Distributed 13.10.64.

NI/64/Second Meeting

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Minutes of the meeting held at 2, Carlton Gardens, London, S.W.1 on 22nd September, 1964

Present: Lord Bridges (Chairman)
Dr. J. B. Adams
Sir Robert Aitken
Professor P. I. Dee
Professor B. H. Flowers
Sir Alan Hitchman
Sir Harrie Massey
Professor C. F. Powell
Dr. F. A. Vick
Dr. E. M. Wright
Professor A. W. Merrison
Dr. T. G. Pickavance
Dr. J. A. V. Willis (Secretary)

Mr. L. S. Smith attended on behalf of Sir Harry Melville for the discussion of items 6, 7 and 8.

Apologies for absence were received from Professor Brambell, Sir John Cockcroft, Sir William Hodge, Sir Harry Melville, Professor Wilkinson and Sir John Wolfenden.

1. MINUTES OF THE LAST MEETING

An amendment was made to the second paragraph of Minute 7.4 of the meeting on 16th March, 1964 (at the top of page 4) referring to the proposal for a high-flux beam reactor. This paragraph should read:-

> "The Chairman asked whether anything should be put in the five-year forecast for a high-flux beam reactor or other source of high neutron flux. Sir John Cockcroft said that he did not think that the Institute were at present in a position to put in any forecast. One reason was that the Physics Committee did not feel able to judge the scientific merits of the case in relation to the other proposals. They had concluded that a review by a wider group of scientists, especially solid-state physicists, was needed to prepare a case for Government support. Sir John did think that the Board ought to consider their long-term responsibilities for providing reactor facilities when they had clearer information to work on, but he suggested that it would be better to defer this consideration for the present."

With the above amendment, the Minutes of the meeting on 16th March, 1964 were approved.

2. COMMITTEES

The Board took note of the Minutes of the following Committee meetings:-

General Purposes Committee	-	13th April, 21st July and 3rd September
Atlas Computer Committee	-	6th May
Physics Committee	-	14th July
Personnel Committee	-	30th July
Research Reactor Committee	-	5th August

Matters arising from these minutes were discussed:-

2.1 General Purposes Committee: Professor Merrison said that financial approval for the Daresbury Laboratory restaurant had been received from the A.E.A.

2.2 Physics Committee:

Siting of a possible Nuclear Structure Laboratory: Sir Harrie Massey said that a panel consisting of Sir John Cockcroft, Professor Powell and himself had been invited by the Physics Committee to consider the siting of the suggested nuclear structure laboratory of N.I.R.N.S., should it be approved, and to make a recommendation to the Board. The Panel had met twice. They had received and considered memoranda from Birmingham, Liverpool, Manchester and Oxford making the case for location at Birmingham, Daresbury and Culham. The views of twelve other centres where nuclear structure research is carried out had been obtained and taken into account. The Panel had also taken account of the number of nuclear structure research workers likely to be available to use the laboratory in the different regions.

Sir Harrie gave the Panel's recommendations as follows:-

> "The Panel have come to the conclusion that, on the assumption that one nuclear structure laboratory only is approved as part of the long term N.I.R.N.S. programme, it should be sited at the Rutherford Laboratory as a successor to the P.L.A. It would then be possible to make use of many of the services and staff now absorbed by the P.L.A. The current expenditure of the P.L.A. which is £700,000 per annum would be an offset against the expenditure on the nuclear structure laboratory.
>
> In making this recommendation the Panel do not, of course, commit themselves to recommending that the nuclear structure laboratory should be built since this would be a matter for the next meeting of the Physics Committee to consider."

The Chairman said that the recommendations made by Sir John Cockcroft, Sir Harrie Massey and Professor Powell and the recommendation awaited from the Physics Committee as to whether a nuclear structure laboratory should be built were important matters which would require careful consideration. In the meantime provision for a nuclear structure laboratory had been put into the draft estimates and would of course be reviewed in the light of the decisions taken.

It was agreed that the siting panel should not be asked to answer detailed questions as to how they reached their conclusion but that the Board would welcome a short statement from them about the major considerations which they took into account. The Board also invited the Physics Committee's views on the recommendation that the nuclear structure laboratory should replace the P.L.A. as well as their views on the nuclear structure laboratory itself. The Board reserved their full consideration of the proposal until they should have the Physics Committee's views on these matters.

2.3 Personnel Committee: The Chairman drew attention to the appointment of Dr. A. C. W. V. Clarke to take charge of the Institute's central administration and finance on secondment from the Authority from the 1st November, 1964.

2.4 Research Reactor Committee: Dr. Pickavance said that a meeting of potential users of a high flux beam reactor or other high intensity neutron source had been held at the Rutherford Laboratory on 3rd July, 1964. A detailed account was being prepared and he hoped that it would be sent to the Board in time for the next meeting. Dr. Vick said that he hoped that a report of the A.E.A.'s Study Group which

would be sent to the Board as well as to other bodies concerned would also be ready in time for the next Board meeting. With reference to the special interest of Glasgow University mentioned at the last meeting (Minute 7.4) he undertook to write to Professor Dee.

3. PROGRESS AT THE RUTHERFORD LABORATORY - NI/64/7

In addition to the information reported in paper NI/64/7 Dr. Pickavance said that after the shut down Nimrod was now running again with an intensity of 6-8 times 10^{11} protons per pulse, and that the national hydrogen bubble chamber had now taken several hundred thousand successful pictures at C.E.R.N.

The following points were raised in discussion of Dr. Pickavance's report.

(a) It was suggested that a major effort should now be put into getting the intensity up to 10^{13} protons per pulse rather than 10^{12}. Dr. Pickavance said that the major effort was at present being put into the experimental programme and into increasing the reliability of the machine and going on to three-shift operation. He said however that there was little doubt that the intensity could be progressively increased and that the recent measurements of radiation damage were reassuring about the probable life of the vacuum vessel at a high intensity; very roughly they suggested a vacuum vessel life of five years at an intensity of several times 10^{12} protons per pulse. After discussion the Board expressed approval of the policy of giving the experimental programme the first priority at present.

(b) Dr. Pickavance was asked to explain the relationship to the figure of 140 research physicists stated to be running or preparing experiments on Nimrod with the figure of 250 given in the five year forecast as the number which Nimrod would support. He said that the figure of 140 would increase as bubble chamber physics got under way on Nimrod and when K-meson beams were brought into use.

(c) Dr. Pickavance was asked about the progress of the assembly of the heavy liquid bubble chamber and replied that it was going satisfactorily.

The Chairman said that the progress with Nimrod was very satisfactory and congratulated Dr. Pickavance on it.

4. PROGRESS AT THE DARESBURY LABORATORY - NI/64/8

Professor Merrison commented on the main points in his report NI/64/8. He said that the reason why the contract for the NINA vacuum vessel had not yet been let was that there were radiation problems, and time was being taken to make the best possible design. He said thatthe revised NINA estimate in his report required amendment to £4,580,000, a reduction resulting merely from the exclusion of certain charges from the capital sum, on the advice of the A.E.A.

Professor Merrison was asked to comment on the large increase in the revised estimate as compared with the original sanction. He said that the machine was as originally conceived. He said that the increase of £700,000, which represented 18% increase over the original estimate, was made up essentially of three parts: a quarter was due to price increases, a quarter was due to charges for installation, which would now be done largely by contract labour, and about one-third was due to underestimating. He said that the revised estimate was firmly based because the main plant contracts had been let at fixed prices. If it had not been possible to place contracts abroad, there would have been no alternative to placing development contracts for several items.

5. PROPOSED PROGRAMME AND ESTIMATES 1965-66 - NI/64/9

5.1 The Chairman said that there would clearly be long negotiations with the Department of Education and Science and the Treasury about the estimates. He asked for the Board's general observations on the proposals in paper NI/64/9 and said that subject to such observations he would like these proposals to be approved as the basis for negotiations.

5.2 Dr. Pickavance and Professor Merrison explained the comparison with previous forecasts given on pages 2-4 of the report and the proposed programmes outlined on pages 4-6.

5.3 The main discussion was based upon Table I on page 7 of the paper:

(a) Rutherford and Daresbury Laboratories: Attention was drawn to the shadow cut of £350,000 in the estimate. Professor Merrison said that he regarded half of this as a fair figure for shadow cut on the Daresbury estimate most of which was concerned with NINA construction. Dr. Pickavance said that assuming that the other half of the £350,000 must apply to the Rutherford Laboratory he would have to cut his programme to that extent, as there was no scope for a shadow cut on construction at the stage which the Rutherford Laboratory had now reached. The second experimental area was one item which would probably have to be deferred in such a cut.

Dr. Pickavance said that the Treasury might insist on negotiating on the basis of the Chief Secretary's figure. The Rutherford Laboratory component of this was £6.4 million at December, 1962 prices (£6.64 million after price adjustment as in Table I of paper NI/64/9). This was, as it always had been, a rock-bottom figure, from which he could not make any shadow or real cut. He wished the Board to know that if the net grant were less than this figure (corrected to current prices) he could not operate the Laboratory without deliberate reduction of the programme, leading to uneconomic use of Nimrod. The Board noted this statement. They agreed that their estimates should be based on a reasonable rather than a rock-bottom figure for the Rutherford Laboratory, and that it would be quite wrong to try to slow down the construction of the Daresbury Laboratory. They therefore agreed that they should not ask for less, for the Rutherford and Daresbury Laboratories, than the figure of £9.749 millions shown in Table I.

(b) Provision for Film Measurement and Data Processing Units at Universities: It was agreed that a case had been well made for the additional film measurement and data processing units but it was suggested that the way in which these were presented in the draft estimates was not quite right. It might appear from the draft that they were in competition with the proposed nuclear structure laboratory, whereas there was a strong case for regarding them as part of the present programme. It was agreed that the provision should be included in the Rutherford Laboratory section of the estimate, which would then become £7.254 millions compared with the Minister's planning figure of £7.26 millions. It was agreed however that special arrangements would need to be made for dealing rather separately with the money for these units in universities.

(c) Nuclear Structure Laboratory: It was agreed to leave the present figures in the estimate for the time being subject to amendment in the light of later information before the estimates were finally presented to the Treasury.

(d) Atlas Laboratory: It was noted that the Atlas Computer Committee would be meeting on 8th October and might make minor amendments to the estimates for the Atlas Laboratory.

(e) Policy in meeting university demands: A general point was raised

concerning the policy to be adopted on the scale of the university demands which the Institute should meet. It was agreed that the point should be further discussed at a later occasion after consultation with university departments. The point was made that the inevitable limitation of resources made it easier to concentrate on the best experiments.

6. BUBBLE CHAMBER FILM ANALYSIS EQUIPMENT - NI/64/11

6.1 Professor Flowers introduced paper NI/64/11 containing the Physics Committee's recommendations concerning bubble chamber film analysis equipment for universities. He said that the Physics Committee thought that four units should be provided and had set up a small panel to make recommendations on the siting of the first. The panel had recommended siting the first unit at Glasgow. He thought that it was right to give some indication of the basis on which this recommendation was made. The panel had found that there were two centres with particularly strong claims, namely Oxford and Glasgow. Both were well placed to make rapid progress with the first unit, but Glasgow were in the position that high energy physics should now be actively encouraged if they were to continue to work in this field. The Oxford team were particularly well placed to develop more advanced equipment for the next stage. It was part of their recommendation that the Oxford team should be given encouragement and assistance to do so.

Professor Flowers said that it was understood that the first set of equipment at Glasgow was to be made available for use by other university bubble chamber groups also. Professor Dee confirmed this.

6.2 The working agreement with the D.S.I.R. It was pointed out that this provision of N.I.R.N.S. units at universities was a somewhat new departure. The Chairman said that it was right to bring out this point. The division of responsibility for film measuring equipment with the D.S.I.R. was based on a working agreement described in Appendix I of paper NI/64/11. Mr. Smith said that the D.S.I.R. were satisfied with the working agreement under which the D.S.I.R. were responsible for the first generation film analysis equipment and the Institute were responsible for the second generation film analysis equipment and he would suppose that N.I.R.N.S. would also be responsible for the third generation equipment.

6.3 Answering a question as to why the requirement for film measuring equipment had not been foreseen sooner, Professor Flowers said that it had been foreseen in part but had expanded more quickly than had been expected. Also the university's computing facilities had proved less adequate than had been expected.

7. WORKING PARTY ON COMPUTERS FOR NUCLEAR PHYSICS - NI/64/12

Professor Flowers said that the Physics Committee had recommended that the Board should set up a working party under his chairmanship to study the computing facilities required for nuclear physics. He had drawn up a list of people who he thought should be members of such a working party and this list was given in the paper. The Board fully endorsed the Physics Committee's proposal and invited Professor Flowers to take account also of a question which was raised about his proposal to deal also with computing requirements in fields outside nuclear physics. It was suggested that while the working party's recommendations in the field of nuclear physics would carry great weight, any extension beyond this field should only be attempted with great caution. Professor Flowers said that he hoped to be able to put the nuclear physics needs into perspective, rather than to attempt a review of needs in all fields.

8. N.I.R.N.S. FINANCIAL AGREEMENTS WITH UNIVERSITIES - NI/64/13

Dr. Pickavance and Professor Merrison said that they had been considering the question of N.I.R.N.S. financial agreements with universities very actively since the last meeting of the Board and expected soon to be ready to make specific recommendations. The Chairman asked any Member of the Board who wished to do so to write to them on the matter.

Dr. Pickavance drew attention to the suggestion in Professor Cassels's letter of 31st July, 1964 that the U.G.C. should be asked to take over at the end of quinquennia recognisable programmes of work previously supported by N.I.R.N.S. that had become established. The Chairman said that he had a letter from Professor Brambell agreeing that this question should be explored but saying that there might be considerable difficulties. It was agreed that the Institute ought to take action quickly with regard to this suggestion in Professor Cassels's letter, as the U.G.C. had already written to universities about programmes previously supported by research councils, which might be taken over in the coming quinquennium.

9. PROPOSED EXECUTIVE COMMITTEE - NI/64/10

The Chairman said that in many ways it might have been easier to defer the formation of an Executive Committee until after the expected reorganisation following the Trend Committee's report. However, he was sure that such a Committee was needed without delay and he hoped that the Board would feel able to endorse the proposals made. The Board agreed to the proposals and the comment was made that the Committee was likely to be suitable to be continued in a new organisation. Dr. Adams who was asked to be a member of the Committee, said that he was sure that its members would have to devote a considerable amount of time to the work and he regretted he was not yet in a position to say whether he would be available to join the Committee. He promised to communicate with the Chairman after consulting the A.E.A.

10. COMPARISON OF EXPENDITURE AT THE RUTHERFORD LABORATORY AND C.E.R.N. - NI/64/14

The Chairman said that the comparison of expenditure at the Rutherford Laboratory and C.E.R.N. was clearly a complicated matter which the Executive Committee would wish to look at in detail. It was pointed out that the comparison was particularly valuable because of the fairly close correspondence in size and nature of work and because C.E.R.N. dealt only with high energy and nuclear physics and the cost of this work was therefore known without any doubt.

J. A. V. Willis,
Secretary.

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