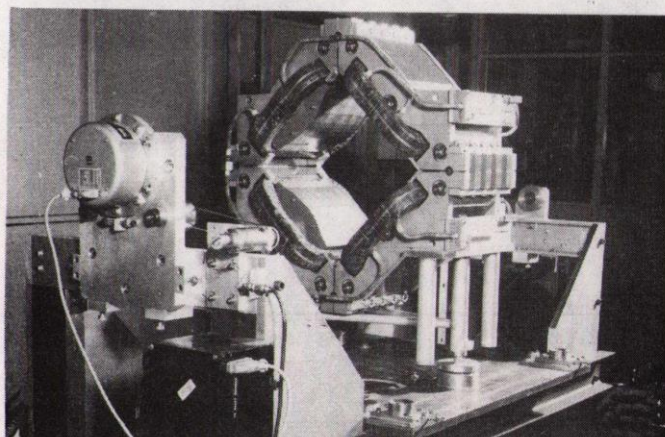
Trim Quadrupoles

One month earlier the first of the SNS synchrotron magnets was delivered to the site. Made in Denmark by Danfysik A.S., it is the prototype trim quadrupole, of which twenty are required in the 800 MeV proton synchrotron.

The quadrupole has an extremely small length/aperture ratio, hence end effects had to be taken into account when determining the shape of the pole. Tests have shown that the field distribution agrees well with predictions and therefore production can start immediately.



Dr Geoff Manning welds the pneumatic drill to good effect at the "Turf Cutting" ceremony in Hall 3.



The Prototype Trim Quadrupole mounted in the magnetic measurement bench.

(cont. on p.3.)

INTERNAL Events

RUTHERFORD LECTURE

LECTURE THEATRE - 1515 hrs
15 Nov: Dr R Hancox/Culham
"Fusion Power, Progress
and Prospects"

INTERACTIVE COMPUTING FOR CHEMICAL ENGINEERS

ATLAS CENTRE - 1030-1630 hrs
29 Nov: Chairman Prof C McGreavy
This meeting is to introduce
potential users to the
facilities available to them.

HEP SEMINARS

R61 CONFERENCE ROOM - 1100 hrs
14 Nov: Dr D Fairlie/Durham
"Instantons - a Review"
21 Nov: Dr J Kinson/Birmingham
"Recent Results from the
8.25 GeV/c K⁺p Experiment
(including the observation
of a narrow γ^* at 3170 MeV)."

FILM SHOW

LECTURE THEATRE - 1230 hrs
13 Nov: "NEUTRON SCATTERING"
introduced by Dr Bruce Forsyth

NIMROD LECTURE SERIES

LECTURE THEATRE - 1400 hrs
12 Nov: Prof E Paschos/Dortmund
"Testable Consequences of
Grand Unifying Gauge
Theories."
19 Nov: Dr R Tripp/CERN & Berkeley
"In Search of Baryonium."

EXTERNAL Events

ASTROPHYSICS SEMINARS

F5 CONF. RM. - CULHAM - 1400 hrs
14 Nov: Dr Keith Tritton/UKST Unit
Edinburgh
"Results from the UK Schmidt
in Australia, and plans for
a Space Schmidt."
28 Nov: Dr Philip Dufton/Queen's,
Belfast
"High-resolution Spectroscopy
of Early-type Stars and CNO
Abundances."

LOW TEMP. PHYS. SEMINARS

SUSSEX - 1415 hrs
20 Nov: J D Reppy/Cornell & Sussex
"Critical Velocities in
Superfluid ³He."

THEORY GROUP SEMINARS

DARESBUURY LAB - 1400 hrs
19 Nov: Prof J P Elliott/Sussex
"Limitations of Nuclear
Models in the Mass 50 to
150 Region."
26 Nov: Dr A L Stewart/Queen's
Belfast
"Applications of Perturbation
Theory to Photoionisation".

THEO. PHYS. SEMINARS

QMC - 1615 hrs
12 Nov: Dr D S McKenzie/QEC
"Breakdown of Hyperscaling
in Three Dimensions."
19 Nov: Dr F E Close/RL
"QCD Perturbation Theory
for Confined Quarks and
Gluons."
26 Nov: Dr R Marshall/RL and DESY
"QCD Jets from JADE."

THEOR. PHYSICS SEMINARS

CLARENDON LAB. OXFORD - 1615 hrs
15 Nov: Dr P Davies/King's
"The Direction of Time."
22 Nov: Dr D Sherrington/Imperial
"Spin Glasses."

PHYSICS COLLOQUIA

CLARENDON LAB OXFORD - 1545 hrs
16 Nov: Prof M W Thompson/Sussex
"The Channelling of Ions in
Crystals and Related
Phenomena."
23 Nov: Prof R W P Drever/Glasgow
"Gravitational Wave Detection."

ELEM. PART. PHYS. SEMINARS

WESTFIELD COLLEGE - 1400 hrs
15 Nov: Dr R Cashmore/Oxford
"The Gluon in e^+e^-
annihilation: evidence from
the TASSO detector."
22 Nov: Dr L Lukaszuk/Warsaw
"Reggeisation in Theories
with Broken Symmetry."

PART. PHYS. DIS. GP. MTGS

BIRMINGHAM - 1615 hrs
16 Nov: Dr A Hey/Southampton
"Missing Hadrons and Exotics."

HEP SEMINARS

CAVENDISH LAB CAMBRIDGE - 1500 hrs
14 Nov: Dr B R Webber/Cambridge
"Multi-quark States"
21 Nov: Dr A J G Hey/Southampton
"Missing Hadrons and Exotics."

ELEM. PART. PHYS. SEMINARS

NPd OXFORD - 1430 hrs
15 Nov: Dr W S C Williams/Oxford
"Deep Inelastic Lepton
Scattering as Reviewed at
the FERMILAB Symposium."
22 Nov: Prof D Lichtenberg/Indiana
"Meson Spectroscopy with
Phenomenological Quark-
antiquark Potentials."

NUCLEAR PHYS SEMINARS

NPd OXFORD - 1430 hrs
19 Nov: Dr R J Cashmore/Oxford
"Topical High-Energy Physics."

THEO. ELEM. PART. PHYS. SEMINARS

NPd OXFORD - 1430 hrs
16 Nov: Dr B Morel/Harvard
"QCD Factorization in
Higher Orders."

THEO. PHYSICS SEMINARS

TPD CONF. RM. - AERE - 1400 hrs
13 Nov: Dr D A MacInnes/Culcheth
"High Temperature/
Thermodynamics of UO₂ and
Implications for FBR Studies."
20 Nov: Dr J H Tair/AERE
"Uranium Enrichment."

NPd COLLOQUIUM

H8 CONF. RM. - AERE - 1530 hrs
22 Nov: Dr R L Nelson/AERE
"From Nuclear Fuels to
Pharmaceuticals by Gel-
processing."

Sales to Employees

Sales of scrap metal/plastics as set
out in RLN 12/73 will be made on
16 and 30 November at the scrap
compound rear of R40 from
1200-1230 hrs.

Christian Fellowship

The Fellowship meets in the R2
Conference Room at 12.30 p.m. each
Thursday. All members of staff and
visitors are very welcome to attend.

Film Badge Notice

It is period 12, colour strip
PURPLE for beta-gamma films. Please
check that you are wearing the
correct film badge and any old ones
are returned.

Next Film Change
3 December.

SNS (continued from p.1.)

The function of the trim quadrupole is twofold: to provide a fast change of focussing in the synchrotron during the 480 μ sec inspection period, and thereafter during the 10 msec of acceleration to provide fine-tuning of the horizontal and vertical betatron frequencies.

Because of these requirements, the programmable power supplies which feed current to the quadrupoles will not be easy to design. Danfysik who also have contracted to build the supplies, may well consider the second function more challenging than the first.

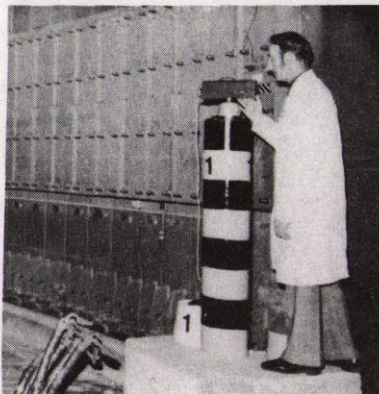
Visual Aid

A model of the SNS layout was commissioned to show the access and relative positions of components. It was difficult to visualise the interaction of the extracted beam with the accelerating ring, especially if a shielding tunnel was to be built. The model effectively shows this, and it is also easy to work out possible routes for removing active components from the machine. An additional feature incorporated into the model is a removable floor, to expose the catacombs for planning the routes for water and electrical services.

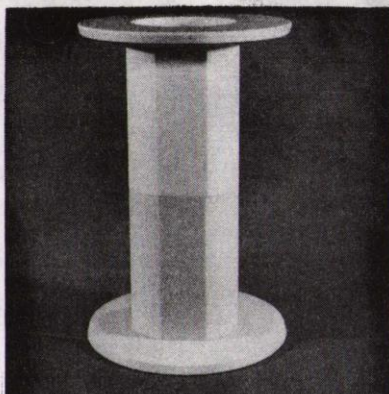
New Survey Method

The SNS has ten primary survey monuments in R5 from which the main dipoles can be positioned. Other components will be surveyed from the dipoles.

The device shown in the photo is an alignment tool as used at CERN for the determination of length measurement. A method of "length only" measurement, to position components, has been adopted in order to reduce the time spent in a radiation area. The time taken for a planned survey of these 10 points was approximately six hours at the first attempt, which is a factor of ten better than using previous methods.



Prototype Ceramic Chamber Arrives



Prototype Ceramic Vacuum Chamber for the singlet quadrupole magnets.

Electrically insulating vacuum chambers are required within the rapid cycling magnets of the SNS synchrotron to prevent eddy current losses and perturbations of the magnetic fields. The chambers are constructed from 20 to 30 cm long high purity alumina tubes and butt joined with a suitable glass which gives both the necessary strength and vacuum tight seals. The chamber for the singlet quadrupoles is constructed from only two sections and is 589 cm long including the ceramic flanges. The alumina sections arrive at the Laboratory with their ends preglazed, then the tubes are assembled vertically in a furnace where the temperature is raised to 1100°C for joining.

We thank Alan Carne, Roger Bennett, Mike Harold, Jim Liddbury and Robin Elliott for their assistance in compiling this article.

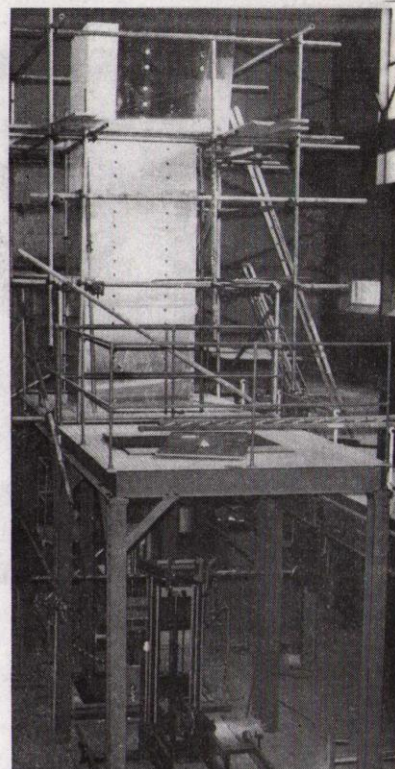
In the next issue we propose to feature the instruments that SNS will eventually support.

ICF for Chemical Engineers

A meeting to introduce potential users to the Interactive Computing Facilities available to them will be held at the Atlas Centre, Rutherford Laboratory on Thursday 29 November.

The speakers will be Dr F Stainthorpe, UMIST, Dr P E Preece, Leeds, Dr J Ingham, Bradford, Dr B Gray, Aston, Dr J Panton, Edinburgh. They will outline the way in which interactive computing is being used to solve problems in Chemical Engineering. Demonstrations will also be given of how the Rutherford and UMIST facilities can be accessed.

It should be noted that an important part of the programme sponsored by SRC is concerned not only with provision of hardware but with the means of carrying out interactive computing effectively. This means that considerable emphasis must be placed on supporting software and it is hoped that the discussions will identify what particular range of packages might be of value to Chemical Engineers.



Furnace under construction for joining ceramic sections.

OVERSEAS Visits

W G Seddon to CERN
from 12 - 16 Nov: for commissioning of delay line readout system on ISR.
H Roskell and L J Wyatt to DESY
from 12 - 16 Nov: for administrative discussions.
A Astbury to Canada and USA
from 12 - 12 Nov: to attend Experiment Evaluation Committee at TRIUMF and to visit laboratories.
J B Forsyth to Grenoble
from 19 Nov - 5 Dec: to carry out experiment.
J M Valentine to CERN and ILL
from 19 - 22 Nov: for discussions.
J G V Guy to Prague
from 19 - 23 Nov: for lecture and discussions.
M J Teper to CERN
from 25 Nov - 8 Dec: to consult with members of CERN Theory.

Training

COURSES

NATIONAL CENTRE OF TRIBOLOGY
11 Dec: "Wear Resistant Treatments & Coatings"

LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY
18-21 Dec: "Principles of Designing Microprocessor systems in Industry."

UNIVERSITY COLLEGE OF SWANSEA
9-11 April: "Basic Finite Elements Methods."

SEMINAR

BRUNEL UNIVERSITY
12-15 Nov: "Organisation and Management of R & D."



Fred Wedlock and Chris Newman played to a packed audience at our last meeting. The evening was a resounding success with Fred's humorous songs and Chris' outstanding guitar playing. The 'Navvies' performed a good supporting role with their own individual brand of folk.

The next meeting will be on Friday 7 December featuring "Wild Oats" a four piece band, with an attractive girl

singer, who play contemporary and traditional folk music. Also appearing is Alan White who performs very funny original songs.

Tickets are on sale at £1.20 in advance, or £1.40 at the door. Please contact:-

John Ellis	Ext.6369/494
Alan Hodges	Ext.6323
George Pullinger	Ext.6661

Crib Final Night

A Crib Final Night is to be held on Jan 25 1980 - the Singles and Doubles Competitions to be held on the same night. Anyone interested in entering these competitions should contact T Morgan R18 or P Craske R2 by 23 November. Players competing in the Lunchtime League are automatically entered. The entrance fee is 50p per person. Some of the games will be played at lunchtime so that there will remain only 32 Singles and 16 Doubles matches to be played on Finals Night.

It has been proposed that a DARTS NIGHT should also be run on the same night as the Crib. Will all those interested please contact Ian Foster R6, Peter Craske R2, or Tudor Morgan R18. The entrance fee is, again, 50p and there will be Singles, Doubles and Teams of four.

At Last

A Recreational Society DANCE

on Friday 23 November

Dancing to Billie Collins and her Band from 9pm - 1am

Tickets from

P Craske R2 or D Evans R34

A Clerical Housewife's Day

Look at the clock, trip on the mat,
Call the kids and feed the cat,
Wash and breakfast, coat and hat,
Bus to Rutherford.

Greet my friends, sit at my desk.
Gee oh gosh I need a rest
But duty calls, must do my best
For Rutherford.

What's in my tray? An RLQ,
A Notice, a memo or two.
I wonder when my pay slip's due
From Rutherford.

Five to twelve and I must rush.
Hope it's not the mini-bus.
What a queue, no good to fuss
At Rutherford.

Afternoon - I need a break.
Should I eat a piece of cake?
More work to do - must keep awake
In Rutherford.

Home again and work once more,
Dinner, ironing, wash the floor.
Tomorrow I'll go out the door
and bus to Rutherford.

Anon.

Lunchtime Films

The films are shown in the R22 Lecture Theatre on alternate Wednesdays at 1230 hrs.

14 Nov: 'A CURIOUS HISTORY OF BRITISH FOOD.' - a look at the preparation of food throughout the ages, and the origins of some of our popular dishes.

"COUNTY CRICKET COMMEMORATIVE STAMP." - the background to the design of this recent postage stamp issue.

28 Nov: 'UNKNOWN EIFFEL' - a look at the man who did many other things than just build the famous Tower.

'HUNGER' - a cartoon about what happens to you if you eat too much - be warned!

Neutron Scattering Film Show

This event, introduced by Dr Bruce Forsyth of Neutron Division, will take place at 12.30hrs in the Lecture Theatre on Tuesday 13 November.

The one-hour programme will consist of a film on the construction of the high flux reactor at the Institut Laue Langevin (ILL), a film on instrumentation for neutron scattering at ILL and an audio-visual programme describing neutron scattering research.



RUTHERFORD LABORATORY

BULLETIN

Deadline for Insertions

1000 hrs Monday 19 November

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