

at this level, so this experiment does provide an interesting evaluation of the selection tests.

## 5. Results and discussion

The most important results are given in Tables 1-5. As can be seen from Table 3, the correlation coefficients are generally very low, and as the sample is small, little can be said about the significance of the results; conclusions based on these results are necessarily speculative. Some of the subtest scores had fairly high negative correlations with some measures of ability, and this particularly applies to AH6 and WG. This suggests that these tests, which were not specifically designed with programmer selection in mind, may be misused by selectors who take a high score to indicate good potential, where it is in fact the subjects with lowest score in these subtests who performed best in the experiment.

CPAB VM and some other subtests did not correlate to any useful extent with any ability measures, but two subtests WG YM and CPAB LS stand out in Table 4. From this table, a low score in WG YM appears to go with good programming ability, and a high score in CPAB LS seems a fair indication that a testee will program well. The 'hits and misses' tables in Table 5 were produced by the Discriminant Analysis section of ICL's XDS3 Package, and show how many of the subjects predicted by subtests CPAB LS and WG YM to be among the top five (high group) and the bottom five (low group) performers respectively, actually had performances which fell into the predicted group in practice. Probable actual group member-

## References

- KULSRUD, H. E. (1974). Some statistics on the reasons for compiler use, *Software Practice and Experience*, Vol. 4, pp. 241-249.
- MORRIS, J., and MARTIN, J. (1972). *Computer Personnel Selection—2: Programmers*, National Computing Centre Ltd
- PENNEY, G. (1975). Aptitude testing for employment in computer jobs, *Proceedings of IFIP Conference on Computers in Education*
- SAVILLE, P., and SIMPSON, D. (1973). Selection testing for computer staff, *Data Processing*, Sept./Oct. 1973.
- SIMPSON, D. (1970). The aptitudes of computer programmers, *The Computer Bulletin*, Vol. 14, No. 2.
- SRA (1974). *Computer Programmer Aptitude Battery—Examiners' Manual*, Science Research Associates Inc.

## Book reviews

*Symposium on the Use of Computers in Shipboard Automation, The Royal Institute of Naval Architects, 1975; 104 pages. £10.00.*

The proceedings of this symposium consist of seven papers from various members of a UK study group set up to survey the progress of ship automation in this country and abroad. The group was set up by the Department of Trade and Industry and the project managed by the British Ship Research Association.

The papers surveyed developments in this field since 1967 and potential applications for computer based ship board automation. Consideration was given to technical, economic and personnel aspects of automation from the user's point of view with little contribution from equipment manufacturers.

Applications fall into three areas:

### 1. Machinery applications

Surveillance, data logging, control of such operations as start up procedures, speed control, lubrication, emergency shutdown and startup of standby units. Surveillance and control of refrigerated or liquid cargoes.

### 2. Bridge systems

Route planning, navigation, collision avoidance radar systems, automatic berthing control and communications systems.

### 3. General shipbusiness

Calculations of ship stability, structural loadings, cargo planning and administration.

The authors conclude that there is an economic case for bridge systems automation, mainly derived from enhanced safety, and that a computer system installed to perform this function could also handle some general calculation work. They see little advantage in centralised digital techniques for machinery control over existing

ship is calculated by the package after a statistical analysis of the unweighted performance figures. Both subtests clearly discriminated between the best and worst performers and thus appear to be valuable for picking the most likely prospects from a batch of applicants.

However from Table 4 it can be seen that neither CPAB LS nor WG YM produced scores that correlated at even the 0.30 level with the avoidance of logical errors—the measure of the students' ability to design programs. The subtests AH6 N + D and CPAB D had the best correlations with the measure. This was to be expected in the case of CPAB D which consists of flowcharting problems, but was less predictable for AH6 N + D which includes problems similar to those in CPAB LS with the letters in the series replaced by numbers and diagrams.

On the basis of this experiment therefore, the scores of either WG YM or CPAB LS if interpreted carefully appear to be good predictors of how well programmers perform in most activities involving errors in programming, and their weaknesses may be covered by other subtests. However the sample size would have to be increased considerably before definitive generalised conclusions could be made.

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localised analogue systems. There is an inconclusive discussion of the merits of a central processor serviced by a ringway data transfer system over the use of local stand alone microprocessors. The manning and training implications of automation were treated very superficially.

As a general comment the papers were disappointing and uninformative.

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*Cobol Programming—An Introduction* by T. Ekman and K. Nilsson, 167 pages. (Studentlitteratur, Lund, Sweden, £5.75).

This book is in effect a new edition of an earlier book in the same series—*Introduction to COBOL* by Anna Lysegård, though oddly there is no acknowledgement of this fact in the preface. Nevertheless the two books have the same structure; much of the text is virtually identical as are most of the programming examples. The original text needed little improvement; but that little has been provided. The lead-in chapters have been rewritten to bring them up to date, and a number of flowcharts have been included. More important than either of these, the readability has been greatly improved by numerous small changes in the wording. Indeed a sentence-by-sentence comparison of the two texts should be a required exercise for all aspiring technical writers (and not a few non-technical writers as well). If one had to make a criticism, it is that the authors did not take the opportunity to include something on programming style and debugging techniques. And of course one misses the little quotes at the head of each chapter in the original text.

The Scandinavian Studentlitteratur series deserves serious attention from anyone responsible for selecting textbooks. Although covering a smaller range than our own Macdonald-Elsevier series, the quality is perhaps consistently higher. Distributors in UK are Input Two-Nine Ltd of Purley, Surrey. G. EMERY (Aberystwyth)