The book becomes a history of the scientist in search of his social rôle, first in the open air of Greece, then in the classroom of the medieval university, in the Royal Society and the French Academy and the German research institute, up to the massive professionalized science of contemporary America. The theme is illuminated by a wide reading of European and American literature on science and by some fascinating genealogies of researchers in experimental psychology, which illustrate how the concept (and the folk lore) of a subject are inherited through a sort of international "apostolic succession".

Ben-David is too good a scholar to succumb to the temptation of drawing upon the past to predict the future. Nevertheless, he does give us a wise concluding chapter on the social conditions of scientific activity; and he offers some comment on an issue which has recently become important, namely, the effect of the values held by society on the content and scope of what is believed to be value-free science. From his conclusions it is possible to speculate on the way scientific effort is likely to go, now that its exponential burst of expansion is over. For scientists and those who have to participate in decision-making about science this is an invaluable book. It deserves to be widely read.

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BLOCK, JAMES H. (ed.), *Mastery Learning: Theory and Practice*. New York: Dryden Press, 1971. pp. 152.

A conservative demand for a return to "essentials" and "accountability" in education is receiving much attention among American educators and policy makers. The concept of "mastery learning", put forward by Professor B. S. Bloom, is being promoted as a strategy that will bring the schools to something like perfect effectiveness. In this volume James H. Block, a student of Bloom's, brings together 88 pages of short papers – two by Bloom, one by Carroll, three by disciples of Bloom – supplemented by abstracts of about 50 reports, dissertations, and papers having a direct or tangential relation to the main theme. It is most important here to place Bloom's proposals in perspective; the book itself shall be disposed of briefly. It is a convenient, inexpensively produced memorandum on current notions. As such, it makes no attempt to weigh alternatives thoughtfully; some of the writing is sheer propaganda. The abstractors seem often to have found what they wanted to find in the literature. For example, certain conclusions from a study by Behr are presented with no word of caution, even though they are shown to be without foundation in a monograph by Cronbach and Snow that is also abstracted in the book. However, the reader can use this book to inform himself about how the believers in mastery learning are thinking, and to evaluate their argument.

Locke said it all first. He optimistically saw man's faculties as "capable almost of anything", and saw excellence as the fruit of practice. If one but perseveres, he will master. But if a man attempts what is difficult he may fail and bruise his spirit to the point where he abandons learning. Hence the content to be learned should be set out in a gradual sequence through which the learner will progress at a comfortable pace. "When the mind by insensible degrees has brought itself to attention and close

thinking, it will be able to cope with difficulties and master them without any prejudice to itself and then it may go on roundly" (*Of the Conduct of the Understanding*). In *Thoughts on Education* Locke adds the one further ingredient: insistence on close study of the individual so that teaching methods may be matched to his needs.

Bloom and company restate all this, adding some justified condemnation of grading-on-the-curve and other competitive instructional practices. Their theory seems to add nothing to Locke save redundancy. Their practice, however, is important: they have tried out the strategy of precisely sequenced learning materials, frequent diagnostic testing, and extended instruction for those students who are slower to learn and have, they say, brought 90 per cent or more of the students to a high level of performance. Unfortunately, none of the papers in this book is sufficiently concrete to provide a model for the would-be user of the strategy.

Most American educational theory has had its base in Dewey. For him, lessons were primarily a vehicle through which the pupil would develop broad concepts, a style of self-critical thought, social skills, and the ability and inclination to express himself. Bruner and others recently reawakened enthusiasm for a curriculum that invites the pupil to develop his own point of view instead of ingesting prepackaged conclusions and algorithms. Tyler's long-lasting influence, seen in Bloom's own *Taxonomies*, was to stress transfer outcomes ("higher" mental processes, belief systems, emotional sensitivities); these develop gradually and are not to be impressed on the pupil by direct lessons. Even though Bloom gives passing mention to "the realm of ideas and self-development", his arguments seem to abandon all Deweyan thought. The emphasis is squarely on the content of lessons, never on the concomitant outcomes (save for the effect of success on self-concept and willingness to persist). The content is imposed: the teacher chooses it, the teacher knows the desired response, the teacher evaluates with his own template.

The attentive reader will find the single paragraph that says the approach is limited to "closed" subject matter, where knowledge is not changing and curriculum makers have agreed on what the pupil should be trained to do. Moreover, it is restricted to "sequential" contents, divisible into parts that are first mastered and then assembled into more complex performances. This muted caveat restricts the Bloom strategy to just a portion of the curriculum. From Dewey to the new math, modern educational theories have stemmed from the 20th-century view that knowledge is emergent, in the individual and in the culture.

There are obvious benefits in individualizing instruction by altering pace and matching remedial lessons to precisely identified student deficiencies. The strategy is well-suited to the basic skills of reading for plain sense, computation, and handwriting. It is understandable that Bloom, Bereiter, Jensen and others became discouraged about teaching for transfer when the compensatory-education programs of the mid-1960's failed. If we do not know how to improve understanding and learning abilities in pupils where they are weak, perhaps the schools ought to hammer home the minimal skills needed to be employable. Thus even if some children require a long time to reach mastery, they will have something to show for their years in school. But Carroll estimates that the bottom five percent of pupils will need five years to learn what the top five per cent learn in one year. If the Bloom proposals were to be accepted, we would soon need another Ayres to write another *Laggards in the Schools*.

What the pupil gains from all-out concentration on what can be "mastered" is not an education. The strategy probably cannot be extended even to verbal self-expres-

sion and reading comprehension. To channel as much time as is needed into a mastery regimen for "closed" subjects is to impoverish the program. It is hard to see how this can lead to anything but a caste system in which slow learners use their time on "fundamentals" while fast learners go on to intellectual and humane learning. No one has yet suggested how one can have the benefits of mastery without enchaining the student.

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BROSAN, GEORGE, *et al.*, *Patterns and Policies in Higher Education.* Harmondsworth: Penguin, 1971. 186 S. 40 p.

*Innovation in Higher Education: New Universities in the United Kingdom* Paris: OECD, 1969. 250 S. DM 23,30.

*Innovation in Higher Education: Technical Education in the United Kingdom.* Paris: OECD, 1971. 145 S. DM 13,60.

Die Idee für das Buch von Brosan und seinen Kollegen geht auf eine 1969 in Cambridge stattgefundene Konferenz zurück, auf der Probleme des weiterführenden Bildungssektors in Großbritannien diskutiert wurden. In dem Bändchen wurde eine Reihe von thematisch und konzeptionell unterschiedlichen Beiträgen zusammengestellt, die durch mehr als ein Oberthema und zwei Buchdeckel zusammengehalten werden. Der Reiz des Buches besteht in der bewußten thematischen Überschneidung der einzelnen Beiträge und der an verschiedenen Stellen wieder aufgenommenen Diskussion kritischer Punkte.

Einer Einleitung (P. Venables), die in groben Zügen die Norm einer über die Sekundarstufe hinausgehenden Bildung für breite Bevölkerungsschichten begründet folgt ein Kapitel, in dem die wichtigsten Ergebnisse einer Projektion der enormen Expansion (des akademischen Teils) des "tertiären Ausbildungssektors" entwickelt und dargestellt werden (R. Layard und G. Williams). Im dritten Kapitel (P. Venables) wird ein Überblick über die historische Entwicklung und die gegenwärtige Struktur der tertiären Stufe in England gegeben. Damit ist der Grund gelegt für die folgenden zehn Diskussionsbeiträge von G. Brosan, Ch. Carter, und P. Venables, die in den Kapiteln 4 bis 7 zusammengestellt sind.

Leitthemen der Diskussion sind die Entwicklungsperspektiven des sogenannten "binären Systems", das den Bereich der tertiären Bildung in England charakterisiert. Die eine Hälfte dieses Systems sind die "autonomen" Universitäten (von den "privaten" Universitäten wie Oxford und Cambridge bis hin zu den Mitte der fünfziger Jahre gegründeten Colleges of Advanced Technology (CATs), die 1966/67 autonome technologische Universitäten wurden), während die andere Hälfte des binären Systems aus "öffentlichen" Institutionen besteht, die in stärkerer Abhängigkeit von den jeweiligen lokalen Gegebenheiten ein breites Spektrum von Ausbildungsgängen und -formen bieten – vom Berufsschulniveau bis hin zu (primär technisch-wirtschaftlich orientierten) akademischen Qualifikationen. Vor dem Hintergrund der Prämisse, daß bisher benachteiligte Bevölkerungsschichten – relativ unabhängig von der sozialen Herkunft vor allem Frauen – verbesserte Weiterbildungschancen mindestens bis zum heutigen Niveau der USA erhalten müßten, diskutieren die