Beyond the information given by Jerome S. Bruner, George Allen & Unwin, 1974, 502 pages, £5.85

Jerome S. Bruner is one of America’s most distinguished psychologists. For many years Professor of Psychology at Harvard and a founder and director of the Center for Cognitive Studies at Cambridge (Mass.), he is now a most welcome émigré as Watts Professor of Experimental Psychology at Oxford (Oxon). This book is a major collection of his papers, edited with comments preceding each section by J. M. Anglin. These comments serve mainly to set the papers in historical and contemporary context, avoiding critical comment or interpretation so that we are, rightly, presented with Bruner speaking for himself. The papers are arranged in sections: Perception, Thought, Skill in infancy, Representation in childhood, and Education. In each we find penetrating ideas and some important experiments. Many of these papers are very well known; but it is useful to have them available in a volume for reference, and their interest is enhanced by the context of related papers available for immediate reference and comparison. Included are such rightly celebrated papers as “On perceptual readiness”, and “On the perception of incongruity” which describes what happens when familiar categories are mixed—by switching black and red for the suits of specially made playing cards. Among more sober results Bruner and Postman got responses (with short exposures) such as: “I can’t make the suit out, whatever it is. It didn’t even look like a card that time. I don’t know what colour it is now or whether it’s a spade or a heart. I’m not even sure now what a spade looks like! My God!” Various kinds of disruption of perception are analysed.

This is an exciting, highly suggestive experiment.

Some of these papers are straightforward accounts of experiments, others are clearly intended as literary squibs to fire the imagination. Take for example the opening of “The conditions of creativity”.

“There is something antic about creating, although the enterprise be serious. And there is a matching antic spirit that goes with writing about it; for, if ever there were a silent process, it is the creative one. Antic and serious and silent. Yet there is good reason to inquire about creativity, a reason beyond practicality; for practicality is not a reason but a justification after the fact. The reason is the ancient search of the humanist for the excellence of man: The next creative act may bring man to a new dignity.”

This is Bruner the stylist, enjoying writing—and why not? Writing in psychology, as William James showed, does not have to be turgid; as demonstrated also by George Miller to whom this book is dedicated. One might stop to wonder while reading this passage just what ‘antic’ means, or is taken to mean—however good a job it does in waking the reader and tuning him to Bruner’s style. The Shorter Oxford Dictionary relates ‘antic’ to ‘grotesque’, as: “absurd from incongruity, grotesque, in gesture, shape or attire”; and “a performer who plays a grotesque part, a clown ...”. In Hamlet (1, V, 172) we find: ‘an Anticke disposition”; and Marlowe (Edward II, 1, I, 59) has the famous lines (from which of course Aldous Huxley takes Antic Hay for his novel containing the grotesquely creative inventor of pneumatic trousers, Theodore Gumbrill, BA Oxon):

“My men, like satyrs grazing on the lawns,
Shall with their goat-feet dance an antic hay.”

Is Bruner referring us back to our half-forgotten exposures to ‘antic’? Was he, perhaps, making use of his experience of the switched colours of playing cards, to produce a verbal shock and puzzlement, to make his reader break down and restructure his thoughts? He makes further use of this odd word, in what turns out to be a kind of prose poem on the role of the psychologist and the dignity of man:

“Make no mistake about it, it is not simply as technicians that we are being called, but as adjutants to the moralist. My antic sense rises in self-defense. My advice, in the midst of the seriousness, is to keep an eye out for the tinker shuffle, the flying of kites, and kindred sources of surprised amusement.”

Then we are given the central idea—that the hallmark of the creative is effective surprise. How does the creative surprise of the creative arise, how generated?
"I would propose that all the forms of effective surprise grow out of combinatorial activity—a
placing of things in new perspectives. But it is somehow not simply a taking of known elements
and running them together by algorithm into a welter of permutations. One could design a
computer to do that, but it would be with some embarrassment, for this is stupid even for a
computer ... Invention is discernment, choice. If not a brute algorithm, then it must be a
heuristic that guides one to fruitful combinations. What is the heuristics?"

We are not presented with heuristics for creating; but to expect this would be to ask too much on
current knowledge. Poincare's notion of feeling for beauty of mathematical or geometrical elegance
is accepted as part of the story; but, also that there is, for each kind of activity a kind of 'intuitive
familiarity', to be specified by the kind of activity involved which must be appreciated to understand
how we are creative. Bruner says also that: "The triumph of effective surprise is that it takes one
beyond common ways of experiencing the world". So there is here acknowledged paradox, for
creativity is seen as given both by following techniques and by winning divorce from the obvious.

This essay first appeared in 1962, somewhat before the impact of Artificial Intelligence. Bruner
seems at that time to have regarded machines and programs as little to do with processes of human
thought or perception, except perhaps to threaten our dignity. He does however espouse the
Craikian and Bartlettian notions of 'internal models' and 'schemata' which turn out to be basic to
machine intelligence, limited as so far it is. Bruner sees perception as a creative activity, making
sense of the world from limited data. This of course is the meaning of the book's title, which is
also one of the most interesting of the papers: "Going beyond the information given", which first
appeared in 1957. This opens with a quotation from Bartlett (F. C. Bartlett, Thinking, 1951):

"The bother is that nobody has ever been able to find any case of the human use of evidence
which does not include characters that run beyond what is directly observed by the senses. So,
according to this, people think whenever they do anything at all with evidence. If we adopt that
view we very soon find ourselves looking out upon a boundless and turbulent ocean of problems."

Bruner's response to this is: "Bother though it be, there is little else than to plunge in". What he
fishes out are the concepts of classification and coding. Classification is introduced with a colourful
phrase from William James: "Hello! Thingumbob again". We may sometimes wonder whether this
verbal fun and frolic is much more than stylish hand waving; but even so it is worth reading, for it
waves us on with enthusiasm urging us to join him fishing in Bartlett's ocean of problems which is
cognitive psychology. There is meat: the notion of coding is applied with some power, and related
to observations and experiments. There are, too, suggestive implications for education. Bruner is
not drowning in these problems. He is calling out: "Look chaps, here is the deep end. I can't see
the bottom yet, but these are good goggles."

Bruner's most recent work is on perceptual development in infants. Here are elegant
experimental techniques of considerable technical difficulty. His technique for investigating infants'
recognitions and interests, by monitoring the sucking of the feeding bottle, allowing babies to
control the focus of slide projectors, is a tour de force.

Bruner is not afraid of talking about attention in babies (a taboo word but a decade or so ago in
some experimental journals) and even intention. Perhaps the power of experiment is at last
overcoming philosophical scruples in psychology, as it has over the last few hundred years in
physics. If Bruner is going a little beyond the information given, he always strives after more
evidence, and he employs it with an enthusiasm, charm, and courage, which makes much of
academic psychology appear by contrast merely academic.

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Learning and perceptuo-motor disabilities in children by K. Wedell, John Wiley, Chichester, 1973,
138 pages, £2.75

It is not difficult to feel sympathy for people working with and trying to teach mentally disabled
children. Occasionally there are breakthroughs and these are uplifting, but generally the story is
that the child's development remains stubbornly resistant to the efforts of teachers, parents, and
other well-meaning individuals. This lack of progress quite naturally resigns one to the view that
the child has the disability because of his brain or of some malfunction in his nervous system
which one can do little about. Thus, the term 'brain-injured' tends to arise as an explanation of the child's lack of ability. Or one labels the child as 'dyslexic' with the implication that there is something wrong with his brain which is preventing him learning to read properly. This medical-type diagnosis is essentially pessimistic and offers no encouragement to a teacher. Also, it has the effect of absolving the teacher of responsibility and placing it squarely on the shoulders of the unfortunate child. The most refreshing thing about Dr Wedell's book is that it completely rejects this position and argues instead that what we should be doing is not pigeon-holing disabled children, but examining in detail what it is they are failing to do or are doing wrong, and then trying to put it right by means of a specially designed teaching programme. This is the approach of the pragmatic operant researcher. The important assumption is that, when a child fails to perform successfully on some task which we set him, then he fails because of a poor teaching programme, in the broadest sense, and not because of his poor brain. So the burden is transferred to the teacher who is also the researcher. The first step is to analyse the task. The second step is to diagnose the child's area of difficulty, which will be in the form of a hypothesis. The third step is to design a programme testing the hypothesis. This is the strategy adopted by Dr Wedell. First, he sketches out a rough model of the components involved in a skill, such as copying a design with a pencil and paper, namely receptor efficiency, sensory organisation, decision making, motor organisation, and effector efficiency. Then he looks at some research which tries to separate out these things in a child's performance, in particular sensory and motor organisation. Finally he suggests some simple training programmes to put things right.

I have a great deal of sympathy with Dr Wedell, since a few years ago I also wrote a book with the same underlying strategy. Though I feel the book was a failure, my faith in the strategy remains. Like myself, in spite of good intentions, Dr Wedell has not succeeded in the task he set himself. The divisions between the various components in his model become increasingly blurred, not clarified, as the book progresses. His analysis of the copying task leaves out a number of important aspects, such as looking at the model (there's hardly a thing in the book about eye movements), hand position, and drawing movements. The analysis is nowhere near detailed enough. A task like copying also involves memory, which is also ignored by Wedell, despite the growing evidence that children's 'perceptual' problems are more in the nature of memory failures than failures in discrimination. The child's motivation to do the task is another neglected variable. Another problem concerns how the child conceives the task. As Caldwell and Hall have shown, 'the' problem for young children is often that they have different criteria of excellence than the testing adult. Watching children perform badly on 'perceptual' tasks I am always asking: 'Do they really understand what we want?' The same problem occurs in a more severe form with animals. We have much to learn from the operant researcher/animal trainer in developing ways of communicating with children, to whom our tasks seem to mean different things than they do to us.

A final criticism concerns Dr Wedell's selection of research material which is solidly from educational as opposed to psychological sources. He has very largely ignored, for what reason is not clear, the substantial amount of relevant psychological research and thinking into the orientation issue (the b-d problem which occupies much of Wedell's attention) of people, such as Bryant, Over and Over, Corballis, and Olson. I would like to have seen more effort made to look at the biological background (for example the split-brain work and cerebral dominance). Surprising also is the failure to mention work on the Aston Index for predicting reading failure, the approach of which fits in nicely with the above strategy.

Despite these criticisms I liked the book. It is honest and thoughtful and shows a real concern for the children whose problems provide the focus of the book. The fact that Wedell failed to give a satisfactory account of these problems and, even less, to show us how they might be overcome is less important than the effort involved in trying. This is something the reader can share in, and perhaps be stimulated by this example to think of better accounts and solutions.

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