The forms of the motor representation are concerned with motor schemata, control laws, perceptual traces, and coordinative structures.

Literature on knowledge of results feedback or training schedules was not mentioned.

Although a chapter on such an extended area as human movement control can hardly be complete, it discusses the three subareas in a clear and pleasant way.

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Volume 2, chapter 8, pp. 511–587.
Representation in Memory – by David E. Rumelhart and Donald A. Norman.

The title of this chapter is somewhat misleading. Relatively few pages are devoted to the 'psychological reality' of representational formats that have been proposed for various categories of memory content. The literature on analogical versus propositional representation of mental images is reviewed in some detail. The largest part of the text deals with the more general topic of 'knowledge representation' and this would have been a more appropriate title.

The authors start off with an illuminating characterization of the fundamental concepts of representation and representational system. Then they introduce the four major 'styles' of knowledge representation which are presently in use:

- *propositional* (semantic features; symbolic logic and predicate calculus; semantic nets and spreading activation; frames, schemes, scripts),
- *analogical* (spatial),
- *procedural* (production systems), and
- *distributed* representations.

Expositions like these, which are mandatory in introductions to Artificial Intelligence or Cognitive Science, are still unusual in Experimental Psychology handbooks. I welcome the editors' decision to pay due attention to these basic topics. However, the chapter should have opened the Cognition part of the Handbook so that the other cognitive chapters could have profited from the conceptual and terminological framework developed in it.

The text seems to have been shelved for a number of years. The choice of models, theories and experimental data serving as illustrations reflects the taste of the seventies – an impression which is confirmed by the fact that the most recent literature references date back to 1983. This is a distinct disadvantage in view of the rapid progress connectionist models have made since then. Distributed knowledge representations – the trademark of connectionism – are indeed discussed but only in terms of an example taken from the

1981 volume edited by G.E. Hinton and J.A. Anderson. (The word connectionism does not figure in the Handbook's Subject Index.)

Although the chapter is conspicuous for the clarity of its expositions, the discussion of procedural respresentations left me in the air at an important point (p. 561 ff.; a serious printing error (?) in the example on page 563 was not conducive to better understanding). Why have the authors chosen to present production systems as the prime example of procedural representation systems? I agree that cognitive and other skills are often modeled in terms of production systems but they lend themselves equally well to representating declarative knowledge (e.g., see the SOAR and ACT(*) models by A. Newell and J.R. Anderson respectively). At any rate, the authors' classification is at variance with the Artificial Intelligence literature which tends to associate procedural representations with '(sub)routines' of imperative programming languages, with 'procedural attachment' in object-oriented programming, etc. However, I realize I shouldn't belabor this too much: if there is one point Rumelhart and Norman succeed in driving home in the final pages, then it is the relativeness of such oft-debated distinctions as between propositional and analogical, continuous and discrete, and... declarative and procedural representational formats.

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Volume 2, chapter 9, pp. 589–672.
Problem Solving and Reasoning – by James G. Greeno and Herbert A. Simon.

In Stevens' original handbook, human problem solving and reasoning were merely thrown in as a makeweight. They have their modest place at the very end of the chapter on cognitive processes by R. Leeper, and in the final section of the chapter on speech and language by G.A. Miller. The 84 pages of the present chapter 9 indicate that the study of human thinking has increased enormeously, both in size and in importance. The chapter is 30 percent longer than the average of the remaining chapters, but it is neither tedious nor exerting because of its clear partitioning and fluent style. Indeed, it provides an excellent review of the present wide and differentiated area.

The growth of the body of research over the half century since Duncker, Luchins and Wertheimer is mirrored by the quoted literature. Of the 230 references, just a few are from before 1960 and only one quarter from the present decade. Thus, the bulk of the reviewed work dates from the fruitful stage of the 1960s and 1970s that was set by Newell and Simon. Thanks to their view of the computer as a model of thought, and their insistence on its implementation in working programs, the study of problem solving has