

to express in terms of rules, language, and learning. Since these attempts have not been and are not likely to be successful, Dr. Taube concludes that the mechanization of language translation and learning and (by implication) of abstracting and indexing is not possible. The author writes interestingly, often amusingly, but the tone of his argument raises some doubt as to the author's detachment, an essential characteristic of a critic. This Dr. Taube himself seems to sense when he states in his introduction that at times his argument becomes quite devious and difficult to follow. "After all," he tells us, "if the fox twists and turns, so must the hound."

Briefly, here are some of his arguments: For machine translation of languages, language A has to be formally (mechanically) translatable into language B. This presupposes that languages A and B can be translated into formal elements A and B and that there is a one-to-one relationship between elements A and B. Dr. Taube claims that neither supposition is true. Chess playing by computer is cited as the classic example of machine learning. Dr. Taube distinguishes between *learning the rules* of the game and *learning to play* the game. The latter learning process cannot be mechanized. The rules of chess can be formalized, but at a cost. Dr. Taube estimates that a forty-move game requires  $10^{120}$  instructions. Learning to play chess, and by analogy learning, is not a formal process and can, therefore, not be mechanized.

This book can be read on at least two levels. On a rather unsophisticated level, it reassures librarians that their jobs will not be taken over by computers. Dr. Taube does more than this. He questions the validity of the work of leading researchers in the fields under discussion. About ten years ago, Dr. Taube introduced the Uniterm system of coordinate indexing and along with it levelled some serious charges against traditional indexes. This is not the time nor the place to discuss these charges. Suffice it to say that the questions are still under debate and that Dr. Taube's words and deeds have stimulated work in this field to the benefit of the profession. In writing this book Dr. Taube has once again put on his armor, but this time against an army of opponents who are ahead of the times (in fact, way out ac-

ording to Dr. Taube) instead of behind the times. There is no doubt that this book will stimulate thought and action on these important problems.—G. Jahoda, *Esso Research and Engineering Co.*

## Photocopying

*Photocopying from Bound Volumes.* By William R. Hawken. Chicago: ALA, 1962. xvi, 208p. (LTP Publications, No. 4) \$5.00.

For the past several decades, libraries have acknowledged a responsibility not only for selecting, acquiring, and organizing books but also for transmitting information by methods other than circulating library materials. Since the 1930's, microphotography has been the primary method of intermediate transmission. Although full-size copying was first developed in 1839, it was not until 1950 that techniques were perfected (xerography, transfer reversal) which gave libraries a tool for direct, full-size copying from bound volumes. Since that time the market has been flooded with a bewildering variety of equipment, all of which seem to promise the ideal solution to the information transmission problem.

Recognizing the impossibility of the average librarian's evaluating the myriad claims of competing types of equipment (one machine has been marketed by six companies under six different trade names!) the Library Technology Project, under a grant from the Council on Library Resources, commissioned William Hawken to analyze and report on all varieties of book copying devices, excluding microfilm.

Over the period of a year, Mr. Hawken tested twenty different copying machines. The report thoroughly covers the generic types of copying methods so that the reader is familiarized with the basic differences between contact reflex (diffusion-transfer-reversal, thermographic, gelatin-dye-transfer) and optical copying methods. Each type has certain problems as well as advantages, which are well summarized, and the author evaluates the permanence of the copy produced by each method.

Of particular value is the detailed analysis of each machine tested. The author has given machine specifications, price, exposure

area, possible damage to the book being copied, and a critique of the advantages and disadvantages of each piece of equipment tested. Detailed unit-cost studies are given for supplies and operator's time, with the latter reported in tabular form according to hourly rates ranging from 90 cents to \$2.40 per hour. A step-by-step operational analysis gives the reader a basis for comparing the relative complexity of operation between various types of machines.

Difficulty of operation is reflected in the unit costs, and quality of results is stated. The author admits that the waste factor is one of the important elements in evaluating the performance of a given type of copier but, as this is dependent on the skill and experience of the operator, the variable is too uncertain to be included in the unit cost figures. There is, however, a table showing unit costs assuming 10 per cent, 25 per cent, 50 per cent, and 100 per cent remakes.

As a result of the tests, a variety of techniques were discovered which avoid damage to the bound volume while making the copying operation easier. These techniques

will also result in a better finished product.

With their fourth publication, the Library Technology Project has performed a real service for the profession. Mr. Hawken has done an excellent job of listing copying machines available, their purchase price, capabilities and limitations, permanence of copy and the unit costs of operation.

This publication will be valuable to use not only in selecting equipment to be purchased but also in providing an excellent operator's handbook for libraries which have already acquired a copying machine.

A complementary publication surveying the literature of book copying methods is the author's *Production of Full-Size Copies*, which appeared in 1960 as Volume 5, Part 3 of *The State of the Library Art*, published by the Rutgers University Graduate School of Library Service.

Particular attention should be called to the quality of design, layout, typography and illustration which distinguishes this report from most similar publications being issued today.—*James E. Skipper, University of Connecticut Libraries.*

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