colleagues or not, drew unwarranted conclusions from insufficient data, and then she gently but firmly drew attention to the lapse. Her help and counsel were much in demand by her colleagues at home and overseas, and she was always ready to assist them. She will be sadly missed not only in the centre but by locust scientists all over the world.

Correspondence

A-levels and University Performance

SIR,—I would like to comment on D. G. Bagg's interesting article on A-levels and university performance (*Nature*, **225**, 1105; 1970), and to take a different view of the predictive value of examinations based upon a less literal interpretation of the results of analysis and consequently reaching more conventional conclusions.

I have made an investigation of the predictive validity of examinations from university entry qualifications to final degree for all candidates for the honours degree in mechanical engineering of the University of Salford from 1959 to 1964. This study is continuing; there is, however, a time delay of five years to allow for students who require five years to complete the normal four-year course. As in Bagg's work, the study is longitudinal, but attempts to predict only from one sessional examination to the following sessional or final examination taken one year later. The predictive criterion used is the average mark per script obtained by each candidate in each of the successive examinations. This criterion was selected because it gave significantly better correlation from year to year than the mark in any individual subject and also because the frequency distribution of average mark per script was found to be very close to a normal distribution for sessional and final examinations, thus satisfying an important condition for a linear regression model.

Table 1

Entry qualification	No. of candidates	Average mark per script	Correlation coefficient
GCE Advanced level in three or more subjects, including maths and physics	243	56·7	0·286
GCE Advanced level in maths and physics only	187	53·1	0·292
Ordinary National Diploma	40	58·0	0·461
Ordinary National Certificate (internally examined)	155	55·3	0·285
Ordinary National Certificate (externally examined, with four subjects)	121	54·8	0·422
Ordinary National Certificate (externally examined, with three subjects)	65	53·1	0·213

The condition of normal frequency distribution was not satisfied by the marks obtained in the entry qualifying examinations, these marks tending to be biased towards the minimum acceptable standards for the course. For this reason and because of the variety of entry qualifications offered by students, which in turn led to relatively few students in some of the categories of entry group, linear regression equations were not calculated to predict first-year sessional examination performance from entry qualification performance. However, product-moment correlation coefficients between entry qualification performance (divided into six categories of qualification) and average mark per script obtained in the first-year sessional examination were calculated and provide an indication of the degree of relationship between these variables. The average mark per script obtained in the first-year sessional examinations for all candidates in each of the

six entry qualification categories was also calculated and is shown, with the correlation coefficients, in Table 1.

The regression equations and correlation coefficients for performance in sessional and final examinations of candidates in successive years of the course are shown in Table 2, in which $x_{1,2,3,4}$ denotes the average mark per script obtained by a candidate in the first, second and third year sessional examinations and the final examinations respectively.

Table 2

Sessional examination	No. of candidates	Correlation coefficient	Predicted mark
First to second	265	0·660	$x_2 = 11·82 + 0·745\, x_1$
Second to third	232	0·723	$x_3 = 6·58 + 0·916\, x_2$
Third to final	233	0·736	$x_4 = 4·63 + 0·887\, x_3$

The correlation coefficients shown in Tables 1 and 2 indicate that performances in successive university examinations are more closely related than performance in GCE Advanced level or other entry qualifying examinations with subsequent performance in university examinations. It would be surprising if this were not so, in view of the relative homogeneity of the university situation compared with the variety of examining boards, schools and social backgrounds of the candidates before university entrance.

This factor, in conjunction with the reasonable surmise that undergraduates are, by the time they begin university courses, already highly selected from the general population as far as examination performance is concerned, leads me to conclude that final degree performance cannot be expected to bear marked relationship to performance in A-level examinations as a whole. This relationship can be expected to weaken with performance in a single A-level subject and to become negligible if factors affecting performance which are common to two or more subjects are removed in the regression analysis. This effect is clear in the multiple regression equations presented in Bagg's analysis. This is not to argue that A-level grades are unreliable and possibly hazardous predictors of future academic performance but that to expect more than a general indication of academic ability is to expect too much. That A-level performance does provide such an indication has been demonstrated by Petch[1], who states that of a sample of 3,523 students who entered a university in October 1956, after being examined by the Joint Matriculation Board, nine out of ten justified their selection by subsequently completing degree courses and that incidence of premature termination of courses was higher for less well qualified groups of students than for groups which obtained better results at Advanced level. An additional inference which may be drawn from Table 1 is that A-level performance is not the only indicator of the potential ability of undergraduates, and I suspect that this conclusion is as valid for other disciplines as it is for engineering.

Yours faithfully,

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University of Salford.

[1] Petch, J. A., *GCE and Degree, Part I. Joint Matriculation Board* (Manchester, April 1961).

University News

Geoffrey V. Ball, head of the Department of Ophthalmic Optics, has been appointed professor of ophthalmic optics in the **University of Aston in Birmingham**, and Dr Michael R. W. Brown, Bath University of Technology, has been appointed professor and head of the Department of Pharmacy, also in the **University of Aston in Birmingham**.