

NATIONAL INSTITUTE FOR RESEARCH IN NUCLEAR SCIENCE

GOVERNING BOARD

Comparison of C.E.R.N. Expenditure and N.I.R.N.S. Forecasts

by A. Miller

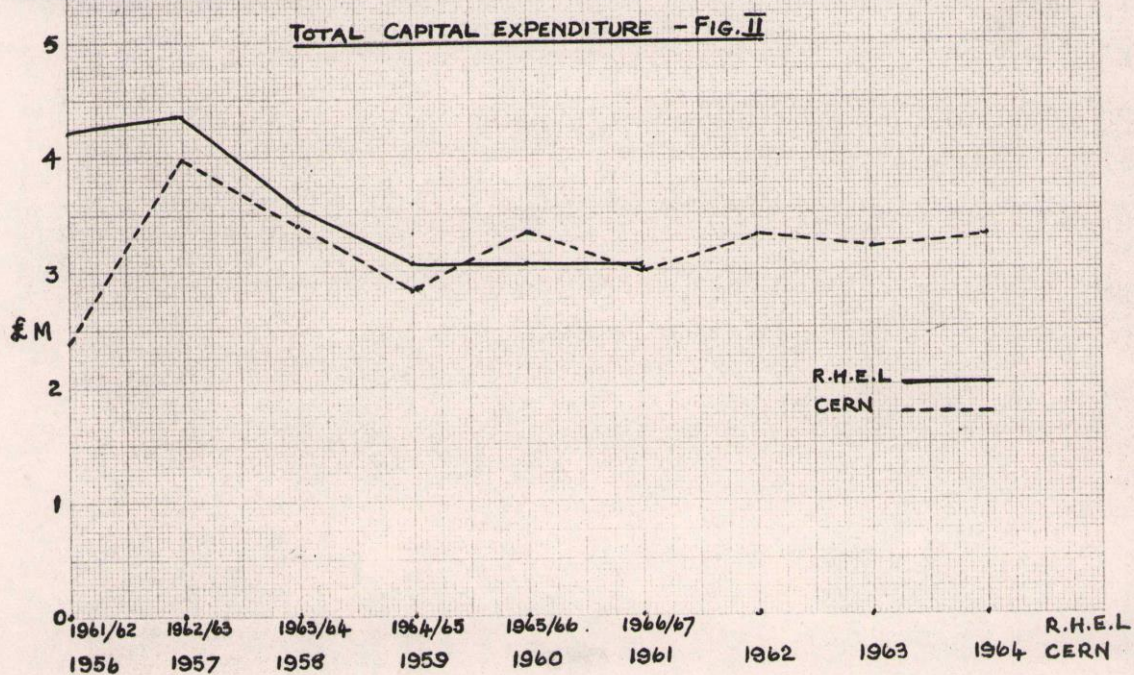
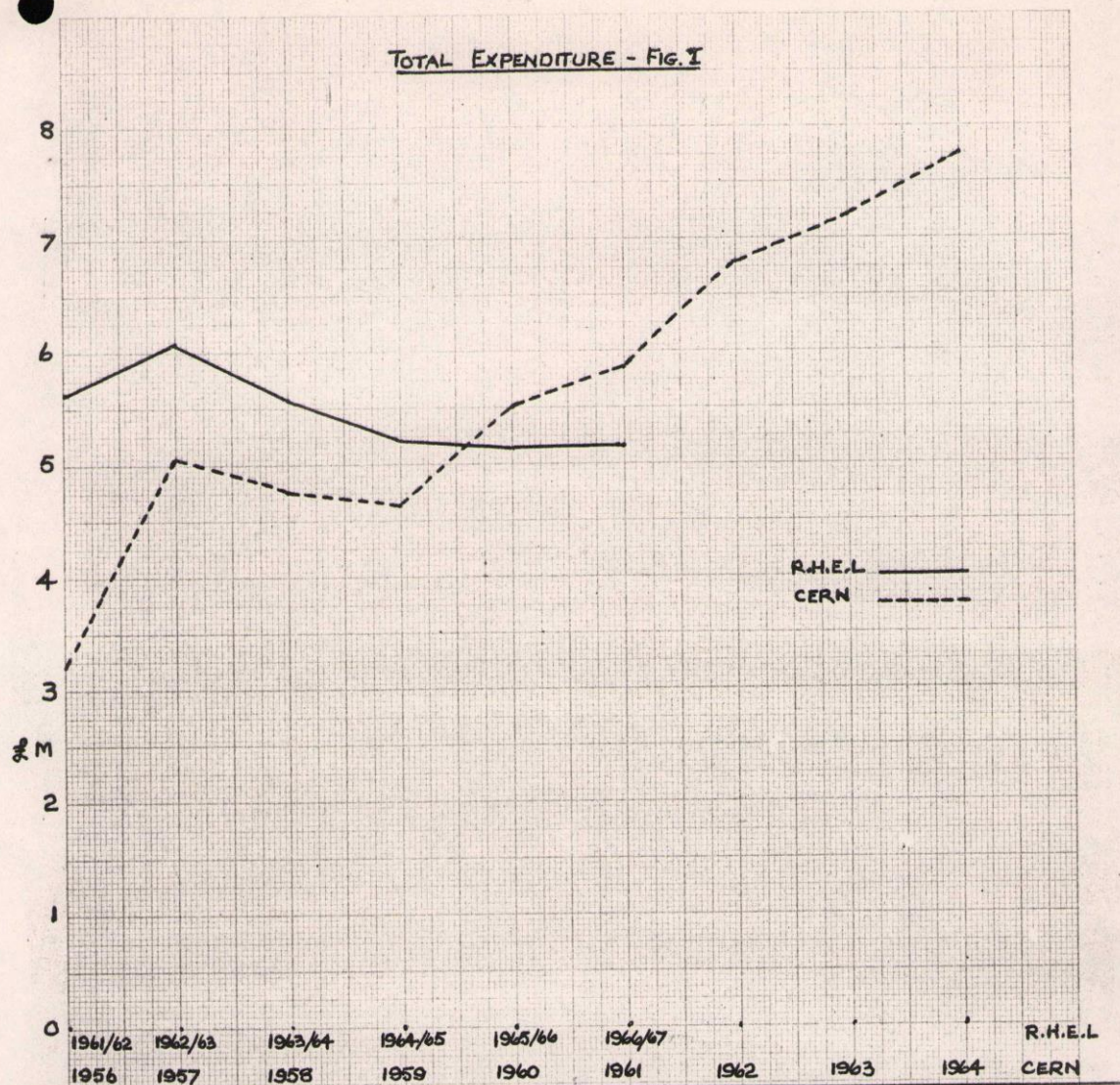
1. When the Board considered the paper "Future Expenditure by the N.I.R.N.S." (NI/61/20) on 18th September, 1961, it was pointed out that C.E.R.N. total expenditure increased steadily whilst the Rutherford Laboratory forecast showed a sharp falling off after 1962-63. The purpose of this paper is to compare C.E.R.N. expenditure with the N.I.R.N.S. forecasts for the Rutherford Laboratory. The first four years expenditure has been omitted in each case since the circumstances at the commencement of the two laboratories differed so widely. The Rutherford Laboratory, for example, had the support of A.E.R.E. from the outset, together with the loan of a large number of physicists and engineers.
2. Figure 1 shows the total expenditure and forecasts at the two sites and, although both show a peak in the sixth year, the trends are as stated at the meeting of 18th September.
3. The comparison of capital expenditure (Fig. II) shows peaks in the sixth year followed by very similar rates of expenditure in the succeeding four years. Figures III to VI show the main items of capital expenditure and from them it is apparent that although the peaks coincide, they arise from different causes. The Rutherford Laboratory, with a higher number of staff in the earlier years (Fig. VII), achieved a correspondingly higher rate of expenditure on plant. Building expenditure on the other hand was limited by the amount of local labour available at Harwell whilst C.E.R.N. found the building labour problem much less difficult.
4. Figure VIII shows a very similar trend in the total expenditure per head at the two laboratories. The high C.E.R.N. figure in 1957 is accounted for by the high building expenditure together with the small staff numbers.
5. The staff expenditure (Fig. II) shows a marked difference and it is here that the reasons for the differences in Figure I become clear. They are mainly due to:-
 - (a) higher salaries, etc. at C.E.R.N. - the cost per head at C.E.R.N. in 1962 is £2,140 per annum whilst the cost at the Rutherford Laboratory in 1961-62 is £1,280 per annum. When comparing trends it must be pointed out that C.E.R.N. figures are mainly actual and therefore take account of pay awards, etc. as they arose. At the Rutherford Laboratory, however, all the figures are based on current salary scales in accordance with the established Treasury practice.
 - (b) higher staff numbers at C.E.R.N. (Fig. VII) - although slower building up, C.E.R.N. has shown a steady increase which is not expected to level off until 1965, i.e. in the 14th year of the laboratory. R.H.E.L. numbers are expected to level off during 1966-67, i.e. in the 10th year at approximately two-thirds of the C.E.R.N. total. Rutherford Laboratory staff numbers in

Figure VII are the average numbers of N.I.R.N.S. employees in post. For a truer comparison with C.E.R.N. the whole R.H.E.L. line should be raised by 150 to take account of the approximate number of A.E.R.E. supporting staff (transport, contracts, etc.).

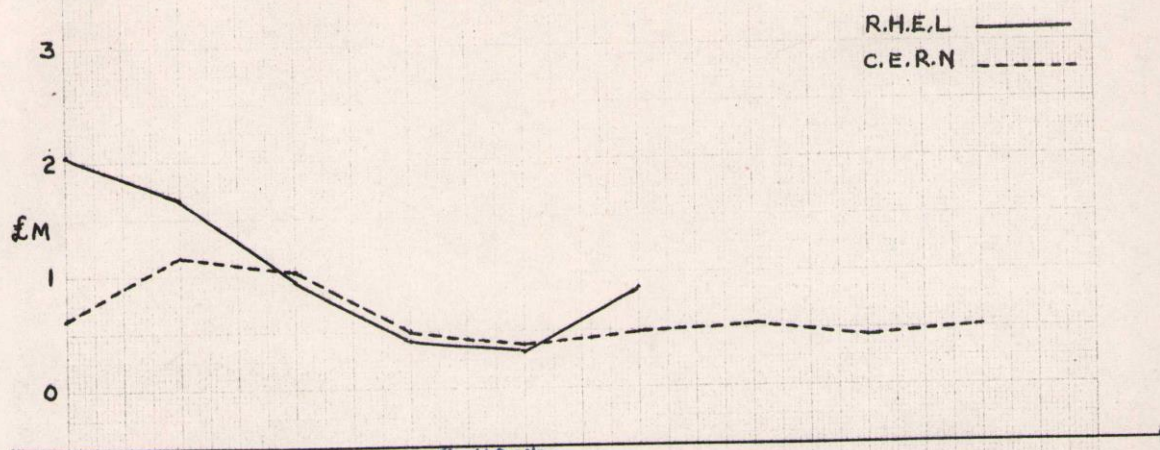
6. On the basis of a total staff complement of 950 at the Rutherford Laboratory, it appears that the forecasts by the N.I.R.N.S. are broadly in line with the experience at C.E.R.N. The Treasury have, however, recognised the right of the N.I.R.N.S. to submit proposals substantially increasing the forecasts for 1963-64 and for later years should a sufficiently strong case arise on scientific grounds. In addition, increases can be expected to cover future pay awards.

7. In this paper, the C.E.R.N. definition of "capital" has been used and Rutherford Laboratory expenditure has been re-analysed accordingly. This expenditure takes account of shadow cuts but does not include any provision for the Atlas Computer.

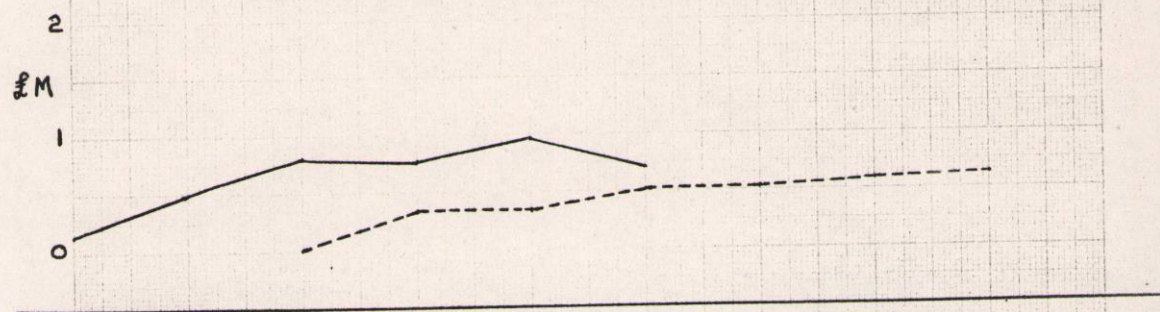
Rutherford High Energy Laboratory,
HARWELL, Didcot, Berks.



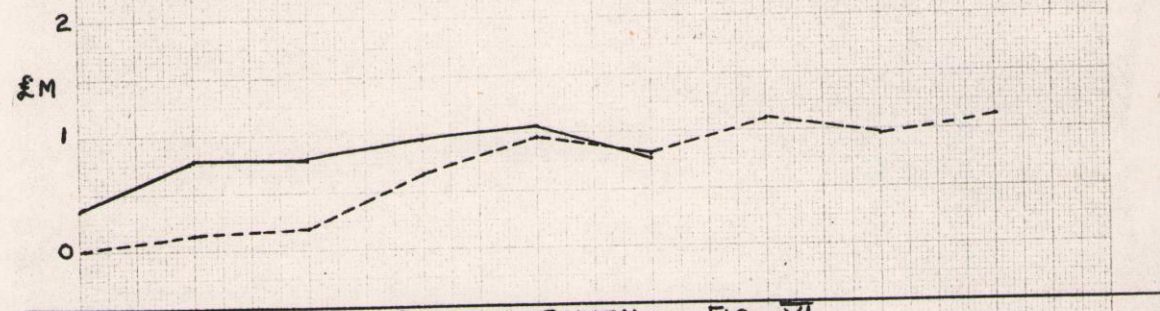
ACCELERATORS CAPITAL - FIG. III



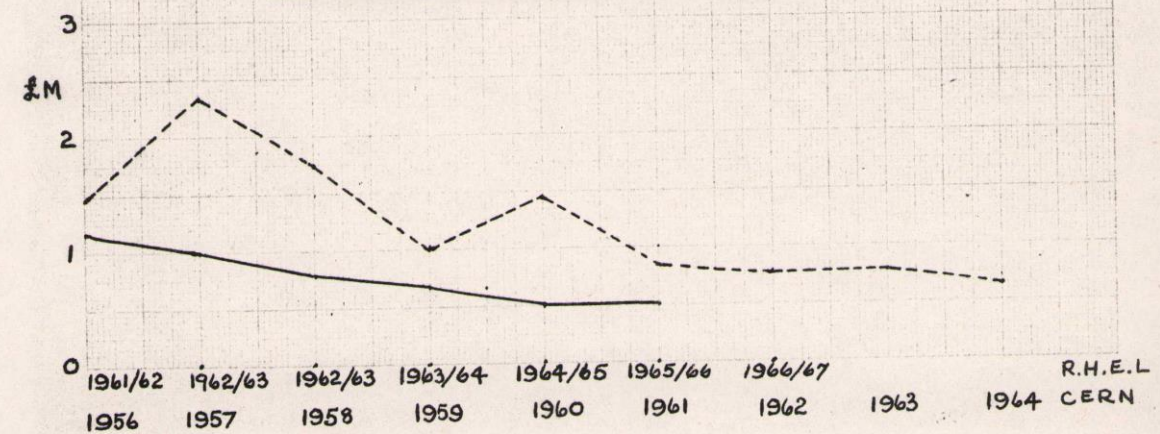
BEAMS AND ~~HANDLING~~ ^{SHIELDING} CAPITAL - FIG. IV



EXPERIMENTAL EQUIPMENT CAPITAL - FIG. V

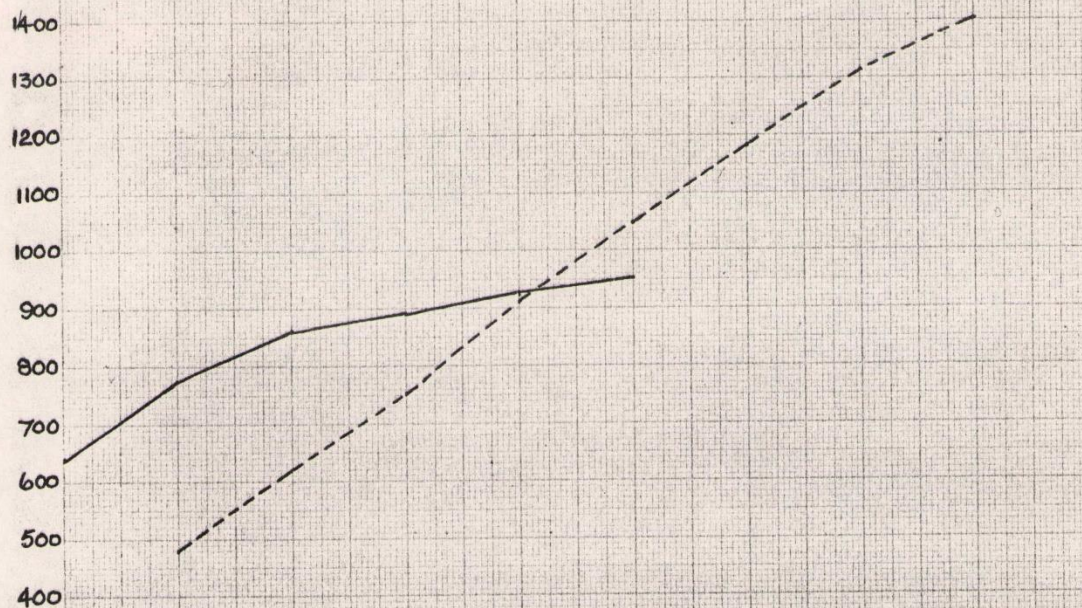


SITE AND BUILDINGS CAPITAL - FIG. VI

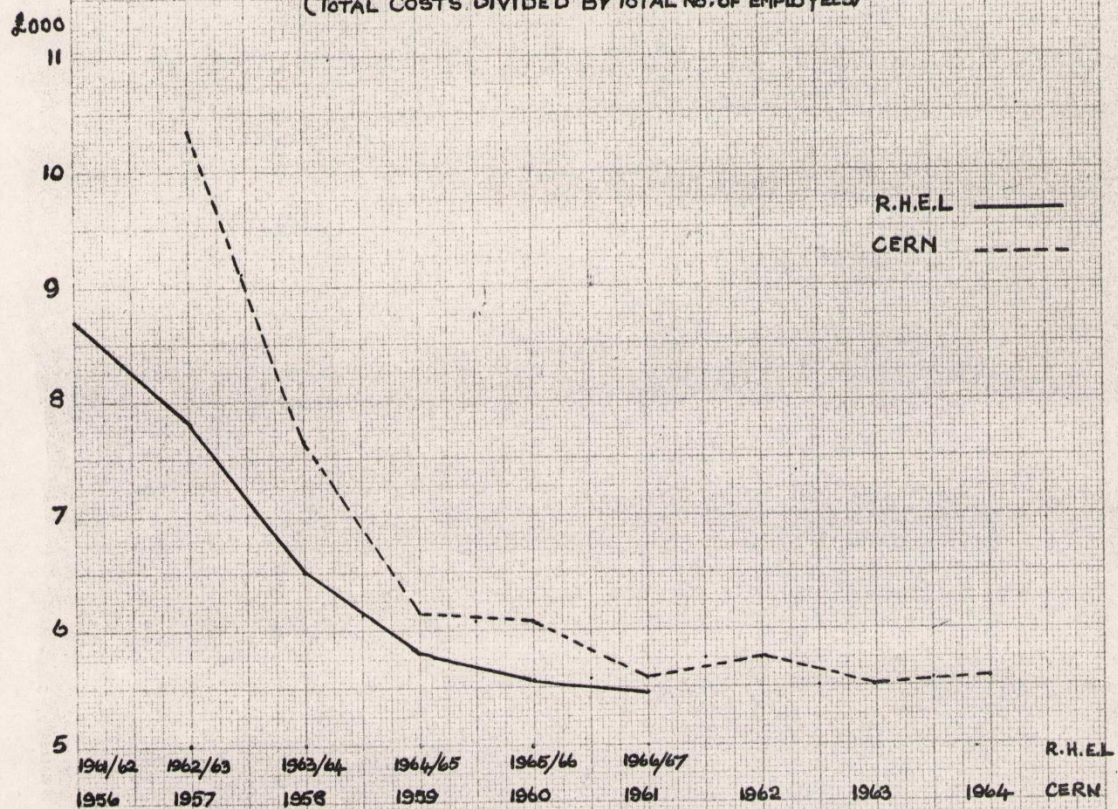


1961/62 1962/63 1962/63 1963/64 1964/65 1965/66 1966/67 R.H.E.L.
1956 1957 1958 1959 1960 1961 1962 1963 1964 CERN

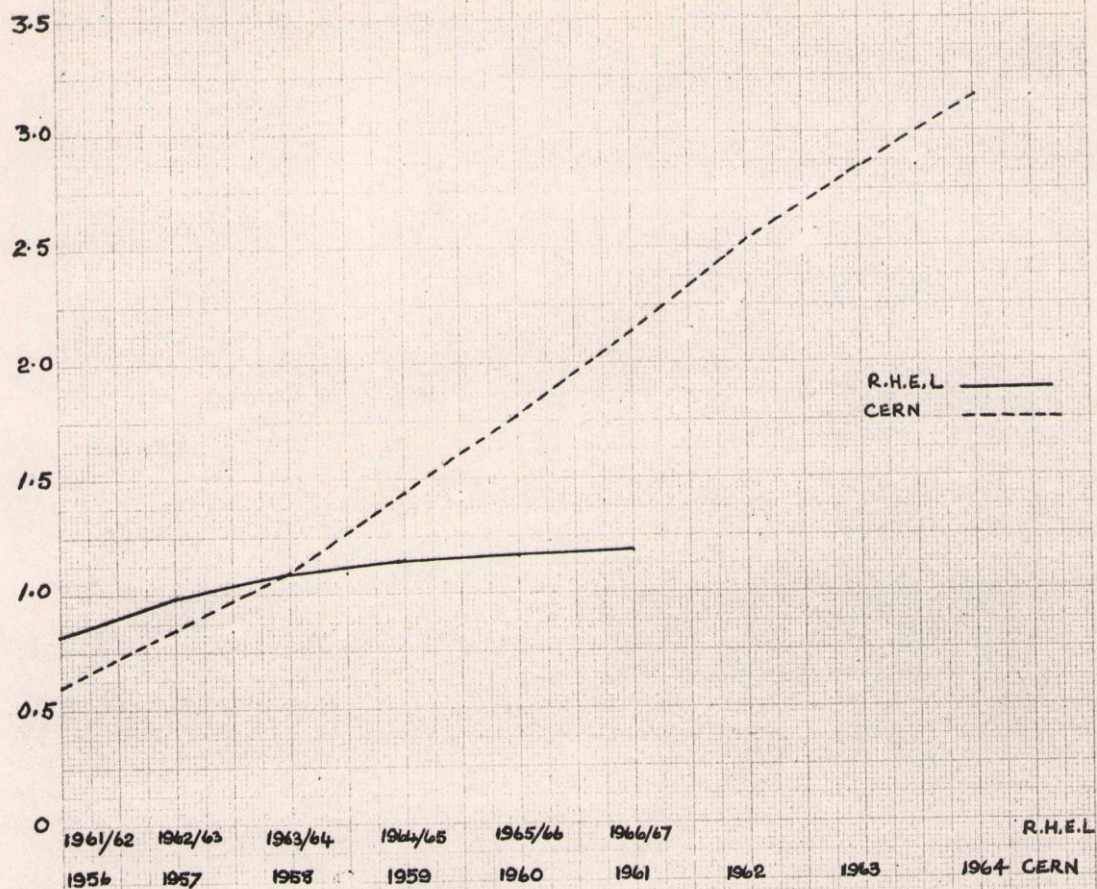
AVERAGE STAFF NUMBERS - FIG. VII



TOTAL EXPENDITURE PER HEAD - FIG VIII
(TOTAL COSTS DIVIDED BY TOTAL NO. OF EMPLOYEES)



TOTAL STAFF EXPENDITURE - FIG IX
(SALARIES, WAGES, SUPERANNUATION, TRAV. EXPENSES ETC.)



SOME COMMENTS FROM C.E.R.N.

The draft of paper NI/61/26 was sent to Mr. S. A. ff. Dakin, the Directorate Member for Administration at C.E.R.N., to enquire whether there was any objection to the use made of C.E.R.N. figures, which were taken from what were at the time unpublished sources. Mr. Dakin's reply contains some comments which the Board should see, and it is therefore reproduced below.

"Dear Willis,

You wrote to me on 16 November asking if there was any objection to you making use of certain CERN past figures and prognostications for the purpose of a paper which you are putting to your Board about your own forecasts of future expenditure. I have, of course, no objection. The CERN figures you quote either appear in our public accounts or by the time your paper gets a wider circulation will, I assume, have appeared as a Council document which is also public. There seem to me to be one or two points in your paper which may perhaps give slightly the wrong impression to your Board and may indirectly prejudice the picture of CERN as seen from the U.K. Many of these points are suggested by Mervyn Hine. You may like to take account of them.

1. In general the year to year comparison between NIRNS and CERN seems to us to be about two years wrong - since the significant dates are surely those when the major machine came into operation (particularly for the purpose of forecast expenditure after that date) and not the date at which the Organization started. Our feeling then is that, for instance, 1962/3 NIRNS should be compared with 1959 CERN and not with 1957. If you shift all the NIRNS graphs two years to the right, you will find I think that they make rather more sense by comparison with the CERN graphs.
2. I suppose that the early peak in capital expenditure, which is nevertheless relatively low for NIRNS than for CERN, is due to the fact that while your accelerator was more expensive than ours, your expenditure for buildings was rather less.
3. The latter fact may explain why your expenditure on beams and shielding is so surprisingly high - are you providing more shielding blocks rather than relatively radiation-proof buildings?
4. Several rather startling contrasts between the two laboratories - the cost of salary per head, the expected future rise in staff, the staff expenditure, and even possibly your future predictions of expenditure on experimental equipment - may be partly explained by the fact that, as I understand it, you expect to make a proportionately greater use of a visitor staff than even we do. With the result, I suppose, that the proportion of your senior graduate staff is lower and that you should be able to avoid some of the rise of staff which we have experienced and expected since the machine came into operation nearly two years ago. This, of course, does reflect on your possible future experimental capital expenditure, which is a true correction in so far as you expect a higher proportion of your experimental equipment to be made elsewhere and at other people's expense. But we cannot help wondering whether, in spite of these differentiating factors, you have made sufficient allowance for the future. Our present estimates of operating staff needed for the PS, for instance, are considerably higher than they were even two years ago, and the same is true for the figures of other

supporting staff, heavy lifting gangs and so on. We have also found that the installation expenses of equipment, particularly really large equipment coming from other institutions, are higher than we had expected. It seems to us quite possible, therefore, that even in your different circumstances you will find your estimates of future staff too low and that if they have to be revised upwards, your total expenditure of other sorts will have to rise with them.

I should be extremely interested to hear how your exercise goes from now on.

Yours sincerely,

(signed) S.A. ff Dakin

Directorate Member for Administration"