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# In Search of the Sources of Rationality: A Study of the Work of Jerome Bruner

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# IN SEARCH OF THE SOURCES OF RATIONALITY:

# A STUDY OF THE WORK OF JEROME BRUNER

by

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A thesis submitted in partial satisfaction of the

requirements for the degree Master of Arts

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To the Middle Years

In Transition

TABLE OF CONTENTS

TABLE OF CONTENTS

(continued)

LIST OF FIGURES

ACKNOWLEDGMENTS

I would like to express my deep appreciation to my hosts during my research stay in England, Professor Ron Davies, his wife, gentle earth-mother Anne, and their most wonderful three year old Jacob, a constant source of delight and refreshment. Professor John Lyman, good friend and "boss" for some ten years at UCLA, deserves special thanks for his patience and consideration during this intense time of research. I would like to thank all my colleagues in the Biotechnology Laboratory, most of whom are graduate students at UCLA, for their encouragement and understanding, and three persons in particular: Kevin Corker, for his dual skills at statistics and I Ching, for his considerable humor, and for serving as Peer Reader on my committee; Richard Weisbrod for his suggestion that I look at the work of Jerome Bruner long before I undertook this endeavor and for his irreverent curiosity about the philosophy of science, and Terrie Keen Columbia, who not only served as my "right arm" in her laboratory duties, but as the person in charge of collecting and putting in order the works of Jerome Bruner, a monumental task. Her lunch hours were cluttered with such doings for the better part of nine months during the parturition of this thesis.

Among others who encouraged me in the direction I was to pursue were psychologist Bernd Weiss and educational psychologist Russell Hunter. Physiologist F. Eugene Yates, Professor at USC, gave me not only his good counsel, but many hours and much patience in the explanations of reductionism, the theory of complementarity, and such; scientist he, with the soul of a poet. Good friends and mentors, all.

Across the Atlantic, Professor Bruner's staff and graduate students were most gracious and helpful. Margaret (Meg) Penning-Rowsell, an editor of unequaled qualifications, was most generous and kind; it is my hope that she will be working with me in putting this present work into a book. And there is no way adequately to thank the dear and wonderful Mary Poppins of Oxford's Department of Psychology, Megan Kenyon, Professor Bruner's secretary. Megan waved her magic wand and accomplished myriad miracles. Housing in Oxford was arranged, papers of Professor Bruner's, unavailable elsewhere, were found and the use of the copying machine managed, a place to sit and a typewriter to work with, batteries at the last possible minute for my tape recorder, just as Bruner was about to start a lecture, all these wonders were performed by this bright eyed, cheerful Britisher whose light and airy manner belie her profound understanding of the human condition.

Of course I owe most to the man himself, Jerome S. Bruner, who allowed me to take up residence, for all practical purposes, in his laboratory for eight days during October, 1977, to record the two lectures he presented which I was able to attend (and to record as well several of the ten or so hours of interview time which he was kind enough to grant me), and to read 105 pages of his unedited first draft of his autobiography for the prestigious History of Psychology in Autobiography. It was Bruner himself who set the tone of this thesis: I told of my desire first to do the thesis, then to revise it to book form as a kind of biographical study of his work. I did not, I said,

wish to publish anything of which he would not approve.

"You cannot do it that way," he said.

Taken aback, I asked why. He replied that writing a biography required that one write what he thought was right, and that it should not be submitted to the subject for approval.

I then asked if he would remark on the thesis, and he responded that he was not certain if he would or would not. He would, he assured me, read it. Finally, I asked him to send up a "smart missile" if he saw any glaring errors, and he laughed and agreed to do so. I hope he will.

Professor Bruner has kindly answered the questions I put to him; the omissions in the thesis are due to my ignorance of what to ask, not to any lack of cooperation on his part. He was candid and generous, and kept nicely to the point when I, inexperienced in the art of interviews, tended to stray. This is most clear when I review the tape recordings of these conversations. Another talent of Jerome Bruner's appears on these tapes: he is a man with the unusual faculty for speaking in complete sentences. It is amazing how few of us do, at least without a script.

Thanks are due also to Mrs. Bruner, a charming and intelligent woman, gentle of motion, who can put together a continental dinner that would make a French Chef look to his laurels. Mrs. Bruner made me feel most welcome in their home, and shared with me her paintings, her current frustrations with her moss-bound lawn, and many anecdotes, both personal and political. She made this volume and the visit richer.

M. Brewster Smith, President of the American Psychological Association for the 1977-78 year, Professor of Psychology at the University of California at Santa Cruz, has been kind enough to give me time and counsel over the past few years; it was, in fact, on his advice that I first wrote to Professor Bruner for an interview.

Father Dan Doherty, Jesuit priest of Cambridge's church of the Blessed Sacrament, saw to it that I had housing in the Rectory of that church for the brief time I was able to visit Harvard in April, 1978. Father Doherty is a psychologist and a teacher, and our long conversations about psychology, philosophy, and the plights of we humans contributed much to my perspective and I am certain affected this thesis. The incredible kindness and consideration shown me, an avowed agnostic, by this man of the cloth, will not soon be forgotten.

I would like to thank Professor Emeritus B. F. Skinner for the time he granted me for an interview in William James Hall at Harvard; his adversary position, I believe, balanced this work. Henry Murray, Professor Emeritus at Harvard, took the time to speak with me in his home in Cambridge though he had just returned from a trip and was quite busy; I am very grateful to him. Laurence Young, Professor at the Massachusetts Institute of Technology, told me of some work he had done with Bruner which I have not found in the publications, but which relates to work which has been published. Ms. Katz of Harvard's William James Hall 6th Floor Library allowed me to have reprints from her files on Jerome Bruner, and to copy those which she could not spare. She also allowed me to use the library for research.

I had the opportunity to interview Ernest "Jack" Hilgard on the UCLA campus; Professor Emeritus Hilgard (Stanford University) had worked with Bruner during the war and had been in Cambridge, England, during Bruner's sabbatical there. Dr. Hilgard's comments on Niels Bohr's theory of complementarity and Bohr's conviction that this concept was not for physics alone reinforced my notion of the applicability of this theory to psychology as an art and as a science. Dr. Hilgard has also been kind enough to serve on my committee for this thesis as Professional Reader, for which I am most grateful.

Dr. Peggy McAlister, Faculty Administrator for Lindenwood IV, is another of those persons for whom there are no words adequate to express my appreciation. Without Peggy's insistence on the best I could do, this project would never have been begun, and I wounder if, without her encouragement, I would ever have completed it! Suffice it to say that no one has had more influence on my recent educational process or on the change in my concepts of what education is, indeed, all about, with the possible exception of Jerome Bruner. It is difficult to imagine how different this thesis might have been if what I learned from the work of Jerome Bruner had not been preceded by the philosophies incorporated into my educational milieu by Peggy McAllister.

I would like to note also that, though my association with her has been much shorter, Dr. Valerie Simms presented several suggestions on the drafts of this thesis which have been incorporated into the final work. Her careful comments were most helpful, especially with regard to format and structure.

Perhaps the person who has affected the tone of this thesis the most, next to Jerome Bruner, is Dr. Roger Gould of the Neuropsychiatric Institute of UCLA. His emphasis on transitions in human development helped immeasurably in the presentation of certain periods of Bruner's life in what I hope is a broader light. Dr. Gould read each portion of the first draft as I finished it, and critiqued it with what James would call "a fresh eye." With his background as a psychoanalyst, Roger Gould perceived Jerome Bruner and his work from a very different view than the academician steeped in theories of learning or educational psychology. If this thesis emerges with cohesiveness and form, and I hope, of course, that it does, I believe considerable credit must be given to Roger Gould.

One can never thank all those who helped, who stood by and who encouraged when things tended to bog down or the spirit faltered a bit. If these pages seem long it is because so many have been generous with their time, their efforts and their understanding. My children, my neighbors, and my friends have been patient when I could not spend the time with them that had already been committed to putting words to paper.

Thank you all.

INTRODUCTION

To study the life of Jerome Bruner is an adventure in itself. It is incumbent upon the author of such a writing as this to inform the reader what it is he is about to read and, perhaps more importantly, what it is not.

This endeavor is a thesis as partial fulfillment for a Master's Degree in Psychology. Its subject is the work and, inasmuch as possible, something of the life that directed that work, of Jerome Seymour Bruner.

There are huge gaps. There are years, in particular in the 1960's and 1970's, for which I have little personal information. The biographical data are based on two interviews with Professor Bruner in Oxford, England, in October, 1977, that correspondence which we have had since the spring of 1977 consisting of several delightful letters, those notations which Bruner made regularly throughout the years in prefaces and forewords to books or which appeared in papers and presentations, and the first draft of his chapter in preparation for the History of Psychology in Autobiography. The chapter was a draft only; because I have not seen the final product, there are not quotations from it here. To assist the reader in source identification, those passages which are quotations from the tapes of the interviews with Bruner appear in the text in italics.

Additional bits of information, mostly to do with Professor Bruner's work, rather than his personal life, were gleaned from brief interviews with his colleagues at Harvard and elsewhere: M. Brewster Smith, Professor of Psychology at the University of California at Santa Cruz, B. F. Skinner, Professor Emeritus at Harvard, Henry Murray, Professor

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Emeritus at Harvard, Laurence Young, Professor at Massachusetts Institute of Technology, Ward Edwards, Professor at the University of Southern California, Patricia Marks Greenfield, Associate Professor, University of California at Los Angeles, Ernest Hilgard, Professor Emeritus, Stanford University, and those of Bruner's colleagues at Oxford with whom I was able to speak for a few moments. Ms. Katz of the 6th Floor Library in William James Hall at Harvard University assisted me with further resource material in April, 1978.

The text of this thesis is, in the main, based on a chronological review of Bruner's published writings.

As to what this work is not: it is not a critical analysis of the work of Jerome Bruner, nor is it simply reportage. It is not a biography; I have no access to any of Bruner's personal letters except those addressed to me, and they are few (though candid and charming). It is not an "approved biographical study;" Bruner has been quite clear about that constraint, as I noted in the section of acknowledgments. To make his point quite clear, Bruner told me the following antecdote.

It seems that when James M. Cain, author of the novel The Postman Always Rings Twice, was approached by the writer of the screen play to review and approve the product, Cain said, in essence,

"I wrote the book. You write the screen play."

Jerome Bruner lived the life and did the work. It is my task to write the thesis.

I have had no private conversations with those of Bruner's associates to whom he feels closest; especially notable in its absence

is the input of George Miller; I was unable to contact Professor Miller in time to set up an appointment, though he was kind enough to send a letter of regret.

I have had the pleasure of meeting the present Mrs. (Blanche) Bruner, but the only contact I have had with Jerome Bruner's first wife, Kay, is through an article she published when she left her position as an Editorial Assistant for the Journal of Abnormal and Social Psychology (Bruner, K., 1943). I have not met Mrs. Weems nee Solomon, nor have I met any of Jerome Bruner's children or his stepchildren, nor his siblings.

Even in the face of these enormous drawbacks, and with the time limitation necessarily imposed on the completion of a work of this kind, I have accomplished what I set out to do and, as is the way with such projects, have discovered new goals in the process. As it has turned out, I have come to a sense of a general direction of the work of Jerome Bruner, one that has led him to discover many coves, if one may analogize his sailordom, on the way to the place of anchor. What he has set about to discover, though I daresay he did not so define his task at the outset, were the sources of rationality. The transitions in the course of this journey, given the constraints I have mentioned, are presented as I see them. There is considerable quotation of Bruner himself, in part to get a flavor of the nuances of his thinking at the time of each writing, but more because he says what he has to say well, and to paraphrase would be unkind to the man and the meaning.

Why Bruner? I am better able to answer why I chose to study Jerome Bruner now than I would have been when I embarked on this project. The theme of my studies in the field of psychology has been to find a resolution of the conflict between the science of psychology and what I choose to call the art. It is easier to define the former than the latter: the science can be determined, at least to some degree, by the expression of research in the literature. The art, at least with Bruner, has to do with what we have come to call the "left hand." It is that in man which makes him human, that which cannot be reduced by the methods of science, cannot be measured, cannot be repeated: it is creativity, it is the gestalt of man's culture, it is that stuff of which myth is made. Bruner brings the art and the science of psychology together in some very unexpected ways. We can be grateful that he often sorts out his thoughts in his writings.

It is out of the concept of left and right handed approaches that we gain from Bruner the Niels Bohr theory of complementarity, or it may have been for Bruner the other way about. I was convinced at the outset that there is more to man than a cellular structure interlaced with spurting transmitter substances and electrical impulses; that man was also more than a mystical set of notions without order or substance. Now I have a better vehicle for consideration of the nature of man — a cup, as it were, to hold the tea.

Bohr's theory of complementarity, described somewhat at length in this thesis, is a three valued notion: in brief, this theory depends on two mutually exclusive descriptions of one concept (light, for example,

defined as waves and light defined as particles), both of which are substantiated by conclusive evidence, and neither of which can exist in the presence of the other, and without either of which, the description of the concept is incomplete.

I am of the opinion that psychology is both a science and an art, and am more convinced than ever that to describe psychology without the consideration of both is not to look fully at the field. Nor can one, without considering the science and the art of man, find the elusive sources of rationality.

NOTE OF EXPLANATION

It is customary in a document of this kind to note clearly the sources of the material presented. Here the author is faced with a measure of difficulty: a considerable amount of what I know and record of Jerome Bruner's life is based on my notes from a rough draft of an autobiography which I was allowed to study, but not allowed to copy directly. It was the specific request of Professor Bruner that this draft not be quoted.

The objective reader does not get many pages into the thesis before he says, "How do you know that?" Where it appeared to this author appropriate in dealing with the biographical data, I have quoted directly from, and referenced, published writings, letters, and, through the means of italics, interviews with Professor Bruner. I have made every effort, when expressing my own opinion, to provide the reader with a modifier of sorts: "it appears that...," or "apparently..." or whatever. I have honored Professor Bruner's request, and have not referenced the autobiographical draft as a source anywhere in the body of the thesis, nor have I indicated where in the thesis the reader is in the presence of that draft, which I believe to be my ethical responsibility. It is therefore incumbent on me to explain that in descriptions of the unfolding events and developments in Jerome Bruner's life, any unreferenced or unmodified biographical information represents the integration of the impact on this author of material from privileged communications, published writings, interviews, and letters.

These are the constraints under which the thesis is written. I beg the indulgence of the academic purists among my readers.

IN SEARCH OF THE SOURCES OF RATIONALITY:

A STUDY OF THE WORK OF JEROME BRUNER

A trim, 62 year old professor can be seen pedaling his way along South Parks Road in Oxford. His glasses are very thick, his hair is thinning; still he doesn't look his age. Perhaps it is his delight in life that keeps him deceptively youthful. Jerome Bruner is a man of enormous energy, and an equal amount of discipline. He is Oxford University's first Watts Professor of Psychology, a Fellow of Wolfson College. He has been at Oxford since 1972; before that he had spent almost all of his professorial life at Harvard. His impact on the field of psychology has been remarkable, both in quantity and quality.

TO BEGIN WITH...

Jerome Seymour Bruner was born on October 1, 1915, in New York. He was to be the last of four children. The eldest child, Adolphus, had been the issue of a prior marriage; his father had died before he was born. Both Herman Bruner and Rose Glücksmann had come to the United States from Europe. The three children of their marriage were Min, Alice and Jerome. When Min was born, Rose felt her family complete. She had very definite ideas about family formation: it was her theory that children should be reared in pairs! Twelve years later, infant Alice unbalanced Rose Bruner's idea of the appropriate family tree, and in two years little Jerome arrived, the "theoretical child."

The little boy was born blind, and was not to have his sight until cataracts were removed when he was about two years old. It was

Min, 14 years his senior, who was more the mother to little Jerome, and he speaks of her still with warmth and affection. Whatever Jerome missed in those first two years of sightlessness he must have made up for in multiples as soon as he could see; he says of his mother that she *"must have despaired of this energetic child!"*

Jerome Bruner, called "Sonny" by his family until he went to college, grew up in suburbia on Long Island, New York, in what might now be termed an upper middle class milieu. He read a great deal, wandered in the woods and about the salt marshes, and was still, on balance, a gregarious sort with many friends.

He speaks of attending, in his early years, a school on Long Island which was

> *"...a very good, middle class, suburban public school...they had just extended New York out to the edge of Nassau County, so that in effect it was out in the country but it was part of the city."* [1]

In speaking of this early suburbia, he says,

> *"I enjoyed it, and I got into all sorts of troubles...I got left back...I really couldn't believe what they were asking me to do... I was truly puzzled...it just didn't fit with what my image of school was all about."*

First he was set back one year to repeat a class, and then *"...somebody had a different theory about the thing, so they put me ahead two years!"*

His formal education included lessons in French, which were to serve him well in later years. He speaks of himself at the age of eleven, when

> "...I fell in love with my patrician French teacher, a delightful South Carolinian lady, Mrs. Brown, who had a fiery temper and a flawless accent. There is no feat that an eleven year old boy in love with a beautiful woman in her thirties will not perform in the interest of sublimation. I learned French!"
>
> Bruner, July 17, 1977
> Personal Communication

---

[1] Italics throughout the text indicate direct quotes from interviews.

The household of Jerome Bruner's childhood was a lively one; the children and their friends, visitors from abroad, and a variety of pets coming and going. Jerome grew up with a sense of nostalgia associated with seeing his father off to his business interests in Europe, and being a part of the excitement of his homecomings. It was a full and happy time.

There appeared to be a wonderful warmth between Jerome Bruner and his father. He says of him,

> *"...we were very close. I just adored the man. I have no feeling of ambivalence...I even know that on the occasions he really chewed me out about things that he was doing it in a principled way...I always knew him to be a principled man."*

Herman Bruner's principles made a lifetime impression on young "Sonny," as did his wit and his wisdom.

Herman Bruner was in the business of making watch movements in a partnership with his brother, and it was this business that often took him to Switzerland. His father's trips, the European origins of both his parents, along with the exposure to guests from abroad in his home flavored Jerome's life with an identification with the "old world" to which he refers as his "European-ness."

Jerome's father discussed with him all manner of things. They spoke of the stars. And of opera, which Herman Bruner dearly loved. They spoke of ethics in both a profound philosophical sense, and with regard to such everyday matters as the refusal to buy the newspaper of a publisher whom one considered to be unprincipled. If a man misused his power, he was to be held responsible. This commitment to principle is clearly still intact in the character of Herman Bruner's son. This

father not only accepted the restless and energetic person who was his son, he conversed with him, respected his ideas, and in doing so, filled the boy with pride.

In 1926 Herman Bruner became ill with cancer; in February, 1928, this man of wonderful kindness and understanding died. Jerome was only twelve. It was less than two years before the crash of the stock market. The world around him was riding a wild merry-go-round, and Jerome Bruner was devastated. Just entering the confusion of adolescence, he felt set adrift. There was no real closeness between him and his mother, and the deep grief he felt over the loss of his father was to stay with him, not to be expressed until many years later.

His mother, as he puts it, *"released of this scholarly figure of my father...went all over the place!"* The older children were grown, and Jerome found himself attending half a dozen different high schools and preparatory schools between the ages of twelve and sixteen. He speaks of being unable to find a balance in the middle, and says of his mother during this period that she "*...drifted off.*" It would be many years before he would be able to say of his mother that he and she shared things at all. It was a time of loneliness for his father, made more poignant by the confusions of adolescence.

But there were bright spots. It was during these years that Jerome Bruner became more and more interested in boats and the sea. At first he was intrigued with engines...

> *"I regarded sailing as rather effeminate; that's what the girls got excited about. Our machismo was in the form of engines. I'm pretty good at engines, actually. So I didn't really start sailing until my twenties..."*

Since then, sailing (both for quiet recreation and as a racing sport) has been a part of his life. We shall see analogically that he has, in the main, raced his own race.

The Crash came in 1929, and though Adolphus, who had been managing the funds, met with some of the difficulties of those times, Herman Bruner had had the foresight to secure the financial future of his family in a manner not destructible by the stock market's inconsistencies or by the massive depression which appeared in the wake of the Crash. It is interesting to note that we are not aware of money being an issue, certainly it was not a deciding factor, in Jerome Bruner's life, even through his graduate education at Harvard. When he notes that he has taken a summer in Canada, or in Europe, or has just gone fishing, the financial wherewithal is left unmentioned. There is no sense of great wealth, but rather with a sort of well-to-do-ness. Certainly, one never gains the notion from any research of Bruner's life of anything bordering on want. So it appears that, though he grew up in the depths of the depression, financial struggle had no part in the development of Jerome Bruner.

Since the restrictions in life style as a result of the Crash were minimal for the Bruner family, Jerome was able to proceed without interruption. He was to start college at 16, and would return home thereafter only to visit. He was ready to take on his own identity, ready to become his own man.

THE YEARS AT DUKE 1931 - 1938

While Jerome Bruner was in his first year at Duke, he came to terms with the grief he had borne since the death of his father. A performance of Handel's "Messiah" was the catalyst; the tears refused to be denied any longer, and the sadness which had been deeply a part of Jerome Bruner since his father's death confronted him and was, for the main, put to rest, leaving the rich love and respect, and the integration in a more total way of the values and cultural joys into his own views of the world. And the long mourning was done.

When he entered Duke University, Bruner had a vague notion that he might pursue a course in law. The time of coming to terms with one's parental conflicts and with one's own inner person to which Erik Erikson refers as an identity crisis seemed more to Bruner an identity search and exploration. Once the resolution of the grief over his father's death had taken place, Bruner's vital curiosity and the excitement of intellectual involvement and sharing took a primary place in his life. Along the way, Bruner came into contact with William McDougall[1]. Bruner described something of the interesting events involving his relationship with McDougall in his Oxford Inaugural Address.

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[1] William McDougall (1871 - 1938)
"McDougall is best known through his vigorous espousal of an instinct theory of considerable scope and complexity and for his fervent opposition to a mechanistic interpretation of the behavior and experience of man." From R. I. Watson, 1971, p. 432. Also see William McDougall, 1960 (23rd ed., 1936; first published 1908); C. Murchison (ed), 1961, pp. 191-224; and E. G. Boring, 1950, pp. 465-67, 496, 717-18.

"As an undergraduate, I came under the influence, almost inadvertently, of Professor William McDougall, F.R.S.[2], a former Wilde Reader in Mental Philosophy of this (Oxford) University, who had gone from Oxford to Harvard to take the Chair there in Psychology and then, some years later, had gone on to the newly transformed Duke University where I first encountered him as a most daunting lecturer in one of my courses. At that time I was involved in a headstrong, if lonely, confrontation with the University, involving compulsory chapel services that I had refused on principle to attend. It was a very adolescent and very unhappy incident. I was summarily suspended from the University. McDougall somehow persuaded the Dean to reinstate me and promised that I would work in his laboratory during the chapel hour. It was the start of my career as a psychologist. When the time came for me to go off for post-graduate study, I chose Harvard where I had gained a place as an assistant. McDougall had me to tea and warned me that Harvard, whence he had just fled, was a place where psychology was greatly over-simplified, mechanistic explanations flourishing, I recall him saying, like weeds. I also recall his remarking about Oxford at that time that it was notable not for oversimplification but, worse, for a total indifference to <u>any</u> form of psychological explanation. So, first to Harvard and then to Oxford went I, as if retracing McDougall's steps.

"But if we migrated geographically in opposite directions, not so intellectually. For McDougall made a lasting and massive impression on me in one way: he convinced me early and irreversibly that one could not understand the organization of behaviour without taking into account its directionality, its purpose, its intention — its teleo-logical structure, however heuristically one might formulate it. The conviction has guided me into studies of selectivity in perception, into work on strategies in thinking, and now to a functionalist theory of development in an age of structuralism. Being the first Watts Professor of Psychology in this University, I have no predecessor to salute. But I will take this occasion to salute McDougall, although he never quite thought of himself as an Oxford man."

(Bruner 1974 , p.6-7)
(Footnote and parentheses mine)

In 1970, Elizabeth Hall inquired of Bruner how he decided to become a psychologist. Bruner told her about McDougall's timely rescue, and went on to say,

---

[2] Elected Fellow of the Royal Society, 1912

> "So I worked briefly in McDougall's Laboratory and became interested in psychology. Karl Zener let me work on conditioned salivary responses with him. Donald Adams let me have a young macaque to train. Tom McCulloch, fresh from Yale, let me do one of the early experiments on conditioned helplessness in rats. I was very quickly hooked. The graduate students took me in, and I never fully recovered. It was splendid, happy and effective indoctrination."
>
> (Hall, 1970)

In 1939, a paper by McCulloch and Bruner, "The Effect of Electric Shock upon Subsequent Learning in the Rat" (McCulloch, 1939) and a paper Bruner wrote with zoologist Bert Cunningham, "The Effect of Thymus Extract on the Sexual Behavior of the Female Rat," (Bruner, 1939) were both published. In the experiment described in the latter paper, an attempt was made to discover the effects of the injection of a thymus extract on the sexual behavior of the female rat. These middle of the night studies, which found Bruner cheerfully riding his bike home at midnight for several months, impelled him toward the kind of thinking of which scientists are made: a change in behavior was observed upon the injection of thymus extract; was it the extract itself? or some other variable? If it was the extract, how did it affect the change? Was there some kind of a perceptual differentiation which developed because of the extract injection? Question after question begged to be answered, and the enchantment of science had begun its work in the life of Jerome Bruner. Incidentally, from this paper we find that Bruner had lost a kind mentor; among the acknowledgements we find one to "the late Professor William McDougall."

The summer that followed was one of more new learning: Bruner worked in experimental surgery at Cold Spring Harbor Laboratory of Quantitative Biology. In the fall he learned something of Cherokee

customs of dance and styles, and found himself exposed, in helping Leonard Broom, to field studies in anthropology. Underlying all that he was learning began the wonder of how people know things. And it was this question, of all the questions bubbling up to challenge this man's curiosity, which was to assume a position of primary significance in Jerome Bruner's investigations, and in his published research.

Bruner had met Margaret Mead and Aldous Huxley during his undergraduate years (by the time he had completed his graduate work, he had also read all of Huxley's published novels). Bruner was struggling with the concepts of the relation of the will to perception of George Frederick Stout[3], who was known as an "act psychologist." These widespread experiences and interests would serve Jerome Bruner well; physiology, sociology, anthropology, and varied ways of looking at perception would become important in Bruner's later work.

For a while during this very active period at Duke during the middle nineteen-thirties, Bruner joined the Communist Party with his friend, Sheldon Harte (also an undergraduate). Bruner's membership was brief, ending shortly after he arrived at Harvard, and was based in the main on the observation that the Russian Communists opposed fascism. So, indeed, did Jerome Bruner, who, though he was of a non-religious family, had been born a Jew.

Bruner attended his first American Psychological Society meeting during the "Duke years;" the meeting was held at Dartmouth College, and he recalls anger at the reductionism of Clark Hull's presentation.

---

[3] George Frederick Stout (1860 - 1944)
E. G. Boring comments, "Activity comes into Stout's system in the famous doctrine of conation, the fact and experience of striving... Stout held that psychology deals with psychical processes that are in themselves subjective and that have mental objects like sensations." (Boring, 1950:464)

Bruner applied both to Yale and to Harvard as a graduate student; he had finished his undergraduate work at Duke early, but had stayed on to do research. At Yale he was offered an assistanceship with R. M. Yerkes, who gained fame as founder of the Yerkes Laboratories of Primate Biology (Orange Park, Florida) and for his direction of the Yale Laboratories of Primate Biology from 1919 to 1941.[4]

Harvard made no promises, but Jerome Bruner apparently exercised his romantic inclinations and, thinking of Harvard as the intellectual home of Henry and William James and of Emerson Hall as a place of the elite, he opted for Harvard.

The young man who left Duke clearly had a very different view of the world than the one who had arrived there. One can see that he had lost his intellectual innocence: he had discovered what he now calls the orgasmic quality of an idea. He had found what would ever be the mistress of his mind, the life-long love affair with the search for how man thinks and knows: the sources of rationality. He had entered Duke University innocent of the field of psychology; he departed engaged in its conflicts (an engagement which would increase in intensity and variety throughout his professional years). He would be a man who would follow his passions. He had, indeed, found a new identity.

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[4] Robert Mearns Yerkes (1876 - 1956)
A Source Book in the History of Psychology (Herrnstein and Boring, eds., 1965) notes: "Yerkes' dominating interest lay in the evolution of intelligence, as he demonstrated during his long and distinguished career by investigating the behavior of protozoon, crab, turtle, medusa, crawfish, frog, Daphnia, tortoise, mouse, earthworm, rat, crow, pig, ringdove, monkey, ape, and man." (p. 544, 1974 printing)
Also see Boring (1950), p. 626 and 628.

In the summer of 1938, Bruner went to a little French Canadian village called Montfort where he knew no one. He found a place to board with an English speaking family, and had a wonderful time with a goodly variety of superb books. He made friends with whom he was able to share his thoughts during this transition from undergraduate life at Duke to graduate studies at Harvard. In particular, he was both fascinated and angered by the reductionistic finalism of V. M. Bekhterev[5], whose views (along with Pavlov's) developed in Russia from those of Ivan Michailovich Sechenov; all three argued for "objective psychology," which Bekhterev would later call reflexology, and Pavlov would move forward to the concept of the conditioned reflex. It was a series of 54 lectures published in 1917 under the title, General Principles of Human Reflexology, with his arguments against "mentalism" which so annoyed Bruner that summer.

We see even this early some hint of the functionalist point of view that Bruner will develop, a view much closer to Dewey than to that of the Pavlovian classical conditioning. It is interesting to note that Bruner had embarked on his career in science doing experiments, among others, with Karl Zener on conditioned salivary responses, the very general field of Pavlov's most famous salivating dog experiments through which the world was convinced of the validity of his theory of classical conditioning!

So Bruner had been trained to science, and science is considered by some to be by its very nature reductionistic; still there was something

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[5] Vladimir Michailovich Bekhterev (1857 - 1927)
See E. G. Boring (1950) p. 637-38 and 661 and R. I. Watson (1971) p. 424-425. Watson notes of Bekhterev's view: "Habits were seen as the compounding of motor reflexes, and even the thought processes were essentailly activities of the speech musculature...(his was) a plea for a psychology based upon the tools and concepts of physiology with no appeal to subjective processes."

amiss in the application of this stern, implacable approach to man. Bruner no doubt recalled McDougall's warning against mechanism. Clark Hull's mechanistic paper at the American Psychological Association Meeting, followed the next year with Bruner's review of Bekhterev's work, would fire a frustration in Jerome Bruner that would repeat itself throughout his career, and would echo most clearly in his Herbert Spencer Lecture in Oxford in 1976, when he would take Harvard's B. F. Skinner to task. But more of that later.

HARVARD AND THE CORPS d'ELITE

Harvard's Edwin G. Boring had made famous the idea that the graduate student's work week was 80 hours, and Jerome Bruner soon agreed this was so. But what a way to spend that 80 hours! The esprit d'corps was clearly unparalleled; the Harvard of Bruner's graduate years appeared to promote a sustained and intense loyal elitism. The gathering together of such a distinguished, talented and heterogeneous group to become collaborators in the education of a few must be, if not unique in the annals of higher education, at least most unusual. This was the Harvard of E. G. Boring, psychology's grand old man of history, of the amazing Henry Murray, of the Allports, both Gordon and Floyd, of Karl Lashley, of S. S. Stevens, and of many others; we will see more of this Harvard later.

The first year Bruner spent as a graduate student at Harvard, he worked in Lashley's laboratory. Karl Lashley[1] seemed to Bruner more distant than the other professors of Harvard at that time; he had less of the famous esprit d'corps. Bruner speaks of him as a *"very tight, spider-like man"* whose output Bruner admired more than he admired his person. Lashley had made his name in the development of his theories of

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[1] Karl Spencer Lashley (1890-1958)
E. G. Boring says of Lashley that he "is known chiefly for his work on the localization of brain functions and his discoveries of how little precise and persistent localization there is" (Boring, 1950: 648). See also K. S. Lashley (1929), and R. I. Watson (1971:544 and 546-547). It is interesting to note that K. S. Lashley was President of the American Psychological Society and a member of the National Academy of Sciences -- both before he was 40 years of age!

equipotentiality[2] and mass action[3]; we will see Bruner's theoretical developments not so involved with psychophysiology. In any case, Bruner was not to be an 'ivory tower' sort, but rather much the activist. He moved on to do his thesis research with a more appropriate mentor: Gordon Allport.

Gordon Allport[4] appeared to have a view that was much more humanistically oriented. Hall and Lindzey (1970) speak of his as the "Psychology of the Individual." They note that

> "Allport represents one of the few theorists who provides an effective bridge between academic psychology and its traditions on the one hand and the rapidly developing field of clinical and personality psychology on the other hand."
>
> (p. 291)

Allport's view was that of a functionalist; in fact, he introduced the concept of "functional autonomy." He emphasized intention as part of the cognitive process; we will see a strong echo of this in Bruner's work.[5]

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[2] "Equipotentiality means that one part of the cortex is as good as another in contributing to a certain function, like learning and 'intelligence'" (Boring, 1950:76).

[3] "Mass Action means that all equipotential parts work together and that the loss of one diminishes efficiency in proportion to the magnitude of the loss, no matter where the loss occurs" (Boring, 1950:76).

[4] Gordon W. Allport (1887-1967)
See Hall and Lindzey (1970:258-297), R. I. Watson (1971:551), G. W. Allport in E. G. Boring and G. Lindzey, eds. (1967, V:3-25), and G. W. Allport (1937).

[5] When McDougall was still at Harvard, Allport had assisted in his elementary course. He said he admired McDougall's "vigor and independence," but deplored some of his doctrines. (G. W. Allport in E. G. Boring and G. Lindzey, eds., 1967:V:3-25.)

In his brief autobiography (Boring and Lindzey, eds., 1967), Gordon Allport describes his psychological philosophy and explains the differences he has with McDougall (who had influenced both Allport and Bruner):

> "To establish my main point (that a full bodied psychology of the human person is possible) I had to devise and adapt a number of rather novel supporting propositions. Chief among them was the concept of functional autonomy. No theory of motivation, I maintained, could be adequate if based on the exclusive primacy of drives and on the reactive aspects of human nature. I hesitated to adopt McDougall's concept of purpose because it was anchored to dubious instinct theory. I felt that in the course of life, motives can, and usually do, undergo radical transformation and that the propelling force lay in the present on-moving structure of personality, not in some anachronistic conditioning of past motives." (p. 15)

Although Gordon Allport is widely known for his theory of personality, he was highly involved in social psychology, indeed Bruner's thesis, for which Allport was the major guide, was clearly one which fit under the aegis of social psychology. Allport gives us a notion of the "state of the art" in psychology during this period:

> "Psychology was a rapidly growing subject in the 1930's. The social emphasis was suddenly enhanced by the impact of world events: the depression, the rise of Hitler, the threat or war, and other fractures in the social edifice. There were relatively few social psychologists. Thus a host of responsibilities came my way..." (Boring and Lindzey, 1967: 14-15)

Allport was elected President of the American Psychological Association in 1939, and found himself on committees for the National Research Council and the Social Science Research Council, as editor on the Journal of Abnormal and Social Psychology, and Chairman of the Department of Psychology at Harvard, which had newly become independent. A busy time!

Allport speaks in his autobiography (p. 3) of assigning his Harvard seminar the problem, "How shall a psychological life history be written?"

"We did not," he says, "succeed in our self-imposed task..." [6]

The seminar took place in 1940, the same year Bruner and Allport published an article together in the Psychological Bulletin: "Fifty Years of Change in American Psychology" (Bruner and Allport, 1940). Hilgard notes (Interview, 1978) that this paper was the basis for Gordon Allport's presidential address to the American Psychological Association.

"Fifty Years of Change in American Psychology" provided an analysis of the publications of fourteen journals in print at the time, though in the early years of the survey the sources were not so broad: there were only two journals in publication in the beginning year of the survey, 1888! The articles were analyzed in a manner to define the scope and show the shifts of interest in the profession of psychology. By the time the authors had traversed the fifty years to 1938, they had found

> "...two alternative courses for the future. Briefly, these courses might be designated as 'psychology for science's sake' and 'psychology for society's sake.' These designations do not imply, however, simply a choice between pure and applied psychology, nor between isolationism and participationism. For the course selected will determine inevitably the design of mental science in the future — the character of its presuppositions, the systematic nature of its concepts, the structure of its theories, the fashioning of its techniques, as well as the content of its research."
>
> Ibid, p. 775

It would seem that the alternatives are still with us; both courses appear to be energetically pursued in the current literature.

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[6] Allport notes concerning the seminar: "The seminar included the following members: Jerome Bruner, Dorwin Cartwright, Norman Polansky, John R. P. French, Alfred Baldwin, John Harding, Dwight Fiske, Donald McGranahan, Henry Riecken, Robert White, and Freed Bales. I mention their names because it seems to me that while these scholars have pursued diversified and distinguished careers, much of their subsequent creative work has been broadly relevant to the topic of the seminar" (Boring and Lindsey, eds., 1967:3).

Among the others of that lively community of psychologists was the indominable E. G. Boring[7], called "Gary" by some who knew him well. Boring's philosophy differed from others who influenced Bruner; he stated in his brief biography that

> "...the free action of a personal will in a naturalistic world is a delusion."
>
> (E. G. Boring in Boring, et al., eds., 1952:45)

He noted that he felt

> "...more secure as a physicalist (than a dualist)..."
>
> (Ibid., p. 51; parentheses mine)

As to his views about determinism versus freedom, he found free choice to be

> "...man's most useful and important delusion, a delusion required by his culture even when repudiated by his intelligence."
>
> (Ibid., p. 51)[8]

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[7] Edwin Garrigues Boring (1886-1968)
Robert I. Watson, who dedicated his book, The Great Psychologists (1971), "To E. G. B. my teacher, under whom I have never studied," says of Boring that "Between 1912 and 1929 he published research on audition, animal behavior, dementia praecox, educational psychology, organ and alimentary sensations, thermal sensitivity, the psychology of testimony, cutaneous sensations, psychophysics, vision, drive, sleep, psychometrics, statistics, psychological examining, intelligence, facial expression, psychic research, the psychology of science, olfaction, and memory" (p. 547-48). Watson comments on Boring's well known A History Of Experimental Psychology (1950), saying that "It is to this volume that German psychologists turn for the history of their own heritage" (p. 548).

[8] It may be of interest that Boring was of Quaker heritage, and that he had been through the experience of psychoanalysis; especially with respect to his writing, Boring was convinced of the importance of unconscious motivation in his admittedly compulsive personality. "...I have learned," he said, "to turn myself over to my unconscious motivations and let them work through me" (Boring in Boring, et al., eds., 1952:51). Boring reported that he understood his compulsions and his "need for power and achievement," and the effort required to balance it with his "need for approval and affection." It would seem to this author that the behavioristic sound of his insistence that there is no free will was belied by his behavior as though there were, or, at the very least, his willingness to support with his life style a "delusion."

In an interview with Elizabeth Hall, Bruner remembered that he had

> "Edwin Boring to drive us to a consuming vanity about history and its detailed mastery."

(Hall, 1970)

Bruner must have learned the lesson well; his appreciation for history is clear in his conversation, and the detail of his recall is, to this author, nothing short of amazing.

Many years after these spirited times as a graduate student, Bruner would join his colleagues R. J. Herrnstein, E. B. Newman, B. F. Skinner, and S. S. Stevens in the sad task of writing a memorial minute for Edwin Garrigues Boring, who died in 1968 of myeloma at the age of 81. They would speak of him as the "man acclaimed as Mr. Psychology," and would note that he died with the "galley proofs of four papers yet to be received."

Bruner speaks of fondness of Henry Murray (whom he calls "Harry"). The regard appears mutual; Murray says of Bruner, "Jerry was bright from the very beginning..." Murray appears to hold no grudge that Bruner never took any classes with him "...steered clear," Murray said. "He knew what he wanted." Later Murray said,

> "he wanted space, to be independent, and to attract students. He attracted students nobody else could get..."

and then,

> "...he knows how to write...he's a good stylist..."

(Interview, April, 1978)[9]

These were kind words from a man, one of whose claims to fame is that

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[9] The quotations of Murray in this paragraph are all from the same interview in Cambridge, Massachusetts.

he is a master of erudition in his literary commentary on Moby Dick. Bruner says that what he liked best about Murray *"was Harry Murray, the literary critic."* Henry Murray[10], at 85 [11], still holds his enthusiasm for Melville's epic novel; one sees signs everywhere -- a lovely glass whale on the mantel in his parlor, several copies of the novel in the bookshelf, and all sorts of memorabilia. In the spring of 1978, Murray appeared delighted to declare that he had just received ten boards from Melville's barn!

There were many others of note among Harvard's psychology faculty: S. S. "Smitty" Stevens[12], Kurt Lewin[13], and Leo Hurvich[14] were a few. The graduate students would lunch together, and the "junior faculty," which included Stevens and Hurvich, would join in for the lively and never ending gustatory debates.

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[10] Henry A. Murray (1893- )
Murray describes this period at Harvard in a delightful vignette in The History of Psychology in Autobiography, in which he addresses himself throughout as "Murr." (Murray, H. A., in Boring and Lindzey, eds., 1967)

[11] Murray noted that Bruner "...is 33 years younger than I am, so he's just a child from my standpoint..." (Interview, 1978)

[12] Stanley Smith Stevens (1907-1973)
See S. S. Stevens in Lindzey, G., ed., (1970).
The reader who is interested in a sample of Stevens' work is referred to "Mathematics, Measurement, and Psychophysics" in Stevens, S. S. (ed.), Handbook of Experimental Psychology (1951).

[13] Kurt Lewin (1890-1947)
From the Gestalt school, Lewin was famed for his "field theory" approach to personality and to social psychology. His impact was both in theory and in application. Craig Eisendrath, Dean of College IV of Lindenwood College, informs us that Lewin was at Harvard in the late 1930's working on anti-semitism in his T-Groups. (Personal Communication, June, 1978).

[14] Leo Maurice Hurvich (1910- )
Hurvich, Bruner's traveling companion in Europe in 1939, later specialized in vision. He edited (with D. Jameson) Visual Psychophysics, Handbook of Sensory Physiology in 1973.

One would be remiss in describing the Harvard Bruner entered as a graduate student if one ignored William Sheldon and his "constitutional psychology." [15] Somatotypes, the theory of matching physiology to personality factors developed by Sheldon, was quite new on psychology's horizons, and Sheldon, collaborating with S. S. Stevens and others, had the students considering the world of endomorphs, mesomorphs and ectomorphs. One must not ignore either the flow of lecturers who appeared long enough to instruct the students on their views, not the least of whom were Wolfgang Köhler[16] and Edward C. Tolman[17]. The developing psychology student was richly nurtured in a multitheoretical surrounding. Surely there was considerable controversy; and just as surely the clear stature of the proponents of the many views of the way man functions promoted in the novices some regard for legitimate differences in psychological philosophy.

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[15] William H. Sheldon (1899- )
See "Sheldon's Constitutional Psychology," Chapter 9 in Hall, C. S. and G. Lindzey, 1970:338-379 for a review of Sheldon's theories; this reading also contains a brief biographical sketch.
See also W. H. Sheldon, C. W. Dupertuis and E. McDermott, Atlas of Men: A Guide for Somatotyping the Adult Male of All Ages, 1954.

[16] Wolfgang Köhler (1887-1967)
See R. I. Watson (1971:451 and 456-459, and W. Köhler, Mentality of Apes, 1927; also Boring, 1950:595-597.
Köhler was one of the three "founding fathers" of Gestalt Psychology; his experiments with apes brought him to consider "insight" an integral part of learning.

[17] Edward Chace Tolman (1886-1961)
Tolman developed a theory of cognitive mapping, or sign learning, through his experiments with rats. He was adamant in his insistence that he was a behaviorist, however his theories had a great deal to do with the promotion of the area of cognitive psychology.
See E. C. Tolman in E. G. Boring, et al., eds., Volume IV:323-339, 1952, and R. I. Watson, 1971:558.

The camaraderie did not end with lectures and research; there was the social aspect as well: the beer at the end of the day, the music, and the pool shooting at the local bistro. In the rich and stimulating atmosphere the students carried with them, no subject was out of bounds, and all views were to be searched through for their validity. As one looks through the "Who's Who" publications, one finds that each student (and most of them have a listing in these documents) has gone his separate way, has found an appropriate niche for his interests, and one can imagine that each gained the needed background in this unique academic environment.

One other note should be made concerning these graduate years at Harvard. Jerome Bruner's communications — scientific papers, books, letters, whatever — are characterized by his outstanding literary style. He says of his graduate years,

> *"...there was a tremendous demand at Harvard that you write well... I mean not just clearly, but with some degree of felicity. And Allport...if you'd hand a paper to him and you didn't have a section, he would put "AWK!" So you wanted to get the AWK's out of the way. Also, Boring was very insistent on graceful writing."*

Bruner's general love of language, of course, started long before his sojourn at Harvard, but it was at Harvard that he began scientific writing in earnest.

Considerable detail has been given in this chapter concerning the personalities and the atmosphere of Harvard during these years; we are convinced that it was the exposure to one "great man" in psychology after another in a parade of excellence that stimulated the approach that was to become Bruner's: the tolerance for that which he considers

to be legitimate difference, and the intolerance for that which he considers careless. He is stern in his criticism when something fails to "measure up."

In this author's opinion, the Harvard during Bruner's years of development as a psychologist promoted and enhanced the elitist view, and generated in the young persons fortunate enough to be there an idealistic demand for excellence. Though the tone has changed with maturity, it appears that Jerome Bruner still retains these characteristics.

TO EUROPE

Adolph Hitler had taken power in Germany in 1933. He built roads; next he was building the Hitler Youth, and war. The summer before the Nazis marched into and over Poland, Bruner and Leo Hurvich traveled in Europe. It was Bruner's first trip abroad, and in more ways than could have been planned, an exciting one. What he calls his European-ness was reinforced.

Bruner and Hurvich traveled in England, then to France, then Italy. They were still in Italy when, September 1, 1939, at 4:45 a.m., the Schleswig-Holstein, a German battleship, fired on a Polish ammunition dump near Danzig and blew it up, and with it, any vestige of hope for peace. German tanks overran the blue and white wooden border posts of Poland, and the Luftwaffe took over the skies[1]. It was Hitler's philosophy that only fools declared war, so without warning, he simply moved in. The British and French, acting on more traditional views, declared war on Germany September 3, just two days after the invasion, but by September 25, Poland was completely in the hands of the Nazi invaders. Bruner and Hurvich made their way back to France through Switzerland.

Paris was blacked out, but there was no sense of a real war. France had the Maginot Line for her defense, and she depended on it; a false faith. This was the period which came to be called the "phony war;" blackouts, but no bombs, talk, but no troops. Paris went about

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[1] Life's Picture History of World War II, Time, Inc., New York, 1950, is the reference for historical notes concerning the war in this chapter, except where otherwise noted.

her business, inconvenienced a bit, but in the main more or less as usual. Bruner met interesting people and did interesting things. He lived for a month in Paris in the commune of Isadore Duncan's brother, Raymond (who probably most kindly could be described as an eccentric, even for the avante garde community in which he moved).

The lull was deceiving, and not to last long. Soon, Americans still left in Paris were gathered aboard the S. S. Shawnee at Bordeaux to sail for New York, the war smoldering and ready to explode in full force behind them.

The trip to Europe had started out as a lark. By the time Jerome Bruner returned home on the S. S. Shawnee, his considerations were more serious. Jerome Bruner was a Jew, though his Jewishness had never been of particular moment to him; his childhood household had not been a religious one. He was also a man with a strong sense of his European roots. As we see his work develop, we find that it is apparent that Bruner is becoming increasingly conscious of being a member of the world community, as well, and of having some indefinable kind of responsibility to his fellow man.

Bruner was back at Harvard when, on April 9, 1940, Denmark was invaded, and on May 9th, Belgium and Holland were bombed. Holland flooded her canals[2], but to no avail; the Germans brought along rubber boats and moved through Holland. The port city of Rotterdam was bombed

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[2] Conversation with Professor Henk Stassen of Delft, Netherlands, during visit to Netherlands in October, 1977.

nearly out of existence, and Hitler threatened to put the country under water by bombing all the dikes. The Netherlands surrendered May 14, 1940, followed by little Belgium on May 28. Every vessel, large or small, which could take to the seas struck out from Britain across the channel to burning Dunkerque to evacuate the trapped troops, British and French, who had been pushed to the sea by the Nazi onslaught. In ten intense and terrifying days, 336,427 troops had been rescued.

On June 10, 1940, Mussolini brought Italy into the fray. France declared Paris an open city, which saved her from bombing, but she fell to the Nazis on June 14, and by the 22nd, France and Germany met at the old railway car where Germany had surrendered in 1918.

France had fallen.

## THE PROPAGANDA STUDIES BEGIN

Bruner's research energies became directed toward the general area of social psychology in the late 1930's and early 1940's, probably largely influenced both by Gordon Allport and the fast changing condition of the world at war.

As World War II exploded throughout Europe, Hitler's strident haranging came more and more to be heard by the American ear. Even the prevailing desire for isolation could not withstand the increasing reports of inhumanities. At Harvard, its President Conant and Ralph Barton Perry formed a "Committee on the Present Danger," in which Bruner became involved.

Bruner began to study propaganda in 1939 and 1940. His 1941 publications show his increasing absorption:

"The Dimensions of Propaganda: German Short-Wave Broadcasts to America" (Bruner, 1941)

"Personality under Catastrophe: Ninety Life Histories of the Nazi Revolution" (Allport, Bruner and Jandorf, 1941)

"The Impact of Revolution" (Bruner and Bruner, 1941)

"The Strategy of Terror: Audience Response to Blitzkreig im Westem" (Bruner and Fowler, 1941), and

"Shortwave Listening in an Italian Community" (Bruner and Sayre, 1941).

He was also working on his doctoral dissertation, "A Psychological Analysis of International Broadcasts by Belligerent Nations," which he wrote with Professors Allport and Friedrich as his major supervisors.

He says of this period,

> "For me the war years were a special threat to mankind coming from a way of thinking, an ideology, and a way of hating that were all embodied in the Nazi regime in Germany."
>
> (Personal Communication, July 17, 1977)

The propaganda papers Bruner worked on during this time come under the general heading of social psychology. In one, "Personality under Catastrophe: Ninety Life Histories of the Nazi Revolution" (Allport, Bruner and Jandorf, 1941), Bruner and his colleagues asked how the persecuted adult defended himself psychologically against catastrophe, how far catastrophic social disorganization disrupted basic personality integration, how political attitudes change under the impact of catastrophy, what responses appear under conditions of extreme frustration, and, finally, what it is that is the persecutor's psychological plight. In this paper we see the beginning of a direction toward the concept of "intention" in behavior, an idea which will be important in Bruner's writing through the years; we see a hint of this when the authors say,

> "The fact that often as many as five years of intense suffering have to be experienced before an individual gives up his struggle for the fulfillment of long establihsed needs is first and foremost a tribute to goal-directed behavior. One is led to the conclusion that reinforcement response is not the whole story in accounting for the maintenance of goal striving. Certainly no incentives for such persistent activity were present in the social situation. Indeed, the opposite was the case."
>
> (Allport, Bruner and Jandorf, 1941)

"Reinforcement response is not the whole story" is a clear precursor to Bruner's later work, and certainly to his general disagreement with the psychological philosophy of B. F. Skinner. It is of interest that this review was based on compositions submitted as unpublished

autobiographies, of an average length of 100 pages or so, by persons who knew Germany well before and since Hitler; two hundred papers were submitted, and the report involved a detailed psychological analysis of ninety of these.

Bruner authored and co-authored several papers having to do with the effects of propaganda through short wave radio broadcasts. The average family used the radio as a source of both news and entertainment in these years before the advent of the ubiquitous television set. One-fifth of the 45 million or so radio sets in the United States had short wave reception, which meant that some nine million families might have been able to hear the foreign broadcasts beamed to America. Both CBS and NBC maintained listening posts for short wave broadcasts.

Bruner spent the summer of 1940 as a member of the Research Staff of the Princeton Listening Center, working along with Hadley Cantril and others, a foreign broadcast monitoring service to extract such intelligence as they could from German, Japanese and Italian broadcasts.[1]

In his paper, "The Dimensions of Propaganda: German Short Wave Broadcasts to America," published in the Journal of Abnormal and Social Psychology (Bruner, 1941), Bruner noted,

> "In order to correlate changes of opinion with changes in propaganda 'pressure,' systematic methods of expressing variation in propaganda must be developed and used. The determination of such correlations between propaganda and public opinion, affording as it does the basis for prediction of opinion shifts, is a central task of social psychology, particularly in times of crisis."
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> (Ibid, p. 336)

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[1] The Center would eventually end up in Washington, D.C., as the Broadcast Monitoring Service of the Federal Communications Commission (FCC).

Bruner felt that correlation "waits upon the elaboration of systematic dimensions of variation," and that divergent propagandas needed to be compared, so that "trends in propaganda can be represented over a period of time in systematic — even quantitative — fashion." Bruner proposed nine dimensions as an attempt at development of a systematic method for analysis of propaganda which, in the "Dimensions of Propaganda" paper, he applied to four main periods in 1940. The study started arbitrarily on January 20, but the periods were otherwise demarked by specific events: the Altmark incident[2], the invasions of Norway and Denmark, the subsequent invasions of Holland and Belgium, the fall of France, and the study ended with the onset of mass bombings of Britain. One message he reports which certainly must have given the listener pause was Hitler's, "Our strategy is to destroy the enemy from within, to conquer him through himself."

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[2] The Veterans of Foreign Wars Edition Pictorial History of the Second World War (1947) describes the Altmark incident:
"During the early days of February the German tanker Altmark, which had acted as a supply ship to the ill-fated Graf Spee, was nearing the end of her perilous return voyage to Germany. On board she had 300 British seamen who had been captured from ships sunk by the Graf Spee. The British Admiralty decided that these men should be rescued and ordered the destroyer Cossack, under the command of Captain Vian, to intercept the German ship. With the aid of aerial reconnaissance she was located and her position radioed to the Cossack, which intercepted her on the night of February 17, as she was steaming down the Norweigan coast. When the Altmark saw the British destroyer she sought shelter in Joessing Fjord. Disregarding the fact that she was in Norwegian territorial waters, the Cossack followed her in, ran alongside, and her crew boarded the tanker. In the ensuing hand-to-hand fight seven of the German crew were killed but the British sailors were released. They had been held under hatches and had suffered terribly for several weeks. The captain of the Altmark had a fanatical hatred for everything English and his prisoners had suffered the consequences."
(Volume I:54-55).
See also Winston Churchill's The Gathering Storm, page 562.

During the school year at Harvard, Bruner was a teaching assistant, working with the course in introductory psychology under E. G. Boring one term, and Gordon Allport the next. He was tutoring students as well, and we see him heading more and more toward what was to be his academic calling.

In the Far East, Japan had been at war with her neighbors for many years; the United States had responded with the same tendency toward isolationism as it did with regard to the European theatre. There was an abrupt end to isolationism and non involvement when, on December 7, 1941, the Japanese bombing of Pearl Harbor brought the United States into the war. By this time, Bruner had completed his thesis and was again between Princeton and Washington. He was not to give his attention to the war in the Pacific, but rather would be absorbed in the European arena, first with regard to propaganda, and then as a part of the SHAEF contingency during the liberation of France. But more of this in a later chapter.

SOME BEGINNINGS...

Katherine Frost was Gordon Allport's editorial assistant; she was also the departmental secretary. A lady with a facile ability with words, whose study of English literature of the 19th Century served her well, she was no doubt sorely missed when she left those positions. Jerome Bruner made her his wife on November 10, 1940.

Katherine Frost Bruner co-authored a paper for the Saturday Review of Literature with Jerome Bruner (Bruner and Bruner, 1941), but it was the Journal of Abnormal and Social Psychology for which she had worked as an editorial assistant from 1937 to 1941. Her "parting shot" came in the form of an article, "Of Psychological Writing: Being Some Validictory Remarks on Style," a delightful, literary and humorous critique for the writer of psychological papers; an article which, in this author's experience[1], would easily apply to the writing of much of the scientific material submitted for publication (Katherine Bruner, 1943). Of such efforts, she comments:

> "The knowledge that he is 'reporting an experiment' freezes the pen of many an author; thereafter, in a mistaken attempt to achieve the workmanlike and to avoid frivolity, he succeeds in becoming merely dull...Self consciousness can tie a writer into knots appalling to view — and impossible to unravel."
>
> (Katherine Bruner, 1943)

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[1] The author of this thesis served for five years as Editorial Assistant to the Annals of Biomedical Engineering, the Journal of the Biomedical Engineering Society, and presently holds the position of editor in the Biotechnology Laboratory at UCLA, occupations which assure an appreciation not only for the sense of Mrs. Bruner's remarks, but for the fashion in which she presents them.

She continues with a more positive view,

> "But a man convinced of the importance and the timeliness and the ultimate sense of the material with which he is dealing is a man who is already looking outward, away from himself. He will be the less tempted to resort to the tortured circumlocutions of the passive voice, to the troops of qualifying clauses that stumble so interminably around Robinson's barn. He is, instead, simply reporting his data. His task becomes henceforward the direct one of setting forth as accurately as possible the manner whereby he has achieved them and why he finds them worth passing on. Essentially writing is as simple as that."
>
> (Ibid.)

She suggests the writer consider for whom he is writing, and further points out,

> "Look, for instance, at how well a man does when he is explaining his material orally to an audience of one; and look at how he fumbles when he sits down with pen and paper to explain that same material to everybody in America, Europe, and Asia, whether living, dead, or yet unborn. If, on the other hand, he would choose some one person, whether imaginary or real, and then, focussing on his data and that individual, proceed to write, the problem would be simplified and the product more readable."
>
> (Ibid.)

It is interesting that Jerome Bruner spoke, in our interviews, of writing as though he were talking with a close friend; especially he would think of Robert Oppenheimer, he said, or of George Miller when putting together a paper for publication or composing the prose for a book. Katherine Frost Bruner could well have had an impact on Jerome Bruner's writing; or perhaps it was simply a point on which they agreed.

As a final note on Katherine Bruner's article, we see that one of her pet aversions was the ubiquitous use of the passive voice:

> "Why should writers go out of their way to spoil whatever directness and force remain at their disposal? Why must they write, 'It was decided to experiment thus,' as if they themselves has been resident

> on Mars at the moment and knew nothing of this thing which now, lo and behold, they find thrown in their laps? Are they modest; do they think it scientific to run from the pronoun *I*; is it a part of the scientific credo never to say a thing simply when you can reach it obliquely? *I* don't know."
>
> (Ibid.)

Whether or not he was influenced by his wife in matters literary, Bruner has no reticence in the use of the first person, and he is outstandingly readable as an author of science and of opinion. He has in his writing, as he has in his life, a distinct style.

Jerome Bruner was just 25 years old, fast growing into his field. He finished his thesis in 1941, and tells us

> "...The day I got my degree I went immediately to the airport and the next morning wrote my first report on the preceding night's broadcasts from Germany and Italy!"
>
> (Personal Communcation. July 17, 1977)

Bruner arrived in Washington to take up his post with other academics, the newsmen and the political scientists who were involved in the Foreign Broadcast Monitoring Service in June of 1941.

It was during this same month that Hitler turned on his erstwhile ally, Stalin. He was eventually to be set back by the same kind of Russian Winter that defeated Napoleon, but not before terrible devastation had been wreaked, some of it by the Russians themselves. The Russians carried out what was to be called the "scorched earth" policy; they determined not to leave a usable item standing, not even a roof, behind their retreating troops. When the tides changed, and the Russians returned to regain their land, many of their cities had to be completely rebuilt (Life's Picture History of World War II, 1950:56-68).

When Hitler turned on Stalin, the firmly anti-communist Winston Churchill announced his support for the Russian Dictator. When

queried about his inconsistency, Churchill fired back,

> "If Hitler invaded Hell I would make at least a favorable reference to the Devil in the House of Commons."
>
> (Churchill, The Grand Alliance, 1950:370)

The propaganda broadcasts increased, and a week after the Japanese attack on Pearl Harbor in December, 1941, Bruner would find himself at 6:00 a.m. sharp pouring over the last evening's thousands of words with his colleagues. The tasks of translation, review and interpretation were enormous.

Bruner was involved in a public opinion survey program with the Program Surveys Division of the Bureau of Agricultural Economics, along with Ernest Hilgard, Ruth Tolman, Richard Crutchfield, and his classmate of Harvard years, Dorwin Cartwright, as well as many others. Hilgard recalls meeting Jerome Bruner first in 1939 at the American Psychological Association meeting, but getting to know him during these intense war times when they worked in the Office of War Information with Rensis Likert. Hilgard recalls of Bruner,

> "He was what we called a Study Director, and I was an Assistant Director of the Division, so I had to assign and review and audit his work...so we got to know each other pretty well..."
>
> (Hilgard, Interview, May 4, 1978)

Here was Jerome Bruner, a young man, fresh from Harvard with his Ph.D. in Psychology, plunged into the middle of war busy Washington. It must have been a heady time. And it was during this early period of the war that his son, Whitley, was born.

Bruner was becoming increasingly knowledgeable of Washington and its ways, of who had what power, and what about it was changing, when he

decided to accept Hadley Cantril's offer to work as Associate Director at Princeton's Office of Public Opinion Research. Cantril, a social psychologist of strong political orientation, was close to the powers of the presidency, and Bruner came to know with unusual intimacy the workings of the Washington of wartime and of Roosevelt. He found his group directly advising the State Department. Bruner thereafter kept in touch, and his opinions would be invited again by the White House, years later, and on entirely different issues under very different administrations.

When Bruner began his work with Cantril and company, he and his family took up residence on a farm just outside Princeton, a striking contrast in life style to that of the Washington turmoil.

Through the Princeton Listening Center during the spring of 1941, while Bruner was still at Harvard, he and Jeanette Sayre published "Shortwave Listening in an Italian Community," using Boston's North End, "the most densely populated Italian community in the United States," as the source for their polling study. The authors' colorful descriptions of this culturally isolated community showed it to be an excellent location for the study:

> "...an immigrant may live all his life without appreciable contact with any other nationality group. He may speak Italian, read Italian, hear Italian on the air, eat Italian, confess in Italian, buy Italian products in stores run by Italians for Italians..."
>
> (Bruner and Sayre, 1941)

Though there are many differences in the community today, any recent visitor to the North End (and I had that privilege in April, 1978) would recognize the description by Bruner and Sayre,

> "A visitor pushes his way through narrow cobbled streets between pushcarts loaded with Italian cheeses, olive oil, garlic; all around him men and women in solid black elbow each other, shouting about their private affairs, the Pope's last pronouncement..."
>
> (Ibid.)

Mandate from the People, Jerome Bruner's first book, was written during the years Bruner was in Washington and at Princeton (Bruner, 1944a); it is a work which Bruner now considers naive. Given that his upbringing had been, in the eyes of many, highly privileged rather than close to the "common man," Mandate from the People fulfilled quite well its goals of presenting and evaluating the views on public policy of America's average citizen.

Bruner felt that the first task in describing opinion was to "sketch the context in which it grew." He saw as those convictions which played the largest part in forming American opinion of foreign affairs:

a sense of geographic isolation

faith in the nation's security

a feeling of political stability

a hatred of war

a humane point of view, and

a suspicion of foreign powers.

We must note here that the idea of context is a very important one, it is a point of view which we will find often in Bruner's work...in his studies on perception and those on education, and certainly context is highly involved in Bruner's approach to the development of the child and onset of language.

Mandate from the People was based on public opinion surveys. The arts of data gathering and statistical analyses were not as highly developed as they are today; nevertheless, as one reads this book, and considers that it was written well before the end of the war, one must be impressed with the predictive quality of some of the poll results, both with respect to international issues and to the post war home front.

Bruner sees the need for an international view, and so expresses himself in this book. He sees a need for a change from the isolationism of pre war American thinking. At the time the polls for the book were taken, it seems the populace was hardly balanced between internationalism and isolationism; quite the contrary. For example, 53% of those polled (and these numbers would be projected to over 50 millions) had domestic issues as their first concern, while only 16% had international affairs as their first concern, with the large remainder stating that they had no opinion! One can see Bruner's point when he says,

> "...there is a long way to travel before Americans become responsible citizens of the world..."
>
> (Bruner, 1944a)

He also points out,

> "...neither vaccination nor international policing is fully understood. Each in its own way, however, is a specific against an evil. Force stops aggression. Vaccination stops small pox. Never mind the niceties."
>
> (Ibid.)

He was convinced that,

> "public support for international issues stands or falls with our conception of the quid pro quo."
>
> (Ibid.)

The Reciprocal Trade Treaties were the cornerstone of the current trade policies. They were understood sufficiently to be properly defined by only 3% of those polled (19% gave doubtful definitions), and a whopping 78% had no notion what Reciprocal Trade Treaties were!

As to reconstruction, Bruner made the observation that there was hope for an internationalistic view:

> "American sympathy and American self-interest — a magic combination — are on the side of this country's full participation in reconstruction. But such sympathy and such self interest have their roots in our new internationalism."
>
> (Ibid.)

Bruner looked forward to note what later would seem obvious:

> "Europe after this war will be a study in exploded social institutions."
>
> (Ibid.)

In the second part of Mandate from the People, Bruner's survey compilations addressed the "home front," including such concepts as social security, employment (that is, what priorities should be given to returning servicemen), farm parity, the deposition of businesses, and the role of government in all of this.

One can assume that the general public, caught up as it was in rationing, war plant work, and day to day news reports of the war, was not, in the main, concentrating on academic speculation (though these matters would become of primary interest quite soon), but rather was pressing its efforts to win the war.

It was the dual task of the Office of War Information (OWI) to supply the facts and to help the public understand them; in 1943 Bruner published

a paper evaluating, through the use of polls, the effectiveness of the OWI in their assigned projects (Bruner, 1943b). The questions he addressed were whether people felt they had been given the facts, if they knew why we were fighting the war, and if they had any notion of what the aims of their leaders were. Roughly 30% of the public did not feel they were getting the facts, and there seemed to be considerable confusion as to what the war was all about for about 65% of the polled populace. As to particular issues, the data indicated a large division in concepts of what the goals of the country and the leaders were.

In 1943, Bruner became, for a year, editor of the Public Opinion Quarterly, and in December he presented a paper to the American Sociological Society in New York, in which he argued,

> "Foreign policy, like all national policy, endures and is made vital by the consent of the governed."
>
> (Bruner, 1944b)

He felt that,

> "...if opinion does not write the peace, at least it suggests the phraseology to those who do."
>
> (Ibid.)

Bruner had such particular suggestions as to indicate that he was convinced that, at 28 years of age, he could significantly lend to the solution of some of the dire problems facing the world, or at least the American adventure, not the least of which solutions was the effective organization of public opinion. Bruner wrote much about public opinion during this period: "Public Opinion and the Next President " (Bruner, 1944c), "Public Opinion and the Peace" (Bruner, 1944d), and

"Public Opinion and America's Foreign Policy" (Bruner, 1944b). He was a contributing author to Human Nature and Enduring Peace, edited by Gardner Murphy, with a chapter entitled, "Public Opinion and World Order" (Bruner, 1945).

The countryside near Princeton where Jerome Bruner and his family lived provided a certain element of calm for Bruner in a life that was clearly otherwise to become increasingly intense and involved.

THE PHYSICISTS

While at Princeton, Bruner made weekly visits to Washington, D.C., and in order to be ready for work early on Friday morning, he would stay overnight with Richard and Ruth Tolman. Richard Tolman[1], then serving as Vice Chairman of the National Defense Research Committee and as scientific advisor to General Leslie R. Groves on the Manhattan Project[2], was a physicist of renown, and his wife, Ruth, was a psychologist, a sometimes colleague and ever close friend of Bruner's.

It was during one of these visits to the Tolmans, Bruner recalls, that he had

> "...a delightful encounter with Niels Bohr[3]...quite cloak-and-dagger, if in a highbrow way."
>
> (Bruner, 1971a:xiii)

Bruner says, regarding his visits,

> "So regular had the habit become that the Tolmans had provided me a key to their house...one evening I let myself in (noting only that

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[1] Richard Chace Tolman (1881-1948)
In 1922, Richard Tolman joined the faculty of California Institute of Technology. It was Tolman's theory that the universe expanded and contracted (rather than ever expanding, as proposed by some physicists). The vernacular of psychology was not strange; his brother, Edward Chace Tolman (1886-1959) was a psychologist of considerable note, as was his wife, the former Ruth Sherman. (Judith R. Goodstein, 1974.)

[2] The Manhattan Project was the U. S. Military program involved in the production of the atomic bomb (Life Science Library: Energy, 1963:195).

[3] Niels Henrik David Bohr (1885-1962)
Bohr was born and died in Copenhagen, Denmark. He won the Nobel Prize in Physics in 1922. (Rosenfeld, 1974.)

two strange cars were parked outside, both occupied) and was greeted by a charming man who introduced himself as Mr. Baker, a fellow guest, and said he was expecting me, and that the Tolmans would be home shortly. I learned much later that he had within the preceding five days been smuggled out of Denmark and flown across the Atlantic.

We sat over drinks and talked. He said he was a physicist. I was intrigued by the line he followed. It was about complementarity in physics, how he had first thought of it in connection with having to punish his son for what was patently a misdeed. Could he, constrained both by his duty as a father and by his fondness for his son, know his son simultaneously both in the light of love and in the light of justice? Were these not mutually non-convertible ways of knowing?"

(Ibid.)

These words were written, some 25 years after Jerome Bruner met Niels Bohr (alias Mr. Baker) as part of the introductory remarks to a series of essays compiled as the book, The Relevance of Education (Bruner, 1971a). Relating Bohr's anecdote to education, Bruner says,

"...those who study the acquisition of knowledge are surely aware to what extent its acquisition is governed by selective purpose and is thereby subject to bias. For all that, in any particular instance, knowledge transcends the uses to which it is put."

(Ibid.)

He sums up these thoughts with

"What one has and how one gets it turn out to be quite different. And our educational philosophy had better consider both."

(Ibid.)

It is important here to discuss a bit of what Niel Bohr's theory of complementarity involves. It is primarily a theory of physics, however Bohr himself saw many, including epistemological, applications[4], and he

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[4] Leon Rosenfeld (1974) says of Bohr that he "...repeatedly stressed the fortunate circumstance that the simplicity of the physical issue made it possible for him to arrive at an

(continued)

once remarked to Ernest Hilgard that the theory was not to be applied to the field of physics alone (Hilgard, interview, May 8, 1978).

One explicit example of an application of the theory of complementarity to an issue in physics has to do with light. It appears to be accepted in the world of physics that light behaves as if it were composed of particles. That is to say, there are experiments which prove light is particulate in nature. It is also accepted that light behaves as if it were waves; in fact if light did not behave in a wave-like manner, the electron microscope could not have been invented. The concepts are mutually exclusive — if light behaves as particles, it cannot behave as waves, and vice versa[5]. Still, each concept has been experimentally proven. How does one cope with this paradox?[6]

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[4] (continued)
adequate formulation of the relations of complementarity he perceived in all aspects of human knowledge.

"The domain in which complementarity situations manifest themselves most immediately is the realm of psychical phenomena — which had been the starting point for Bohr's early observations. He was now able to express in terms of complementarity the peculiar relation between the description of our emotions as revealed by our behavior and our consciousness of them; in such considerations he liked to imagine (on slender evidence, it must be said) that sayings of ancient philosophers and prophets were groping expressions for complementary aspects of human existence.

"In the development of human societies, Bohr emphasized the dominant role of tradition over the complementary aspect of hereditary transmission in determining the essential elements of what we call culture..." (p. 253).

[5] There is rumor of another resolution to the issue of whether light is particles or light is waves: On Monday, Wednesday and Friday, light is waves; on Tuesday, Thursday and Saturday, light is particles, and on Sunday, light is God.

[6] Kenneth Craik says in The Nature of Explanation (1943) "...lack of verifiability is an unfortunate fact but still does not justify, in my opinion, the confusion between a limit of observation and a limitation

Leon Rosenfeld, Bohr's colleague and biographer, explains:

> "Between phenomena occurring under such strictly specified conditions of observation, there may then arise the type of mutual exclusion for which an indeterminancy relation is the formal expression. It is this relationship of mutual exclusion between two phenomena that Bohr designated as complementarity; by this he wanted to stress that two complementary phenomena belong to aspects of our experience which, though mutually exclusive, are nevertheless indispensible for a full account of experience.
>
> "...it is necessary to realize that complementarity is a logical relationship, referring to our way of describing and communicating our experience of a universe in which we occupy the singular position of being at the same time, and inseparably, spectators and actors."
>
> (Rosenfeld, 1974)

In this author's view, the implications of Bohr's theory of complementarity are profound in their impact on our concepts of the human condition, in particular as we look at psychology. Herein lies the resolution of the war between the psychologist as scientist and the psychologist as therapist. The reductionist and the humanist can now stand together as complementary functions of the same human world, a vindication of unitarian and eclectic alike.

Jerome Bruner's integration of Bohr's theory into his own philosophy of psychology and of education and, indeed, of living, will emerge in various forms in his writings, as we shall later see.

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[6] (continued)
of existence...Science surely is an attempt to find out the nature of reality by experiment, theoretical formulation of hypotheses and verification; not an attempt to assert that reality has the same limitations as our methods of observation...Science is not reality; it is a method of investigating reality."

A more regular visitor to the Richard Tolmans was another physicist, one who would become even better known to the general public: his name was Robert Oppenheimer[7].

Oppenheimer and Tolman, unknown to Jerome Bruner, had the same "boss." General Leslie R. Groves was the Chief on the Manhattan Project, which Tolman directed on the east coast, while Oppenheimer developed the atomic bomb in Los Alamos, New Mexico. As the years went on, Robert Oppenheimer would be to Bruner a very close friend; he would influence his life during the dramatic time of change which would take place when Bruner was in his early forties, he would review Bruner's work, and he would be one of those persons to whom Bruner would "talk" while struggling with the written word (Bruner, Interview, October, 1977).

Jerome Bruner counts among his friends several others whose business is the science of physics, but it was these men (and possibly Johann (John) von Neumann, of whom we will say more later) who greatly influenced his life during particularly critical periods.

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[7] J. Robert Oppenheimer (1904-1967)
Oppenheimer graduated summa cum laude from Harvard in 1925, having completed a four year course in three, and had his Ph.D. in the spring of 1927. It was Oppenheimer's idea that the weapon development for the Manhattan Project be done in Los Alamos, New Mexico, where Oppenheimer had a ranch.

Rudolf Peierls, in his biographical sketch of Oppenheimer (1974) said, "Robert Oppenheimer achieved great distinction in four very different ways: through his personal research, as a teacher, as directory of Los Alamos, and as the elder statesman of postwar physics."

Oppenheimer reached fame (or infamy) for a number of Americans when, during the McCarthy era (in December, 1953), his security clearance was withdrawn. Ten years later, President Johnson presented him with the Atomic Energy Commission's Enrico Fermi Award (R. Peierls, 1974).

A NEW FRENCH CONNECTION

As the war progressed, Bruner became increasingly restless at not being more directly involved. He had attempted to enlist, but was denied (predictably) because of his vision. Then he found it was possible to be attached to a special force, the overseas division of the Office of War Information, if he were willing to waive insurance.

By June 6, 1944, D-Day, Bruner had arrived in London. While in England, he was taught to shoot a rifle though, as it happened, he never fired it in combat. He was, however, fired upon while in France — but only once: unaccustomed as Jerome Bruner was to the rules of the game of war, — and accustomed as he was to considerable self-confidence, he took a risk which taught him a quick lesson. The German troops were on the far side of a river, and the Allied forces were sitting tight, awaiting orders. There was no present shooting, and the area seemed peaceful and quiet enough, so Bruner strode nonchalantly to the end of a pier. As he was about to relieve himself, a sniper from the other side of the river broke the silence with a bullet clearly meant for our hero. It can be presumed that Bruner's retreat was swift. It is certain that he had at that moment a thorough practical indoctrination in instant behavior modification. Being shot at once, Bruner admits, is quite enough!

Bruner's European assignment was with the Anglo American Psychological Warfare Division of Supreme Headquarters Allied Expeditionary Forces Europe (SHAEF), to assess the attitudes of the French as the liberating forces moved across France. It is interesting there was quite a contingent of Harvard colleagues among this group.

It was not long before Jerome Bruner had, with others, organized a series of literary get togethers, dining regularly with people who were the leaders of the time. We will see Bruner develop the habit of dining in a sort of informal club situation again and again; he seems to enjoy immensely this form of discourse.

Pierre Auger, the physicist, invited Jerome Bruner to become an observer at the Commission of Langevin, a group involved in public education. Having been, up to this time, what Ernest Hilgard referred to as a "survey social psychologist," Bruner now found himself beginning to be interested in education and its reform. Although his major publications in educational psychology would not begin until around 1959, the precursor to Jerome Bruner's extensive research and writing in this field was to be found here, in France's struggle to revive itself after the miseries of the war. Out of this experience would come a paper, written with John L. Brown, "Contemporary France and Educational Reform" (Bruner and Brown, 1946).

Franklin Delano Roosevelt had been President of the United States since before Jerome Bruner was of age to cast a ballot. On April 12, 1945, President Roosevelt died in Warm Springs, Georgia, not to see the end of the war through which he had exercised such leadership. It was less than a month later, on May 7, that the surrender was signed at 2:45 a.m. in Rheims, France.

There had been a blackout in Paris when Bruner had seen her last, in 1939 during what had been called the "phony war;" on V-E Day, Bruner and his friends were at the Place de Concorde when the lights of Paris were once again turned on. What a moving sight that must have been!

Following the liberation, one of the first people met in Paris was one Didier Lazard. Bruner was Chief of the Cultural Relation Division of the U. S. Information Service in France, and Lazard worked with him. Together they produced a most interesting paper: it was authored by Lazard, with the translation and the introduction provided by Bruner. It was entitled, "Two Years under a False Name."

Lazard had his doctorate in Law before the war; he was a man of influential family, and had led a generally leisurely, stable and pleasant life. He was, however, a Jew, and his family was prominent, a dangerous status when one's country is being overrun by anti-semites. The report covers his adventures, and the change of world view brought on by these experiences for Lazard. Bruner's introduction gives a literate and gentle analysis of the dramatic effects on a personality of the need to change one's image, and to hide one's name, in order to escape imprisonment and probable death. Bruner sees a collective as well as an individual reaction to "the shock of change:"

> "I have heard a French poet say that he learned during the Occupation not only that there were values he had never suspected but also that he had been adhering to many of them without being aware of it. Lazard's account, like the poet's, is one of a renaissance of awareness."
>
> (Bruner and Lazard, 1946:162)

There were two other publications of Bruner's which should be mentioned. "Americans and Britain" was published in London in January, 1945 (Bruner, 1945a), and "Le Peuple Americain et la Paix," published in Paris in August, 1945. These were the first of his papers whose primary publication was abroad.

Bruner was invited to take the position of "Instructor" at Harvard for the Fall term of 1945; he had completed his second trip to Europe, one much different from the first, with a set of significant experiences behind him.

POSTWAR

Harvard...

In 1945, Jerome Bruner returned to his family, at home now in Belfast, Maine, and in September he returned to Harvard, this time as a lecturer in psychology. He turned thirty in October.

Bruner came back to Harvard a very different person from the young man who flew off to Washington as soon as he had defended his dissertation. He had now established some of what was to become his life style. For instance, he would make it a habit to dine regularly with groups of persons whose intellect and originality he admired. He also now carried a different perspective, one which reached from the individual to the international. We will discuss in this chapter some of Bruner's approaches to the individual: the study of the election of Boston's Mayor Curley; the study of the relationship of one's opinion to his personality, and a new individual in Jerome Bruner's life, his daughter. We will also discuss activity on the international scene, including a proposal to the United Nations. Bruner's exposure and closeness to the sources of political power in Washington, D.C., and then to the politics and the educational needs of France, clearly gave him an awareness of a larger world, and changed his way of looking at social psychology and, particularly, education. It is not surprising that at this time Bruner became very active in the Society for Psychological Study of Social Issues, and was the Chairman of its International Committee in 1945.

As it was a different Bruner who came back to Harvard, so it was a very different Harvard, albeit an exciting one, to which he returned.

Edwin Boring describes how, in 1945, Harvard developed a new Department of Social Relations and Laboratory of Social Relations, as the social psychologists realized "that they had a common mission with the cultural anthropologists and the empirical sociologists, since they were all trying to study human nature in its social setting. As to the formation of a new department, Boring says,

> "I was doubtful, but these human naturalists were sure; and I gave in when Jerome S. Bruner, like Edward VIII before Stanley Baldwin, pleaded for the right of the social psychologists to marry for love."
>
> (Boring, 1952)

The students now at Harvard had been through their own parts of the war, and many were Bruner's contemporaries. They had a maturity bought at the price of the war, so the old status cum professorial rank was perforce diminished, providing a very different atmosphere for both the student and his mentor. New theories and their theorists were emerging: Kurt Lewin had his Center in Group Dynamics just down the Avenue at MIT; Leon Festinger, whose theory of cognitive dissonance would make an enormous impact on social psychology was at Harvard. M. Brewster Smith (later to be President of the American Psychological Association — 1977-78) was a graduate student.

In this new milieu, Bruner began in earnest his research and his professorial career.

Boston...

There were some goings on around Boston in 1945 which were of particular interest to those engaged in the study of social psychology. James Michael Curley, 71 years old, and under federal indictment for using the mails to defraud (he was later convicted), polled 111,868 votes and was thus re-elected in the November Boston mayoral election. His votes totaled more than those of his two nearest rivals combined.

Bruner and Sheldon J. Korchin conducted a poll of 750 voters before the election; they analyzed the campaign efforts of the candidates, and wrote a paper entitled, "The Boss and the Vote: Case Study in City Politics" (Bruner and Korchin, 1946). One of the conclusions to which they came was,

> "Given certain conditions, assumed ability to get things done looms larger in the voter's mind than personal or public morals."
>
> (Bruner and Korchin, 1946)

It seemed that Curley managed to accomplish things in his earlier service as mayor, and that the public preferred a rascal they knew to a rascal they didn't! Bruner invited Mayor Curley to address his class at Harvard. Curley accepted, and it appeared that all, including the students, enjoyed the exercise!

In 1946, Bruner's teaching assignments at Harvard included a joint project with Joachim Friedrich teaching a government class based on the psychological issues involved with government.

A daughter...

Bruner had missed his son during the boy's early years when Bruner was involved in the war an ocean away; in 1946 his daughter, Jane, was born. A few years later, when she was still a very little girl, her father would take her to the Prado in Madrid. Jane ran down the halls, her eyes like saucers, squealing for her father to look with her at the dark, twisted, mad, distorted figures of the late Goya. When she grew to young womanhood, Bruner would take her to England while she awaited her admittance as a student to the Rhode Island School of Design.

Today she is an assistant photographer for the British Museum, and one can see a certain pride in the expression of her father when he tells of her looking at him and saying, in wide eyed awe, "Do you know what it means to hold the Magna Carta in your hands?" (Bruner, Interview, 1977.)

Opinions and Personality...

> "In September 1946, a group of social psychologists, clinical psychologists, and a lone anthropologist met around a table at the Harvard Psychological Clinic on Plympton Street in Cambridge...we were going to study the attitudes of a group of ten mature men with particular reference to the relationship of attitudes to personality as a whole."
>
> (Smith, Bruner and White, 1956)

Though, as one can see, the study was not published until ten years later, the work on the book, Opinions and Personality, from which the above passage was quoted, began in 1946. The attitude which the researchers examined was, for each subject, "Russia as it exists for him," however the authors insisted,

> "This volume is...a study of the psychological processes involved in forming and holding an opinion — any opinion."
>
> (Ibid.)

It must be presumed a compliment to the authors that Lane and Sears would remark in their book, Public Opinion, eight years later, that

> "Perhaps the most ambitious effort to describe opinions was made by M. Brewster Smith, Robert W. White and Jerome Bruner in their Opinions and Personality..."
>
> (Lane and Sears, 1964)

The research included a most comprehensive list of personality (and other) tests and interviews, about thirty hours being spent with each subject in weekly two hour sessions. Three of the ten persons studied

were presented as in depth reviews: one was termed a liberal, the second a radical, and the third a conservative. Briefer reviews were made of other seven personalities. The authors concluded:

> "A man's opinions inevitably bear his personal stamp. His capacities for abstract or practical thinking, for intense feeling, for forthright action set limits on his response to public issues and, indeed, on what he makes of any significant event that impinges on him...An opinion on any given topic represents a person's way of defining a relationship between the demands of the outside object and the requirements of his own interests."

The authors continue,

> "We have been impelled to treat the function of an opinion as a resultant or compromise between reality demands, social demands, and inner psychological demands. The three are inseparable."
>
> (Ibid.)

Though the book itself did not come out until 1956, a brief paper describing the work was published in 1947 (Smith, Bruner and White, 1947).

Things International...

In the survey that resulted in Bruner's paper, "International Research on Social Issues: A World Survey" (Bruner, 1947a), a letter was composed in English, French and Spanish, and was sent to social scientists in 48 countries — about 400 scholars in all, the group made up of psychologists, anthropologists, sociologists, political scientists, and a few psychiatrists. The response from one out of six of those polled indicated an enthusiasm among the respondees for closer international relationships in the social and human sciences.

In another publication, the editorial for an issue of the Journal of Social Issues, Bruner challenges social scientists to create a two

way flow of information, and challenges educators to train graduate students to think in terms of international relations with their social science. He also mentioned the need to clarify and simplify esoteric language to promote a more general understanding. Bruner states,

> "Whoever can contribute to basic methodological knowledge, whether he be working on rats or national character, will play a central role in the application of scientific method to social problems."
>
> (Bruner, 1947b)

Bruner joined Gardner Murphy and Dorwin Cartwright in writing "Resources for World-Wide Research in the Human Sciences" (Murphy, Cartwright and Bruner, 1947), in which exchange programs, international conferences, a French international laboratory plan, the preparation of an international directory, and other matters of the same nature were discussed.

Kurt Lewin's death in 1947 was clearly a loss to the psychological community, and in a cover letter for a proposal to the United Nations, Bruner noted that the international community had suffered a loss as well.

Bruner, as Chairman of the International Committee of the Society for the Psychological Study of Social Issues of the American Psychological Association[1], submitted a proposal to the United Nations that the U. N. establish an Institute of the Human Sciences, and he did so at the request of Assistant Secretary General of the United Nations, Dr. Henri Laugier, and with the accompanying signatures of ten of his distinguished colleagues.

The proposal, in this author's view, lacked cohesiveness and the clarity of purpose one might expect from so expert a committee; the transmittal letter notes that the proposal was compiled from contributions

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[1] He also held the title, Consultant, Department of Social Affairs at the U.N.

of 100 authors from a dozen or so countries — perhaps that explains its apparent lack of continuity.

The first part of the proposal addressed the question of the need for an international institution. Part II presented illustrative research projects in the form of samples, rather than a distinct set of propositions for the establishment of programs, and Part III described the anticipated administration of the Institute. There were some most valuable suggestions embodied in the proposal: A means to define standards could be set up (considered on an international level, a mind boggling task!), and there could be a clearing house for the exploding growth of literature in the social sciences. These "facilitations for communication" included the establishment of international journals, as well as a central archives and facilities for the dispensing of scientific information. The cultivation of interdisciplinary research, and the formation of training facilities (to be supported, in part, by grants in aid) were envisioned (International Committee, Society for the Psychological Study of Social Issues, American Psychological Association, 1947).

The Draft Proposal, with a cover letter signed by Bruner as Chairman of the International Committee (accompanied by the names of a dozen of his most distinguished colleagues as committee members), was submitted on June 5, 1947, and introduced by Dr. Laugier before the Economic and Social Council.

It was a particular disappointment that this proposal, the request for which had come from Henri Laugier, a Frenchman, was defeated by the French delegation.

Potpourri...

Bruner published a few reviews of the works of others: C. A. Siepmann's Radio's Second Chance (Bruner, 1946), and three years later, with M. Brewster Smith as co-author of the review, Krech and Crutchfield's Theory and Problems of Social Psychology (Bruner and Smith, 1949). Of this latter book, the reviewers said that the book

> "...like Gulliver's Travels may instruct the adult while pleasing the child."
>
> (Bruner and Smith, 1949)

In 1950, Bruner did one more review; it was for G. Almond's The American People and Foreign Policy (Bruner, 1950a).

We begin to see a rapid diminution of papers by Bruner devoted to the traditional social psychological matters which have taken his attention to date; in 1949 we see one social psychology paper, and in 1950 another.

In the 1949 paper, we find Bruner as the third author. The paper, entitiled "An Analysis of the Stability of Voting Intentions: Massachusetts, 1948" (Bauer, Riecken and Bruner, 1949) deals with the failure of the polls to predict the election of Truman in the Dewey-Truman struggle for the presidency in 1948.

The work in 1950, "Social Psychology and Group Processes" (Bruner, 1950b) is a review of the field of social psychology from May, 1948 to June, 1949. This 31 page report concludes that social psychology had grown tremendously in the decade preceding the year covered (1939 to 1949), and

> "the critical shortage in social psychology is not in its lack of zeal for data, but in its paucity of integrative theory."
>
> (Bruner, 1950b)

There will be, through the years, other papers which have as part of their themes the kind of study to which Bruner thus far had given so much attention, but there will not be more of the intense "survey, analyze and report" kind of publication.

We will go back, now, to 1946, when, along with his lecturing duties, Bruner was Research Associate in the Laboratory of Social Relations at Harvard. The first paper appeared in a field which would consume most of Bruner's energies for several years. It was reasonable, certainly, after dealing with human societal relations for many years, to wonder how each person concluded as he did about issues; what, that is, is the process of perception that leads to differing social responses? Jerome Bruner, Leo Postman, and their colleagues would provide a new approach, what would be called a "New Look" to perception.

## THE PERSON AS PART OF THE PERCEPTION

Because of the nature of Bruner's work in perception, we will approach this research in a different manner than our usual chronology. Of all the Brunerian fields of inquiry, perception stands alone in that his publications have a distinct time of beginning, and an abrupt cessation. For this reason we will, in this chapter, ignore not only concurrent research endeavors in other areas, we will also exclude the "markers" of Bruner's personal life which occurred during these years. Both of these important subjects will be recorded elsewhere in this document. This chapter, then, will cover the work of Jerome Bruner and his collaborators on various approaches to the subject of perception from 1946 to 1960.

Leo Postman and Jerome Bruner presented the first of many coauthored papers on perception in 1946 In this publication, entitled, "The Reliability of Constant Errors in Psychophysical Measurement" (Postman and Bruner, 1946), the authors described two methods of quantifying the reliability of constant errors, and they described the applicability of the method of statistical reduction known as Analysis of Variance or, in abbreviated form, ANOVA. The authors were demonstrating the use of a precise approach to perception measurement, as precise, at least, as is possible using statistical data reduction. Now we will discuss a bit of what that means.

Since we will find in this group of papers that the data are often analyzed statistically, it would be well for us to take a moment to talk about probability and about statistics.

Probability, as we use the word here, simply gives us an indication of what the possibility is that the result at which we are looking is by chance. If there is one possibility in a thousand, we will say the probability is .001, or p = .001, and we will know that it is very likely that what we have measured is telling us what is really happening.

If we flip a coin, one that has no weighting or bias, we will find that, if we flip the coin enough times, half the time it will come up heads and half the time, tails. So we have a probability of 50%, or p = .5. There are a couple of things we have to attend to here. One is the number of times we flip the coin. We might find that out of five flips, a perfectly legitimate coin would come up heads each time, but after 100 times, we would be much more likely to have half the time heads, half the time tails. So the number of times we test something matters.

The other thing to which we need to attend is what we will call a level of significance. The only significant thing about p = .5 is that the results are exactly chance, that is, in the tossing of a coin, p = .5 means that we probably have a fair coin. If you were, however, to flip the coin 1,000 times, and 998 times it came up heads, you could be reasonably sure that there was what is called an "effect" involved: that the coin was weighted, or that some other factor was acting.

In order to have a statistically significant outcome, that is, one which shows that an effect is involved, we must consider that the number of tests is adequate, as we noted earlier, and that the level of significance, for most tests in the social sciences is p = .01 or less, that is, that there is only one possibility in 100 that the results we are observing are chance. Some studies accept a probability of p = .05, which would mean one

in twenty, and some accept one in ten, but those are not really very good odds in the psychological betting game. We might note that in other areas where probabilities are important, in the testing of drugs, for example, nothing greater than one risk in a thousand ($p = .001$) would even be considered, and a level of $p = .0001$ would be much more acceptable.

Statistics is a way of dealing with numbers of events. Through statistical methods, we are able to describe the data resulting from records of these events and, through statistical techniques, we are able to infer certain things about the data. We can also decide how confident we are about the inference, and can report that confidence numerically.

In an experiment, we try to find out if there is some difference between the group we have treated differently (for example, rats that were shocked at touching one side of a cage) and a group which we did not treat (rats that we did not shock). That is, was there any effect? And if so, was it due to the change we made, or to some other factor (variable)?

The results are often reported in terms of probability, that is, the possibility that the results are by chance, e.g., $p = .01$, in the manner described above.

This is a highly oversimplified report of the use of probability and statistics in psychological studies; it is presented to assist the reader unfamiliar with this means of reducing and reporting data in understanding some of the results and conclusions presented in the work of Bruner and his colleagues on perception[1].

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[1] For a much more complete (but still quite brief) discussion of statistics, see the appendix, "Statistical Methods and Measurements," in Hilgard, Atkinson and Atkinson, Introduction to Psychology (6th ed.) 1975. For full texts, see William L. Hays, Statistics (2nd ed.) 1973 and Geoffrey Keppel, Design and Analysis: A Researcher's Handbook, 1973.

To sum up, then, when we say something is statistically significant, we mean that there is very little possibility that the results we see just "might have happened," and that what possibility there is can be numerically defined at a particular level. The results, when we can describe them as statistically significant, most probably happened because of the specific conditions we set up.

Among the many important perception papers authored by Bruner and his colleagues is one of particular consequence. Cecile Goodman, a graduate student, coauthored the work with Bruner; it was entitled, "Value and Need as Organizing Factors in Perception." The authors proposed that the person perceiving something is not merely a "passive recording system," but rather an active participant in the perception, and that perceiving something is not simply an isolated event, but rather related (even in a laboratory setting) with other functions. The authors present a compleat review of the literature to date on behavioral factors in perception, and they propose that perception undergoes variation when the person doing the perceiving is hungry, in love, in pain, or in the process of solving a problem. They then discuss some of the issues that can affect the way we see things: the sensory nervous system, the adaptive functions of the individual, and the laws of learning and of motivation.

Factors which affect what the authors term behavioral aspects include a kind of classical and reward conditioning, practice in observations, and illusions. An illusion used the the authors' example is the Müller-Lyer

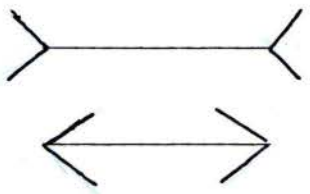

FIGURE 1:

MÜLLER-LYER PHENOMENON

phenomenon, where we see the parallel lines, one with forked ends and the other with arrowed ends, as being of different lengths, though they are, in reality precisely the same in length. It is this kind of visual deception which allows the artist to create a sense of depth and perspective in a two dimensional painting.

The authors noted that the world presents itself as loosely organized, and that perforce we must select what we see; they also inform us that perceptual objects which are habitually selected become more vivid. For example, those of us who are trained to look into a microscope and who are taught what it is we are supposed to be attending to, tend, over time, to ignore other material in the field in favor of those figures we expect to see.

All of this, however, is background; the authors addressed themselves in what appears now to have become a landmark paper to issues of social value, and they hypothesized that the greater the social value of an object, and the greater the need of the individual for that object, the more "marked will be the operation of behavioral determinants."

The question to be answered in the experiment was, put simply, did the value children put on coins, that is, pennies, nickels, dimes, quarters, and half-dollars, affect their perception of the size of each coin? And the answer was "Yes." Now let us see some of the interesting details involved in the experiment, and how it was the researchers came to their conclusion.

The experiment was conducted in two major parts. In the first part, thirty ten-year-old children were given an experimental situation where they were able to make a circle of light larger or smaller by manipulating a knob. Twenty of the youngsters were asked to make the light the sizes of each coin, from a penny through a half dollar, from memory. Then the children were shown the coins, each at a distance of six inches, and asked to make the light the sizes of the coins as they saw them. The other ten children were shown grey discs made of cardboard, and were asked to make the light the same size of the discs.

Figure 2 shows that the children describing the coins saw them as much larger than their actual size. Each coin was not only perceived as larger, but between each graduation the percent of deviation of size was more, except for the fifty-cent piece where, though there was still a significant difference between the perceived size of the coin and the real size of the coin, the percent deviation dropped a few points. The authors hypothesized that perhaps the children did not have a strong grasp on the concept of a 50¢ piece; during 1945 and 1946 (when a quarter bought so much more than it does today) it was possible that the child might not have seen that many!

We can also see in Figure 2 that the cardboard discs did not "grow" in size, and it was the contention of the authors that this was because the discs did not have the social value of the coins. Using an ANOVA procedures, as described in the Bruner-Postman paper in 1946, the probability values were less than one in one hundred (written as $p < .01$) that the results were by chance.

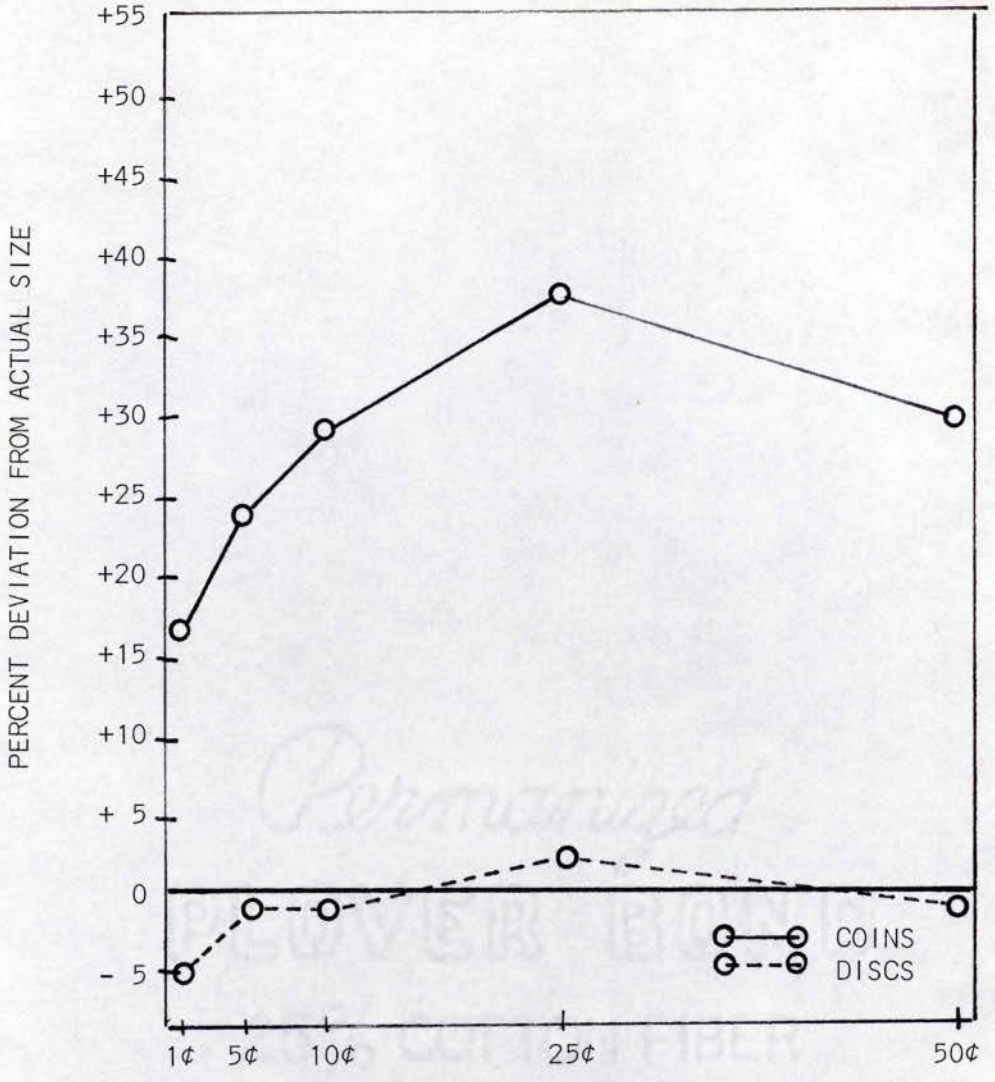


FIGURE 2 SIZE ESTIMATIONS OF COINS AND DISCS OF SAME SIZE MADE BY TEN-YEAR-OLDS

(Method of Average Error)

from J. S. Bruner and C. C. Goodman, "Value and Need as Organizing Factors in Perception," Journal of Abnormal and Social Psychology 42:38, 1947

The second part of the experiment dealt with two groups of ten subjects each. The first set of subjects was

> "drawn from a progressive school in the Boston area, catering to the sons and daughters of prosperous business and professional people..."
>
> (Bruner and Goodman, 1947)

and the second group of ten subjects was chosen from

> "...a settlement house in one of Boston's slum areas."
>
> (Ibid.)

The "poor" group, as seen in Figure 3, overestimated the size of the coins significantly ($p < .01$) more than the "rich" group, though it must be noted that the children who had an easier financial time of it also overestimated the coins sizes[1].

In addition to the experiments described, the "poor" and the "rich" group each estimated the sizes of coins under two conditions, the first with the coin in clear view six inches away, and the second with the coin not present. The sizes of the coins were overestimated in each case, but the overestimations with the coins present compared with the coins absent were closer to one another for the "rich" group than for the "poor" group. The "poor" group, interestingly enough, consistently overestimated the coin size more when the coin was present than when it was absent, a result described by the authors as "a weakened fantasy."

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[1] It is, incidentally, a compliment to the care in selection of the experimental population that the coin size estimation data of the children at large (those who estimated the sizes of coins versus the cardboard discs) falls almost exactly between the line describing the coin estimation data for the "rich" children and that describing the coin estimation data for the "poor" youngsters. (See Figures 2 and 3.)

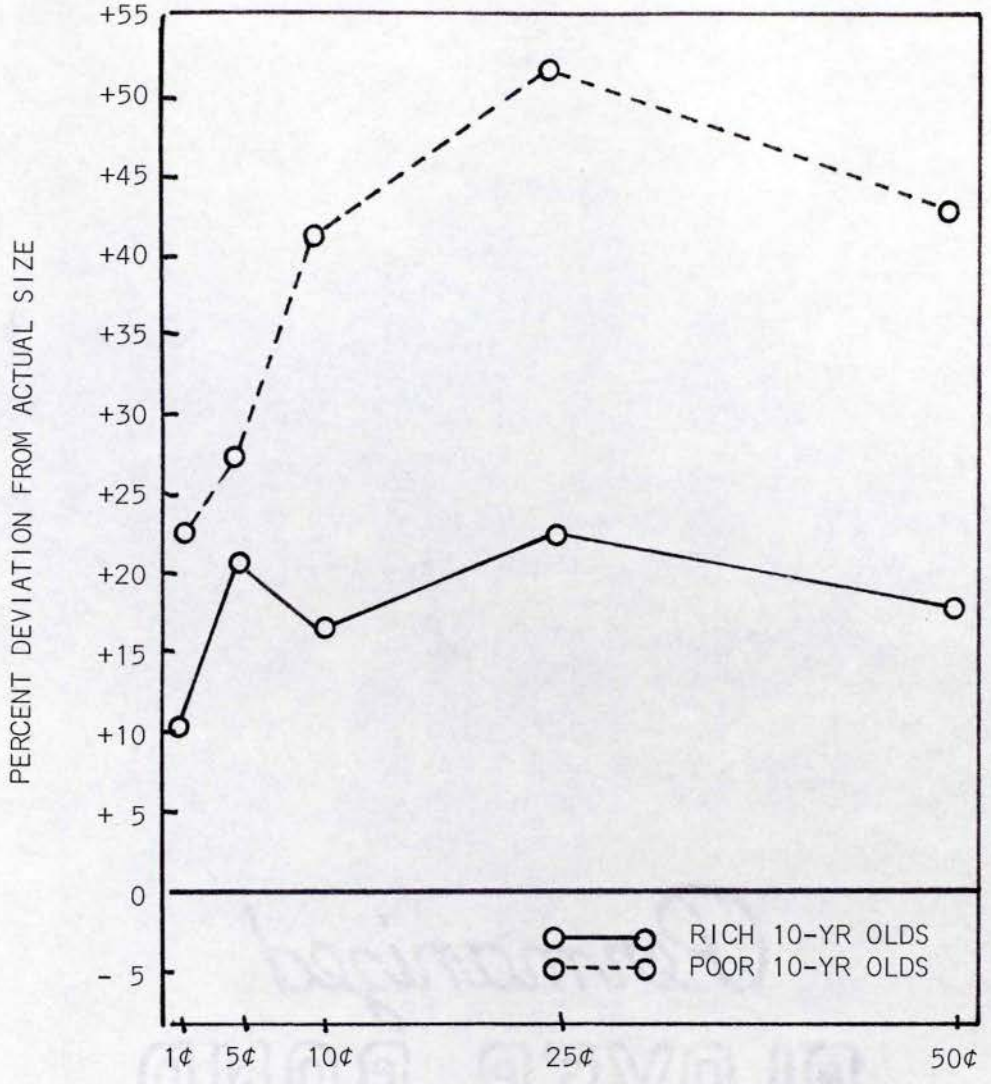


FIGURE 3 SIZE ESTIMATIONS OF COINS MADE BY WELL-TO-DO AND POOR TEN-YEAR-OLDS

(Method of Average Error)

from J. S. Bruner and C. C. Goodman, "Value and Need as Organizing Factors in Perception," Journal of Abnormal and Social Psychology 42:41, 1947

Eugene Galanter remarks about the Bruner and Goodman work,

> "The results of their experiment took the psychological world by storm, and ushered in what came to be called the 'new look' in perception[2]."
>
> (Galanter, 1974)

Galanter goes on to say,

> "This experiment suggested that motivational effects have direct consequences on perceptual events. In general the line taken was that our values, motives, and attitudes do not simply shape our responses, as a Skinnerian might assert, but alter in behaviorally diagnostic ways, our perceptions of the world. These changes in perception lead to changes in response by the same old classical stimulus-response mechanisms. Consequently the unique causal efficacy on behavior of the stimulus itself is unchanged by the introduction of motivational effects. At last the S-R paradigm can rest easily. After all if desires and aversions act simply to alter the proximal stimulus, then we can reinstate Tichner and give behavioral evidence for the existence of context variables."
>
> (Ibid.)

The concept was a controversial one, of course, and there were many challenges to Bruner's work and to that of his colleagues who adopted the "New Look" approach to perception. Carter and Schooler questioned the findings of the Bruner and Goodman study (Carter and Schooler, 1949), as did others. Confirming studies were published by Bruner and Rodrigues in 1953. The controversy aside, the paper still stands, and still maintains a respectable place in the annals of investigation of visual perception.

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[2] In 1951, A. S. Luchins wrote an article, "An Evaluation of Some Current Criticisms of Gestalt Psychological Work on Perception," in which he critiques the "New Look." In an answer, "One Kind of Perception: A Reply to Professor Luchings," Bruner says, "Let 'New Look' merely denote some psychologists who are interested in studying the variance contributed to perceptual phenomena by factors reflecting the life history of the organism."

The papers in perception began to flow in 1947; in 1948 five papers would appear with Bruner's name as author or co-author, all five of them were on the subject of perception. In 1949, three of five publications would be on perception, in 1950, two of four, and in 1951, all four of Jerome Bruner's publications would be on studies in perception. We do not see this singular a concentration on publication subject over such a period of time (for perception papers continue to be published through 1960) in Bruner's work again. A large number of these papers were coauthored by Bruner and Postman, and it is clear that they had a consistent and happy working relationship.

In "Emotional Selectivity in Perception and Reaction" (Bruner and Postman, 1947a), the authors acknowledge that the

> "dramatic experiments of Jung established the relationship between emotionality and speed of verbal association[3]."

The experimental hypothesis was that in the presence of emotional stimuli, reaction and perception time were governed by a common set of principles. Reaction times were measured using various kinds of words, among them such familiar ones as the subject's first and last names, and such potentially loaded ones as raped, death, penis, crazy, anger, etc. Perceptual defense was discussed (including the phenomenon of a slower reaction time to words that were loaded for the particular subject), as was perceptual sensitization (increasing familiarity). One of the conclusions argued,

> "There is for some subjects...a critical degree of emotionality beyond which perceptual defense does not operate."
>
> (Ibid.)

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[3] The authors refer to Carl Jung's Studies in Word Association (1918).

Certainly the clinician of experience could have predicted these results; here, however, the magic elixir of science and its numbers in the form of statistical analyses were brought forward to confirm, in the paradigm of academic psychology, that which had long since been accepted experiencially by those dealing with the healing arts of the emotions of man. More bridges were in the building, with Bruner and his colleagues as architects.

In "Tension and Tension Release as Organizing Factors in Perception," Bruner and Postman looked at the processes of selection, accentuation, and fixation, and then defined perception as "a form of adaptive behavior" (Bruner and Postman, 1947b). They found, for example, a difference in perception when the subject was assured a shock (surely a factor which would produce tension) which had been administered would not appear again (an assurance calculated to produce tension release).

In "Perceptual Theory and the Rorschach Test" (Bruner, 1948), Bruner described the development of the Rorschach test[4] (a projective test commonly known as the "ink blot" test) as "a tribute to energetic empiricism." Bruner argued that Rorschach was guided by psychoanalytic theories of personality and the like, which contained "hidden premises" on perception. Bruner contended that where Rorschach had said, "every performance of a person is an expression of his whole personality,"

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[4] This test is described in H. Rorschach, Psychodiagnostics, 1942.

perception is to be included. He insisted,

> "The question...is not 'How do we perceive ink blots?' but 'How do we perceive?'"
>
> (Bruner, 1948)

He described perception as

> "...an activity of the total organism and, like all other activities, (it) is an aspect of the economy of personality. It serves two general functions for the organism. Through perception we construct a world in which survival and adjustment are possible; through perception we also defend against that which is threatening, distracting or disruptive. The two processes, construction and defense, serve reciprocally to maximize sensitivity to certain classes of events, and to dampen or hinder sensitivity to others.
>
> "...The organization of the perceptual field cannot be understood without reference to ...two sets of conditions: stimulation and the state of the person perceiving, i.e., his set, needs, expectancies, and a host of other directive factors."
>
> (Ibid.)

Bruner studied seven perceptual case histories through the Harvard Psychological Clinic, and found

> "...a definite congruence between responses on the Rorschach and responses in other perceptual situations."
>
> (Ibid.)

Bruner concludes this article with the statement,

> "The future will perforce witness the coalescence of research on perception and research on diagnostics. The two belong together."
>
> (Ibid.)

At this point, with the "New Look" in perception gaining interest, Bruner and Postman produced a magnum opus of sorts, "An Approach to Social Perception." The article does, indeed, define the Bruner-Postman approach, and provides an extensive bibliography (78 references!) in which the works of authors are listed ranging alphabetically from Adrian to Zuk-Kardos! Bruner and Postman propose in this paper to

"...briefly bring some our intellectual ancestors under review, the better to see our way."

(Bruner and Postman, 1948a)

Their review covers psychophysics, act psychology, functionalism, gestalt psychology, and the literature on expectations with respect to influence on perception. They cover the principle of resonance,

"...the person will attempt to organize (ambiguous environmental objects) in a manner congruent with his prevailing set..."

(Ibid.)

the principle of defense,

"...Our description of perceptual defense implies that certain processes of perceptual screening and organization take place before the subject is consciously aware of the nature of the stimulus to which he is reacting..."

(Ibid.)

and the principle of vigilance, that is, once a

"...critical degree of negative emotionality..."

(Ibid.)

has been exceeded, the stimulus

"...is met with utmost alertness and speed."

(Ibid.)

Also described in this paper is perceptual organization, accentuation, and fixation, and, in general, the nature of the perceptual world. The authors posit that all perception has a social component, in that,

"Man cannot persist long in any of his activities without being influenced by society, without looking at his social world."

(Ibid.)

In 1977 (Interview), Bruner claimed not ever to have left social psychology; we can see here the connection with perception.

In a paper which they entitled, "Symbolic Value as an Organizing Factor in Perception" (Bruner and Postman, 1948b), the authors describe an experiment in which a swastika was used as a negative symbol, a dollar sign as a positive symbol, and a square with two diagonals was used as a neutral symbol. These symbols were placed on discs, and the size of each disc was estimated by each subject. All discs were estimated as larger than they were, but the dollar sign (estimated to be the largest) and the swastika (next large) were significantly larger in the eye of the subjects than the neutral sign. This, then, was another study (again, using ANOVA) to confirm a relation between value and the way in which one perceives.

We find, among these papers of Bruner and Postman collaboration especially, a re-defining of the meaning of perception, each time with the result of an enlarged, rather than a more constrained, definition. In "Perception under Stress" (Postman and Bruner, 1948), perception is defined as "goal-directed behavior." They explain,

> "The goal of perception, in its broadest sense, is the construction of a meaningful behavioral environment — an environment congruent with 'reality' on the one hand and the needs and dispositions of the organism on the other..."
>
> (Postman and Bruner, 1948)

The authors argue that the frustration of such goal directed behavior, or the frustration of perception, should have predictable consequences. This goal directed behavior is said by the authors to work through a threefold process of selection, accentuation and fixation. Through this process, say the authors,

> "...the organism strikes a balance or compromise of his perception between the requirements created by physical, biological and social existence...He learns to eliminate from his perceptual field what is extraneous to him and to encompass what is important even to the extent of occasionally 'seeing things that aren't there.'"
>
> (Ibid.)

The purpose of these experiments was, as the title "Perception under Stress" would indicate, to see if there was an effect on perception of stress on the subject. Both the experimental and the control groups were presented a complex picture and series of sentences. The experimental group was harrassed consistently with frustrating comments. The subjects in this group were told that their performance was substandard, were given a great deal of incomprehensible double talk in technical terms, were badgered as to whether the had not "seen something more" than they were reporting, were asked about their "state of mind," and about recent emotional upsets; they were subjected to generally offensive behavior on the part of the experimenters. The control group was not harrassed in this manner. The experimental group did, indeed, show an effect from the stressful treatment: their adaptive behavior was lessened, and their perception appears to have changed dramatically. The authors found that

> "...selection of percepts from a complex field becomes less adequate and sense is less well differentiated from nonsense; there is maladaptive accentuation in the direction of aggression and escape; untested hypotheses are fixated recklessly."
>
> (Postman and Bruner, 1948)

Postman and Bruner were joined by Elliot McGinnies in writing "Personal Values as Selective Factors in Perception" (Postman, Bruner and McGinnies, 1948), in which they argued that personal values are demonstrable determinants of what an individual selects perceptually from his environment. The subject's values were measured by the Allport-Vernon Study of Values, which included theoretical, economic, aesthetic, social, political, and religious value structures. The authors reported in the results that the more value the word had to the individual, the more

rapid was the recognition. The authors concluded that,

> "Value orientation makes for perceptual sensitization to valued stimuli, leads to perceptual defense against inimical stimuli, and gives rise to a process of value resonance which keeps the person responding in terms of objects valuable to him even when such objects are absent from his immediate environment."
>
> (Postman, Bruner and McGinnies, 1948)

The relation of time of recognition to perceptual expectancies is presented in the Bruner and Postman paper, "On Perception of Incongruity: A Paradigm" (Bruner and Postman, 1949a). The experiment on which the paper was based concerned the use of trick playing cards, that is, a red spade card, or one that was black, but of the suite of hearts. The cards were presented at millisecond intervals (from 10 milliseconds through 1,000 milliseconds), and it was noted that recognition not only took longer for the "incongruous" cards, but that four processes were likely to be seen: dominance of either the color or the form; compromise, that is, the color seen as purple, or some such; disruption, that is confusion, such as "I don't know what the hell it is!" and finally, recognition of the incongruity. The authors concluded that perceptual organization is powerfully determined by expectation and that violation of that expectation is met by resistance to the incongruities.

"Perception, Cognition and Behavior" (Bruner and Postman, 1949b) was published in the Journal of Personality, and in the same year, "Multiplicity of Set as a Determinant of Perceptual Behavior" (Postman and Bruner, 1949) appeared in the Journal of Experimental Psychology. These were followed in 1950 by Perception and Personality: A Symposium (Bruner and Krech, 1950) and "A Note on the Measurement of Reversals of Perspective" (Bruner, Postman and Mosteller, 1950), a paper devoted to the Poisson

Distribution (a statistical method) in relation to ANOVA in reversal of perspective illusions. As we can see, Bruner's publications in perception are falling one upon the other.

R. R. Blake and G. V. Ramsey edited a book entitled, Perception: An Approach to Personality, to which Bruner contributed, "Personality Dynamics and the Process of Perceiving" (Bruner, 1951b). In his attempt to demonstrate "the interdependence of the dynamics of personality and the dynamics of perceiving," Bruner says,

> "A theory of personality, I shall contend, cannot be complete without a complementary theory of perception, and, by the same logic, one cannot account for the full range of perceptual phenomena without broadening perceptual theory to a point where it contains personality variables."
>
> (Bruner, 1951b)

In this paper, Bruner described perceiving as a three step cycle which includes expectancy (hypothesis), stimulus (input from the environment), and checking (or confirmation). He insists

> "...that a personality-oriented theory of perception must have systematic means whereby it can account for individual differences in perceiving."
>
> (Ibid.)

Bruner's emphasis here is on cultural differences, and especially on differences in hypotheses (expectations) and on the strength of these hypotheses.

"Expectation and the Perception of Color" (Bruner, Postman and Rodrigues, 1951) was a paper reporting experiments in which colors and shapes were used to affirm that the greater the strength of the hypothesis, the less information is needed to confirm it (and the more to infirm it).

In this paper, the emphasis again was placed on the three-step process of perception developed earlier: hypothesis, input of stimulus information, and confirmation (or infirmation).

> Postman, Bruner and Walk, in "The Perception of Error" (1951), ask,
>
> "What happens perceptually when a complex stimulus field contains a part that violates a well-established expectancy?...To what extent does the presence of an error or an incongruity affect the speed and efficiency with which perceptual organization develops?"
>
> (Postman, Bruner and Walk, 1951)

The "error" in these experiments was a reversed letter placed either in a series of letters or in a word. The fact that the letter was reversed was more likely to be recognized in a series of letters than when it was imbedded in a word. The authors concluded,

> "...Our findings are closely akin to the Gestalt principle that properties of a substructure are largely determined by the properties of the larger whole or structure in which it is embedded."
>
> (Ibid.)

In 1952, Bruner published two papers, both on the subject of perception. With Busiek and Minturn he presented concepts of perceptual assimilation in "Assimilation in the Immediate Reproduction of Visually Perceived Figures" (Bruner, Busiek and Minturn, 1952). Subjects were asked to reproduce simple figures, each of which could represent more than one item. For example, one figure could be interpreted as a trowel or as a pine tree, another as a lima bean or as a canoe. Those who were given one label or another tended to reproduce the drawing resembling the thing which they thought it to be. The authors found that the subject would tend to identify the drawing as labelled by the experimenter.

The other paper published by Bruner in 1952 was with Leo Postman, "Hypothesis and the Principle of Closure: The Effect of Frequency and Recency" (Postman and Bruner, 1952). The principle of closure, a general law of Gestalt psychology, says that we tend to "close" lines which we expect to be contiguous. For example, even if there is a space in a circle's line, we tend to see the circle as complete. If, however, one is trained to look for an opening in the circle, one will be much more likely to see it, even if the exposure to the picture is quite brief. The authors quote Gestalt psychologist Koffka: "Closed areas are more stable and, therefore, more readily reproduced than unclosed ones," and they establish through their experiment that there must be a conscious awareness of the possible "open-ness" of the circle if the subject is not to perceive it as closed.

E. E. Jones and Bruner did some experiments with cards on which a "stick-man" was shown on successive cards in such a manner as to appear to be moving from left to right, while a nonsense object moved an equal distance in the opposite direction. In the first trial, 16 of the 18 subjects saw the man moving faster than the nonsense object, though as the trials increased there was a tendency to see both as moving at the same speed. There were experiments with other pictures which showed a car apparently going over a bridge as against an oblong over an arc, and a ball which appeared to be skidding as against one which appeared to be rolling. The paper reporting this work was entitled, "Expectancy in Apparent Visual Movement" (Jones and Bruner, 1954). The authors noted to begin with that

> "The organism learns to expect movement in some contexts more than in others, and learns to expect certain kinds of movement from some objects and not from others."
>
> (Jones and Bruner, 1954)

In their conclusion, they state that

> "...there are stimulus conditions in which movement under conditions of formal identity is less compelling than movement of a changing object when the change conforms to well-established expectancy and is functional to the requirements of total field conditions."
>
> (Ibid.)

As we can see, Bruner and his colleagues are investigating many ways in which the individual brings himself to the perception. He sees what he expects to see, sometimes in contradiction to "reality." If what he sees is threatening, or if it is not congruous with his knowledge of what is so, he perceives it more slowly. His personality, his cultural background, his momentary state of being, his response to stress, all have an effect on how he perceives and what he perceives.

In 1954, we see the appearance of a new name in Bruner's bibliography: George A. Miller[5]. Miller is both an important colleague and a trusted friend, and we will see his name again in these pages. For

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[5] George Armitage Miller (1920- )
Miller received his doctorate from Harvard in 1946, where he was a Research Fellow in the Harvard Psycho-Acoustic Laboratory. In 1948 he began to work his way up Harvard's professorial ladder as an Assistant Professor; there was a five year hiatus from Harvard when he was an Associate Professor at M.I.T. (1951-1955), and it was during those years that he wrote "Familiarity of Letter Sequences and Tachistoscopic Identification" with Bruner and Postman. He then returned to Harvard, where he became a full professor in 1958. By 1964 he was Chairman of the Department of Psychology, a post which he would keep until 1967. He left Harvard for Rockefeller University in New York in 1968. Miller's work with Bruner in the Cognitive Center at Harvard will be discussed in a later chapter.

the moment, however, let us look at the paper which Miller, Bruner and Postman wrote while Miller was at the Massachusetts Institute of Technology (MIT), Bruner was at Harvard, and Postman was at the University of California at Berkeley. "Familiarity of Letter Sequences and Tachistoscopic Identification" begins by the experimental conclusions of J. McKeen Cattell that

> "words are perceived 'as a whole,' and are as unitary in character as single letters."
>
> (Miller, Bruner and Postman, 1954)

The authors discuss Shannon's theory (Shannon, "A Mathematical Theory of Communication," 1948), which they paraphrase:

> "In its simplest form this theory states that the amount of information carried by a signal is proportional to the logarithm of the number of alternative signals that might have occurred."
>
> (Ibid.)

The authors give as an example that in a language with 64 letters (each letter representing an object) each letter provides more information than each letter in a language with 8 letters.

Context was discussed (that is, which letter follows which is important in recognition), as was redundancy (that is, when there are more letters in a word than we need in order to recognize the word).

In the experiment, eight letters were put together in such a manner as not to form any word to be found in the dictionary, in a range from nonsensical to pseudo words. The most sensible pseudo words produced the highest scores of remembering letters and their correct position in the words, inferring that we have a bias toward recognition based on the structure of our language.

An abstract, "The Effect of Error on the Identification of Familiar Sequences" (O'Dowd, Bruner and Austin, 1954) described an experiment in which familiar nouns, six to eight letters long, were presented to subjects in three forms: an error in the first part of the word, e.g., anatomy formed as naatomy, in the middle, or in the last part of the word. The experimenters found that identification of the word was most difficult if the error was in the first part of the word, next most difficult if it appeared at the end, and that an error in the middle had but a minor effect, the cues at either end of the word making the middle redundant. We who edit papers are now enlightened as to how letters reversed in the middle of a word seem to get by the most careful proofreading!

Bruner, Miller, and Bruner's research assistant, Claire Zimmerman collaborated on "Discriminative Skill and Discriminative Matching in Perceptual Recognition," which had to do with word recognition. Lists of words of one syllable (real words this time, not nonsense words) of 8, 16, 32 or 64 words long were learned by the subjects. Then tests were made for recognition of the words through noise, and tests were made for discrimination of relevant from irrelevant sounds. The effects of illumination and exposure time were also tested. Skill in

discrimination was acquired with practice and discriminative matching improved. This was an exercise in narrowing down the stimuli from the ambient noise of the world to a specific stimulus source — the kind of sorting out each of us does constantly while moving about in our private worlds. It is of interest that this research was concentrated on auditory perception, where Bruner's usual research in perception had to do with vision.

Based on the hypothesis that

> "...such classical laws of perceptual organization as the principle of closure do not necessarily hold <u>after perceptual recognition</u> has occurred...If, for example, a partly closed circle is <u>identified</u> as a C, closure will <u>not</u> operate; if it is identified as an O, it will operate."
>
> (Bruner and Minturn, 1955)

Jerome Bruner and A. Leigh Minturn did the research reported in "Perceptual Identification and Perceptual Organization." The test figure was a broken B, that is, it could be perceived as either a B or as a 13. When the figure was presented for 30 milliseconds, subjects saw a B if they expected a letter, and a 13 if they expected a number; at 150 milliseconds, however, the subjects saw the figure as a number regardless of what they expected. The authors argued that such Gestalt principles as closure had been stated in too general a form. They concluded:

> "There is a wide range of phenomena in everyday perception that are precisely of this order where we see in terms of the properties of objects as these are <u>conceived</u> and fail to 'notice' those features that deviate from this conception. At this level of perception, such classical laws of perception as closure, grouping by proximity, and so on, do not hold as simple and general principles."
>
> (Ibid.)

At the 1957 meeting of the Association for Research in Nervous and Mental Disease, Bruner presented "Neural Mechanisms in Perception" (Bruner, 1957d).

> "I admit to no special expertness in the neurophysiology of perception, although I have followed the growing literature with an increasing interest and a sense of excitement. There was a time, let me confess, when as a student of perception and thinking I operated on the assumption that as far as I was concerned the nervous system was made of green cheese. This form of intellectual cheek, this know-nothing attitude, gives me little comfort nowadays."
>
> (Bruner, 1957d)

Bruner comments further,

> "...the grave difficulty with physiological notions in psychology: their half life is too long, so that their origins are forgotten and they become psychological gospel..."
>
> (Ibid.)

and says that he wishes to find out

> "...what kinds of parallels and linkages might exist between what we believe to be the case in perception and what is gradually emerging concerning neurophysiological mechanisms that might mediate such processes."
>
> (Ibid.)

In this paper, Bruner examines three problems: perceptual representation ("How does perception represent the structure of the physical environment that constitutes stimulation?"), perceptual invariance and variable stimulation ("What accounts for the fact that perception may remain relatively constant while the physical stimuli operating at the receptor surface are varying drastically?"), and perceptual variability and stimulus constancy, as in three dimensional figures with spontaneous alternation ("What accounts for the fact that perception may vary while the stimulus input remains constant?"). Figure 4 presents an example of spontaneous alternation.

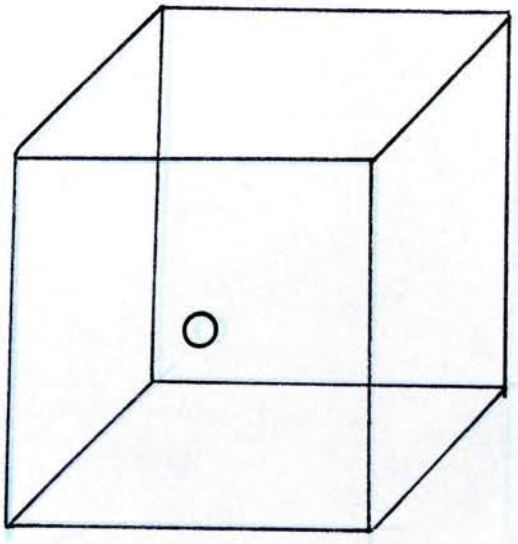

FIGURE 4 THE NECKER CUBE

Though the stimulus (the picture of the cube) is not changed, the perception varies in the example of the Necker Cube. In one instant one sees the circle as being in the middle of the front of the cube; in another moment, it is in the middle of the back. Looking again, the circle can be perceived as being in the lower left back side of the cube, and at another glance in the lower left front. In Eye and Brain: The Psychology of Seeing, R. L. Gregory says,

> "The Necker cube is a pattern which contains no clues as to which of two alternative hypotheses is correct: the perceptual system entertains first one then another hypothesis, and never comes to a conclusion, for there is no best answer."
>
> (Gregory, 1973)

This is the only paper of Bruner's we will see so devoted to physiology, and we find him painting the afferent and efferent processes with a Brunerian broad brush, and with liberal references to the literature of Rosenblith, Adrian, Békésy, Fessard, Hebb, Lashley, and a list of others, with a particular note of thanks to Karl Pribram and Walter Rosenblith "for their helpful advice and criticism."

In his conclusion, Bruner writes:

> "The tracing and manipulation of efferent fibers carrying impulses to synapses along receptor pathways and to sensory receptors themselves indicate that the neural model we shall be using is one in which centrally induced control of sense data will play an increasing role. If the neurophysiology of a generation ago forced psychology into a peripheralist mold, certainly the model emerging today corrects this bias and places a new emphasis on the role of central factors in perception. Most important of all, I have the impression that the neurological model of perception that is now emerging begins for the first time to conform to our knowledge of more complex forms of perception, both in humans and at the infrahuman level."
>
> (Ibid.)

It was also in 1957 that Jerome Bruner did a paper entitled, "On Perceptual Readiness," one which he considered even 20 years later to be of particular import (Interview, Bruner, 1977). It is a paper which indicates a turning point in his approach, with its emphasis on categories, an emphasis which we find coordinated with his work (being published concurrently) in cognition. "Perceptual readiness," he says, "refers to the relative accessibility of categories to afferent stimulus inputs" (Bruner, 1957e). He notes,

> "The processes involved in sorting sensory inputs into categories involve cue utilization...The processes are conceived of as mediators of categorizing and its forms of connectivity, the phenomena of differential threshold levels for various environmental events, the guidance of cue search behavior, and, lastly, the phenomena of sensory inhibition and filtering..."
>
> (Bruner, 1957e)

Bruner describes two general determinants of category accessibility: the likelihood of occurrance of events dictated by experience, and the requirements to search dictated by need states.

Bruner contends that failure of perceptual readiness comes about through failure to learn appropriate categories, and, further,

> "Failure to achieve a state of perceptual readiness that matches the probability of events in ones world can be dealt with in one of two ways: either by the relearning of categories and expectancies or by constant close inspection of events and objects...Readiness in the sense that we are using it is not a luxury but a necessity for smooth adjustment."
>
> (Ibid.)

Bruner describes the mechanisms which mediate perceptual readiness, and those of failure of readiness; all pointing to the theme of the paper, the notion that perception involves an act of categorization.

In 1958, Bruner co-authored a work with Jean Piaget and other colleagues, Logique et Perception, published in Paris (Bruner, Bresson, Morf, and Piaget, 1958), unfortunately unavailable to this author either in presence or in language.

It was in this year that his contribution to Maccoby, Newcomb and Hartley (editors) book, Readings in Social Psychology, was published. The article was entitled, "Social Psychology and Perception," and is one of those proofs in time that Bruner has not, as he insists that he has not (Bruner, Interview, 1977), really left the field of social psychology. The work is, as is indicated in the title, a joining of the subfields of social psychology and perception.

Though we have made an effort in this chapter to ignore the rest of what was going on in Jerome Bruner's life, and concentrate only on his work in perception, we have come to a point where we must make some reference to the fact that a change of considerable magnitude has occurred both in his personal life and in his work. The reflection of this change becomes apparent in his writing. In his perception papers, we see him reaching out from the precise world of the tachistoscope to the fresh (to him) realm of physiology and reaching back, in "Social Psychology and Perception," to a familiar world with a new artistic bent, to wit,

> "All the ways in which we deal with environmental complexity at the perceptual level are deeply tinged with the hues of the society in which we live."
>
> (Bruner, 1958d)

We see, in this quite general paper, a precursor to Jerome Bruner's current interest in linguistics, and the manner in which he attempts to "tie the bundle together," to integrate the myriad new intellectual adventures into a more consolidated and more encompassing field of interests. He says,

> "Social attitudes are defined as a readiness to experience events in certain consistent and selective ways, and the most recent writings on the psychology of language, inspired by Benjamin Lee Whorf, urge that the structure of a language and its lexical units determine or at least influence what one habitually notices in the world about one."
>
> (Ibid.)

Included in this consolidating effort is a field in which Bruner is concurrently highly involved, that of cognition. He writes,

> "...the abiding fact about the process of knowing, of which perceiving is one aspect, is that organisms have a highly limited span of attention and a highly limited span of immediate memory. Selectivity is forced upon us by the nature of these limitations..."

Bruner speaks in this paper about creativity, about social change, and about innovation. He notes,

> "If it is true that people are selective, must be selective to match their limited cognitive capacities to the complexities of the social and physical environment, it is also true that they are not completely trapped in this selectivity, that the conditions for producing a change in perceiving and thinking about events are there."
>
> (Ibid.)

And so we see a point of view of human choice. As we can bring the person to the perception, it now appears that we can change the person we bring.

Bruner reviews the literature of the "New Look" in perception, and discusses perceptual theoretical models. He concludes,

> "..perceptual readiness reflects the dual requirements of coping with an environment — directedness with respect to goals and efficiency with respect to the means by which the goals can be attained... The student of society...provides descriptions of the 'external environement'...The question is how people perceive or register upon these features of the social environment."
>
> (Ibid.)

In "A Note on the Informativeness of Parts of Words" (Bruner and O'Dowd, 1958), the authors apparently confirm the work published earlier (O'Dowd, Bruner and Austin, 1954) in an abstract, namely, that "the beginning of a word is more informative than the end, the end more than the middle..." (Bruner and O'Dowd, 1958). Bruner and Henry Wechsler published, in the "Notes and Discussion" section of the American Journal of Psychology, "Sequential Probability as a Determinant of Perceptual Closure" (Bruner and Wechsler, 1958). It is a sort of follow up on two earlier papers concerned with perceptual closure (Postman and Bruner, 1952, and Bruner and Minturn, 1955), in which the results showed that the

tendency to perceive a circle as open or as closed is strongly influenced by the nature of the circle that went before.

"The Economy of Perceiving" (Bruner, 1959c) was published in the Proceedings of the 15th International Congress of Psychology, Brussels, 1957; by this time Bruner had established himself as an international figure in the field of psychology, as we shall see later.

In "The Functions of Perceiving: New Look Retrospect" (Bruner and Klein, 1960), which Jerome Bruner and George S. Klein wrote for a series of essays in honor of Heinz Werner, the authors discuss the "New Look" from an historical perspective,

> "Very likely, the most interesting thing historically about the 'New Look' is that it represented a moment of confluence in psychological theory — a response to a desire or a historical force that was antiseparatist in spirit, possibly too much so...while enthusiastic New Lookers have at times confused the issues and muddied the waters with imperfectly designed and executed research, in the end they may also have contributed materially to the outlook and findings that constitute the field of perceptual research..."
>
> (Bruner and Klein, 1960)

The authors also note that

> "If it were the case that needs and interests served to program an organism's selectivity of organization and awareness, it was even more the case that past experience had such an effect. It is not a trivial finding that speed of recognition of stimulus materials could be predicted..."
>
> (Ibid.)

One perceives a certain wryness in their comment,

> "It is notable, by the way, that some of our purest perceptual virgins have entered the fray after it was demonstrated that virtue was not automatically to be lost by exposing oneself to the temptations of the unconscious..."
>
> (Ibid.)

The authors sum up their view by stating,

> "In the end, what we are saying is that full explanation of any phenomenon — be it perception or anything else — requires both a close study of the context in which the phenomenon occurs, and also of the intrinsic nature of the phenomenon itself under idealized conditions ...The New Lookers have tended to do the former, the researcher raised in psychophysics and sensory physiology the latter."
>
> (Ibid.)

Four years later, Jerome Bruner and Mary C. Potter published "Interference in Visual Recognition" in Science (Bruner and Potter, 1964). In brief, when one sees a picture out of focus slowly coming into focus, "the greater or more prolonged the initial blur, the slower the eventual recognition. The authors propose that "Interference may be accounted for partly by the difficulty of rejecting incorrect hypotheses based on substandard cues."

Now the formal studies of perception, some of which were the building blocks for other studies already in progress, were completed. Bruner and Postman and their colleagues had reviewed the involvement of the subject with his own perception from a considerable number of angles.

One of the criticisms levied at Jerome Bruner is that he moves from one field to another when the going gets tough. Here the accusation is patently false. It wasn't that the going got tough, but rather that he had, through his years of research, established answers to some of his questions about the relationship between the perceiver and his perception. He had done the experiments, they had been dealt with statistically, and the material had led him on to other interests, a legitimate progression in the movement of science. It was time to move on, to approach more closely the sources of rationality.

In this section on perception we have attended to visual and, on occasion, auditory perception; we have ignored some papers which deal with a kind of emotional, or social, perception, where the cues are somewhat more obscure. These papers are really combinations of the workings of social psychology and perception, and we will deal with them briefly here.

The first of these papers, "Some Determinants of the Perception of Positive and Negative Feelings in Others" (Tagiuri, Blake and Bruner, 1953) addressed the question, "Are members of a group able to perceive their feelings for each other more accurately than might be predicted by chance?" The authors' attempt was to measure accuracy, congruency and mutuality in relation to the following:

Preferences and aversions of the person being queried for others in the group

Feelings other group members actually have for the person

Guesses of the person about the feelings other group members have for him.

The authors found that perceptions of how other members in the group felt about each subject was in excess of chance for those where the subject was liked, but that recognition of rejection or indifference was not significantly different from chance.

The authors proposed that, since cues were used in this kind of perception, as in any other kind of perception, the lack of recognition of rejection or indifference might be due to the masking of rejection cues by politeness, the denial of these cues as an ego defense by the subject, or inadequate training in the recognition of cues.

The authors concluded that,

> "Accuracy of perception in interpersonal relations seems as much a product of other factors as a skill in its own right...In sum, the interpersonal perceptions of individuals...appear to be dependent to a large extent upon the operation of a congruency between how a member feels toward another and how the other is seen as feeling toward him. If two individuals have mutual feelings toward each other, their impressions of each other are likely, thereby, to be "accurate." If mutuality of feeling... be absent, they may be at cross purposes with each other... relieved by the practice of politeness."
>
> (Tagiuri, Blake and Bruner, 1953)

In 1954, Jerome Bruner and Renato Tagiuri published "The Perception of People" in the Handbook of Social Psychology (Bruner and Tagiuri, 1954). The paper deals with

> "...First, the recognition or identification of emotions in others; second, the judgment or perception of personality."
>
> (Bruner and Tagiuri, 1954)

This is, as one might expect of a chapter in a handbook, a review article, a comment on the state of the art, and one with abundant and appropriate references. A somewhat inconclusive conclusion states,

> "The first step in reacting to another is forming an impression of him. Later reactions depend on this first step. If there is to be a science of interpersonal behavior, it will rest upon a cornerstone of social perception."
>
> (Ibid.)

The next year, 1955, a mathematical modeling paper entitled, "Estimating the Chance Expectancies of Diadic Relationships within a Group" (Tagiuri, Bruner and Kogan, 1955) was published. Another

article, "The Transparency of Interpersonal Choice" (Tagiuri, Kogan and Bruner, 1955), addressed the "transparency" of the individual, that is, the extent to which one's intentions were clear to others. The authors found that reciprocated choices were far more transparent than those not reciprocated, just as mutuality of feeling had produced clearer results in earlier work (Tagiuri, Blake and Bruner, 1953). The authors were convinced that transparency is more a function of mutuality of choice than of the personal characteristics of the individual, however they did find that expansiveness, self-confidence, popularity, and responsiveness provided more transparency, particularly when these qualities were "in the middle range."

Jerome Bruner, David Shapiro and Renato Tagiuri (1958) published "The Meaning of Traits in Isolation and in Combination," saying that the paper was

> "offered as a study in the nature of inference."
>
> (Bruner, Shapiro and Tagiuri, 1958)

The authors explain,

> "Traits are extensively used by the layman in describing people. In fact, any adjective can be put to that use, from 'antediluvian' to 'zany.' ...When we know a person possesses certain traits, we infer the presence or absence of certain other traits...Trait words are likewise the common currency of much personality theory and research...no systematic knowledge of the connotative meaning of traits, either for the layman or for the psychologist, is available...
>
> "The object of this paper is to inquire into the relation between inferences made from single traits in isolation and the inferences made from the same traits in combination. In short, our concern is with the combinatorial process in impression formation."
>
> (Ibid.)

The "given" traits were: considerate, independent, intelligent, and inconsiderate. Against these traits, used singly and in combinations, the subject was to indicate whether a person who had one of these traits or combinations of traits very often was

tended to be

may or may not be

tended not to be

seldom was

any one of 59 "list" traits, such as aggressive, awkward, active, etc. The authors concluded,

> "...we were able to show that, in spite of the apparent complexity of the phenomenon, certain aspects of inference made from trait combinations can be predicted amazingly well from the characteristics of the inferences made from the components."
>
> (Ibid.)

It was also in 1958 that Tagiuri, Bruner and Blake contributed to Readings in Social Psychology the article "On the Relation between Feelings and the Perception of Feelings among Members of Small Groups" (Tagiuri, Bruner and Blake, 1958).

In his studies of the perception of man, Jerome Bruner has presented us with a very practical bridge between the clinicians and the applied psychologists, and those committed to psychology as a science. While working within the constraints of proper experimental design and acceptable statistical procedure, he has taken a fresh view. It is, simply, that the person is an active part of the perception.

## THE EARLY 1950'S

Ernest Hilgard once remarked that the studies of Bruner and his colleagues "made perception interesting to a broader audience...took it out of the eye, ear, nose and throat psychology" (Hilgard, Interview, 1978). As for Jerome Bruner, as the questions began to be answered about perception, the underlying issue of inference became increasingly important, as we saw in the later perception papers. Now we will see Bruner take the step from how we perceive to how we think, and that well mixed with how we learn. The progression will then lead to how we teach, and somewhat later, something of who we teach, and how that "who" develops, and then to the first signs of an effort at formal communication: language. In academic terms, then, we shall watch the progress of Jerome Bruner's research for more than 25 years from the early fifties through the subdisciplines of psychology: cognition, education, development, and early language.

It must have been disconcerting to those who had spent entire careers in any one of these particular specialties to see Jerome Bruner test the water, then suddenly, be splashing about in their pond!

Professors have certain obligations. The "publish or perish" dictum of old still stands (clearly not an area of worry for Professor Bruner!). They are also desirable persons for service on committees of community and government. From 1950 to 1952, Bruner served on the Advisory Panel of the Office of Naval Research, and as Chairman of a Panel on the Committee on Underseas Warfare of the National Academy of Sciences. From 1951 to 1952, he served as a member of Project TROY, a special

project evaluating American information policy for the Secretary of State, advising the State Department on problems of international communication. On the other side of the country in 1951, Stanford University's President Sterling asked Ernest R. Hilgard to be Dean of the Graduate Division, leaving vacant his position as Head of the Department of Psychology at that institution (Hilgard, 1974). Hilgard suggested the Department invite Bruner as its new Head. Hilgard remembers,

> "...he came out and seemed sort of interested, but Harvard would give him everything he wanted and change his title...new space and everything, so he stayed at Harvard..."
>
> (Hilgard, Interview, 1978)

In 1951, Bruner received an appointment as a Visiting Member of the Institute for Advanced Study at Princeton. He spent a year there, and it was a time of both stimulation and contemplation. He was at a point of shifting interests in his research, and needed to think out things in general, and this year gave him an opportunity to do so, while surrounded by persons of lively intellect and ever fresh views.

One can see throughout Bruner's career pauses to reconsider his view of the world, to regroup the forces of his thinking. The year at Princeton was one of those.

Robert Oppenheimer had been Director of the Institute for Advanced Study since 1947.

> "Until then the Institute had been a kind of retreat for great scientists and scholars who wanted to get on with their studies in peace. Under Oppenheimer's regime the population of the Institute grew in number, and it included many young scientists, mostly as short term members for a year or two.."
>
> (Peierls, 1974)

Oppenheimer described the work of the Institute:

> "What we do not know we try to explain to each other."
>
> (Ibid.)

Oppenheimer had established a committee, which, though it only met once or twice a year, advised him (one can assume from the names of its members, advised him well) on the state of the art of psychology, so that he might decide what the role of this field was in the work of the Institute; it included Bruner among its members, along with Hilgard, Donald O. Hebb (McGill University), Ruth Tolman (Edward Tolman would also some to these meetings on occasion), and Oppenheimer would bring along physicists Niels Bohr (whose correct name Bruner now knew!) and John von Neumann.

A word here about von Neumann, as he had a particular influence on the development of Jerome Bruner's line of thinking. Johann (later known as "John") von Neumann[1] was born in Budapest in a family which could afford to educate him according to his soon obvious mathematical talents. In 1933, he became the youngest permanent member of the Institute for Advanced Study at Princeton, and he worked with Oppenheimer on the Los Alamos Project during the Second World War. Von Neumann had some notions about strategies and codes which turned out to be noticeably contributory to Bruner's work on cognition.

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[1] Johann (John) von Neumann (1903-1957)
Von Neumann was a rarity in mathematical circles in that he was equally competent in both theoretical and in applied mathematics. He was a mathematical physicist as well (see Mathematical Physics in Collected Works of John von Neumann, A. H. Taub, editor, 1961) and became interested in Game Theory, which he is considered to have founded, and later, its application to economics (see Von Neumann and Morgenstern, Theory of Games and Economic Behavior, 2nd edition, 1947).

See also J. Dieudonné, "Von Neumann, Johann," 1974.

The ever gregarious Bruner had, with others, set up a kind of supper club in the late 1940's which met the first Friday of each month. These culinary and intellectual repasts included among their attendees attorneys, historians, economists, sociologists, McGeorge Bundy, a political scientist who would appear later in the national public eye, but again in the fabric of Bruner's life, Julius Stratton, then Provost of M.I.T., and Edwin Land of Polaroid; Bruner was the only psychologist. They met for twenty years, until about the time of the Viet Nam War. While at Princeton, he and others established another such group, this time including Oppenheimer, von Neumann, Bram Pais, Harold Cherniss, and others. At the same time, Sir Frederic Bartlett in Britain had taken Bruner under his wing, in a way, and there was a conversation by correspondence in process. Bruner, with his rich appreciation of such things, had surrounded himself with the creative excellence of lively intellect; the year at Princeton must have gone quite swiftly.

In 1952, when he was 36, Bruner returned to Europe to spend the summer in Salzburg as a Lecturer; he attended a number of seminars, and visited Vienna, and generally soaked up Mozart and the Europe he loved.

When Bruner returned to Harvard, social psychologist and expert in the psychology of language, had become a part of the Department; Walter Rosenblith, later to become Provost at M.I.T., was around, and there were many others, some old and some new faces. And at 9 Bow Street in Cambridge there began Thursday afternoon seminars of the Harvard Cognition Project, as a part of the Laboratory of Social Relations. This was the foundation for the research for A Study of Thinking (Bruner,

Goodnow and Austin, 1956), and Bruner would say of these times:

> "The program of research and the subsequent stages of analysis and writing were greatly aided by our regular but unofficial Thursday afternoon seminars, attended by research students, assistants, and an occasional colleague engaged in allied work. The kind of seminar that is nourished by work in progress, we discovered, is the best seminar of all. We hope this book does justice to the hotbed of ideas that flourished on Bow Street on Thursday afternoons."
>
> (Bruner, Goodnow, and Austin, 1956)

Things were clearly moving well at Harvard; in 1952 Bruner had risen to full professorial status, having been made Associate Professor in 1948.

In 1953, we see a precursor to A Study of Thinking in an article entitled, "Fixed Choice Strategies in Concept Attainment" (Austin, Bruner and Seymour). In this year, we will also see something of the tragedy of the McCarthy era as it affected Bruner's dear friend, Robert Oppenheimer.

In 1949, Robert Oppenheimer had opposed a crash program for the development of the hydrogen bomb, and since the war he had been, in addition to his work at the Institute at Princeton, writing and lecturing a good deal. He became concerned with informing the layman about science, "with the relations between the scientist and society" (Peierls, 1974), and his lectures included, through Britain's BBC, "Science and the Common Understanding," in November, 1953. In December of that year, Oppenheimer was told that his security clearance was being withdrawn "because of accusations that his loyalty was in doubt" (Ibid.). There were hearings, at his insistence, before a three-man Personnel Security Board, which found that though he was a loyal citizen "he was to blame for opposing the hydrogen-bomb program and later

for lacking in enthusiasm for it" (Ibid.). The Atomic Energy Commission acted on this report by confirming his clearance withdrawal based on "defects of character." It is some comfort that in both the Board and the Commission reports there was, for each, a dissenting opinion.

It behooves us to be aware of political climate during different periods of Jerome Bruner's research activities; the political milieu has had its affect on the progress and the direction of science and of its investigations since Copernicus and Galileo and before, and we will see later a closer effect on Bruner himself.

In the summer of 1954, Bruner had an opportunity to visit New Mexico with regard to research with Navajo and Zuni societies "to get some sense of the cross-cultural importance of categorizing phenomena" (Bruner, Goodnow and Austin, 1956), and the information gleaned would be part of the aggregate of material for A Study of Thinking.

Bruner was involved in a number of drive[2] studies (we recall that one of his first publications, while still at Duke University, was on the effect of shock on learning: McCullough and Bruner, 1938). These begin in 1954 and progress through 1958, and we will discuss them all here.

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[2] Drive: Used as a general term to include instinctive and other impulses, or motive forces, prompting an animal to directed activity towards an end (James Drever, A Dictionary of Psychology, Revised Edition, Penguin Reference Books, 1964).

These papers were written and published in an intellectual atmosphere where there were many ways of thinking about learning and about drive. The S-R (stimulus-response) people had published voluminously, and Edward Chace Tolman had, in 1948, published "Cognitive Maps in Rats and Men," in which he proposed that the "central office" of the nervous system was more like a map control room than like the stimulus response view of a telephone exchange. There were a number of ways of looking at learning and drive, and there were critics for each way.

Jean Matter, Jerome Bruner and Donald O'Dowd published "'Response' Versus 'Principle' in Reversal Learning" (Matter, Bruner and O'Dowd, 1954) which described experiments where an animal learned left, right, left, right alteration patterns through a four-unit T maze. There were two questions: one, did the animal learn the specific positions, or "the principle of single alteration?" If the animal was learning specific positions, that was termed negligible transfer; if the principle was learned (that is, if the learning could be generalized) the term was positive transfer. The second question had to do with the effects of strong versus mild motivation (this motivation consisted of deprivation of food) on the kind of learning. The experimenters found that strong motivation (or a very hungry rat — deprived of food for 36 hours) produced negligible transfer, while mild motivation (12 hour food deprivation) resulted in positive transfer.

"Breadth of Learning as a Function of Drive Level and Mechanization" (Bruner, Matter and Papanek, 1955) described the use of black and white doors in a single alteration pattern (black door on the left, then on the right, and so on), where the rat would learn to respond to the black

doors only. Edward Tolman is thanked for "many stimulating suggestions," and reference is made to his "Cognitive Maps in Rats and Men," and to his consideration of broad and narrow cognitive maps. The reduction of breadth learning was said by Bruner, et al., to be the result of excessive motivation or frustration, producing a "narrower" cognitive map, that is, one with less breadth. Bruner notes that

> "...one of the determinants of a narrow or a broad map is the range of cues utilized by an organism during cognitive acquisition."
>
> (Bruner, Matter and Papanek, 1955)

The authors concluded that breadth learning could be treated as a dependent variable, with overlearning and overmotivation as affecting conditions, and that

> "...it seems somehow ironic that psychologists for the most part have neglected an aspect of learning — call it breadth, perspective, or what you will — that is so much a feature of our instructional lives. We constantly seek to create the conditions in which our students will grasp the many and varied aspects of the phenomena to which we are introducing them..."
>
> (Ibid.)

The authors found that

> "...the larger the number of alternative cues for which the organism is set, the greater the difficulty involved in recognizing any one of them upon its appearance...to speed up goal attainment, an organism sacrifices breadth of attention and consequently breadth of learning."

In 1957, Bruner wrote a Comment for Psychological Review, "Effect of Overtraining on Subsequent Learning of Incidental Cues" (Bruner, 1958a), and in 1958, the theme was followed up in "The Role of Overlearning and Drive Level in Reversal Learning" (Bruner, Mandler, O'Dowd and Wallach, 1958). Having used variations of the T-maze, food deprivation kind of experiment described earlier, in two experimental studies, the authors

concluded,

> "Thus, given initial overlearning of a pattern, positive transfer to its obverse occurred provided that either original learning or transfer learning took place under moderate drive conditions. High drive during both original learning and transfer, on the other hand, prevented such savings from occurring."
>
> (Bruner, Mandler, O'Dowd, and Wallach, 1958)

The authors explain that the learning of the principle in this experiment is for the animal to turn left, for example, and then keep reversing sides. As to what is meant by "savings," the authors note

> "If there are substantial savings in learning the reversed pattern, this indicates the animal has indeed learned more than a series of specific turning responses, and we may tentatively say that the principle of single alteration has been learned."

The authors sum up,

> "We have presented a not unfamiliar approach to the problem of transfer: That transfer more easily occurs when learning becomes genericized or recoded into a principle that can be applied to a new instance of the principle. This recoding is greatly aided, we have found, by a considerable amount of overlearning."
>
> (Ibid.)

Drive studies, somewhere between how the animal perceives and how he learns, fill in another bit of the puzzle.

When one considers the concentrated research Jerome Bruner was doing in the field of perception, the work in drive studies, and in cognition, the committees on which he served, not to mention his teaching duties, one might wonder if he did else than work; he did. He learned to fly fish, and occasionally went camping...He had been fly fishing all over the world before he finally replaced that form of relaxation with the sea and the sail.

Bruner's teaching was not only in the form of lectures in the classroom; he was also ever in process of guiding students through the shoals of their graduate studies. It is Jerome Bruner's philosophy to this day to get the best students, then

> "... give them their head...then be a little bit tough with them, be a bit of a bastard...that's important...I have very strongly the feeling that one of the great things of teaching research students is to find out what it is they want to do, make them do it so god damned well they never dreamed they could do it that well..."
>
> (Bruner, Interview, 1977)

Again, we see the insistence on excellence.

The man really doesn't know any other way.

We will see him come up to intellectual dishonesty, to smallness of mind, to men called great who lack vision, or who, worse, lack generosity for the vision of another. These incidents appear first to surprise him; he has not learned yet to expect shoddiness. It is not the level on which he lives, nor is it the arena from whence he choses his friends and acquaintances. When the surprise is replaced, it is mostly with annoyance, perhaps a tinge of sadness, regret, or disappointment. Seldom does Bruner take a combative stance. He rarely draws into confrontation any but those whom he in some manner respects; he gives others a broad berth. He does not see himself in an adversary role, though sometimes he assumes it, as we shall see in the years to come.

In the early 1950's, Jerome Bruner built the foundations for many an interesting adventure. And they will come about rather quickly now.

THE GUGGENHEIM FELLOWSHIP

In 1955, Jerome Bruner left Cambridge Massachusetts for Cambridge, England, and the good company of Sir Frederick Bartlett, with whom he had been corresponding, Donald Broadbent, and a host of others. He was to be at Cambridge on a Guggenheim Fellowship. But before we talk about the details of his time in England, let us look for a moment at the political quagmire he left behind in the United States.

It was a period when United States Senator Joseph McCarthy was, for press, cameras and the Congress, waving about sheets of paper, on which, he claimed, were inscribed the names of Communists and Fellow Travelers; people who, in his lights, should be blacklisted and driven out of American society. An incredible number of influential American citizens found themselves suddenly in the limelight, their loyalty questioned. There was a terror abroad in the land based on the demagoguery of this, for a time, inexplicably powerful man. Until the U. S. Senate cleaned its own house through the voice of its censure of Joe McCarthy, even the political moderate (and certainly the liberal!) was made to shake in his boots for fear of persecution, a persecution which often went so far as to separate the person from his source of livelihood. One could be blacklisted without any manner in which to defend himself, sometimes finding that he was persona non grata only after finding he could not get a job. The McCarthy hearings were a dreadful blot on the history of the United States, and Bruner and his colleagues found themselves busy in the preparation of defence for some of their fellow professors caught in the

ugly web of accusation. It is quite possible that if it hadn't happened that the Guggenheim Fellowship took Bruner to England during one of the most terrible years, he would, of course, been a prime object of McCarthy's disaffection — his youthful membership in the Communist party would have made him so.

This was the era of the Loyalty Oath — a symptom of the times which would carry over for many years after McCarthy's demise. Many members of the academic world struggled mightily with the ethical and moral implications of signing, or rather being forced to sign at risk of not being able to work, an oath that declared them not members of any group planning the overthrow of the government, and loyal to the United States. There was a prevailing attitude among political liberals that they should not be required to bow to this coersion in order to be considered loyal so that they might continue their work; surely, they reasoned, anyone with dark intentions toward the United States would sign without a second thought! In many academic institutions, and the University of California was one of these, if one did not sign the Loyalty Oath one could not be hired; if already employed, one could be summarily dismissed. There were signatures over-written with "UNDER PROTEST," and there were those who chose to quit rather than sign.

It was Jerome Bruner's good fortune that neither the State of Massachusetts nor Harvard University put him in a position of choosing to sign or leave. He never signed a loyalty oath. Indeed, in time, he was instrumental in affecting the deletion of the requirement in certain governmental areas through his refusal to sign such a document for the Veterans Administration on one occasion (Bruner, Interview, 1977).

Bruner was able to leave a good part of the turmoil of McCarthyism at least temporarily behind him as he took his family and his research assistant, Michael Wallach, off to England for the 1955-56 year. But there was a different turmoil, one within his own person, which he could not escape; the beginnings of a metamorphosis had already emerged, and changes have already begun to crop up in Bruner's publications...new worlds were beginning to come into view. We will discuss these personal changes which instigated profound changes in Bruner's work in a later chapter. We need to be aware now only that the harbingers are present during this year in England.

On October 2, 1955, the day after Jerome Bruner's fortieth birthday, the Sunday London Times published his book review, entitled, "Freud's Legacy. A Review of E. Jones, Sigmund Freud: Life and Work Volume II: Years of Maturity, 1901-1919." We do not see Freud as a subject of Bruner's work prior to this review, but we will see papers concerning Freud soon afterward.

It is interesting that Bruner sees Jones' record of Freud during these years of Freud's life as

> "Freud, the artist, the Old Testament prophet, the scientist, on the threshold of his middle years: the years of consolidation..."
>
> (Bruner, 1955)

and that he sees Freud's "middle years" as

> "...characterized by a deep and growing sense of the conflicted nature of the human plight."
>
> (Ibid.)

Bruner must have felt a kinship with Sigmund Freud, for this "deep and growing sense of the conflicted nature of the human plight" was certainly with him, and he, too, was "on the threshold of his middle years," and we will see that Bruner, too, goes through years of personal turmoil.

Of particular interest is the recognition by Bruner of the complementary dualities existant in Freud's life during this time:

> "It is an old joke that Freud could not count beyond two, for his psychology in this period is shot through with conflicting dualities: love and hate inexorably mingled, the conflict of narcissitic self-love and object love...If in the early days Freud saw neurosis as a compromise between discordant impluses, in time he came to see human character itself in these terms."
>
> (Ibid.)

Back in the United States, Ernest Hilgard had been through an unpleasant experience which had a sad similarity to Oppenheimer's travail; as a part of the times of the McCarthy era, his loyalty was questioned, and his security clearance was so affected that he was not able, in his then position of Graduate Dean at Stanford, to review classified projects. He decided, after four years as Dean, to return to his position as Professor in Psychology, a move he had planned in any case, but made the sooner due to the discomforts the recent accusations had imposed. He discussed what happened then in an autobiographical sketch:

> "A pleasant interlude between the graduate deanship and the return to the professor's role was provided by an invitation from Jerome Bruner to join a small conference on cognitive processes to be held at St. John's College, Cambridge, to be chaired jointly by him and Sir Frederick Bartlett...In 1955 the new interest in cognition was just emerging (actually pre-Sputnik, which later accelerated it). This rather intimate conference permitted easy acquaintance, including punting on the Cam, with colleagues from England such as Broadbent, Mackworth, Oldfield, Magdalen Vernon, Zangwill, and others, Joseph Nuttin from Belgium, and better mutual understanding with some American

colleagues such as Roger Brown, George Miller, Karl Pribram, and Heinz Werner..."

(Hilgard, 1974)

In recalling these days, Professor Hilgard noted,

"The invitation was not originally from him...It was Sir Frederick Bartlett ...who did the inviting...And Jerry was there and we certainly had a very pleasant time...we met mostly out in the garden behind the general institute that Bartlett was running there...that was physically where we met...we had rooms in the dormitories at St. John's College in Cambridge, and I roomed with George Miller...in what they would call "digs" there ...an old apartment that they had for young faculty members... the meetings were quite informal..we sat around in the garden in front of very pretty flowers and the green grass that one has in England...the afternoons were pretty free. We would go punting on the Cam...it's Cam-bridge...the bridge that goes over the Cam names the town...the Cam is the river...You'd work in the morning and play in the afternoon, then you'd come back for a session quite late, and the Americans were always very restless about the afternoon meeting at 6:00 or something, because you were going to eat at 8:00...but we'd fit it in somehow..."

(Interview, Hilgard, 1978)

Hilgard also mentioned that there was no official publication for the conference itself, but that Jerome Bruner had presented there a paper called, "Going Beyond the Information Given." The concepts in this paper are of sufficient consequence that Jeremy Anglin would, in presenting a collection of Bruner's papers at a later time, entitle his book, Beyond the Information Given (Anglin, ed., 1973).

There are constraints in the publication of science, and one of these is that reportage must stay within the bounds established by the parameters of the data; one may not legitimately presume to make conclusions beyond that information; to do so is considered by some as

scientific heresy. Since going beyond the data was, and still is, considered a cardinal sin in the annals of science, how does Jerome Bruner, a man trained in the tradition of science to be careful and factual, resolve "going beyond the information given" with staying within the data obtained?

To go beyond the information given is an act of inference. Bruner quotes Bartlett's Clayton Memorial Lecture (Bartlett, 1951):

> "Whenever anybody interprets evidence from any source, and his interpretation contains characteristics that cannot be referred wholly to direct sensory observation or perception, this person thinks. 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, 1957b)

Bruner speaks of

> "...rendering some given event equivalent to a class of other things, placing it in an identity class."
>
> (Ibid.)

He describes this equivalence grouping by using a quote from William James (1890) who noted that cognitive life begins when one is able to exclaim, "Hello, Thingumbob again."

Bruner reminds us,

> "If we were to respond to each event as unique and to learn anew what to do about it or even what to call it, we would soon be swamped with the complexity of our environment...Equivalence categories...are the most basic currency one can utilize in going beyond the sensory given. They are the first steps toward rendering the environment generic."
>
> (Ibid.)

We will see this principle extolled again and again as Bruner gets further into cognitive psychology, and in the arena of educational psychology; we see building blocks, some familiar and some new, which

appear to be tumbling over one another, then beginning to stack neatly, like some clever magic in trick photography.

Bruner speaks of coding, a very important concept in cognition:

> "A coding system may be defined as a set of contingently related, nonspecific categories. It is the person's manner of grouping and relating information about his world, and it is constantly subject to change and reorganization.
>
> "We propose that when one goes beyond the information given, one does so by virtue of being able to place the present given in a more generic coding system and that one essentially reads off from the coding system additional information either on the basis of learned contingent probabilities or learned principles of relating material. Much of what has been called transfer of training can be fruitfully considered a case of applying learned coding systems to new events."
>
> (Ibid.)

Here Bruner discusses some of the conditions under which generalizable coding conditions will be acquired, and he includes the "problem of creativity, and its relationship to prediction of readiness to use the coded systems one already has." He says,

> "The scientist constructs formal models or theories that have predictive value, that have a value in going beyond the information available."
>
> (Ibid.)

He speaks of the generality of theories as, in some respects, "emptying" the problem of specific content, that is,

> "What we mean by a theory or model or generic coding system is a representation of the critical characteristics of the situation...a contentless depiction of the ideal case, empty in the sense that geometry is empty of particulars. It is this emptying operation, I would propose, that constitutes the creative step in inventing or producing a coding system. It is also the step that is involved when one learns something generically...generic learning and the abstracting or emptying operation are, I think, the same thing..."
>
> (Ibid.)

In his review of the literature for "Going Beyond the Information Given," Bruner includes an extensive bibliography, one which probably covered a fair amount of the state of the art of cognitive psychology in the mid fifties. Bruner's book with Austin and Goodnow, A Study of Thinking was about to be published, and he was giving lectures during his stay in England at University College, London, on the subject of cognitive psychology (Bruner, Olver and Greenfield, Preface, 1966). One can safely say that Bruner was now well into cognitive psychology.

Bruner was a guest lecturer at the Federation Suisse de Psychologie in 1956 (somewhere along the line, he also became an Honorary Foreign Fellow at the Federation Suisse de Psychologie as well). He also did a book review that year of G. A. Kelley's The Psychology of Personal Constructs. This was a work which appeared in two volumes: Bruner reviewed the first, A Theory of Personality, and Carl Rogers reviewed the second, Clinical Diagnosis and Therapy. Both reviewers agreed that the work was over-wordy, and both agreed that it was of value. Bruner commented that it was "the single greatest contribution of the past decade to the theory of personality functioning... Professor Kelly has written a major work;" his review was entitled, "A Cognitive Theory of Personality" (Bruner, 1956a).

It was during the trip of 1955-1956 that Bruner met, for the first time, the man called "Le Patron:" Jean Piaget. His visit with Piaget would plant the seeds for the beginnings of a new path to his goals; the path would be rocky, thanks to the old gentleman himself, still the work would go forward, and does even today. The first visit to Geneva was a pleasant one, full of comaraderie, hiking and picnicing. Bruner later dared to disagree with this patriarch of developmental psychology, and the gentle companionship was not to continue long. But more of that later.

After these many months in England, with the trips to Europe, Bruner returned to Harvard, and to a very different life. The transformation of the man in his forties[1] was about to come to its fulfillment.

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[1] The word "transformation" is used by Roger Gould to describe the stages of adult growth and development covered in his recent book (Gould, 1978).

A STUDY OF THINKING

In the book, A Study of Thinking (Bruner, Goodnow and Austin, 1956) the Cognition Project of the Laboratory of Social Relations and the Bow Street Thursday afternoon seminars bore their fruit. Jerome Bruner says that to this day, this book is more widely quoted than any of his other publications (Bruner, Interview, 1977). There was a sad event reported in the preface of the book:

> "George Austin, our friend and collaborator, died in his thirty-second year, in December, 1955. The death of one so young, so courageous, and so promising is a loss to his friends and to learning."
>
> (Bruner, Goodnow and Austin, 1956)

During the period of preparation of the book, Barbel Inhelder, Jean Piaget's close collaborator, visited Jerome Bruner. She arrived while he was teaching a class, and spent the time waiting for him to return reading the first three chapters of the book. It was the beginning of a long association, one that is still active today. It also was an informal beginning to his contact with Piaget though, as we mentioned earlier, Bruner did not meet Piaget until he went to Europe in connection with his Guggenheim Fellowship. On the back cover of Wiley's pocketbook edition of A Study of Thinking we find:

> "Jean Piaget: '(This) magnificent book is a revolution in the psychology of thought...It refreshes and reopens completely the great problems in the field.'"
>
> (Ibid.)

The authors describe their purpose:

> "This book is an effort to deal with one of the simplest and most ubiquitous phenomena of cognition: categorizing or conceptualizing."
>
> (Ibid.)

They note that the process of categorization "involves, if you will, an act of invention" and that it is the rendering of discriminably different things to be equivalent so that we do not become "slaves to the particular."

We see shades of von Neumann's theories when Bruner announces, concerning this book,

> "What it did was to change the pattern of research in psychology and introduce the concepts of strategy, dealt with the formal description of the domain, something other than size, shape, and various other dimensions..."
>
> (Bruner, Interview, 1977)

The authors look at identity and equivalence as two kinds of categorizing responses, commenting that Piaget

> "...speaks of the learning of identity as corresponding to a principle of conservation as in the conservation of energy in physics."
>
> (Bruner, Goodnow, Austin, 1956)

In the authors' view,

> "The study of equivalence...becomes a study of coding and recoding processes...."
>
> (Ibid.)

and categories

> "...exist as inventions, not discoveries."
>
> (Ibid.)

The authors continue,

> "The categories in terms of which man sorts out and responds to the world around him reflect deeply the culture into which he is born... his personal history comes to reflect the traditions and thought-ways of his culture, for the events that make it up are filtered through the categorical systems he has learned."
>
> (Ibid.)

What is accomplished by putting things in generalizations, or categories? The environment becomes much less complex, we can better identify the

objects about us, we don't have to learn constantly to identify each individual item (a cat can be a cat, it does not have to be "Tom," "Jerry," or "Heathcliff"), we have a direction for instrumental activity, and we can order things in our thinking, that is, we can relate classes of events in a manner which we might call category systems.

Generally, the book covers how people achieve concepts (or distinguish categories), how they retain the information, and then how they transform that information so that it may be used in other situations, that is, how people generalize. Strategies are conceived of as the means to concept attainment, and considerable description of various strategies and the manner of their selection is given the reader, along with descriptions of various kinds of concepts, as well as the characteristics of categorizing with "probabilistic cues." The first three chapters of the book address themselves to the nature of inference, of concepts and of the attainment of concepts; the rest of the main portion of the book covers the experimentation and a summing up. An Appendix by Roger Brown affords an application of the categorizing theory to linguistics, covering such matters as the categories of speech (morphemes, phonemes, and the like), the issues of linguistic meaning, and the relationship between language and culture.

Robert Oppenheimer, among several others, reviewed the book (Bruner Interview, 1977); the sales were excellent. There was, of course, within the community of academic psychologists a fair contingent of negativity — controversy is the name of the game in academe, and if none were present, one might suspect a lack of content in the presentation. Bruner himself was later to gently criticize the work, and to re-think what other issues might have been presented; still the book stands today as a creative and fairly original approach to the nature of cognition.

## AT FORTY: METAMORPHOSIS

For some of us, life indeed does begin anew at forty. Sometimes our thirties seem to fill us so with a sense of struggle that we anticipate forty to be a beginning of dullness and the slow roll or fast tumble down the other side of the hill of life. And when one arrives, and finds instead that one is emerging from a metamorphosis, as did the ever energetic Bruner, it must be a source of sometimes delightful unsettlement. And unsettled he was.

The marriage between Jerome Bruner and Katherine Bruner ended in divorce in 1956. He threw himself into his work with a fury, trying to connect all that he had done before in some rational way, and to look forward to a wider and more vivid world, and certainly a very lively one.

Bruner spent the summer in London. He read, spent time with friends, sailed, went to museums, and generally took stock. He was concerned about the inadequacies he saw in the now published A Study of Thinking. He was, as we have seen, beginning to look at a good number of things differently, particularly art. We can see also that out of this turmoil and tumult was coming another transition in his work. Bruner was looking now ever more closely at cognitive development, and at the structures involved in thinking and learning; we will see the products of these efforts later in these pages. We cannot present the kaleidoscope of Bruner's interests in their simultaneous appearances; the sum is diverse and massive. We will look at one side and then another of this multifaceted personality, with the hope that when we are done the reader will have some sense of the total person who is Jerome Bruner.

For now, we will look at the dynamics of the emergence of the Bruner in his forties, of what we call his metamorphosis, and the resultant prose.

In an early essay of this period, we see a discussion by Bruner of Sigmund Freud. Bruner was not unfamiliar with Freud. He had, of course, the traditional academic information, and, through an organization called the Commonwealth Fund, Jerome Bruner had undergone psychoanalysis. The Commonwealth Fund set up ten fellowships specifically for behavioral scientists who were not analysts so that they might be psychoanalyzed.

Bruner does not feel himself to be the typical analysand. He generally eschews the sort of psychoanalytic "in-group" talk of neuroses, psychoses, transferences, and the familiar esoteric jargon; he does, however, live with what his analyst called his denial of pain. Bruner hasn't determined to his own satisfaction the source of the denial, but sees a possible relationship to his early blindness (Bruner, Interview, 1977). For the most part, Bruner appears to be a man of good humor about himself, a man who takes his ideas most seriously, and who will, if pressed, do battle in defense of his convictions, but who is also capable of taking himself lightly and laughing at his own foibles.

In the essay, "Freud and the Image of Man" (Bruner, 1956b), Bruner seems to have applied philosophical continuity, using complementarity which is its child, to his interpretation of Freud's contributions:

> "What Freud was proposing was that man at best and at worst is subject to a common set of explanations: good and evil grow from a common process...Freud's genius was his resolution of polarities..."
>
> (Bruner, 1956b)

Bruner describes Freud as making us aware of continuities:

> "The first of these is the continuity of organic lawfulness...'the Freudian slip' has contributed more to the common acceptance of lawfulness in human behavior than perhaps any of the more rigorous and academic formula from Wundt to present...One may argue...that Freud's sense of the continuity of human conditions, of the universality of the human predicament, has made possible a deeper sense of the brotherhood of man."
>
> (Ibid.)

We see the emergence in this essay of a theme which we will see again, especially during this transitional period in Bruner's life; it has to do with an effort to bring together science and humanism:

> "...Freud's recognition of deep unconscious process in the creative act has gone far toward enriching our understanding of the kinship between the artist, the humanist and the man of science."
>
> (Ibid.)

As Bruner speaks of the "image of man" in this essay, he makes an important sociological and political observation:

> "...it is patent that the view one takes of man affects profoundly one's standard of what is humanly possible. And it is by the measure of such a standard that we establish our laws, set our aspirations for learning and judge the fitness of men's acts. It is no surprise then that those who govern must perforce be jealous guardians of man's ideas about man, for the structure of government rests upon an uneasy consensus about human nature and human wants.."
>
> (Ibid.)

One has the sense, in reading this essay, that Bruner is rushing to say everything at once; there is a sense of excitement of the discovery of man and his image and the relationship of the concepts to his roles in society and to the myriad other ways in which we can see man and his development, including, for example, seeing man as a product of an evolutionary process. Bruner skips about through these ideas:

"The behavioral scientist, as some insist on calling him, may propose, but it is the society at large that disposes. Nor is it simply a matter of public concern. For man as an individual has a deep and emotional investment in his image of himself...Man has powerful and exquisite capacities for defending himself against violations of his cherished self-image...

"Two figures stand out massively as architects of our present conception of man: Darwin and Freud. Freud's was the more daring, the more revolutionary and, in a deep sense, the more poetic insight. But Freud is inconceivable without Darwin...What Darwin did was to propose a set of principles unified around the conception that all organic species had their origins and took their form from a common set of circumstances — the requirements of biological survival...Man was not unique but the inheritor of a legacy...As the summit of an evolutionary process, man could still view himself with smug satisfaction, indeed proclaim that God or Nature had shown persistent wisdom in its effort to produce a final, perfect product. It remained for Freud to present the image of man as the unfinished produce of nature: struggling against unreason, impelled by driving inner vicissitudes and urges that had to be contained if man were to live in society, host alike to seeds of madness and majesty, never fully free from an infancy that was anything but innocent."

(Ibid.)

In concluding this powerful essay, we see Bruner introduce in a most concrete way a concept which he will give continuing attention in the years to follow, one which will be prominent in his later comments on education and instruction. It is the issue of metaphor:

"Freud's mode of thought is not a theory in the conventional sense; it is a metaphor, an analogy, a way of conceiving man, a drama...Freud's work is the ground from which theory will grow...he has provided an image of man that has made him comprehensible without at the same time making him contemptible."

(Ibid.)

When Bruner describes in this essay the human dilemma:

"...its conflict, its private torment, its impulsiveness, its secret and frightening urges, its tragic quality..."

(Ibid)

we see an apparently vulnerable human, able through familiarity to touch with his language the heart of the human condition.

We see in Bruner now more than a more colorful language, more than a journey from the verbiage of reports of science to the word-painting of an essay: we see the emerging man. A metamorphosis indeed, and the new man will take flight into imagery and metaphor, and still will not lose the solidity of his scientific spirit. He speaks his new language as though he had just discovered a fresh and delightful freedom in descriptive expressiveness. The things which Bruner wrote during this period are not simply the product of the wanderings of a dilettante, but rather the intense searching of a man for the sources of human rationality. We see now in that search not only the objective measurements of polls and tachistoscopes, but a quest for the sources of imagery, of creativity, of the temper of man and of his emotional power, of his conflicts, his tragedies — in short, Jerome Bruner had begun to envisage the resolutions of the ambiguities of his own life, thus to broaden the avenues of his personal pursuits, and, of course, inevitably the direction of his research.

In 1957, Bruner published a couple of papers on having ideas. One of these was entitled, "What Social Scientists Say about Having an Idea" (Bruner, 1957g), and the other, "What It Takes to Start an Idea," was directed toward persons interested in advertising. Bruner admitted to "rather shaky credentials" in this particular business interest, and said that his

> "...chief aid in this enterprise will have to be what Henry James once described as 'that terrible instrument, the fresh eye.'"
>
> (Bruner, 1957f)

Bruner presented the concept of generics as the ability to transfer learning, but as to the source of ideas, he instructed us to attend to metaphor and myth:

"...good operational ideas very often have their origin in highly personal metaphors that express deep lying impulses in the person, metaphors that have about them some of the character of great myths and legends...this metaphoric flow of ideas...is a substitute for overt action in behalf of the impulse...One of the great sources of hypotheses of ideas, of poetic images, seems to be the taming of such metaphoric flow."

(Ibid.)

As an example, Bruner speaks of

"...the frustration dream, the unquieting type in which we try to reach some objective but somehow never manage to get there. It is conceived in mythology in the myth of Sisyphus who is destined to push a rock to the top of the hill, never quite getting it there...I would not be surprised if someday we found an ancient scroll that tells us that the inspiration of the inventor came about when his quandry during attempted solution made contact with the very personal metaphor of trying to arrive but never getting there."

(Ibid.)

Bruner addresses the principle of what he terms organic economy, that is, that economy of thinking necessary because of human limitations of attention and of memory.

"...one of the purposes of recording or repackaging information is to spare this limited span from being overtaxed by particulars. The best technique that has ever been invented for serving this function is to generalize."

To further emphasize his point, Bruner quotes Oppenheimer as saying that in order to perceive anything at all, we must give up perceiving other things.

He sums up:

"In fine, then, there is a cycle that runs from the open state of having an idea to the more disciplined one of recognizing it as good or fitting or appropriate. At one end, there is the taming of personal metaphor to the purposes of the problem at hand, using it as a guide for constructing new and potentially fruitfully combinatorial hypotheses. At the other there is the rigorous business of recognizing the worthwhileness of an idea. Between the two, between origination and verification, there lie many complex variables."

(Ibid.)

The slim volume entitled, On Knowing: Essays for the Left Hand, was written over a period of several years. "Knowing," Bruner says, "has many faces and it is a linguistic pity that the word is a singular gerund." (Bruner, 1962c). The book contains three major divisions, each comprised of a series of essays. The first division, which Bruner calls "The Shape of Experience," is addressed to knowing; the second, "The Quest for Clarity," contains essays on teaching and learning, and the third is entitled, "The Idea of Action," covers the processes of concepts moving into action. In this last division, the essay "Freud and the Image of Man" is reprinted, and two other essays are presented: "The Control of Human Behavior" and "Fate and the Possible."

We will look at these other two essays as part of "The Idea of Action" section; this transitional period in Bruner's life is filled with the kind of action he describes in his introduction to this section:

> "Action can be said to be determined by what a man knows, although I do not mean this in the rationalist's sense of calculus based on close reckoning of all alternatives...we know in the light of many states, and it is man's fate that knowing in one light often precludes knowing in another at the same time — as Niels Bohr's now-famous dictum that you cannot know somebody at the same time in the light of love and the light of justice. So we can say that, though action follows from what one knows, it is also the case that it never follows from all that one knows. Perhaps it is just as well, or else we should be in a persistent tetanus of indecision."
>
> (Bruner, 1962c:129-130)

In "The Control of Human Behavior," which was originally prepared for presentation to the Graduate Faculty of the New School for Social Research in New York for its 25th anniversary, Bruner speaks of behavior being controlled always, "virtually never random," either from outside forces or internal initiation. He continues,

> "...the question is how one obtains the necessary control while preserving the necessary variability that permits change, innovation, zest, and a lively sense that the invention of new alternatives is more important than the suppression of ones that may prove ugly."
>
> (Bruner, 1962c:131-148)

Bruner includes as forms of behavioral control guiding myths and values not always overtly recognized; these he calls latent culture. He describes two kinds of control: one, the attempt to control men's minds "by shaping their conception of the world in which they live," and the other, the attempt to control men's actions, either by coercion (punishment) or seduction (reward). He notes that "a monopoly over the means of coercion and seduction increases the potentiality for controlling human behavior,"saying,

> "It is not surprising that writers who are fond of fantasies about social control, like my colleague B. F. Skinner in his novel Walden Two, encourage themselves with tales set in a neatly arranged, benign, but nonetheless utterly monopolistic utopia."
>
> (Ibid.)

Bruner makes interesting fare of control by language and myth, by both affiliation and rejection, and most interestingly, by limitation of opportunity. He is suggesting, he says,

> "...that we are already inadvertently controlling behavior by imposing irreversible limits on it with many of our practices in education, considering education now in the broad sense."
>
> (Ibid.)

We will see, at one point in Jerome Bruner's life, that he will try to affect a change in this particular limitation of opportunity.

The essay, "Fate and the Possible," examines "the role of fate in an age of science." Bruner proposes that man does not deal directly with

nature, but rather that nature is a symbolic construct, that is,

> "...A change in one's conception of the world involves not simply a change in what one encounters but also in how one translates it..."
>
> (Bruner, 1962c:159-165)

The image of man of himself must therefore be intimately tied up with his image of the world, and fate may be perceived as "that which is beyond one's control" or an "outer limit." Fate, Bruner says, is the inverse of potency, that is,

> "Fate is the residuum that is left after one has run through the census of what is humanly possible."
>
> (Ibid.)

Bruner tells us more of his view of fate:

> "At one extreme we may speak of a peopled fate, a realm over which one has no control, where purposeful and personalized forces operate...At the other extreme is the view of fate as embodied in mathematical statistics and statistical mechanics...equated with a conception of residual vaiance — the set of all remaining causes that cannot be accounted for because of ignorance or, if all were known, pure unknowable randomness...The secular view of fate pits man as a systematic and controlling intelligence against ignorance and chaos. The religious view of fate pits man against a pantheon of controlling spirits."
>
> (Ibid.)

Bruner concludes,

> "It is Freud who gives the text: effectiveness is not a product of utopia but rests upon insight into the human condition. Indeed, the reform movement we see in American education today, the cultivation of individual excellence as an ideal, again moves from the inside out. It is an attempt to roll back fate through the increase of intellectual potency."

We have seen some dynamic changes in the kinds of things that Jerome Bruner presents in his writings and in the manner in which he portrays them in these years of his early forties. And there is much more. Along with these changes there came a lively lady.

Elizabeth Weems was a dynamic sort of woman: an artist, a political activist, a divorcee, a mother, a person of beauty and turbulence who would be a great influence during this period of Jerome Bruner's life. The relationship continued during the late years of the 1950's, and we read in the introductory remarks to the first section in On Knowing: Essays for the Left Hand, entitled "The Shape of Experience," Bruner tells us how he came to write the essay, "Art as a Mode of Knowing."

> "'Art as a Mode of Knowing' was written originally as a long letter to a painter friend, Mrs. Izler Solomon, who had been struggling bravely to teach me to paint and to look more wisely at pictures. The letter was eventually converted into a lecture for a course I was giving and finally into its present form."
>
> (Bruner, 1962c:11-15)

Mrs. Solomon is, in fact, Elizabeth Weems (Bruner, Interview, 1977).

In "Art as a Mode of Knowing" we see the familiar themes of this transitional period: metaphor, complementarity, and the resolution of the conflicts of science and art. as well as the rule of cognitive economy.

> "Metaphor joins dissimilar experiences by finding the image or the symbol that unites them at some deeper emotional level of meaning... there is also the canon of economy that must operate...Though the idea of economy in metaphor is by no means novel, it is worth special mention in a discussion of art as knowing, for it is precisely in its economy that art shares a fundamental principle with other forms of knowing. There is, perhaps, one universal truth about all forms of human cognition: the ability to deal with knowledge is hugely exceeded by the potential knowledge contained in man's environment...
>
> "Lest it seem that the modes of connecting in art and science are separated by an unbridgeable gap, that in all ways they are different modes of knowing, one primitive similarity should be mentioned — one that partakes of the nature of metaphor. It is the manner in which the scientist gets his hypothesis...prescientific effort ot construct a fruitful hypothesis may indeed be the place where the art of science, like all other art forms, operates by the law of economical metaphor...As Bertrand Russell comments, 'Physics is mathematical not because we know so much about the physical world, but because we know so little: it is only its mathematical properties that we can discover.' And until they are 'discovered' in this more rigorous sense, one proceeds by intuition and metaphor, hoping to be led

> beyond to a new rigor. Until then, the economical combinings of the scientist and the artist share far more than we are often prepared to admit.
>
> (Bruner, 1962:59-74)

These excerpts are merely comments by Bruner on the body of the essay, which itself deals specifically with four aspects of the experience of art, and is illustrated with copies of paintings to make particular points. The comments we have presented, however, give a concept of the kinds of changes which were occurring in Jerome Bruner's perspective and the resolutions that were taking place in his perceptions of his world.

One sometimes has the feeling that Jerome Bruner is walking up a circular staircase during these years, and that he pauses at the windows on the way up and describes to us in his writings the view of the moment. For a while, joining him in his climb, appears Elizabeth Weems.

In 1957, Bruner presented the Keynote Address at the 1957 Conference on World Affairs at the University of Colorado, which he entitled, "The Need for New Myths" (Bruner, 1958c). Here foreign policy was the focus of Bruner's remarks on human values. We find many pronouncements which seem timely today in this essay, and we find again myths, the image of man, and the alienation of the humanist and the scientist. Bruner speaks of a hidden crisis,

> "It is a crisis that has to do with the nature of myths, the guiding myths in terms of which men conduct their enterprises and in the image of which they set their ideals...myths about the nature of the universe and its order."
>
> (Bruner, 1958c)

Bruner presents a case in point:

> "We believe, for example, that time flows equably and inexorably — common sense believes it and watchmakers reinforce the notion with their handicraft. The people of Nuer do not believe it: time is inherent in the act performed. Nor does the quantum theorist in physics operate with such a myth. So, for us the ultimatum and the deadline crises are "real." There can be no such crisis in Nuer or in quantum theory."
>
> (Ibid.)

Bruner speaks of the differences of the science of today, where "nature is inferred from the regularities of experience; it is never directly and naively known," and that of the day of Newton, when "discovery was discovery and positive knowledge was an obvious concept." He reminds us of the shock to man's image of himself that must have occurred when man found himself, by the Copernican revolution, "displaced from the center of the universe," and adds that each change in our human concept of nature has brought a concurrent change in the concepts we have of man, that is to say, a change in our myths, and

> "...we cherish our image of man and suffer innovations...with steadfast gracelessness."
>
> (Ibid.)

In addressing the divided community of the scientist and the poet, he notes that

> "On one side is the more beleaguered type of humanist, shrill in his denunciation of the sciences, their values, their works; on the other the anti-humanist scientist.
>
> "...The contemporary humanist wants his professional world, his working myth, to have no nature in it, so the scientist (and most psychologists are no exception) wants his professional world myth to be without men — at least without whole ones who have anxieties about the nature of man, who construct metaphysics and write quartets."
>
> (Ibid.)

The redundancy of the issue of complementarity in Bruner's prose, either clearly stated or implied, speaks, I believe, for the profound importance of the concept in Jerome Bruner's thinking. It may be of interest that in 1971 Thomas Blackburn published an article in Science in which he discussed ways of "knowing" nature in the light of Bohr's theory[1].

The relation between myth and political philosophy is one of Bruner's issues in addressing this world affairs conference:

> "Without a myth of man and his place in nature that is adequate to the technological realities of our times, there can be no relevant or effective poltical philosophy. For myths must fit the human condition of the time and place; otherwise they can only be a source of anxiety and confusion."
>
> (Ibid.)

Then he issues a challenge:

> "...we are engaged in what can only be called a moral holding operation. Its central idea, its myth, is the ideal of adjustment, of being comfortable, of keeping the show on the road, of not making fusses, of taking

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[1] Thomas R. Blackburn's article, entitled, "Sensuous-Intellectual Complementarity in Science," describes the duality concept of Bohr's theory of complementarity. Blackburn looked at the theory with respect to its application to nature when viewed through different forms of information: either through abstract-quantitative information (that is, the view of science) or through what Blackburn terms "direct sensuous information." He concludes that these two observational methods do, indeed, meet the requirements of complementarity, and he finds the phenomena for each mode both consistent and repeatable. Blackburn contends that "which description of nature one gives depends entirely on one's method of knowing," and that both the scientific and the sensory approach to nature are rational, that is to say, each uses a consistent logic. Neither approach can be subsumed into the other ("A number is not an experience, nor is an equation the same thing as intuition"), thus an important criterion of the theory of complementarity is met. In addition, "Sensuous information is not independent of quantitative knowledge, since they both have their referent in the same system of nature," both descriptions may be true and lead to "reliable models of nature," and, finally, neither "sensuous nor quantitative knowledge of nature is complete...each is really an undernourished view of nature, because it lacks the information available through the other mode"(Blackburn, 1971).

> man from the psychologist's point of view and culture from the anthropologist's. It is the ideal of whistle-while-you-work and be well adjusted and don't make waves. There is a huge irony in the emergence of this bland view of man (and no view of nature) at this particular moment in history when we are perhaps more embattled intellectually, spiritually, and morally than ever before in human history."
>
> (Ibid.)

We see now in Bruner, not the sense of measuring and reporting social issues, but rather an almost preaching sense, a kind of urgency, of involved social responsibility. We see, in fact, a message, one which is repeated in many settings, and that message seems to be that we must consider the <u>whole</u> person (preferably a lively one), and that above all, we must prefer excellence and eschew mediocrity. He says it clearly here, in terms of the personal and of foreign aid:

> "Adjustment, I would submit, is precisely the opposite of dynamism. It is the art of treading water. It does not impel one to strike out for the far shore. Its product in American culture is mediocentrism, making out, being accepted in the organization ...The outgrowth of the cult of adjustment is inevitably realism, the appalling realism that urges one not to make ridiculous demands. The measure is reality testing. If you are reaching for something beyond your grasp you are either sick or you are ridiculous. So Americans risk becoming the most reasonable people in the world, in a world that is rife with unreasonable yearnings...Our present static myth does not fit the challenge, the opportunities, or the dangers of our times...we have drifted into the position of believing that this myth of well-being cum happiness by adjustment is exportable...a deep mistake...this is not the prevailing view of those to whom...we grant foreign aid...they want unreasonable change...an appreciation of change...a season of experimental irresponsibility to test the limits of their capacities...our aid pattern is not cut to the shape of their myths. They do not want our realism."
>
> (Ibid.)

He speaks of freedom, saying it

> "has the implied meaning that it is a state in which prediction is difficult, where surprise is possible...Our cultural power lies... in our capacity to exploit this freedom, to ...serve as a seed-bed for new conceptions, new myths, new possibilities."
>
> (Ibid.)

Those about Bruner must have been startled when he was berating adjustment with such passion. These years, we remember, were the late 1950's and they were the years of an uncommitted generation. The radical movement which swung the pendulum so far in the other direction had not yet become active. If Jerome Bruner had not been in the process of freeing himself from his own personal intellectual and emotional shackles, we might never have seen from him such an idealistic and angry shaking against mediocrity. It is of particular interest that the other side of the coin of the anger was the gentleness, the tender appreciation of art forms and of the poetic nature of man. The dichotomy exists.

In "Identity and the Modern Novel," another essay in On Knowing: Essays for the Left Hand, Bruner speaks of the novel as a metaphoric means to awareness. He begins with:

> "History has been described, probably too simply, as man's effort to make a home for himself in the world. It might better be described as an extension of those urges that impel man to find antecedents for his acts and his dilemmas, to find a prologue for his posture toward the future. The writing of history and the quest for identity share a paradox. A society's grasp of its history and a man's sense of his identity, when fully achieved, are final acts. But a community washed by the currents of growth does not easily come to a sharing of its conceptions of origins or the meaning of events. And no man answers easily the questions: Who am I, where do I belong, and of what am I capable?"
>
> (Bruner, 1962c:43-57)

During this period of his life, we see Jerome Bruner struggling to answer such questions. We see in this essay, as we see in so many essays in On Knowing: Essays for the Left Hand, not only a sense of the paradoxes in life, but a sense of the resolutions of those paradoxes. Here again these resolutions take place through the concept of complementarity:

> "It is Jung who has most strongly urged the complementary principle of human character: a function that is exercised has the effect of strengthening an opposite function. After a while the introvert develops strong extraversive needs; the man whose life has been governed exclusively by thinking craves in time the guide of feeling; the literal man searches eventually for ways of intuiting."
>
> (Ibid.)

In "Myth and Identity" (in On Knowing: Essays for the Left Hand) Bruner describes myth as

> "...at once an external reality and the resonance of the internal vissicitudes of man."
>
> (Bruner, 1962c:31-42)

> "I would urge," he says, "that we not be too tempted into thinking that there is an oppositional contrast between logos and mythos, the grammar of experience and the grammar of myth. For each complements the other, and it is in the light of this complementarity that I wish to examine the relation of myth and personality."
>
> (Ibid.)

There is more paradox:

> "By the subjectifying of our worlds through externalization, we are able, paradoxically enough, to share communally in the nature of internal experience...it is the fact of fashioning an external product out of our internal impulses that the work of art begins."
>
> (Ibid.)

"The Conditions of Creativity," presented originally at a symposium on creative thinking held at the University of Colorado (published in On Knowing: Essays for the Left Hand), came about because of Bruner's singular adventure in industrial psychology. During the course of this effort (and in this he appears to take some pride) he invented a draughtless sleeping bag "..a byproduct that properly ranks as beating swords into plowshares" (Bruner, 1962c:11). Noting that the "road to banality is paved

with creative intentions," Bruner says,

> "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."

And he quotes from Yeats,

> "God guard me from those thoughts men think
> In mind alone;
> He that sings a lasting song
> Thinks in a marrow-bone."
>
> (Bruner 1962c:17-30)

Bruner has a working definition of creativity,

> "An act that produces effective surprise — this I shall take as the hallmark of a creative enterprise."
>
> (Ibid.)

and he suggests certain sometimes paradoxical conditions under which creativity appears: detachment and committment, passion and decorum.

Bruner speaks of the dilemma of abilities:

> "What shall we say of energy, of combinatorial zest, of intelligence, of alertness, of perserverance? I shall say nothing about them. They are obviously important but, from a deeper point of view, they are also trivial. For at any level of energy or intelligence there can be more or less of creating in our sense...I have been speaking of creativity, not genius."
>
> (Ibid.)

There seems to be a compulsion to explain, again and again, in these essays the complementary concept, the conflicts apparent in the human condition, the agonies, and, if you will, the ecstasies of his life during these years. He found many resolutions for the expressions of the left hand and the convictions of the right. So we see the transition from the restless and unsettled professor to a richer and more complete person, more related to the human by nature of his feelings, while not less related by nature of his science.

The essays we have talked about, though published in On Knowing: Essays for the Left Hand in 1962, were written around 1959. There was another paper written in that year which deserves particular attention in that it is unique among Jerome Bruner's writings. It is like that last of several tastes that one gets with a fine white wine: it is a surprise.

The paper is entitled, "The Art of Ambiguity: A Conversation with Zen Master Hisamatsu." The prose in this writing takes on the tone of poetry: it resembles Haiku.

> "Hisamatsu is a composed man. He smiles easily, never grins. The interpreter does not smile, only grins."
>
> (Bruner, 1959a)

The Zen Master described for Bruner his thoughts on ambiguity:

> "The ultimate ambiguity is not so much in describing things as in expressing self.
>
> "From the Zen point of view one goes from natural to rational spontaneity, and then from rational to Zen spontaneity. The latter occurs when one realizes that there are conflicts within the rational sphere which cannot be resolved with rational spontaneity...Satori means such a spontaneity where the conflicts have been disentangled. Satori is the ultimate spontaneity."
>
> (Ibid.)

The Zen Master then described the True Self as "going beneath spontaneity."

When Bruner asked the Zen Master how it was he taught, the answer was:

> "As now. This is how I teach. There is a joke in Japanese which says 'If words are words they are not true.' In Zen negation is not mere negation. 'Not something' does not mean the negation of something, rather it means going underneath, going to a formlessness beneath a work of art. This formlessness finds various forms of expression, as in painting, in flower arranging, in ceramics."
>
> (Ibid.)

When asked of science, the Zen Master replied,

> "If I become pure, if I become my True Self, I become more scientific. If I achieve this then my rational spontaneity will be capable of a more concentrated expression...The point that cannot be solved by science can be solved by Zen. Just as ordinary music does not go beneath music and great music does, so science to be more than ordinary must go beneath itself. True Self expressing itself makes great science."
>
> (Ibid.)

When asked how one finds "True Self," the Master replied,

> "True Self is common to all human beings. To reach it one need not have a Zen Master...You can get satori here in America, you know."
>
> (Ibid.)

And the Zen Master laughed.

Bruner noted the composure and apparent lack of fatigue of the Zen Master on his departure after three hours of interview. Bruner commented:

> "I became acutely aware that there is no gesture at the command of an American for returning the bow of a departing Japanese gentleman."
>
> (Ibid.)

Jerome Bruner says few have read this paper; one was Rudolph Arnheim, and he sent Bruner a delightful note with which he included two post cards, one of Rodin's "Thinker," and the other of a delicate Oriental counterpart. He was, he said, sitting on a straw mat in Kyoto reading Bruner's conversation with a Zen Master.

When asked how he came to write the paper, Bruner says, "I just wrote it...Why did I write it? I think I wrote it for Elizabeth Weems too...probably..."

Bruner has gone forward, in these years of his early forties, with a willingness to approach any subject: art, history, the novel, science, the myth and the metaphor, Freud, Jung, Zen...we feel as we read his prose

that any uneasiness Bruner had was overcome by the strength of his conviction that he had something important to say.

The transformation of Bruner's early forties will be as a pebble tossed in a pond — the concentric ripples will show up for many years to come. We will see the wake in his papers on thinking, on learning, on teaching... Bruner will ever struggle with concepts, and will play them against one another.

We will go on now, but we must keep in mind that the changes of the forties have been incorporated into the person of Jerome Bruner, and there will be no going "home again."

A WORLD FULL OF A NUMBER OF THINGS

Bruner was not altogether wrapped up with "left-handedness" during this time; he came to a resolution of left and right handedness which not only influenced his writing, but appears also to have strongly affected his choices with regard to research efforts. In any case, the publications of the late 1950's touched on a number of matters.

Jerome Bruner published several book reviews, and among these was one on K. W. Spence's Behavior Theory and Conditioning, which he entitled "Mechanism Riding High." Though Bruner speaks of Spence's work as a "truly distinguished book," it is clear that he disagrees with Spence's fundamental position. While he "gives the devil his due," Bruner does not miss this opportunity to make clear his own views:

> "Behavior theory over the past twenty years has grown uglier, more cumbersome, narrower in its range of predictiveness, more like a highly elaborate game of chess governed by inelegant rules."
>
> (Bruner, 1957-c)

Surely there can be no more unkind cut to a purported effort at science than the accusation of inelegance! Bruner continues,

> "The rational apparatus that one must manipulate to 'account for' even the simplest behavior has become so formidable and so fraught with the arbitrary game of parameter estimation that it seems a hopeless tool with which to approach what may now seem like 'complex' behavior."
>
> (Ibid.)

With H. V. Perlmutter, Bruner published "Compatriot and Foreigner: A Study of Impression Formation in Three Countries" (Bruner and Perlmutter, 1957). Groups of students throughout Germany, France and

the United States were used to evaluate a "typical" person, based on his occupation and nationality, through a choice of "applicable traits." The authors concluded that, for example,

> "A college professor will do little stereotyping on the basis of being told that a man he is meeting teaches at a university..."
>
> (Bruner and Perlmutter, 1957)

and that

> "In cross-cultural contact, an individual may, in fact exaggerate the impressions of differentness between foreigner and compatriot."
>
> (Ibid.)

In 1958, Bruner published "The Freudian Conception of Man and the Continuity of Nature" (Bruner, 1958b), which is a slightly modified version of a paper we have reviewed quite thoroughly, "Freud and the Image of Man"(Bruner, 1956b and 1962c).

He also wrote a review of Sir Frederic Bartlett's, Thinking: An Experimental and Social Study; he describes is as a

> "...remarkable book, 'vintage Bartlett' as Sir Frederic's students would say, full of insights and ambiguities. If it does not succeed in taming its subject, thinking, it certainly leaves it well worked over."
>
> (Bruner, 1958-e)

Bruner had, of course, already begun his own studies in thinking, and we will see him "work over" the subject further himself.

It seemed in 1959 that there was no end to the energy of Jerome Bruner! Somewhere along the line he had met Jerrold Zacharrias and Francis Friedman, both professors at MIT in physics, and soon Bruner was involved with them, and with others, working on curricula. This was a

full and varied year: Bruner had written a number of essays for On Knowing: Essays for the Left Hand, several papers addressing cognition, and the paper on the interview with Zen Master Hisamatsu. From 1959 to 1961, Bruner was Chairman of the Curriculum Study Group at the National Academy of Sciences, and during the same years he was Education Adviser to the Book Division of Time, Inc. All this time he was writing, teaching and doing his research. He was looking now at a lot of things at once, but particularly at both the psychology of cognition and that of education.

A LOOK AT LEARNING, AT THINKING, AT TEACHING

The paper which appears to be Jerome Bruner's formal entrance to educational psychology is "Learning and Thinking;" it was presented to the Massachusetts Council on Teacher Education on February 13, 1958, and was published in the Harvard Educational Review in 1959. Learning comes first in the title, since

> "Learning something in a generic way is like leaping over a barrier. On the other side of the barrier is thinking."
>
> (Bruner, 1959d)

Of generic learning, he says,

> "We have come to recognize in this work that one of the principal objectives of learning is to save us from subsequent learning... when we learn something, the objective is to learn it in such a way that we get a maximum of travel out of what we have learned."
>
> (Ibid.)

Bruner refers to George Miller's paper, "The Magic Number, Seven Plus or Minus Two: Some Limits on Our Capacity for Processing Information"[1] (Miller, 1956). Bruner says that beyond seven or so independent items at a time, we exceed our

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[1] George A. Miller presented this paper first as an invited address at the Eastern Psychological Association in Philadelphia on April 15, 1955. The introductory remarks to this paper are so delightful that this author has taken the privilege of including them here. Miller says,
"My problem is that I have been persecuted by an integer. For seven years this number has followed me around, has intruded in my most private data, and has assaulted me from the pages of our most public journals. This number assumes a variety of disguises, being sometimes a little larger and sometimes a little smaller than usual, but never changing so much as to be unrecognizable. The persistence with which this number plagues me is far more than random accident. There is...a design behind it, some pattern governing its appearances. Either there really is something unusual about the number or else I am suffering from delusions of persecution" (Miller, 1956).

> "channel capacity...we simply cannot manipulate large masses of information...we must condense and recode."
>
> (Ibid.)

Bruner then describes thinking which is not generic, but which highly influences the course of man's doings:

> "The underlying principle that gives one the power to use literature and the arts in one's thinking is not of the order of a generic condensation of knowledge. Rather it is metaphoric in nature, and perhaps the best way of describing this class of principles is to call them guiding myths."
>
> (Ibid.)

and suggests that guiding myths are powerful in dealing with the human condition:

> "Man must cope with a relatively limited number of plights — birth, growth, loneliness, the passions, death, and not very many more. They are plights that are neither solved nor by-passed by being 'adjusted.' An adjusted man must face his passions just as surely as he faces death. I would urge that a grasp of the basic plights through the basic myths of art and literature provides the organizing principle by which knowledge of the human condition is rendered into a form that makes thinking possible, by which we go beyond learning to the use of knowledge...I urge simply that there be exposure to, and interpretation of, literature that deals deeply with the human condition. I have learned as much from Charley Brown of Peanuts as I have learned from Perseus."
>
> (Ibid.)

The careful reader may have the uneasy feeling that something quite important is missing from the list of the plights of man...pain is a condition of the human predicament not mentioned by Jerome Bruner. When the inquiry was made of Bruner as to why pain was omitted, the reply was simply, *"That's my denial."* (Bruner, Interview, 1977).

It is almost with evangelistic fervor that Bruner speaks against the "passivity of knowledge getting," and of "the embarrassment of passion."

> "I should like to consider now the guiding myth. Let me begin with a summary of the young Christopher Columbus as he is presented in a popular social studies textbook. Young Chris is walking along the water front in his home town and gets to wondering where all those ships go. Eventually he comes back to his brother's cobbler shop and exclaims, 'Gee, Bart, I wonder where all those ships go, whether maybe if they just kept going they wouldn't come back because the would is round.' Bart replies with pleasant brotherly encouragement. Chris is a well adjusted kid. Bart is a nice big brother. And where is the passion that drove this obsessed man across uncharted oceans? What impelled this Columbus with such force that he finally enlisted the aid of Ferdinand and Isabella over the protest of their advisors? Everything is there in the story except the essential truth — the fanatical urge to explore in an age of exploration, the sense of an expanding world. Columbus did not have a schoolboy's whim, nor was he the well-adjusted grownup of this account. He was a man driven to explore, to control. The justification for the pablum that makes up such textbooks is that such accounts as these touch more directly on the life of the child."

Bruner continues with the question,

> "What is this 'life of the child' as seen by text writers and publishers? It is an image created out of an ideal of adjustment. The ideal of adjustment has little place for the driven man, the mythic hero, the idiosyncratic style. Its ideal is mediocentrism, reasonable above all, being nice. Such an ideal does not touch closely the deeper life of the child. It does not appeal to the dark but energizing forces that lie close beneath the surface. The Old Testament, the Greek Myths, the Norse legends — these are embarrassing chronicles of men of passion. They were devised to catch and preserve the power and tragedy of the human condition — and its ambiguity, too. In their place we have substituted the noncontroversial and the banal."
>
> (Ibid.)

Bruner describes creative approaches to arithmetic, and a particularly interesting way to look at teaching geography. He describes a class that was presented with a map showing rivers, lakes and resources of the area around what is today Chicago, but on this map no cities were shown. The task of the class was to figure out where the cities should be based on the information at hand. The children became involved and excited, arguing for the pros and cons of a city here or there. There was considerable impatience to see a map to confirm or contradict rationales.

Bruner takes on the entire educational system when he says,

> "I do not wish to mince words. The educational and cultural level of the majority of American teachers is not impressive. On the whole they do not have a good grasp of the subject matter they are teaching."
>
> (Ibid.)

He insists that

> "It matters not <u>what</u> we have learned. What we can <u>do</u> with what we have learned; this is the issue.."

and that we not judge our students simply on <u>what</u> they know:

> "That is the philosophy of a quiz program. Rather, let them be judged on what they can generate from what they know — how well they can leap the barrier from learning to thinking."
>
> (Ibid.)

This paper is, in my opinion, one of lasting quality. Though the public view has gone through stages from radical back to noncommitment, any where along the line there is unusual value in the philosophy of education expressed here. It seems that our colleges and universities today continue to concern themselves with a regurgitation of "facts" as presented (with appropriate biases) by the specific professor, a modus operandi which promotes more emphasis on "psyching out" the professor than it does on scholarship. Bruner's creative approach, based on generative learning, seems to bring with it a joy and enthusiasm too seldom seen in the institutions of education today.

In the Fall of 1958, Bruner published "A Colloquy on the Unity of Learning," (Bruner, 1958a), and in 1959, in <u>Psychosomatic Medicine</u>, he published "The Cognitive Consequences of Early Sensory Deprivation," in which he concludes,

> "...that early sensory deprivation prevents the formulation of adequate models and strategies for dealing with the environment and that later sensory deprivation in normal adults disrupts the vital evaluation process by which one constantly models and strategies one has learned to employ in dealing with the environment."
>
> (Bruner, 1959b)

Bruner does not deal here with critical learning periods, but the implication appears to be included.

With his colleagues Michael Wallach and Eugene H. Galanter, Bruner addressed "The Identification of Recurrent Regularity" (Bruner, Wallach and Galanter, 1959). The authors posited that

> "Much of what we classify as learning, recognition, and problem-solving consists of being able to identify recurrent regularities in the environment."
>
> (Bruner, Wallach and Galanter, 1959)

They were concerned with the sources of interference which prevented the easy identification of these regularities.

Another publication appearing in 1959 was Bruner's book review of Inhelder and Piaget's The Growth of Logical Thinking (From Childhood to Adolescence). Bruner's review was subtitled, "A Psychologist's Viewpoint," and another review was done by Charles Parsons, entitiled, "A Logician's Viewpoint." Both reviews were published in the British Journal of Psychology. Bruner comments:

> "In many ways, this latest in the series of books from the pen of Inhelder and Piaget is the most important yet to appear: for it represents something of a culmination of Piaget's efforts — ably aided by Professor Inhelder — to trace the intellectual operations of man from childhood to maturity."
>
> (Bruner, 1959f)

Bruner says this book describes the crossing of the gap in thinking from a "world of things present to a world of things possible." He describes the stages of development as proposed by Piaget, and translates what he interprets as Piaget's meaning; that is,

> "After a prolonged struggle over this point, I have come to the conclusion that what Piaget wishes to say when he writes 'equilibrium' is that each stage of operational thinking develops its own internal consistency, its own compensatory reversibility, and predictability by virtue of being based on a set of rules of operation and that these rules can be described as logical stuctures."
>
> (Ibid.)

It seems to this author that the work of Piaget is subject to as much, perhaps even more!, interpretation than that of Freud and of Jung.

During these years of study of thinking and learning and teaching, Jerome Bruner came to study as well the blocks to learning, "the conditions that prevent children from learning, from exercising their normal curiosity" (Bruner, 1962c, p. 12). Bruner discovered a phenomenon which he called the "pre-emptive metaphor." The pre-emptive metaphor is a kind of negative generalizing; Bruner describes it as

> "a technique by which many seemingly unrelated things are tied together by a common fear and a common avoidance. The joining of such disparate collections of fears seemed to be metaphoric. I was struck by the fact that metaphor, so often the vehicle for mythic leaping, could also be a device for a kind of cancerous illness. The cancerous quality was in the manner of the spread of a fear — akin to what in medicine is called metastasis, what in literary analysis is referred to as synecdoche."
>
> (Bruner, 1962c:12)

In 1960, Bruner published "The Anguished Quest for Identity" (Bruner, 1960a), and "The Functions of Teaching" (Bruner, 1960b). He also published "Individual and Collective Problems in the Study of

Thinking" (Bruner, 1960c), which provides an excellent updating of the literature of cognitive psychology from the days of A Study of Thinking, and addresses the whole issue quite differently. Bruner looks at the problem of organization in the light of a concept called "propositional calculus"[2] which he contrasts with what he calls the 'prescriptive' style of Newell and others of the Rand group. He suggests agreement with George Miller's comment that there is no reason to believe that God issued us an insurance policy against complexity, and proceeds to describe some of the complexities with which the pursuit of understanding of thinking and memory is faced. Bruner points out considerations of language and of myth as they have to do with thought, and we will eventually see him concentrating on the issues of early language in his personal pursuit of the sources of rationality.

A number of researchers in and around the field of cognition are recognized in this paper, and their approaches defined (albeit briefly). This work was, for its time, an excellent source paper for the field of cognition.

In the Spring of 1959, Dr. Randall Whaley, Director of the Education Office of the National Academy of Sciences, called Jerome Bruner to initiate what came to be called the Woods Hole Conference. The National Academy of Sciences had facilities for such a conference in a lovely setting on Cape Cod, Massachusetts in a place called Woods Hole. It was here that for ten days in September, 1959, all manner of scientists and educators, thirty-five in all, came together under the chairmanship of Jerome Bruner to discuss education and its methods. Represented were the fields of mathematics, psychology, history, education, physics, cinematography, biology, the

[2] My colleague, Kevin Corker, suggests as a reference for propositional calculus, McCulloch, W. and W. Pitts, "A Logical Calculus of the Ideas Immanent in Nervous Activity," Bulletin of Mathematical Biophysics, 5:115-133, 1943.

classics, and medicine. In attendance were Robert Gagné[3], Jerrold Zacharias, Kenneth Spence, Barbel Inhelder, George Miller, Francis Friedman, John Latimer, Lee Cronbach, Randall Whaley (this time in his role of physicist with Purdue University), and many others. Most of the members of the conference attended for ten days. B. F. Skinner came for a day to talk about his teaching machines, but even during the brief time he was their he felt he was unfairly attacked by Zacharrias on an issue where he had, in fact, used Zacharrias' own data (Skinner, Interview, 1978). All in all, however, the conference appeared to provide more communication than conflict. Out of this conference would come a report by the Chairman, Jerome Bruner, which was published as the book, The Process of Education. By 1970, this book had been translated into twenty-one languages (Hall, 1970).

Once again, the world and its politics, at this point the politics of the cold war, shaped the direction of science and its pursuits, and, because of its direct relation, of education as well. Bruner later looked back on this period and commented,

> "The year of 1959 was a time of great concern over the intellectual aimlessness of our schools. Great strides had been made in many fields of knowledge, and these advances were not being reflected in what was taught in our schools. A huge gap had grown between what might be called the head and the tail of the academic procession. There was great fear, particularly that we were not producing enough scientists and engineers...It was the period...shortly after Sputnik..."
>
> (Bruner, 1971b)

The national competitive spirit that arose from the launching of the first Sputnik, and a month later, Sputnik II, with its passenger, the dog, Laika, by the Soviet Union, October 4, 1957, has been noted by

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[3] In 1965, Gagné published The Conditions of Learning, in which he states that the book is intended to answer the question, "What is known about the process of learning that can be put to use in designing a better education?" (Gagne, 2nd ed., 1975:v).

Hilgard as instigating a special educational awareness (Hilgard, Lecture at UCLA, May, 1978); the fear of the advancing technology of the Soviets created a lively activity in the United States. Catching up with and getting ahead of the Soviet Union became a national priority, and education was the prime mover. Educational psychology was the natural outgrowth of Jerome Bruner's interest in how man reasons; the political temper of the times, however, made the direction of Bruner's research on a timeless theme particularly timely.

The Process of Education attends to four major themes:

structure: "To learn structure, in short, is to learn how things are related"

readiness for learning: "...the foundations of any subject may be taught to anybody at any age in some form"

intuition: "the training of hunches" and

interest, or motivation: "the desire to learn and how it may be stimulated."

Bruner describes an attitude toward learning:

> "...Mastery of the fundamental ideas of a field involves not only the grasping of general principles, but also the development of an attitude toward learning and inquiry, toward guessing and hunches, toward the possibility of solving problems on one's own. Just as a physicist has certain attitudes about the ultimate orderliness of nature and a conviction that order can be discovered, so a young physics student needs some working version of these attitudes if he is to organize his learning in such a way as to make what he learns usable and meaningful in his thinking."
>
> (Bruner, 1960e)

He speaks of

> "...The shrewd guess, the fertile hypothesis, the courageous leap to a tentative conclusion -- these are the most valuable coin of the thinker at work, whatever his line of work. Can school children be let to master this gift?"
>
> (Ibid.)

Bruner says something of the "spiral curriculum," that is, the idea that a curriculum should turn "back on itself at higher levels;" a concept related to the idea that anyone can be honestly taught the foundations of any subject at any age. Bruner explains

> "...that intellectual activity anywhere is the same, whether at the frontier of knowledge or in a third-grade classroom...the difference is in degree, not kind."
>
> (Ibid.)

Bruner suggested that the need was for more concrete and less abstract notions in the classrooms of the young, and he insisted, as is consistent with his earlier views;

> "We may take as perhaps the most general objective of education that it cultivate excellence."
>
> (Ibid.)

The theme still exists today; he presses the Minister of Education in England to

> "...stand up to all this...about elitism and build up the centers of excellence."
>
> (Bruner , Interview, 1977)

The Process of Education was an enormous success, and Jerome Bruner suddenly found himself in the national limelight. He was asked to give the Keynote Address for the National Education Association, and thus found himself listening to the awesome echoes of his own voice in Madison Square Garden. The press was paying attention: the Washington Post, various newspapers and magazines, and Henry Luce himself, of Time-Life. Bruner spoke also on these issues with the then Senator John F. Kennedy, with whose presidential administration he would have dealings as well. It was quite a splash!

Bruner was now immersed in the interests of pedagogy. In "On Learning Mathematics" (Bruner, 1960d), first published in The Mathematics Teacher, and later in On Knowing, Essays for the Left Hand, Bruner reported on "a notion of the philosopher Weldon" with regard to discriminations among difficulties, puzzles and problems. These ideas come up again in Bruner's writings; roughly translated, it came to this:

difficulty: a minimum trouble — not knowing exactly how to get from here to there...an imprecise sort of quandry

puzzle: a game with precise rules and a precise definition of the issues at hand; a puzzle has definite givens and definite constraints

problem: a difficulty on which we impose a puzzle.

Bruner defines the task of the mathematician as a student of the puzzle, but insists that his job is not "pure puzzle mongering," but rather the establishment of exemplars (or generalities of families of puzzles) and of kinship among puzzles. For example, he cites commutative, associative and distributive laws in mathematics.

The conviction of Bruner's that "to understand something well is to sense wherein it is simple" is fundamental in the concept of the spiral curriculum. In this paper Bruner also addresses the question as to whether a particular item is, indeed, worth knowing:

> "I can think of only two good criteria and one middling one for deciding such an issue: whether the knowledge gives a sense of delight and whether it bestows the gift of intellectual travel beyond the information given, in the sense of containing within it the basis of a generalization. The middling criterion is whether the knowledge is useful."

and he reminds us that, as Charles Sanders Pierce commented,

> "useful knowledge takes care of itself..."
>
> (Bruner, 1960d)

Bruner then addresses the readers own 'pleasure principle.' He seems to anticipate a reader saying, "Theorizing is fine, but what's really in it for me?" and in this case he says,

> "But what of delight? If you should ask me as a student of thought processes what produces the most fundamental form of pleasure in man's intellectual life, I think that I would reply that it is the reduction of surprise and complexity to predictability and simplicity. But immediately there is a paradox. For it is the act of reducing surprise and complexity that gives pleasure. The road is better than the inn, for there is not all that much delight in simple unsurprisingness, and the cry 'not that again' is surely a cry of dismay. It is precisely this readiness for new acts of simplification and surprise reduction that provides the thread of delight in what we have called a spiral curriculum. The great structural themes in learning lent themselves to just such an approach..."
>
> (Ibid.)

We will find progressively that publications will appear in two or three places each; some would appear in collections of Bruner's writings, some of which became quite popular. This is not to say that Bruner's work lacked novelty (though surely there is more redundancy in these years and forward than there was in earlier work), but rather that the demands on his time and for his views were increasing very rapidly. So it is that the essay "On Learning Mathematics" was published in the two places we mentioned earlier, and in the Proceedings of the 1961 Summer Conference, The Image of Man (Western Washington State College Bulletin) as well. This item would appear, however, as only one entry in Bruner's bibliography of nearly 250 books and papers. There are only rare incidents when a slightly modified article will appear in two places on this list of publications. When one of Bruner's friends said to him, "You should write more!", Bruner replied, "You cruel man! I write all the time!" (Bruner, Interview, 1977). I, for one, second the response.

Jerome Bruner spent many years dealing with the ideas of learning, thinking and teaching, and we will discuss some of this work in later pages. For now, we will look at some of the other important things happening in Jerome Bruner's life during these years.

Family...

On January 16, 1960, in that period between the Woods Hole Conference and the publication of its issue, The Process of Education, Jerome Bruner, after a brief and intense courtship, married Blanche Marshall McLane. The collective family was of a good size[1], and Bruner comments with clear pleasure on the sense of sharing which has pervaded the relationship through the years.

Blanche Bruner had raced sailing vessels for years before her marriage to Jerome, and they took great delight in sailing together. She assisted him in his research for a bit, but in the main she has had her own activities. She paints, her style differing with her mood; she is an accomplished seamstress, takes great joy in her garden, and sets a delightful and abundant table, always sure that there is a light directed to "Jerry's" food ("I think it may be from his blindness as a child, but he likes to see what he is eating."). She is, it seems, that marvelous combination of real time earth mother with ever evident gentleness, and cultural and intellectual partner to her husband. Bruner says of Blanche that she "tends to be more existential and more involved with her round of things than I am. She's more with the structure of experience, I think, than I am" (Bruner, Interview, 1977). It appears a happy

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[1] The Process of Education was dedicated to all of the children: Jane, Angus, Bonnie, Whit, Lyn, Sandy and Jock.

combination. There are those who know Blanche Bruner who consider her to be indeed a very private person; quite a feat, since she is married to a very public man!

Jerome Bruner does not mention his family often in his writing, however he does record one incident concerning Bonnie, Blanche's daughter, whom Bruner holds most dear. It is clear that this kind of situation takes all one's skill as a parent, as an educator, and as a psychologist:

> "...she was applying for entry to a college that requires applicants to write an autobiographical sketch. She wrote one and brought the piece to me for comment. It was very much her — full of her warm enthusiasm — yet the written document was almost a caricature of a warm-hearted girl. It is difficult to be graceful in one's comments about another's writing, and the more so when there is a close bond between the critic and his charge. You cannot say to a 17-year-old girl, however gay your tone of voice, 'My dear, this is gushy.' The diagnosis of gushiness carries no remedial prescription with it. I stumbled on the happy formula. Could she rewrite the piece without a single adjective, not a one? Two hours later she returned with the news that her first draft had been disgustingly effusive, that I should have told her so, and that in spite of my failure in candor the sketch was being rescued from its original state. I suspect something more happened than just a change in writing."
>
> (Bruner, 1966f:110)

The Center for Cognitive Studies...

Work was going well.

McGeorge Bundy extended an informal invitation to Jerome Bruner to get involved in government, but Bruner declined, confirming his conviction that his place was in academia and specifically, at that point, at Harvard.

Psychology at Harvard had, by 1960 become largely an increasingly split domain of S. S. Stevens and B. F. Skinner. There was, of course,

Henry Murray's Psychological Clinic, and there was also the Department of Social relations which, we recall, had been established for those whose application of psychology was to society. Though Bruner, as E. G. Boring recorded, had been instrumental in its establishment, the goals of this department did not address his current interests.

So it was that Jerome Bruner and his good friend and colleague, George Miller, established the Center for Cognitive Studies at Harvard. The Center provided Miller, Bruner, and the many others involved with it a grand and happy meeting ground for excellence in psychology, one in which they would all thrive.

It was an exceptionally good time for obtaining funds, as there was a "post-Sputnik" enthusiasm for research that has been hard to match in our history. Bruner and Miller applied to the Carnegie Foundation and were funded for five years. The Cognitive Center would, over the years, receive financial support from many sources, among them the Ford Foundation, the National Institutes of Health, and the U. S. Office of Education.

The Center took up residence at 61 Kirkland Street (the present William James Hall, center for psychology at Harvard, is at 33 Kirkland). Historians, linguists, philosophers psychologists of many shades of interests, and scientists of many other disciplines offered their views, and students and faculty alike seemed to flourish in spirit and intellect. The Center for Cognitive Studies dealt in excellence.

That the Center was a success was acknowledged by B. F. Skinner, though he noted he "had nothing to do with it" (Skinner, Interview, 1978). There was admiration from Henry Murray who, as a paragon of

independence himself, no doubt enjoyed watching this fellow Jerome Bruner turn things upside down and get things going.

Bruner described some of the early work of the Center for Cognitive Studies:

> "A new series of experiments was begun in 1960, with the objective of exploring the course of human intellectual development. These were not directly concerned with individual differences or with the effects of school instruction proper but rather with the maturing of various cognitive operations. Indeed, it would be misleading to describe the opening of this phase of research as a 'series' of experiments. The approach was too inductive and exploratory from the outset to merit so purposeful a description. The first work was carried out by an informal seminar consisting of a few graduate students and a few faculty members at the newly established Center for Cognitive Studies. Work on the development of equivalence formation, information seeking, and perceptual recognition was undertaken with techniques very similar to those developed for use with the school children studied several years before."
>
> (Bruner, Olver and Greenfield, et al., 1966)

This was, in 1960, the start of the formal work with graduate students and post doctoral fellows encompassing six years that would culminate in the book, Studies in Cognitive Growth (Bruner, Olver and Greenfield, et al., 1966). Actually, it was begun in spirit much earlier, in fact, probably during Bruner's first visit with Jean Piaget in Geneva in 1956. Certainly we can see here that Bruner is well into seeking answers in the developmental view of cognitive psychology. So from cognition and its development to the natural progression of the psychology of education; Bruner goes from how does it happen to how do we make it happen better, more clearly, more effectively. He walks across the street, as it were, to educational psychology from cognition for the same practical purpose as the proverbial chicken: to get to the other side. Bruner spent several years back and forth between cognition and education,

cognition studies being the more abstracted view and educational psychology the more applied. But the application itself involved a problem that would take Jerome Bruner back to the psychology of society: the issues of poverty, of politics, and of the perverseness of the collective nature of man would come full bloom in Jerome Bruner's life about 1966. Much will happen between the time of the establishment of the Center for Cognitive Studies and the fulfillment of one of its original projects culminating in the publication of Studies in Cognitive Growth. We will look next at the ensuing five years.

## 1961 THROUGH 1965: MOSTLY PEDAGOGY, PROFESSIONAL SOCIETIES, AND THE CONGRESS

In 1961, Barbel Inhelder, Piaget's close colleague, worked with the Center for Cognitive Studies, no doubt tutoring all on the Piagetian point of view. Henry Murray says of this remarkable lady,

> "Of course everyone falls in love with Inhelder right away...she's so marvelous...oh, she's wonderful!
>
> (Murray, Interview, 1978)

She seems, in any case, to have gotten on well at the Center.

Bruner was Chairman of the Group on Educational Technology and Training studying educational problems in Africa and other underdeveloped countries, and somewhere in the early 1960's he became a member of the Education Advisory Committee, where he served for a number of years in both the Kennedy and the Johnson administrations.

"The Act of Discovery" (Bruner, 1961a) appeared first in print in 1961. In it Bruner notes that "Discovery, like surprise, favors the well-prepared mind." He proposes that there are two kinds of teaching: that which keeps the student bench-bound, that is, expository teaching, and that which encourages discovery in that the student takes part in the formation of hypotheses and evaluations as the data come in. This he calls hypothetical teaching.

He says,

> "Emphasis on discovery in learning has precisely the effect on the learner of leading him to be a constructionist, to organize what he is encountering in a manner not only designed to discover regularity and

relatedness, but also to avoid the kind of information drift that fails to keep account of the use to which information might have to be put. Emphasis on discovery, indeed, helps the child learn the varieties of problem solving, of transforming information for better use, helps him to learn how to go about the very task of learning."

(Bruner, 1961a)

Bruner goes on to comment about the effects of internalizing the information:

"Once internalization has occurred, the child...is able to go beyond the information he has been given to generate additional ideas that either can be checked immediately from experience or can, at least, be used as a basis for formulating reasonable hypotheses...To use a metaphor that David Reisman developed in a quite different context, mental life moves from a state of outer-directedness, in which the fortuity of stimuli and reinforcement are crucial, to a state of inner-directedness in which the growth and maintenance of mastery becomes central and dominant."

(Ibid.)

Bruner published two articles in French: "Quelques Observations sur le Choix" in Journal de Psychologie (Bruner, 1961d), and "Affrontement et Défense" in Journal de Psychologie Normale et Pathologique (Bruner, 1961b). "Affrontement et Défense" was published as "On Coping and Defending" in English, though it did not appear in this version until 1966 (Bruner, 1966f). This article, which is concerned with learning blocks essentially, has a more clinically oriented quality than we see in most of Bruner's work.

He defines the key title words:

coping: respects the requirements of problems we encounter while still respecting our integrity

defending: "a strategy whose objective is avoiding or escaping from problems for which we believe there is no solution that does not violate our integrity of functioning."

He describes the need to use defense in preference to coping as the

the determining "sick" factor. Bruner applied these concepts to learning blocks with children:

> "...their efforts to defend themselves from the activity of learning and from its consequences made it extremely difficult for them to get into the activity of 'school learning' itself."
>
> (Bruner, 1966f)

Bruner discussed some of the apparent causal factors, including the parental gain/loss situations at home, sibling rivalry, and a number of other possible contributing issues. He notes that

> "Given the human condition, neither coping nor defending is found often in pure form."
>
> (Ibid.)

"The dangerous thoughts of childhood" are seen as developing to "pre-emptive metaphors" of cognitive activity. The concept of the pre-emptive metaphor, mentioned before in The Process of Education, is an important one. Bruner sees it as representing "a principle of cognitive organization that is complexive rather than conceptual," that is, the child sees concepts as "things that can hurt me."

For example, Bruner gives us the case of Angus:

> "What Angus appears to be doing is scanning his environment for anything that can be related to his own central retribution-and-injury theme. Once he finds it, he then incorporates it into a kind of fantasy about how to avoid hurt or how to bring the harm under his own control rather than being caught out by it. The organization of the concept 'what-will-hurt-me'...(guarantees) that Angus will not 'miss anything that might hurt me or lead me to hurt those to whom I feel hostile'...It is this type of almost cancerous growth of a preempting metaphor that is the basis of the kind of learning that supports defense and makes coping virtually impossible."
>
> (Ibid.)

Bruner sees the child with the learning block as "the classic case of the double bind — he is damned if he succeeds and damned if he fails."

The use of playfulness is suggested, and Bruner describes some of his own therapeutic uses of this method to defuse situations for these youngsters. He explains,

> "The learning block is not an instance of rebellion and overt refusal to study or attend to lessons...they fail...even when they try...some cases trying is the worst prescription. Whatever the 'unconscious' means, these children were operating by its directions."
>
> (Ibid.)

He sums up with,

> "In a word, then, coping and defending are not, in my opinion, processes of the same kind that differ merely in degree. They differ in kind."
>
> (Ibid.)

"After John Dewey, What?" appeared in the June, 1961 Saturday Review. In 1897, when Dewey was 38 years old, he had written "My Pedagogic Creed," in which he had established five "articles of faith." These included, briefly,

- that all education proceeds by the participation of the individual in the social consciousness of the race,
- that education is a process of living and not a preparation for future living,
- that the true center is the child's social life, which gives the unconscious unity and background for all efforts and attainments,
- that conscious states tend to project themselves in action, and the law for presenting and treating material is the law implicit in the child's own nature, and, finally,
- that education is the fundamental method of social progress and reform.

Bruner suggests that between the time of Dewey's writing and 1961

> "we have lived through a revolution in our understanding of the nature of man, his intelligence, his capabilities, his passions, and the forms of his growth."
>
> (Bruner, 1961c)

As against the "sterility and rigidity of the school instruction" of Dewey's time, Bruner says, "His was a noble yet tender view of his time." Bruner says of his own time, however, that education had the task of transmitting the current culture and encouraging the individual to "create an interior culture of his own." Bruner felt that education must be

> "...also a provider of alternative views of the world and a strengthener of the will to explore them...The powers of the mind grow with exercise. Adjustment is too modest an ideal, if it is an ideal at all. Competence...is much more to the point."
>
> (Ibid.)

Again, we hear of excellence:

> "I would urge that the yeast of education is the idea of excellence."

and of knowledge,

> "Knowledge is a model we construct to give meaning and structure to the regularities in experience. The organizing ideas of any body of knowledge are inventions for rendering experience economical and connected...The history of culture is the history of the development of great organizing ideas...experience is not had direct and neat, but filtered through the programmed readiness of our senses. The program is constructed of our expectations, and these are derived from our models or ideas about what exists and what follows what."
>
> (Ibid.)

The structure of knowledge, according to Jerome Bruner, is the proper emphasis for education, whereas the unity of knowledge is to be found within knowledge itself. Bruner, at age 45, defines what he finds to be essential to the educated man, and we wonder how differently would he have judged the essentials at 25, or if he would judge them differently in his sixties. His criteria in 1961 included:

> "...knowledge of the natural world, knowledge of the human condition, knowledge of the nature and dynamics of society, knowledge of the past so that one may use it in experiencing the present and aspiring to the future...To these must be added another — knowledge of the products of our artistic heritage that mark the history of our esthetic wonder and delight."
>
> (Ibid.)

Perhaps one of Bruner's most thoughtful statements about education appears in this writing on Dewey; Bruner says,

> "The process and the goal of education are one and the same thing. The goal of education is disciplined understanding. That is the process as well."
>
> (Ibid.)

We move now to a most unremarkable set of papers; we will cover all three of them here, though they appeared in 1965 as well as in 1961, since they seem to be an encapsulated work. Bruner explains his attitude:

> "It is the lot of each investigator that he must live with his own demons. Because of either inclination or training, I have hever been drawn to studies of individual difference and consistency...Dr. Tajfel and I have published some work on cognitive risk taking (1961) which he later developed far beyond those original studies: for my part I have gone on to other, though related kinds of work."
>
> (Bruner, Olver, Greenfield, et al., 1966)

The paper to which Bruner refers is entitled "Cognitive Risk and Environmental Change" (Bruner and Tajfel, 1961); it addresses the question as to whether breadth of categorizing reflects how people deal with risks in errors in judgment. Through an experiment involving 48 Fifth Grade students, the authors concluded that there were, indeed, consistencies in broad or narrow categorizing, and that the narrow categorizer preferred the risk of reacting and being wrong, where he who categorized more broadly preferred not reacting to a change, and possibly being wrong.

This is the last we hear of narrow and broad categorizing traits under this joint authorship until 1965, when, under the section of "Brief Articles" in the Journal of Personality and Social Psychology we find a response by these authors to two other authors who have criticized their paper.

Riley W. Gardner and Robert A. Schoen of the Menninger Foundation in Topeka, Kansas, published a paper which included a criticism of the 1961 Bruner and Tajfel article (Gardner and Schoen, 1962). Bruner and Tajfel then suggested, in "Width of Category and Concept Differentiation, A Note on Some Comments by Gardner and Schoen" (Bruner and Tajfel, 1965a) that the manner in which Gardner and Schoen reported the work of others did not live up to the standards "that one has come to accept as usual in our journals," and Bruner and Tajfel argue the point for several pages. This article is followed immediately by Gardner and Schoen's "Reply to the Note by Bruner and Tajfel," which is followed, again immediately in the same journal, by "A Rejoiner" by Bruner and Tajfel, an acid response, including such comments as,

> "...The methodological points made by Gardner and Schoen could be of 'value to others' but only if they did not consist of such busy hiding of clearly visible needles in haystacks."
>
> (Bruner and Tajfel, 1965a)

It seems a pity that Bruner and Tajfel found it necessary to respond to Gardner and Schoen in a manner that smacked of peevishness. It is a credit to Bruner that one does not find very much of this kind of writing among his papers, but rather finds disagreements laced with a more pleasant good humor, with room provided for the other fellow to have his view. One would hope that in the case of these two writings (Bruner and Tajfel, 1965a,b) there was a true necessity to clarify the issues...

In 1961, Bruner organized the National Academy of Sciences - National Research Council Symposium on Science Education. He was a member of the African Study Group on Mathematics with Jerrold Zacharias. He went to Africa, studied problems of school learning in West and in East Africa, visited the University of Dakar, and reported the results in "Report of the Working Group on the Application of Technology to Educational and Cultural Affairs," June 30, 1961 (Bruner, 1961f).

The list of activities to which Jerome Bruner committed himself in 1961 might have been a bit much for anyone with lesser quantities of energy. There was the business of the Center for Cognitive Studies, research in general, a forward to McDougall's Body and Mind (Bruner, 1961e), Africa, a near-new marriage, children, and, of course, his teaching and his writing. And 1962 would bring more of the same, which, for Jerome Bruner, meant more of things different.

1962...

Jerome Bruner was, in 1962, more public a figure than he had been in prior years, that is to say, he became more "visible." In particular, he won the American Psychological Association Award for Distinguished Scientific Contribution, and he testified before a subcommittee of the Committee on Appropriations of the House of Representatives. Before we go into the details of these occasions, let us look at his publications in 1962.

On Knowing, Essays for the Left Hand was published in 1962, the little book which described in so many ways the transitional period of Jerome Bruner's forties in the form of essays, each of which we described when we discussed the periods in which they were written. In the introduction to this book, Bruner notes:

> "In any man's intellectual life there are only a few topics, only a limited set of persistent queries and themes."
>
> (Bruner, 1962c)

Some, one must reply when considering the work of Jerome Bruner, have a few more topics than others! Bruner also notes that, although he emphasizes the artificial separation of the modes of knowing of the scientist and the poet, it was not his principal purpose to serve as a mediator between the humanist and the scientist, but rather "to explore the range of the left hand in dealing with the nature of knowing" (Bruner, 1962c).

The introduction to the translation of Lev Semenovich Vygotsky's exceptional work, Thought and Language, was written by Bruner (Bruner, 1962d). The original book was published posthumously in 1934 in Moscow,

but was suppressed in 1936, not to reappear until 1956, and the translation into English was first done in 1962, supported by the U. S. Public Health Service. Bruner said of Vygotsky[1] that

> "...he would not brook either reductionism nor mentalism, nor the easy Cartesian dualism that opted frontally for one and let the other in through the back door..."
>
> (Bruner, 1962d)

and that

> "It was inevitable that his work should disturb the doctrinaire guardians of 'proper Marxian interpretation,' particularly during the period of the 'battle for consciousness.'"
>
> (Ibid.)

Bruner spoke of Vygotsky as "an original."

It is appropriate that Bruner introduced a book entitled Thought and Language; at the time he wrote the introduction, Bruner was deeply immersed in concepts of thought, and in a dozen or so years he would be academically deeply involved in concepts of language.

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[1] Lev Semenovich Vygotsky (1896-1934)
The back cover of the pocket edition of Thought and Language (1962) provides some biographical notes on Vygotsky, some of which we include here:
"...Vygotsky...studied at Moscow University and acquired in his brief life-span a nearly encyclopedic knowledge of the social sciences, psychology, philosophy, linguistics, literature and the arts. He began his systematic work in psychology at 28, and within a few years formulated his theory of the development of the specifically human mental functions. He died prematurely of tuberculosis at 38 leaving 80 unpublished manuscripts. His last work (was) Thought and Language."

For the American Textbook Publishers, Bruner produced an article which he called, "Books, Courses and Curricula" (Bruner, 1962a), which was published in The Challenge of Change. It described his views of the nature of a book, the "shape and content of a curriculum," and the nature of learning. He suggested the possibility of an Institute of Curriculum Development, and described what facilities might ideally be incorporated.

In another article, this one published by American Behavioral Scientist, Bruner noted,

> "Education, in short, is being brought into the mainstream of national life — both intellectually and from the point of view of forming of policy."
>
> (Bruner, 1962b)

In this article, entitled, "Introduction: The New Educational Technology," Bruner suggests that the "history of the school chair" reflects the style of prevailing theories of learning "more than the actual content of such theories."

> "When the Thorndikean model of association learning was at its height, chairs were ordered in rows, fastened to the floor. The student was tacitly regarded as a recipient of materials to be associated or otherwise stored away. Dewey's instrumentalism led schoolmen to unfasten the chairs from the floor, to group them according to the projects at hand. The child-centered school produced a circle of seated children surrounding the teacher. The new emphasis on phenomenology and the experience of the child — particularly his "social perception" — led to the semicircular arrangement."
>
> (Ibid.)

Bruner insists again in this article on the ideas promoted in the concept of the "spiral curriculum," the ideas that are involved with the restatement of any complex problem in such a manner as to bring it "within the reach of any solver."

1962 was a busy year for Jerome Bruner: he was President of the Society for Social Issues (1962-1963), was Harper Lecturer at the University of Chicago for 1962, and was still a member of the Advisory Board of Educational Testing Service (with which he had been associated since 1960) and of Educational Services, Incorporated (as he had been since 1959).

It was late in February in 1962 when Jerome Bruner testified at hearings before a Subcommittee on the Committee for Appropriations of the U. S. House of Representatives, for the National Science Foundation (in its second session, which was entitled in its record, "Highlights of Science in the United States") (Highlights of Science in the United States, 1962). Testifying also was Bruner's good friend, Jerrold Zacharias, who had done considerable work on revision of curriculum for physics classes in high schools, and who was then Professor of Physics and Head of the Laboratory of Nuclear Science at the Massachusetts Institute of Technology.

The record of the hearings makes fascinating reading; it appears as a slice of history of the recent developments of science. It was but those few short years ago that the congressional subcommittee was instructed by James Van Allen about the Van Allen Belts, by Frederick Seitz (Head of the Department of Physics at the University of Illinois) about solid state physics and the LAZER Project, then quite new, by Nobel Prize winner Edward M. Purcell about nuclear physics and radio astronomy, and by Philip Handler (Biochemist at Duke University) about molecular and cellular biology and, among other things, about progress in information about hereditary diseases.

In following with his testimony these erudite explanations, Bruner said,

> "I shall be telling you about a discipline which is not so mature but which is certainly showing every healthy sign of a vigorous and brawling childhood. My concern is with the field of psychology and particularly with the nature of the higher mental processes."
>
> (Highlights of Science in the United States, 1962)

Bruner discussed in his testimony, in the main, such matters as perception on varying levels; the subcommittee questioned him (since he was a psychologist, one must presume) on such matters as Communist brain washing techniques, mental disturbance, and hypnotism. All in all, it must have been a most interesting experience.

Jerome Seymour Bruner received the American Psychological Association Distinguished Scientific Contribution Award in 1962. It was the seventh year the Award had been given (three persons received it each year), and his co-winners were William K. Estes and Harry Helson.

Each recipient was presented with a citation and with a check for $1,000. B. F. Skinner was the chairman of the five man Committee for Selecting the Recipients of Awards for Outstanding Contribution to Scientific Psychology, but it was Ernest R. Hilgard who substituted for Skinner in the presentation. Bruner's citation read:

> "For his fertile and ingenious contributions in the great tradition of American functionalism to the study of strategies and tactics of man's informational transactions with his environment. His provocative 'new look' at man as perceiver launched a decade of research and controversy, extending our knowledge of the perceiver's contribution to his own perceptions. A related concern with man's efforts to make personal sense of an ambiguous world informed his substantial contributions to the study of public opinion. More recently, he has joined able colleagues in ground-breaking research on fundamental aspects of conceiving and thinking to deepen our understanding of how man processes and transforms information for his uses. As a good functionalist, he has recognized no barrier between laboratory and practical world, borrowing freely for the laboratory insights gleaned

> from school or clinic and, most recently, bringing his research-informed wisdom to bear in a searching and influential examination of 'the process of education.'"
>
> (American Psychological Association, 1962)

Nineteen hundred sixty-two was, it is clear, an interesting and productive year.

1963...

In 1963 Jerome Bruner uses a very wide variety of publications as outlets for his work. We find "How We Learn and How We Remember" in the Harvard Alumni Bulletin (Bruner, 1963a); "Looking at the Curriculum" in a Toronto publication, The Educational Courier,(Bruner, 1963b); "Needed: A Theory of Instruction" in a journal called Educational Leadership (Bruner, 1963c); "School for Wives" in The Winsor Club Bulletin (Bruner, 1963d) and, "Structures in Learning" in NEA Journal (Bruner, 1963e). This author has not been able to obtain copies of any of these articles, however it is possible that Robert R. Leeper, in his introduction to a booklet incorporating the presentations of the NEA ASCD St. Louis Conference in 1971, entitled Dare to Care/Dare to Act, may be referring to this article when he says,

> "Dr. Bruner perceptively analyzed the thinking and climate in society and in education at the time of his 1963 presentation at an earlier ASCD Annual Conference in St. Louis. He openly and graphically portrayed the feeling that was prevalent at the time that rationality alone, when introduced skillfully and pervasively, could redeem both education and society..."
>
> (Leeper, 1971)

Leeper goes on to say how Bruner's views had changed by 1971, and we will see this come about as Bruner tries to apply this thinking in the practical world of education and the society it attempts to serve.

Bruner wrote "Observations on the Learning of Mathematics" with Helen Kenney (Bruner and Kenney, 1963) in which the authors refer to "the explosion of interest in the teaching and learning of mathematics." Of particular interest is a means of teaching the idea of a quadratic

equation by using wood in blocks and strips in such a manner as to demonstrate this notation. Figure 5 illustrates the components for the construction as developed by Z. P. Dienes. We can see that the longer sides are labeled (arbitrarily) "X", and the shorter sides, "1." If we put the pieces together we have $X^2$ (the large square with X on each side), plus four of the lengths of X, or 4x, and then we have four of one on each side, or 1 times 4, which is 4. Simply put, we have

$$X^2 + 4X + 4$$

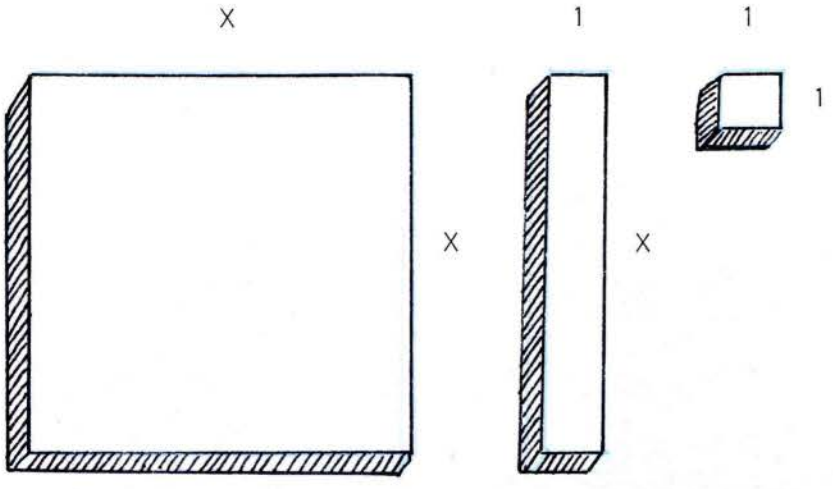
or a quadratic equation.

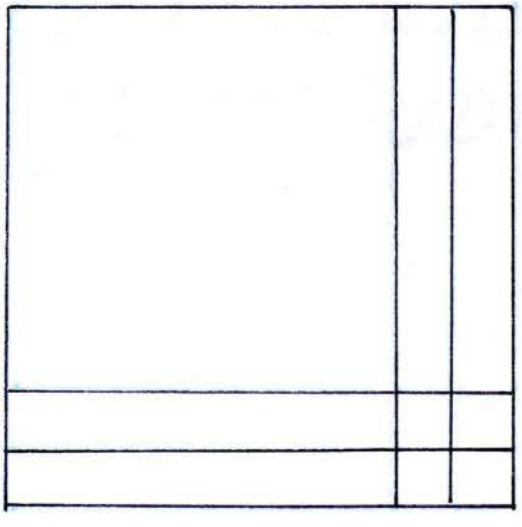
The authors discuss several theorems in their efforts to present the work of innovative teachers in mathematics and to encourage the active participation of the student. This work is part of the approach we will see in education to which Bruner subscribes emphasizing both novelty and the active involvement of the student.

Jerome Bruner and Rose Olver published "Development of Equivalence Transformations in Children" (Bruner and Olver, 1963) in Monographs of the Society for Research in Child Development. The authors tell us,

> "We happen to be of the school that assumes that associations do not just happen, and that they are governed by certain rules, and that these are the result of certain rather complex transformations imposed on data by active, collective, limitbound, talking organisms."
>
> (Bruner and Olver, 1963)

In the experiments reported, children from a little over six years to about eleven and one-half years old were presented two words together (for example, "bell" and "horn") and asked how alike and how different they were. Then words were added until there were nine words in all,



$X^2 + 4X + 4$

FIGURE 5 DEMONSTRATION OF THE QUADRATIC EQUATION

and the same questions were asked. The strategies the children showed for encoding the information were analyzed. The authors concluded that

> "...what distinguishes the young child from the older child is the fact that the young one is more complicated than the older one, not the reverse."
>
> (Ibid.)

The authors continued,

> "The effect of the complexity is not only to produce cognitive overload...but also to establish structures that are less amenable to change through experience and learning...You will note that (these points) are quite counter to ...S-R theories."
>
> (Ibid.)

It is interesting to note that while in the first grade, girls are at about the level of fourth grade boys, by the time they are at the sixth grade, both boys and girls tend to perform at about the same level.

The authors speculate concerning their results:

> "May it not be the case that development consists of finding techniques for being simple with respect to information?"
>
> (Ibid.)

During the summer of 1963, the President's Advisory Committee Panel on Educational Research and Development, through grants from the National Science Foundation and the U. S. Office of Education, sponsored a conference at Harvard dedicated to the subject of learning and development. Jerrold Zacharias chaired the conference, but it was Bruner who edited the proceedings, which were published in 1966 under the title Learning about Learning (Bruner, 1966i).

Bruner writes in the preface of his book Toward a Theory of Instruction that some of the themes of the essays of that book he first thought of because of discussions at that "lively conference."

In a luncheon address for the Educational Testing Service's Invitational Conference on Testing Problems (November 2, 1963), Bruner discussed "Growing" (Bruner, 1964c). He scattered Brunerian definitions of terms then being bandied about the field of cognition throughout the talk, for example,

> "I shall take it that by thinking we mean that an organism has freed itself from domination by the stimulus, that he is able to maintain an invarient response in the face of a changing stimulus input or able to vary response in the face of an invariant stimulus environment..."
>
> (Bruner, 1964c)

Then he speaks of the "means whereby an organism effects this freedom from stimulus control" as the mediating process:

> "A mediating process consists at the very least of some representation or model of the environment plus some rules for performing transformations on the representations such that the organism can represent not only past and present states, but also states of the world that might exist."
>
> (Ibid.)

Then he says,

> "In this case I shall define the world simply as the recurrent regularities in man's experience."
>
> (Ibid.)

Bruner speaks of modes of representation, and reviews the views of others with special attention to Piaget; then he states what every parent has already discovered,

> "By the age of three the child has become a paragon of sensory distractibility..."
>
> (Ibid.)

Bruner advises us that

> "If a given generation succeeds well, then the next generation climbs on its shoulders. In an ironic vein, we can turn Haeckel's formulation on its head. Where human evolution is concerned, it is the case that phylogeny recapitulated ontogeny rather than vice versa."
>
> (Ibid.)

He adds,

> "...when we have fully exploited where...the individual is able to go, then we will be in a position to estimate where the species might go."
>
> (Ibid.)

Another conference, held at Lesley College in Cambridge, Massachusetts produced a proceedings entitled, New Directions in Kindergarten Programs. Bruner's presentation was called, "Is Well Begun Half Done?" (Bruner, 1964d).

Another year had gone by, and there had been a mix of publications in cognition and in education, both from the point of view of learning and that of teaching...and there will be more of these in 1964.

1964...

In 1964 Bruner received an honorary degree (D.H.L.) from Lesley College; and it was a year in which he published a number of papers. He began, as well, to put together the essays which would culminate in the book, The Relevance of Education (Bruner, 1971a). Bruner noted in the preface of this book that the essays were written between 1964 and 1970; he says these were

> "years of deep and tumultuous change. They were disturbing years... They had an impact in their own right, amplified by my increasingly strong involvement during the period with very young human beings. These were my 'subjects' in experiments and observations. The contrast between the exterior social turbulence and human helplessness I was studying kept imposing itself."
>
> (Bruner, 1971a)

We see Bruner using his pen to order his thoughts. If Bruner finds the sum of his various approaches to a concept or related set of concepts as reasonably cohesive, we are likely to see a book and we are likely to see it in about five years from his first expression of interest in the subject. These books, particularly those containing essays, seem to give us a picture of the philosophical struggles in which Bruner engages in the process of the development of the research in a field. Sometimes they are the gathering together of his thoughts after he has "wrapped up" a bit of work, a sort of "summing up" (a phrase oft used by Bruner). These books tend to set together the gestalt of groups of Bruner's experiences, and are very valuable in reviewing his work. In addition, of course, they provide delightful reading with which to intersperse the rather dryer reportage of the experimental studies in which he is ever engaged.

On the 23rd of April, 1964, Bruner addressed the Association of Higher Education of the National Education Association in Chicago on "On Teaching

Teachers" (1964e). His suggestion for the more effective transition of knowledge was that the teacher both be trained to understand the many ways in which a student might go about learning a subject, and in an understanding of the psychological processes involved in learning for each student. No small task. I find it of particular interest that in 1964, Bruner could refer to a teacher as "she" almost exclusively (and did, when referring to teachers of the pre-college student) and not be emphatically attacked as supporting a sexist view! A fellow (or for that matter, a lady) could not proceed in such a manner today!

Ernest Hilgard edited the Sixty-Third Yearbook of the National Society of Education, Part I (Theories of Learning and Instruction) in which Bruner published "Some Theorems on Instruction Illustrated with Reference to Mathematics" (Bruner, 1964g). It later appeared in a revised version under the title "Education as Social Invention" in The Relevance of Education (Bruner 1971a). This paper sums up a good deal of the work that Jerome Bruner had been doing with J. P. Dienes and others. He notes

> "Dr. Dienes particularly formed our thinking about the mode of presenting mathematical material..."
>
> (Bruner, 1964g)

He acknowledged several other persons as well who had to do with the math tutoring study reported in this paper.

> "A theory of instruction is prescriptive in the sense that it sets forth rules concerning the most effective way of achieving knowledge or skill. By the same token, such a theory provides a yardstick for criticizing or evaluating any particular way of teaching or learning ...A theory of instruction is a normative theory. It sets up criteria and states the conditions for meeting them."
>
> (Ibid.)

Bruner proposes four major features in his theory of instruction; they have to do with, in brief, what he terms predispositions, structure and the form of knowledge, sequence and its uses, and the form and pacing of reinforcement. With regard to predispositions, he emphasizes,

> "...predisposition to explore alternatives. For it is this predisposition that is often most affected by cultural and motivational factors."
>
> (Ibid.)

He notes that

> "...exploration of alternatives requires something to get it started, something to keep it going, and something to keep it from being random."
>
> (Ibid.)

translated, then, into activation, maintenance, and direction.

The second feature, structure and form of knowledge, leads Bruner to his often repeated contention that "Any idea or problem or body of knowledge can be presented in a form simple enough so that any particular learner can understand it." He characterizes structure as involving mode of representation (enactive, ikonic, and symbolic), economy, and effective power. There is an interesting note here on the relationship between economy and power:

> "Theoretically, the two are independent: indeed, it is clear that a structure may be economical but powerless. But it is rare for a powerful structuring technique in any field to be uneconomical. This is what leads to the canon of parsimony and the faith shared by many scientists that nature is simple: perhaps it is only when nature can be made reasonably simple that it can be understood."
>
> (Ibid.)

As to the third feature, sequence, Bruner suggests that the order of statements and restatements must be done in such a manner that the learner can not only grasp what he is learning, but transform and transfer

that learning, that is, the learner needs to be able to generalize. Bruner says,

> "In short, the sequence in which a learner encounters materials within a domain of knowledge affects the difficulty he will have in achieving mastery."
>
> (Ibid.)

The fourth feature of instruction, reinforcement, is, according to Bruner, highly dependent upon timing to be most effective. He says,

> "Learning depends upon knowledge of results at a time when and at a place where the knowledge can be used for correction...The tutor must correct the learner in a fashion that eventually makes it possible for the learner to take over the corrective function himself."
>
> (Ibid.)

As one might conclude, an article entitled, "Some Theorems on Instruction Illustrated with Reference to Mathematics," rightly provides an example of instruction which concerns the teaching of mathematics. The teacher, in this instance, was Z. P. Dienes, and

> "his assistant was a professor of psychology at Harvard who has worked long and hard on human thought processes."
>
> (Ibid.)

We may, I hope, assume this assistant to be a modest Jerome Bruner.

In a class of two eight-year old boys and two eight-year old girls, Dienes taught quadratic equations in the picturesque way described earlier and illustrated in Figure 5, as part of his effort to encourage the students to "form perceptual images" of mathematical ideas.

In "The Course of Cognitive Growth" (Bruner, 1964a) we see an approach to cognition swiftly moving into developmental psychology, an effort to go on his own by Bruner, rather than to just review and to

the work of Piaget (or the 'Geneva School,' as he calls it). One senses that on this occasion, as he has done on others, Bruner would like to just sit back and look over the field, take stock, and decide the direction in which the work appears to be headed. When this happens, we get some sort of "state of the art" paper, as we have seen before. "The Course of Cognitive Growth" strikes this author as one of those. We read,

> "Growth depends upon the mastery of techniques and cannot be understood without reference to such mastery. These techniques are not, in the main, inventions of the individuals who are growing up; they are, rather, skills transmitted with varying efficiency and success by the culture — language being a prime example. Cognitive growth, then, is in a major way from the outside in as well as from the inside out.
>
> "We move, perceive, and think in a fashion that depends upon techniques rather than upon wired-in arrangements in our nervous systems."
>
> (Bruner, 1964a)

We see Bruner restate the modes of representation (enactive, ikonic and symbolic), and the need for representation of recurrent regularities, as well as the primary importance in memory not so much of storage as of retrieval. Language again comes to the forefront as an integral part of cognition, as it did in A Study of Thinking and in Thought and Language. Bruner speaks of the need to internalize language:

> "Once the child has succeeded in internalizing language as a cognitive instrument, it becomes possible for him to represent and systematically transform the regularities of experience with far greater flexibility and power than before.
>
> "What is significant about the growth of the mind in the child is to what degree it depends not upon capacity, but upon the unlocking of capacity by techniques that come from exposure to the specialized environment of a culture."
>
> (Ibid.)

Years later, Jerome Bruner looked back on this period and remembered that

> "American educational reform in the early '60's was concerned principally with the reconstruction of curriculum. The ideal was clarity and self direction of intellect in the use of modern knowledge."
>
> (Bruner, 1971a)

Bruner's presidential address for the Society for the Psychological Study of Social Issues, "Education as Social Invention," published in the Journal of Social Issues in 1964 (Bruner, 1964b), affirms his memory of these years. In it he says that he should like to

> "...argue the critical importance of redefining afresh the nature, direction, and aims of education if man is to remain free to develop his full potential as a human being."
>
> (Bruner, 1964b)

He continued,

> "...I deeply believe that education must be viewed as a social and moral issue before it can be approached sensibly as a technical one."
>
> (Ibid.)

Bruner tells us as well that he

> "...cannot work up much enthusiasm for philsopher-kings, psychologist-kings, doctor-kings, or even mixed-committee kings. The political process — and decisions about the aims of education must work their way through that process — is slow, perhaps, but is committed to the patient pursuit of the possible."
>
> (Ibid.)

Jerome Bruner's patience with the political process with regard to education will wane, and will be replaced by a sort of wise cynicism mixed with disappointment at a somewhat later date, but for now he says,

> "It is, if you will, the psychologist's lively sense of what is possible that can make him a powerful force."
>
> (Ibid.)

Along with all the other things in busy 1964, Bruner wrote a preface to Z. P. Dienes' An Experimental Study of Mathematical Learning (1964f), and he wrote a review of Frank Brown's The Non Graded High School, which Bruner called "A Vivid Glimpse of the Future" (Bruner, 1964h). The book described an educational experiment where courses were organized into phases which went from remedial through independent study in five stages in subjects including math, science, English, and history. Bruner quotes Dr. Brown,

> "Motion itself is not the cure for monotony in the schools; liveliness of image is the key."
>
> (Bruner, 1964h)

In evaluating the system involved in the experiment reported in Brown's book (carried out in a high school in Melbourne, Florida), Bruner notes that, like all social inventions, the non-graded high school

> "...has a power to liberate human energy to an astonishing degree — and it is this that makes it so promising."
>
> (Ibid.)

It was in 1964, at the age of 49, that Jerome Bruner became President of the American Psychological Association for the 1964-1965 term, an honor about which he had mixed feelings. He found the job itself boring, but the contact with those whom he found fine and devoted persons most pleasurable. Jerome Bruner seems to see the value of professional associations, while acknowledging, with regret, the lack of professional generosity of a good many of their members.

1965...

In 1965, two honorary degrees were conferred on Jerome Bruner; the D.Sc. from Northwestern University, and the LL.D. from Temple University. He was still President of the American Psychological Association through a good part of this year, and also held the post of Bacon Professor at the University Aix-en-Provence in France.

In an interview with Elizabeth Hall, Bruner says,

> "...in 1965 I took a leave of absence from Harvard and taught fifth grade for three months while I was working on school curriculum...I taught each day until 1:15 and came back to my office exhausted. Like other teachers, I had to prepare most things myself...after you teach for a while you cannot expend energy that hard and lay your ego that constantly on the line..."
>
> (Hall, 1968)

Bruner described something of the fifth grade class. He said they had

> "...lectures, discussions, and even seminars...the children accepted the idea of accountability for their own utterances — that if you said something...you could be asked to explain without feeling you were being challenged or accosted."
>
> (Ibid.)

We who engage in the writing of theses would have done well to have had such preparatory training!

Bruner noted in his conversation with Elizabeth Hall that "'Man, A Course of Study' was designed to give teachers back up;" in this remark he referred to a paper describing the culmination of an enormous body of work covering several years of research. The work originally actually came from an idea from a series of lectures Bruner and George Miller gave at Harvard in a course entitled, "Conceptions of Man." "Man, A Course of Study" (Bruner, 1965c) addresses the questions,

> "What is human about human beings? How do they get that way? How can they be made more so?"
>
> (Bruner, 1965c)

Bruner convinces us of a kind of mandated serendipity in learning:

> "Unless the learner also masters himself, disciplines his taste, deepens his view of the world, the 'something' that is got across is hardly worth the effort of transmission."
>
> (Ibid.)

In this paper, Bruner considers the humanizing forces of mankind, and counts among them tool making, language, social organization, prolonged childhood, and one's world view, or, as Bruner puts it, man's drive "to explain and represent his world." He also says that "The very essence of being human lies in the use of symbols."

As techniques of pedagogy, Bruner suggests the following:

contrast - man versus primates, man versus prehistoric man, technological man versus primitive man, man versus child

stimulation - the use of informed guessing

participation - especially in games.

Bruner tells us,

> "If we can concurrently activate a passion for bringing order into what has been studied, the task is well started."
>
> (Ibid.)

Bruner would have it that each unit of study would be

> "...a body of materials and exercises that may occupy as much as several days of class time or as little as half a class period..."
>
> (Ibid.)

giving the instructor considerable choice of emphasis. The course is a collection of appropriate units of study, so comprised as to each contain six elements: materials for teachers themselves (called "talks to teachers"), questions for teachers to use and contrasts to suggest, reading materials for the student, films, and so forth, all of which are

called devices, model exercises to help children develop better intellectual habits (Bruner suggests here that the teacher also be supplied with special additional devices to enhance the model exercises — these he refers to as "a kind of pedagogical first-aid kit"), documentaries, and such supplementary materials as seem appropriate with the experience of the teacher and the needs of the students to "fill out the standard fare." All these materials, then, were provided for the course "A Study of Man," and the scope of the course was clearly grand.

"Man, A Course of Study" took years to develop; several continents were traversed and myriad cultures observed and reported upon, it was the result of conglomerate talents of diverse specialists of a multitude of fields. "Man, A Course of Study," then, was a prototype for the application of all the powerful theoretical concepts Jerome Bruner had brought to learning theory and to educational psychology. It was a point of intellectual culmination for Bruner: the left and the right hand were brought together in a credible, significant, and productive way. This course called for the best Bruner and a number of other people had to offer.

Here we get the concept from Bruner of "failing well." One must fail, he insists, because the ultimate goal must be placed out of reach in order to measure the farthest reach of the student; the effort, however, must be grand enough to be worth failing at.

It is of particular interest that the John Birch Society took umbrage at this course as anti-religious. The matter even went so far that one of the members of the United States House of Representatives considered the course a conspiracy of Communists and intellectuals, such as Harvard's B. F. Skinner and J. S. Bruner! One finds Skinner and Bruner together in such strange places!

Bruner recorded in the preface to the book that the first drafts of the multi authored Studies of Cognitive Growth (Bruner, Olver, Greenfield, et al., 1966) had been completed by the spring of 1965, and that he had

> "...escaped the distractions of home base by going into hiding in London, where I had the wonderful experience of 'reworking' the manuscript for ten hours a day, six days a week, for a month."
>
> (Bruner, Olver, Greenfield, et al., 1966)

We will discuss the book in the next chapter; here we mean only to note that it is ever amazing that Jerome Bruner can appear to be many places doing many things, all at once!

"The Growth of Mind" was Bruner's presidential address to the American Psychological Association. First published in the American Psychologist in 1965 (Bruner, 1965a), the paper can now be found in at least three other places: two books, The Relevance of Education (Bruner 1971a) and Beyond the Information Given (Anglin, 1973), and as an Occasional Paper for Educational Services Social Studies Curriculum Project in 1966. In "Growth of Mind" Bruner explains,

> "Since a culture, particularly an advanced one, transcends the bounds of individual competence, the limits for individual growth are by definition greater than what any single person has previously attained; the limits of growth depend on how a culture assists the individual to use such intellectual potential as he may possess."
>
> (Bruner, 1965a)

He continues with a discussion of the evolution of intelligence as a result of bipedalism and tool using, and other factors of general human evolution. He discusses the learning patterns of baboons, especially the shaping of behavior through peer play activities, and now we will see the idea of play in learning gradually become more prominent in Bruner's writing until, in 1976, Bruner and his colleagues will edit a book entitled Play: Its Role in Evolution and Development (Bruner, Jolly and Sylva, eds., 1976).

The tribal learning behaviors of the !Kung Bushmen of Kalahari (a desert area of Southwest Africa) reported in "The Growth of Mind" show a constant interaction between child and adult, modeling behavior, and play. There is no "teaching" as such, rather

> "...play hunting, play bossing, play exchanging, play baby tending, play housemaking. In the end, every man in the culture knows nearly all there is to know about how to get on with life as a man, and every woman as a woman — the skills, the rituals and myths, the obligations and rights."
>
> (Ibid.)

Bruner refers to this as a sort of "teaching in context."

In this paper, Bruner discusses in some detail the efforts involved in "Man, A Course of Study." He concludes,

> "I am deeply convinced that the psychologists cannot alone construct a theory of how to assist cognitive development and cannot alone learn how to enrich and amplify the powers of a growing human mind. The task belongs to the whole intellectual community: the behavioral scientists and the artist, scientists and scholars who are the custodians of skill, taste, and knowledge in our culture."
>
> (Ibid.)

On July 1, 1965, Jerome Bruner gave the keynote address for a day's program devoted to "New Dynamics in the School Curriculum," for the National Education Association Convention in New York. The address was condensed into an article entitled, "Liberal Education for All Youth" (Bruner, 1965b). In it he discusses questions on education which he feels to be both philosophical and practical, noting they "deal with matters of wearying difficulty." Bruner discusses the evolution of intelligence as he sees it, the mastery of prerequisites in the course of cognitive growth, the spiral curriculum, "knowledge of knowledge," and self image and the human condition. He notes,

> "Perhaps the most important thing that we can do for a growing child from the intellectual point of view, is to design curricula for him that permit him to achieve skill in at least one area of knowledge, to experience the self-rewarding and confidence-giving pleasure of going deeply into something..."
>
> (Bruner, 1965b)

In the paper, "Representation and Mathematics Learning," Bruner and Helen Kenney (1965) follow up their "Observations on the Learning of Mathematics" (Bruner and Kenney, 1963) and Bruner's "Some Theorems on Instruction Illustrated with Reference to Mathematics" (Bruner, 1964). The concepts of these papers are included in future papers, as former concepts appear in this summing up, for example, we have action (enactiveness), imagery (ikonicism), and symbolism (in this case, the 'language' of mathematics):

> "...while the development of insight into mathematics in our group of children depended upon their development of example-free abstractions, this did not lead them to give up their imagery. Quite to the contrary, we had the impression that their enriched imagery was very useful to them in dealing with new problems...We would suggest that learning mathematics may be viewed as a microcosm of intellectual development. It begins with instrumental activity, a kind of definition of things by doing. Such operations become represented and summarized in the form of particular images. Finally, and with the help of a symbolic notation that remains invariant across transformations in imagery, the learner comes to grasp the formal or abstract properties of the things he is dealing with."
>
> (Bruner and Kenney, 1965)

"Toward a Disciplined Intuition" (Bruner, 1971a:82-97) was written with Blythe Clinchy during the Learning about Learning Conference sponsored by the U. S. Office of Education (see 1966i), and was published as one of the essays in The Relevance of Education (1971a). It was an effort to follow up work which had been presented in The Process of Education.

In this paper, the authors describe both the analytic and intuitive approaches to any field of intellectual endeavor, noting the aim of a balanced schooling to be

> "...to enable the child to proceed intuitively when necessary and to analyze when appropriate."
>
> (Bruner, 1971a:82-97)

The authors describe intuitive thinking as involving certain features, including activation (that is, the overcoming of inertia, or getting started), confidence, visualization, a certain non verbal ability, informal structuring of the task, and the partial use of available information. Regarding non verbal ability, the authors note,

> "...the behavior is not fully...translatable into language necessary for summary, transformation, and criticism."
>
> (Ibid.)

The authors argue that

> "Analysis in a well trained problem solver can be just as activating as intuition, but in many cases it takes a hunch to figure out where the analytic tools should be applied...it does not always hold that intuition is always vague and analysis always rigorous."
>
> (Ibid.)

Eleven essays on science, culture, and society were delivered on the occasion of the 200th anniversary of the birth of James Smithson (1765-1829), the donor of the Smithsonian Institute in Washington. Among these was Jerome Bruner's "The Perfectibility of the Intellect" (Bruner, 1966d). Bruner included this among the essays he published in The Relevance of Education (1971a), and by way of introduction he would say,

> "Some essays come close to possessing their author in the writing for several years after. This had that effect on me. Its elaboration would come close to a kind of intellectual autobiography."
>
> (Bruner, 1971a)

Bruner speaks in this essay of four constraints on the exercise of intellect: the nature of knowing itself, the nature of the evolution of primate intelligence, the nature of the manner in which intellectual growth takes place, and the nature of codified knowledge.

It is possible that in this essay we have, in the main, a sort of summary of Jerome Bruner's philosophy about thinking, about knowing, about what we generally call cognition. We do not see a distinct formula or diagram for the processing of information. We do not see descriptions of the physiology of synaptic transmission or analyses of electroencephalographic tracings and their relationships to certain states of consciousness. The level of abstraction through which Jerome Bruner approaches cognition is that of strategies for reducing multiple stimuli to managable constructs, and those of action, imagery and symbolism. It is through this conceptual level that Bruner seeks the sources of rationality. And Bruner as social psychologist has not disappeared in the process of this search; his societal consciousness is clear when he says,

> "Let me confess that I, indeed any student of human intellect, can hardly pretend that what I say of the reach and range of human intellect is innocent of social, political, and moral consequences... The issue of the perfectibility of intellect stirs passionate debate ...What the student of human intellect can do is to refresh the debate with estimates of what is possible and estimates of what is the cost of the possible."
>
> (Bruner, 1966d)

In discussing the first of the four constraints on the exercise of intellect, the nature of knowing itself, Bruner reminds us of the limits

of our capacity in dealing with quantities of information to seven plus or minus two, noting that "We easily become overwhelmed by complexity or clutter." He reminds us also that what does not change in our perceptual field ceases to register. He speaks of the construction of models and of subsequent efforts at predictability therefrom, and, of course, he reminds us again of the modes of representation, action, imagery and symbols. And he does not neglect the intuitive leap that has become so fundamental to Brunerian concepts, "going beyond the information given." Bruner tells us of the vicarious nature of thought, and the service to which it is put with the human in the reduction of error:

> "...the exercise of intellect...always courts the possibility of error...Both in achieving the economy with which human thought repre-wents the world and in effecting swift correction for error, the categorizing tendency of intelligence is central...In the main, we do the greater part of our work by manipulating our representations or models of reality rather than by acting directly on the world itself. Thought is then vicarious action, in which the high cost of error is strikingly reduced. It is characteristic of human beings and no other species that we can carry out this vicarious action with the aid of a large number of intellectual prosthetic devices that are, so to speak, tools provided by the culture. Natural language is the prime example..."
>
> (Ibid.)

With regard to the second constraint on the exercise of intellect, which Bruner states as the evolution of primate intelligence, emphasis is put on the fact that man was bipedal, thus freeing his hands and allowing for the use of tools. Bruner notes,

> "The picture that emerges in the transition from lower mammals through primates is one of decreasing control by the hormonal system and an increasing part played by early experience through intervention of the cerebral cortex."
>
> (Ibid.)

He speaks also of the prolonged dependency of human childhood, and the gradual progression for primitiveness to abstractness with early schooling.

The third constraint on the exercise of intellect has to do with intellectual growth. Bruner notes that it

> "does not flow smoothly but rather in spurts of rapid growth followed by consolidation...The spurts of growth seem to be organized around the emergence of certain capacities,..(which) have the character of prerequisites: one thing must be mastered before the child can go on to the next."
>
> (Ibid.)

Among these prerequisites, Bruner sees the maintenance of invariance (accomplished through various means of representation) and the transendence of momentariness. Bruner speaks also of the self reward of learning and of the development of competence.

Of the last constraint on the exercise of intellect, the nature of codified knowledge, Bruner points out many changes in our concepts or conjectures about the nature of knowledge. He notes of the function of a theory that it is

> "...a set of propositions that...yield(s) occasional predictions...A theory is also a way of stating tersely what one already knows without the burden of detail. In this sense it is a canny and economical way of keeping in mind a vast amount while thinking about very little..."
>
> (Ibid.)

In speaking of this essay, Bruner admits

> "I have concentrated on right-handed knowledge and given short shrift to the left hand — the disciplines of art, of poetry, of history, of drama, and of metaphysics...I have placed heavy emphasis upon the role of models or theories that human beings build to render the varieties of experience into some manageable and economical form. Man creates theories before he creates tools...His myths, his art, his ritual, his sciences are all expressions of his deep-lying tendency to explicate and condense, to seek steady meaning in capricious experience."
>
> (Ibid.)

Bruner closes the essay with,

> "The perfecting of intellect begins earlier than we thought and goes communally from the outside in as well as growing from within."
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> (Ibid.)

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Bruner presented "Some Elements of Discovery" at a 1965 conference organized by the Committee on Education and Development of the Social Science Research Council; the talk appeared in the book Learning by Discovery (1966e) and later in The Relevance of Education (1971a). Bruner says,

> "I am not quite sure I understand anymore what discovery is and I don't think it matters very much. But a few things can be said about how people can be helped to discover things for themselves."
>
> (Bruner, 1966e)

He insists,

> "You cannot consider education without taking into account how a culture gets passed on..."
>
> (Ibid.)

and he discusses programming of skill development, the effect of models and of the environment, and questions the role of discovery as a way in which one finds out about one's environment. He notes, with reference to the first syntactic utterance of the child, that having a model is more important than discovery.

Bruner describes six sub problems involved in teaching a child so that the material is appropriately used. The first has to do with attitude or, if you will, using one's own head, that is, the reflection for a solution of a problem on what one has already learned. The second he calls compatibility; this has to do with finding a connection with something one already knows, thus "making the knowledge one's own." He says that you can, "at your peril" call this association, but he describes this concept as "like a rope in which no single fiber runs all the way through." The next concept is one of particular importance, and we see it other places in Bruner's work: competence, he contends, is its own reward, and "you can corrupt them all" (children) "too easily into seeking your favor, your rewards, your grades." Another

sub problem in the appropriate use of taught material has to do with problem solving through hypothesis, and here he notes

> "Training in being concise is, like limits testing and hypothesis making, a neglected though crucial area of skill training."
>
> (Ibid.)

Bruner then considers the "self-loop problem," as he terms it, by which he is indicating the situation where a child is able to perform an act but not able to describe what he has done, for example, the case where the child can put weights on both sides of a balance scale but cannot verbalize his actions. The last issue Bruner addresses is "the power of contrast." Contrast Bruner considers to be "an acquired taste." He says,

> "We believe that by getting the child to explore contrasts, he is more likely to organize his knowledge in a fashion that helps discovery in particular situations where discovery is needed."
>
> (Ibid.)

It is difficult to imagine how Jerome Bruner found it possible to be in so many places and doing so many things at once during 1965, or, for that matter, during all the years from 1960 to 1965. Both Henry Murray and Ernest Hilgard remarked during my interviews with them on Jerome Bruner's unusual energy. The production of these years we have just described surely enhanced that reputation.

OF 1966: STUDIES IN COGNITIVE GROWTH ... AND MORE

> "Six year of research on intellectual and perceptual development in children from the third year of life culminated in the publication of a book, Studies in Cognitive Growth."
>
> (Bruner, Olver and Greenfield, et al., 1966)

It was this book that Jerome Bruner spent ten hours a day for a month editing in London in 1965, and that he presented to Jean Piaget on August 9, 1966, at the XVIII International Congress of Psychology in Moscow. The dedication page of the book states,

> "For Jean Piaget
> Friend and mentor, whose brilliant insights have given new and powerful form to the study of cognitive growth.
> In honor of his seventieth birthday."
>
> (Ibid.)

It is an unfortunate reality that Piaget's reception of the book lacked enthusiasm. The challenges the authors put forward to his work appeared to meet with less than good humor, eliciting disappointment from Bruner and his co-authors.

About the authors: there were three major ones listed, Jerome Bruner, Rose Olver and Patricia Greenfield, along with nine additional authors.

Rose Olver, whose Ph.D. was earned at Radcliffe, was the first woman on the faculty at Amherst (where she held an assistant professorship at the time of the publication of the book). She had been a member of the Harvard Faculty for two years after her degree, and a Fellow at the Center for Cognitive Studies.

Patricia Marks Greenfield, presently on the faculty at UCLA, had just received her Ph.D. from Harvard in 1966, where she had also been a Teaching Fellow. From 1968 to 1972, she was a Research Fellow in cognitive studies at Harvard. Dr. Greenfield states that all three primary authors were highly involved in the editing process of the book (Greenfield, Telephone Conversation, May 15, 1978). Some of the remaining names of authors are familiar from their appearance as co-authors with Bruner on other papers. They are: Joan Rigney Hornsby, Helen J. Kenney, Michael Maccoby, Nancy Modiano, Frederic A. Mosher, David R. Olson, Mary C. Potter, Lee C. Reich, and Anne McKinnon Sonstroem.

Bruner wants the reader to know that the book was not "written by a committee," but rather was the collaborative effort of his graduate students, Fellows at the Center for Cognitive Studies, and himself, an effort directed toward the problem of how intellect develops.

In remarking on the international and intercultural flavor of this book, Bruner points out the studies of Patricia Greenfield in Senegal, of Michael Maccoby in Mexico, of Lee Reich in Alaska, and inputs from Boston, from London and, through the work of Piaget and Inhelder, from Geneva. Bruner says,

> "It is plain, to be sure, that there are deeply ingrained universals in human growth. The impact of culture is one of those universals. Even though human cultures have great differences on the surface, they also have certain notable communalities. It would be a mistake to take these universal cultural traits for granted, and to forget their huge role in aiding and empowering the growth of individual human beings. But culture produces great differences as well, and these we shall attempt to explicate while keeping in mind the universals."
>
> (Ibid.)

We shall review in detail only those chapters of the book written by Bruner or co-authored by him; a concept of the breadth of the book as a whole can be gained by looking at the titles of other chapters. They are: "On Equivalence," "On Asking Questions," "On Perceptual Recognition," "On Conceptual Strategies," "On Conservation of Solids," "On Culture and Conservation," and "On The Culture and Equivalence."

In the first chapter, which is entitled, "On Cognitive Growth," Bruner restates the issue of the book as "How human beings increase their mastery in achieving and using knowledge." Among the issues he brings forward are the growth of classification, of information seeking, and of perceptual recognition. In this chapter he discusses the enactive and the ikonic representation modes (terms with which the reader is already familiar), and in Chapter 2 he deals with symbolic representation, that is, language.

He says,

> "...we are searching...for the nature of the protosymbolic activity that supports language and all other forms of symbolization."
>
> (Ibid.)

Bruner speaks of the arbitrariness of the symbol reference, that is, of the name that gets tagged on to the object, noting as well that the child's use of language is categorical, covering classes of things. He describes the onset of gramaticalness from the holophrase through more mature forms, and we are again made aware of the very logical progression of the study of humans from cognition through development and to language.

Discussed in this chapter are the works of Vygotsky, Jacobson, Lashley, and, of course, throughout we find references to the work of Piaget.

Bruner explains,

> "If one is using symbolic representation to guide looking or to guide action, the success of the effort will depend upon the extent to which the sphere of experience or action has been prepared to bring it into some conformance with the requirements of language."
>
> (Ibid.)

He suggests as a sort of generalization that

> "Growth has a way of minimizing the conflicted ways of knowing, making retrospective efforts at creating a developmental psychology worse than hazardous..."
>
> (Ibid.)

Bruner and Helen J. Kenney coauthored Chapter 7, which is entitled, "On Multiple Ordering." They say,

> "...the means by which the growing child brings classificatory order into the world around him ...(is) modification."
>
> (Ibid.)

and they quote Inhelder and Piaget as naming two aspects of "classificatory behavior:"

extension — in which members of a class are specified, and

intention — in which the common property defining the members is specified.

Bruner and Kenney state their case,

> "...we believe that logical behavior grows out of and is sustained by psychological processes. To define the psychological problem of classification as representing a difficulty in coordinating intensional and extensional definitions of class is to beg the question..."
>
> (Ibid.)

The description of a matrix is presented in which glasses grow in width in one direction and in height in the other, nine glasses in all in the three by three matrix. An experiment done with ten children each of ages 3, 4, 5, 6, and 7 required them to replace, reproduce and transpose the matrix. The ability to replace and reproduce the matrix grows, as one might suspect it would, with age; only the oldest of these children were able to transpose the matrix. The children used three linguistic modes (or kinds of verbal description) in referring to the problem: dimensional (short, fat skinny), global (big or little in either diameter or in height), and what the authors refer to as confounding. The confounding concept is a predictor of failure: one end of the continuum is described dimensionally, while the other is described globally. The authors feel that what is needed for the child to

> "...take that step (transposition) is organizing experience into a form that allows more complex language to be used as a tool not only for describing it but transforming it."
>
> (Ibid.)

In the eighth chapter of this book, Bruner and Kenney address relational concepts. They remind us that the young child is "apt to base his notions of the world on some feature to which he can point directly," so that he is likely to rely on color, height, and width, and that he is a "one-track" sort of organism, that is, he is likely to look at only one aspect of a thing at one time. (One must wonder here, does this mean that seven plus or minus two pieces of information maintained at once in one's thinking is applicable only to the mature human animal? One must assume that this ability is one which is a function of the maturing process, especially in the light of some of Bruner's other studies where

it is shown that the infant nursing cannot continue to nurse while pursuing an object visually until he reaches a certain level of maturity.)

Both the need to point directly and the one-trackedness of the child the authors see as "typical of early ikonic functioning."

When we get to comparative informational concepts, that is, fuller or emptier, rather than full or empty, or to successive items of information, we then have to deal with symbolic operations, and the structure of hierarchies; this is the manner in which we decide if the taller, thinner glass is fuller or emptier than the shorter, fatter glass.

After testing children in these concepts, the authors concluded,

> "We have examined the manner in which a powerful concept like proportion grows step by step in the child's thinking. What emerges is the importance of this method of dealing with the perceptual features of the task. The child begins with a discrete, almost binary rendering of the two extreme states, empty and full...at the next stage...'Full' means much water, and 'empty' means much empty space. When the child achieves this new bit of cognitive technology, he is led into what appears to be a contradiction."
>
> (Ibid.)

Here the authors find that the child is "progressing to the next level."

These concepts lead quite naturally to Chapter 9, authored by Bruner alone: "On the Conservation of Liquids."

> "Our concern in this chapter...is with the growth of the ability to recognize that, though a partcular magnitude has changed its appearance, it is still the same magnitude. It is a powerful idea not only in science but also in the conduct of everyday life... Indeed, much of common sense and all of science would be impossible without conservation."
>
> (Ibid.)

Bruner reviews the well publicized conclusions of Piaget and Inhelder that children under seven are typically unable to "conserve" a quantity of matter over transformations in its appearance. He goes on to say,

> "Our argument is in sharp contrast to Piaget's. On purely logical grounds, we believe he has missed the heart of conservation. Both inversion and compensation to be effective must rest upon an appreciation of the original equality of the quantities involved. A continued grasp of this initial equality is crucial to both inversion and compensation. Indeed, the inverse operation of "pouring back" is effective for achieving conservation only insofar as it is a path to the original state of equality in the two "standard" beakers...one senses in Piaget's writings that at first it is the inverse operation and later the compensation that makes conservation possible."
>
> (Ibid.)

That Piaget did not receive this book well might be laid to his antipathy to this kind of strong critical review of "Le Patron's" contributions to theories of development and of cognition.

Bruner tells us,

> "We assume, at the outset, that some primitive sense of identity is either innate, or develops well before the child is active in the manipulation of objects...the young child's capacity to recognize objects previously presented underlines this 'sense of sameness.'"

Bruner says,

> "The <u>sense of sameness</u> is the very keel and backbone of our thinking...We do not care whether there be a <u>real</u> sameness in things or not, or whether the mind be true or false in its assumptions of it. Our principle only lays it down that the mind makes continual use of the <u>notion</u> of sameness, and if deprived of it, would have a different structure from what it has."
>
> (Ibid.)

He then goes on to discuss the more 'complicated' forms of invariance, saying that

> "they develop when this earliest conception of identity is translated into new terms – terms of action, of imagery, and of symbolism."
>
> (Ibid.)

Here we find the description of an interesting experiment done by Patricia Nair. It involves pre-testing and testing 40 five-year olds from a Boston suburb kindergarten. The experiment must have been a delight to the youngsters; it was designed in such a way

> "...as to highlight the identity of a quantity of water being moved from one vessel to another – an objective served by having the water 'owned' by a wooden duck, who 'takes the water with him' in moving from one 'lake' to another."
>
> (Ibid.)

The pre-test for each of the children was to establish whether the child had a concept of conservation or did not. The children were then divided between those who had established a sense of conservation, and those who had not. The results led to the conclusion that

> "...for the children with conservation already established, identity is 'in the system.' Conservation responses and nonperceptual reasons are stimulated by 'reminding' the child first about identity. Identity is present in most children who do <u>not</u> have a notion like invariance of amount."
>
> (Ibid.)

Bruner then notes that there is a point in the development from identity to equivalence that "there is little explicit distinction made" between the two. Once the child has been able to make the distinction, Bruner suggests he can say, for example,

> "'They are the same water, but they do not look the same.' Finally this can be translated into the linguistic equivalent, 'They are the same amount.'"
>
> (Ibid.)

Bruner sums up the content of the book in the last chapter, appropriately entitled, "An Overview;" in it he describes the manner in which the authors have looked at growth as <u>instrumental conceptualism</u>

and the purpose of the work essentially as testing this view through observations of growing children in various cultures. He reminds us that models "develop as a function of the uses to which they have been put" in two senses; first models develop with reference to the uses to which they are put by the culture, and then to the uses to which they are put by the individual.

The issues involved in the experiments presented in this book are, in sum,

> "...the growth of rules of equivalence, the development of 'efficient' information searching, and the establishment of invariance as a tool in thinking."
>
> (Ibid.)

Bruner notes that growth is bound in some ways to cultural differences:

> "...by comparing the behavior of Wolof or Eskimo or rural Mexican children, our Western picture turns out to be culture-bound — indeed, any particular pattern of growth one ever finds must be in some important measure culture-bound."
>
> (Ibid.)

All in all, Bruner concludes,

> "Insofar as man's powers are expressed and amplified through the instruments of culture, the limits to which he can attain excellence of intellect must surely be as wide as are the culture's combined capabilities. We do not know in any deep sense as yet how we shall, in the future, better empower men. Insofar as the sciences of knowing can throw light on the growth of mind, the efficacy of the culture in fulfilling its responsibility to the individual can likely be increased to levels higher than ever before imagined.
>
> (Ibid.)

"The Growth of Representational Processes in Children" by Bruner was published in the Proceedings of the XVIIIth International Congress of

Psychology in Moscow (Bruner, 1966a). It was at this conference in the summer of 1966 that Bruner presented to Jean Piaget the book we just discussed at length, Studies in Cognitive Growth. In this paper, presented separately, Bruner argued that the most fruitful approach to intellectual growth was not to see it in the form of increased effectiveness in performance, but rather to adopt a view which included many facets: an analysis of what a child does when he is thinking, what Bruner speaks of as the "natural ways of thought, the ones that seem ordinary or intuitively obvious," the culture in which the person grows, and "the manner in which the evolution of the primates and of man imposes a pattern on his growth." Now once this has been considered in the formulation of a theory of growth,

> "let us also ask whether we have contributed to our understanding of how to educate man to the point where he can use his intellectual heritage to the full. For if a theory of growth of mind cannot help in that enterprise, nor contribute to the understanding of education, it must surely be at fault."
>
> (Bruner, 1966a)

Here again we see a consolidation of Jerome Bruner's interests. True to his claim, he surely has never left social psychology; it is clear that Bruner sees man as what Eliot Aronson calls a "social animal," a product of his evolution and of his culture. Bruner ignores neither the science (the right hand) nor intuition (the left). In speaking of how the child grows in his thinking, Bruner is, by nature of the query, looking at both cognition and at development, and then we see him relate all of this to education. Through these processes, Bruner appears to see the developmental goal in a way which we have come to expect — the goal is mastery, an indication of competence and of excellence.

The year 1966 was one for the publication of books for Jerome Bruner! Toward a Theory of Instruction (Bruner, 1966f) was the result of five year's work, an effort concurrent with, but different from, Studies in Cognitive Growth. Toward a Theory of Instruction has been translated into German, Rumanian, Danish, Portuguese, Spanish, Swedish, Italian, Japanese and Slovak, at last count; by now it may appear in other languages as well!

The book consists of a series of essays, most of which had been through several versions. Bruner says these papers had "lived long together in the community of my thoughts," and that they had been "produced under the stress of practical need." Some of these essays, it should be noted, appeared elsewhere in slightly altered form.

Of those essays which appear in Toward a Theory of Instruction (Bruner, 1966f) which we have already reviewed elsewhere, "Man, A Course of Study" is particularly significant. "Coping and Defending" appeared in French, and "Education as Social Invention" was published as an article in the Journal of Social Issues in 1964; we have reviewed them both. "Notes on a Theory of Instruction" was discussed earlier in these pages under the title, "Some Theorems on Instruction Illustrated with Reference to Mathematics" (Bruner, 1964g). There are four additional essays; we will look briefly at each.

In the essay, "Patterns of Growth," Bruner comments,

> "Instruction is, after all, an effort to assist or to shape growth... This book is...in effect a theory of how growth and development are assisted by diverse means."
>
> (Bruner, 1966f:1-21)

Bruner gives us a list of benchmarks of intellectual growth in which he includes "increasing independence of response from the immediate nature of

stimulus," the internalizing of events into a "storage system" that corresponds to the environment, and

> "...an increasing capacity to say to oneself and to others by means of words or symbols what one has done...or will do...,"
>
> (Ibid.)

that is, a sort of self accounting, or self consciousness. In addition, Bruner says that growth depends "upon a systematic and contingent interaction between a tutor and a learner." The next benchmark, Bruner lists as language, and the last as the ability to deal with several alternatives simultaneously...properly dividing time and attention. Bruner is, of course, speaking in terms of the one year old versus the ten year old, but with regard to dealing with several alternatives simultaneously and with appropriate hierarchical attention, one must wonder if, in this busy world, the average adult manages this phase of intellectual growth! As I consider the state of my desk, the question repeats itself.

Bruner repeats the modes of representation again here, but with a slightly different approach: he finds the concept of stimulus/response as "fairly adequate" when one speaks of the learning acting within the realm of enactive representation; he goes on to say that

> "Gestalt theory is the system par excellance for analysis of the iconic mode..."
>
> (Ibid.)

As to symbolism, that is, language, Bruner has this to say:

> "There has been perhaps too much emphasis on the so-called Whorfian hypothesis - that different languages structure reality differently for their users. Much more to the point is the general question of how language as such affects the cognitive processes, no matter what the language."
>
> (Ibid.)

Among Bruner's major themes of education and, consequently, of growing, is that of the spiral curriculum. We see it here repeated when he says,

> "I suspect that much of growth starts out by our turning around on our own traces and recoding in new forms...then going on to new modes of organization...The new models are formed in increasingly powerful representational systems. It is this that leads me to think that the heart of the educational process consists of providing aids and dialogues for translating experience into more powerful systems of notation and ordering. And it is for this reason that I think a theory of development must be linked both to a theory of knowledge and to a theory of instruction, or be doomed to triviality."
>
> (Ibid.)

In this essay we have again seen the consolidation of the fields of interests of Jerome Bruner.

Bruner begins the essay, "Teaching a Native Language" (Bruner, 1966f: 102-112) with a thought which might be the private delight of many thesis weary academics, as well as the occasional therapist (but for different reasons):

> "I have often thought that I would do more for my students by teaching them to write and think in English than teaching them my own subject. It is not so much that I value discourse to others that is right and clear and graceful — be it spoken or written — as that practice in such discourse is the only way of assuring that one says things right and courteously and powerfully <u>to oneself</u>. For it is extraordinarily difficult to say foolishness clearly without exposing it for what it is — whether you recognize it or have the favor done for you."
>
> (Bruner, 1966f:102-112)

Bruner reminds us that

> "...language is a major instrument of thought. When we are thinking at the far reach of our capacities, we are engaged with words, even led forward by them..."
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>
> (Ibid.)

Bruner convinces us readily that we should instigate an anniversary party for each child for that time when the child "mysteriously constructs a syntactical utterance." Mother washes jam from his hands. He says "All-gone sticky." The child, Bruner says, "has acquired not only a way of saying something but a powerful instrument for combining experiences." Bruner closes this essay with,

> "It was Dante, I believe, who commented that the poor workman hated his tools. It is more than a little troubling to me that so many of our students dislike two of the major tools of thought — mathematics and the conscious deployment of their native language in its written form, both of them devices for ordering thoughts about things and thoughts about thoughts. I should hope that in the new era that lies ahead we will give proper consideration to making these tools more lovable. Perhaps the best way to make them so is to make them more powerful in the hands of their users."
>
> (Ibid.)

In "The Will to Learn" (Bruner 1966f:113-128), Bruner says that

> "The single most characteristic thing about human beings is that they learn. Learning is so deeply ingrained in man that it is almost involuntary, and thoughtful students of human behavior have even speculated that our specialization as a species is a specialization for learning."
>
> (Bruner, 1966f:113-128)

We will see now a growing interest in the subject of play in Bruner's writing; he will, with his colleagues, publish a book on play in the next decade, and we can see the precurors here in their embryonic form.

We will take a moment here to indulge in a fanciful analogy with regard to Jerome Bruner and his interests as they proceed in their development. As we have seen before, ideas struggle for attention, peep their heads up in Bruner's garden of words, pop up here and there over

the years, and then sometimes they will come to full bloom and take up a solid space in Bruner's garden of ideas and of words. So it is with language, which first we see in 1956 (A Study of Thinking), and which appears now and then in the interim, and now, two decades after its original flower, has the center of his attention. So it is with play. Play will now begin to appear here and there, as it has a few times before this writing; it will culminate as a subset of learning and cognition, and will have its place in language as well, and in prelinguistic behavior (peek-a-boo being a prime example). There is a fascinating kalaidoscope of concepts encountered in the writings of Jerome Bruner, and it would appear that when one seems to grow more powerful to Bruner than the others, when it seems to prey on his thinking, to interrupt, even as we see it in his writing, he tends then to turn his attention to the concept, and finally to give it full voice. This would be a presumptive conclusion were not the pattern so clear.

In the essay we are considering now, play blossoms briefly,

> "Observations of young children and the young of other species suggest that a good deal of their play must be understood as practice in coping with the environment."
>
> (Ibid.)

Bruner argues that "We get interested at what we are good at," and he also contends that

> "To achieve the sense of accomplishment requries a task that has some beginning and some terminus."
>
> (Ibid.)

Seeing the end, Bruner neglects to mention, is not always easy! He does, however, note that

"The will to learn is an intrinsic motive, one that finds both its source and its reward in its own exercise."

(Ibid.)

Bruner answers the theorists who insist that reinforcement and reward are necessary for learning,

"External reinforcement may indeed get a particular act going and may even lead to its repetition, but it does not nourish, reliably, the long course of learning by which man slowly builds in his own way a servicable model of what the world is and what it can be."

(Ibid.)

The liberationists for womens' causes will be delighted to know that finally, in this last essay in Toward a Theory of Instruction, Jerome Bruner has come to use both the masculine and feminine gender in referring to school teachers! This essay is entitled, "A Retrospect on Making and Judging" (Bruner, 1966f:149-171).

He begins,

"In the foregoing essays, I have tried to explore the relation between two enterprises, each difficult enough on its own. One is the course of intellectual development, the other pedagogy...Our proper subject is, of course, how a culture is transmitted — its skills, values, style, technology and wisdom — and how, in transmission, it produces more effective and zestful human beings."

(Bruner, 1966f:149-171)

In this essay Bruner describes the difficulties encountered in trying to introduce a new theoretical perspective into the schoolroom, a process of

"...going from Widener (Harvard's famous library) to Wichita — from the first research in the library to the official launching of the curriculum."

(Ibid.)

First, there was the subject matter itself (subject matters, Bruner says, "are an invention of highly literate societies"), and then the need to encourage the child to find the problem connected with the subject, rather than working on the theme of figuring out what the teacher wants. The youngster then needs, in some manner, to have a personal involvement with what is to be learned; in some way the subject must relate to the individual. Then, of course, there needs to be feedback, that is, evaluation so timed as to be helpful to the learning process. Bruner notes that it is

> "...one thing to enunciate a set of guidelines; quite another to implement them."
>
> (Ibid.)

Bruner encourages us not to "take for granted as true what has merely become habitual." He says,

> "I can only hope that in pursuing a theory of instruction we shall have the courage to recognize what we do not understand and to permit ourselves a new and innocent look."
>
> (Ibid.)

We can see that these essays do, indeed, move us toward Bruner's theory of instruction, with its mix of culture and of anthropological heritage, of spiral curricula and present organization, and with its appreciation for the developmental process.

Patricia Marks Greenfield's paper co-authored by Bruner, "Culture and Cognitive Growth," was published (among other places) in the Handbook of Socialization Theory and Research. The paper is based on Dr. Greenfield's extensive work with the Wolof children in Senegal, in what was once French West Africa. The work was done in 1963 and 1964, and addresses itself to the dependence of intellectual development on external environmental influences versus dependence on maturation per se.

The authors argue that

> "Species specific behavior does not appear out of the blue. It has evolutionary history, and that history reflects itself in the early growth of the young."
>
> (Greenfield and Bruner, 1966)

They balance this view with the statement that

> "...some environments push cognitive growth better, earlier and longer than others..."
>
> (Ibid.)

There is interaction, the authors insist, of culture and biological maturation; they do not "espouse a view of complete cultural determinism."

There were three other publications of Jerome Bruner's in 1966, none of which this author was able to locate. "The Infancy of Man" (Bruner, 1966b) was an occasional paper for Expanding Horizons of Knowledge about Man: A Symposium at the Yeshiva University in New York. "A Look at Incongruity" was also presented as an occasional paper at the University of Cincinnati (Bruner 1966c). Bruner also made a contribution to Education and Training in Developing Countries: The Role of U. S. Foreign Aid.

These years had been packed for Jerome Bruner; the Center was lively, his personal professional reputation was now well established, for better or for worse. In some places it was for worse, for psychology, like all endeavors, harbors in its midst jealosies and resentments among those in the field; the only difference in psychology

is that the clinicians, at least, are more ready to analyze such matters — which does not seem, on balance, to affect the difficulties in the least. The non clinicians are a very separate lot (they are the scientists and the academicians) and Bruner was among those.

Jerome Bruner did things that had an impact on the fields to which he addressed himself (though B. F. Skinner insists that he cannot see that Bruner's contribution to education was effective, and that Bruner did not change the way things were taught) (Skinner, Interview, 1978). It is clear from his publications that Bruner read the literature in the fields of his interests; he also respected, in the main, the views of those with whom he chose to disagree, for example, Piaget, to whom he dedicated the book Studies in Cognitive Growth, in the text of which he took clear issue with some of "Le Patron's" theories. Bruner did, however, tend to invade a new field, or at least it must have appeared so to the onlooker, like a tank at war. He soon had opinions, and strong ones; he had them in his first publications in the field of education, and we have just read of his views in the area of the growth of intellect, touching both on development and on cognition. Certainly he presented a challenge to "older and wiser heads" in developmental psychology and in linguistics, and this must have been disconcerting to some, at the very least. We would present an incomplete picture if we indicated that Jerome Bruner is a man universally loved. He admits readily that he may have stepped on some toes on his way to an idea. He is a person of great charm, fine intellect, and incredibily abundant energy, and there are those, even among his detractors, who admit that they enjoy his company, though they may not admire the particulars of his work.

THE SYMBOLIC MODE: DEBUT

The year 1967 gave Bruner's printers a brief respite; he lists only one publication that year! This was not a reflection on the energies of Jerome Bruner so much as it was on the perversities of publishing houses, delay times being as they are. The one paper published was surely not an idle exercise. It was the beginning of Bruner's real immersion into the field of lingusitics, an essay to honor Roman Jacobson's 70th birthday. It was called, "The Ontogenesis of Symbols."

This twenty page paper is addressed (as the title and a passing familiarity with Bruner's 'modes of representation' would lead us to believe) to the subject of language. It is Bruner's first report on language per se, though we have seen an involvement of the symbolic mode in his papers for several years. It will be 1975 before we see a number of publication addressing linguistic issues; in 1967 he has, so to speak, taken a dip in the water. By 1975 he will have decided the water is fine.

The foundations for Jerome Bruner's views on language are laid out in this publication, and he contrasts his ideas with those of persons already known in the field. As we recall, in 1962, Bruner wrote the preface to Vygotsky's Thought and Language; in June, 1967 he presents his disagreement with Vygotsky:

> "I would argue that language itself is not what is 'imposed' on experience — as already suggested in my rejection of Vygotsky's idea that language is internalized and becomes inner speech, which is tantamount to thought. Rather, language comes from the same basic root out of which symbolically organized experience grows. I tend to think of symbolic activity of some basic or primitive type that finds its first and fullest expression in language, then in tool-using, and finally in the organizing of experience. It is by the interactions of language and the barely symbolic organized experience of the child of two or three that language gradually finds its way into the realm of experience."
>
> (Bruner, 1967)

This extension of the symbolic mode to tool using and experience organization is a fresh approach.

As he does ever when becoming seriously interested in a subject, Bruner presents us with a review of the literature throughout this paper. In particular, he refers to Karl Lashley's work reported in "The Problem of Serial Order in Behavior" (Lashley, 1951) to Miller and Chomsky's 1963 publication in the Handbook of Mathematical Psychology II, "Finitary Models of Language Users" (Miller and Chomsky, 1963), to Luria's book, The Role of Speech in the Regulation of Normal and Abnormal Behavior (Luria, 1961), and to the work of J. J. Katz, E. Sapir, and Ruth Weir to name a few. He does not neglect those he has referenced often before, Roger Brown and Piaget. Bruner quotes Miller and Chomsky's 1963 paper mentioned above:

> "An organism that is intricate and highly structured enough to perform the operations that we have seen to be involved in linguistic communication does not suddenly lose its intricacy and structure when it turns to non-linguistic activities. In particular, such an organism can form verbal plans to guide many of its non-verbal acts. The verbal machinery turns out sentences —and for civilized men, sentences have a compelling power to control both thought and action."
>
> (Miller and Chomsky, 1963)

As for Bruner's view, he sums up by saying

> "...symbolic activity stems from some primitive or protosymbolic system that is species-specific to man. This system becomes specialized in expression in various domains of the life of a human being: in language, in tool-using, in various atemporally organized and skilled forms of serial behavior, and in the organization of experience itself. We have suggested some mimimum properties of such a symbolic system: categoriality, hierarchy, predication, causation, and modification. We have suggested that any symbolic activity, and especially language, is logically and empirically unthinkable without these properties."
>
> (Bruner, 1967)

This paper is of sufficient complexity and detail that we admit that we have surely not done it justice; suffice it to say that it is a particularly important work as a foundational discourse on which a good deal of Brunerian effort will be spent in future years.

For now, it is appropriate that we attend to two major issues. One is Jerome Bruner's primary research on the development of the infant. The other is the state of the world in which Bruner's work was being done. The world had changed considerably from the era of McCarthyism; the uncommitted generation had become the "establishment," leaving those who came after to swing the pendulum to the radicalism that characterized the late 1960's. The phrase "the generation gap" came into popular usage as the differences between youth and its elders, present since the beginning of the recorded word, widened ever further until there was considerable difficulty in any kind of communication and, indeed, often little effort. One might speculate that there was a particular need to understand language and symbolic communication during these years; they were years filled with a physically active rebellion to what the younger generation imagined to be the values of the adult world into which they were coming of age, and with an idealism for a more honest and more humane future. The surprised and often angry older generation, when it tried at last to talk, found there were few to listen.

FROM CHILD TO INFANT

The world was in terrible turmoil in 1968, and the United States was steeped in particular misery in 1968. There were areas of Jerome Bruner's life which were deeply affected by the state of the world and the nation, and we will speak more of this in the next chapter. For the moment, however, we will attend to that approach to the development of human intelligence which deals with the infant. The papers which represent this work do not seem affected by a nation at war in fact and in ideal in which they were written. They seem simply to put forward the results of the rigors of the experiments which they report.

The work with infants continues in Jerome Bruner's laboratories today, with particular emphasis currently on pre-linguistic communication following on to the development of language. In this chapter we do not intend to cover all the work involving infants in Bruner's research, but rather to provide an insight into the direction of that research.

We have referred, on occasion, to some of Jerome Bruner's work as developmental psychology, and there is a sense in which that is so. But we must modify that description somewhat. Bruner is not looking at the development of the emotional states of the child, nor is he looking at physiological development except as it affects the centering of attention. For example, Bruner is interested in the ability of the child to grasp with regard to hand-eye coordination, and to the infant's tendency to follow the adult "line of regard" eye movement with more fixed concentration with increasing age. The child's ability to point to what he wants as pre-verbal communication is noted. Bruner does not, however, attend to a range of age, but only to the graduating abilities of the

infant and the very young child (and these appear in his work in reverse order). Bruner's concepts of the pre-school and school aged child are shown most often against the foil of Jean Piaget; there is little relationship to the works of, say, Erik Erikson or to Gesell, Ilg and Ames. So in all candor, we cannot speak of Jerome Bruner as a developmental psychologist; rather we must we see his work in human development in the light of what appears to be his major theme. He is still in search of the sources of rationality, and it is toward this goal that his interests in the changes in infants and children as they grow is directed. The logical progression to an interest in the development of language can be predicted if we take this view.

It is interesting that throughout the years, Bruner's studies in thinking, learning, and competence have gone in reverse order of age. In A Study of Thinking, the strategies and hierarchies did not apply to the child per se, but to the population at large. The studies in conservation, in multiple ordering, in the 1965 papers on the work with Dienes, on the concepts children could grasp via a spiral curriculum, and those appearing in Studies in Cognitive Growth in 1966 address themselves, in the main, to the school aged child and the pre-schooler. Now we see Bruner attending to the first hint of syntax, to the first "sticky all-gone," to the holophrase, and to prelinguistic communciation. And in these papers he looks at the progression of the ability of the infant to attend to whatever his business may be (sucking, looking, whatever) and to develop competence in hand-eye coordination. Laurence Young, Professor at M.I.T., mentioned to me (Personal Communication, May 16, 1978) that he and Daniel Kahneman had discussed the question of eye movement monitoring in young children and looked at pupil diameter as a measure of attention around 1965; it is

possible that some of the material reviewed among them has found its way into these studies. In any event, there was probably considerable interaction among Bruner and his colleagues during the years of research required before a report on the work emerges.

The Heinz Werner Lecture Series, "designed to provide a forum for outstanding scholars" in developmental psychology, was the vehicle for Bruner's two lecture work (published as a five chapter book), Processes of Cognitive Growth: Infancy (Bruner, 1968d). This series, given at Clark University, was sponsored by the Heinz Werner Institute of Developmental Psychology; Bruner was in good company in participating in the series, as Jean Piaget and Roman Jakobson presented the annual lectures in the year before and the year after, respectively.

As we have mentioned, Bruner's involvement with education and with the school aged child was intense; in this small book we can see the equal intensity of his study of infancy. Bruner says,

> "Like Heinz Werner, I take it as a working premise that growth cannot be understood without reference to human culture and to primate evolution. Human beings, unique among species, grow in a fashion that permits them to participate in human culture, to use its language, its kinship system, its technological way of organizing work."
>
> (Bruner, 1968d)

Bruner emphasizes the evolutionary viewpoint once again:

> "So in considering the early life of a member of our own species, it helps to bear in mind not only what the infant and child are developing towards but also what they have developed from."
>
> (Ibid.)

Bruner discusses "four great issues in human infancy" in these lectures, which he enumerates as voluntary control of behavior, the child's ability to gain control of his own attention, the infant's progress from one at a time limitation in his activity to being able to do several things at a time, and, "Finally, how does the infant manage to begin a career of reciprocation and exchange that prepares him in such a degree for culture using in general and language using in particular?" In response to the questions posed by these issues, Bruner reports research of sucking, looking, manipulating, and interaction with adults. He notes that the infant has a "prolonged period of scanning the environment without early motor commitment," that the process of mastering motor functions is very slow, and that there is a prolonged period of dependency upon the adult. He suggests that infancy can, in light of these observations, "be conceived almost as a shield against premature specialization" (Bruner, 1968d).

Bruner discusses the integration of developing infant activity, beginning with sucking. Bruner describes the apparatus developed to measure sucking, presenting graphs and photographs to demonstrate the research. Bruner notes that the infant sucks not only for nutrition, but non nutritively as well, in a sort of burst and pause pattern. The infant's growing capacity to handle information is demonstrated in Bruner's reports, for example, at birth the tiny human usually sucks with eyes shut; looking and listening disrupts sucking. (It is of interest that the infant has been practicing sucking en utero long before birth; it is not a procedure he must learn after birth, given a normal period of gestation.) Among the non nutritive functions of sucking, Bruner notes that there may be analgesic or antidistractive benefits to the infant. By the time he is three to five weeks old, the infant's eyes may be open when he is nursing,

however when visual fixation or tracking occur, the sucking will be very likely to stop. From nine to thirteen weeks, the baby sucks in bursts, looks in pauses, and by about three months, he appears to be able to suck and look at the same time (though there still tends to be a reduction in active sucking while looking).

In experiments where the infant's sucking brings a picture into focus (while cessation of sucking makes it go out of focus, or vise versa), the child will opt to do what is necessary to keep the picture so he can see it most clearly. Such results were produced experimenting with infants as young as six weeks! Bruner remarks,

> "Indeed, before the third month of life, there is ample indication that the activity of sucking not only serves innately predetermined multiple functions — nutrition, pain reduction, and exploration — but that it can also be diverted to arbitrary and intelligent instrumental activity that could not possibly have been preordained by evolution."
>
> (Ibid.)

Bruner discusses "the intelligent use of the hands," that is, "volition, skill and tools," of which he notes,

> "It is a much neglected topic, perhaps because we professors are intellectuals who are more preoccupied with words and images and ideas than with tools and tool-making."
>
> (Ibid.)

Bruner describes the work of Russian neurophysiologist Bernstein published in 1967, noting that Bernstein states that the achievement of control always involves reducing degrees of freedom "in the action system being regulated." Bruner proposes that control over degrees of freedom may be accomplished by development of "sequentially organized skill," and by forceful limitation or restriction. He says,

> "I shall argue that the mastery of intelligent, visually guided manipulation in infancy and childhood involves precisely a cycle of brute restriction of movement and of skill formation within the limits of that restriction, with skill moving to the next step only when that restriction is altered. Any given program of skilled voluntary action is gradually consolidated within its own restrictions. Its consolidation is signalled by the well-known plateau in the learning curve."
>
> (Ibid.)

Bruner says that he sees developmental progress in the infant as qualitative, rather than quantitative, involving the development of new strategies of actions to be consolidated.

One can see by Bruner's report that in the physical world as well as in the philosophical, one must establish a discipline (in this case, over movement so that it is not random) in order to establish a freedom (in this case, the ability to move one's limbs directively to reach for a particular object or to walk or run in a particular way). One must limit the degrees of freedom from all possible motion to a particular and precise movement, and the ability for this kind of limitation comes only with maturity in the human species. One might then wonder, as an aside, about the developmental maturation of the human ability for disciplining the degrees of freedom of intellectual concept, of cultural appreciation, and in the direction of the powers of the emotions. One might also wonder if some of these areas of the discipline/freedom complementarity are as age defined as the normal, if you will, development of muscle control. These are areas ripe for the pursuit of investigators of the maturing human not only in the areas of childhood and adolescence, but of that maturing human whom we call the adult.

Robert Howe had designed, with Bruner, an infant seating arrangement with a broad elastic across the belly of the child, and a

headrest with an appropriate indentation, all of which prevented the child from slipping and sliding, while keeping him free to wiggle arms and legs and turn his head as his stage of development and desires would combine to allow. Andrew Marshall, III, was highly involved in the design of recording and stimuli presenting devices. Bruner described data of changes in the trunk and head movements, the "fixated gaze and actively working mouth," and, finally, when the infant had matured enough, the "swiping" at the object which had been passed close enough to the child that it might be reached. Bruner developed a wonderful collection of toys and baubles for the infants, and from the looks on the faces of these youngsters in illustrations in Processes of Growth: Infancy, the children enjoyed the studies at least as much as the investigators.

Bruner notes, incidentally, that

> "It is crucial to recognize the significance of eye closing and gaze aversion during troubles in reaching and grasping. Functionally, this too must be interpreted as part of the general program of reducing complexity in the interest of the exercise of limited skill."
>
> (Ibid.)

The closed, working mouth and tight fist move in the infant to the open hand and open mouth. Bruner describes step by step the processes over two years of maturation. The seven month old "pounce reach," the "successively Cartesian" reach of fourteen months, and the "flexible, oblique reaching" of 27 months are described and illustrated.

Bruner suggests,

> "One's ability to process multiple events is precisely a function of the ability to process rather than merely to recognize or perceive that objects are present. The infant is constructing forms of multiplicity by his way of coping with the situation."
>
> (Ibid.)

Bruner then discusses "the child's acquisition of rules that precede the rules of syntax;" here he concludes,

> "It seems to be a not unreasonable hypothesis that human skill, human information processing, and human language might conceivably be a set of related responses that differentiated man as he evolved from his hominid ancestors."
>
> (Ibid.)

Bruner speaks of "code learning."

> "What seems to get established very quickly between parent and infant is some sort of code of mutual expectancy."
>
> (Ibid.)

Bruner has noticed that the cry of the infant becomes less intense once it is established, through experience, that there will be a response.

> "The channel of language is doubtless dependent on the growth of interaction codes. The origin of the uniquely human form of language remains very much a mystery. I have proposed that it is a refinement or extension of human skill as exhibited in the attentional system and the motor system as represented by man's clever hands..."
>
> (Ibid.)

Bruner sums up by stating that what he proposes are really biases, rather than conclusions. They include his functionalist view of man as a system oriented organism.

> "...organic activity can be understood only by recourse to the idea of systems conceived as designed to fulfill functions...as in systems engineering...The major functions in living require systems for their fulfillment...Responses are parts of larger systems, and these larger systems are what require deeper study."
>
> (Ibid.)

They include as well his perception of the orderliness of structure of man.

> "...man's structure imposes a shape on human skills just as crucially as do the bizarre proportions of science fiction

> characters...the inheritance of evolution is structural order that leads to language taking a particular form, to attention being organized along certain lines, etc."
>
> (Ibid.)

With regard to evolution, he notes,

> "Granted ontogeny does not recapitulate phylogeny, we would do well to continue to attend to the relation between the two...a developmental science of man without a sense of man's primate origins would be shallow."
>
> (Ibid.)

We see in this series of lectures a definition of Bruner's concept of cognition: "the achievement, retention, and storage of information." He says that it is inherent in "the functional enterprises of organisms, having its origins in the early development of intelligent action."

Bruner closes these lectures by suggesting that,

> "...to survive, humans, like other animals, must take their place as members of the species...to become members of linguistic and mythologically instructed communities, to join a common data base, to use a pool technology..."
>
> (Ibid.)

Bruner's involvement with the developing human intelligence is clearly a strong one in the years of the late 1960's, and the Heinz Werner lectures give us some notion of the energy and thoughtfulness that Jerome Bruner has devoted to this subject. Next we shall consider a paper which Jerome and Blanche Bruner wrote together: "Voluntary Action and Its Hierarchical Structure." It was published in Beyond Reductionism: New Perspectives in the Life Sciences of the Alpbach Symposium in Austria in 1968, in the International Journal of Psychology, and later it was among the series of writings which made up Beyond the Information Given. The authors argue,

> "It is quite apparent that many biological systems operate from the outset as hierarchically organized wholes by their very nature...A newborn can suck, swallow and breathe..."
>
> (Bruner and Bruner, 1968)

The authors make an interesting point in this paper about the afferent nervous system; it is that it is "necessary to distinguish between exafference and reafference." They credit Van Holts, and explain as follows,

> "If I shake the branch of a tree, various receptors of my skin and joints produce a reafference, but if I place my hand on a branch shaken by the wind, the stimuli of the same receptors produce an exafference...the same receptor can serve both the reafference and exafference...Stimuli from its own movements must not be interpreted as movements of the environment."
>
> (Ibid.)

The authors concentrate on sucking (both as a nutritive and as a comfort giving action) and on the manipulation of objects as guided by vision. They look at both of these systems in the light of structure and of their development. "Our progress," they say, "will be from mouth to hand rather than from hand to mouth."

Experiments were reported on the relation of sucking to eye function. With regard to eye-hand voluntary control, the authors pointed out that

> "The beginning of skill is diffusely organized awkwardness guided by a small number of directional specifications...Diffuse awkwardness is then transplanted with stiff awkwardness...fingers are now spread wide open, elbow rigid. The midline becomes dominant...The system gets stiff, but it gets vastly more effective."
>
> (Ibid.)

The experiments included the analysis of a seven month old child coping with the use of a cup for the first time. This analysis was

done using sequences filmed at 50 frames per second, a speed which allowed for careful study. The child's behavior appeared to the investigators "more playful than purposeful." They explain,

> "In play, ends are altered to suit means, rather than means being altered to achieve an end held constant, as in problem-solving."
>
> (Ibid.)

They find Thorndike's theory of behavior shaping by trial and error "surely an adult-centered view."

> "Trial and error implies the capacity to hold an end constant while varying means. The segments in which this is possible are very short in duration for the child. What thwarts him is distraction, not error."
>
> (Ibid.)

A general theoretical philosophy regarding development has taken on a definitive shape by this time, and the authors spell this out quite clearly in the conclusive portion of this paper. They contrast their view with those of Skinner and Piaget:

> "...Skinner attributes such order as there is to control of behavior by orderly stimuli in the world. Piaget sees more order than Skinner, so he attributes it to the inherent logical structures of mind, accommodating only slightly to the lessons of the environment. Skinner's solution has some of the monotony of nature. But it is much more fortuitous than nature could afford to be. The generativeness in behavior that makes it economical vanishes at Skinner's touch, even from language. With Piaget, it is the opposite. The order and generativeness are all there from the start, like the shape of the mollusk, ready to eat so long as nutriment enters the system."

Using Skinner as a foil for the expression of Brunerian theoretical notions is not new; we will see it again in a few years in the Herbert Spencer Lecture. The oblique reference to Piaget's early expertise in the study of mollusks gives an added dimension to this critique of his ideas, leaving the reader with a faint smile, whether or not he is in agreement with the authors Bruner, at their cleverness with the sworded word.

The authors continue,

> "We have no complaint either against universality in human intellectual functioning, or against the shaping power of the environment. But we do have a complaint about theories that opt for internal universality in surfeit or for environmental shaping as the mold for such uniformity. Human beings are the most awkward species on earth, the most uneven in development, the most beset by obstacles that are not intrinsic to the task. We urge a new functional analysis of what it takes to grow up intelligent, a job description for growing up."
>
> (Ibid.)

The authors pose the questions central to these issues:

> "How do strategies for coping with complexity develop? How are limited resources used for achieving goals the means to which vary? How do we sustain action over sufficiently long trains of striving? How do we recognize (when we do) invariant features of events so that we are not constantly ensnared in learning? We suggest we proceed not with a bang, not with a whimper, but with a good close look."
>
> (Ibid.)

In 1967, Bruner wrote "Processes in Growth in Infancy" for the CIBA Foundation - CASDS Study Group in London, which was later published as a part of the proceedings entitled, Stimulation in Early Infancy (Bruner, 1969g). (If one notes a certain familiar ring in the title of this presentation, it is because the Heinz Werner Lecture Series presentation was similarly entitled, "Processes of Cognitive Growth in Infancy.")

The following year, the CIBA Foundation - CASDS Study Group met again in London (November, 1968); here Bruner contributed what he considers to be a "turning point" paper: "The Growth and Structure of Skill." The paper not only appeared in the Proceedings of the study group, which was entitled, Mechanisms of Motor Skill in Development (K. J. Connolly, editor, 1970), but in Beyond the Information Given, edited by Anglin, at a later date (Anglin, 1972).

"The Growth and Structure of Skill" (Bruner, 1970a) has to do with the development of eye skills (especially tracking), hand skills, and hand/eye combination skills. Bruner explains his purpose:

> "I should like to explore what it is that may be species-specific about human sensorimotor skill. My eventual hope is to understand how human skill eventuates in human tool use...There is simply no adequate literature on skill development in infancy, and such as there is tends in the main to be concerned with the achievement of norms rather than with the close description of behavior, whether a norm is achieved or not."
>
> (Bruner, 1970a)

After considerable discussion of theoretical views and the literature related to the issues addressed, such as existed, Bruner described several experiments. In one, a toy was given to the youngster (aged somewhere between four and seventeen months) in one hand, then when it had been ascertained that the infant had the toy in possession, another was offered on the same side as the toy being held. If the child had not taken the toy after 15 or 20 seconds, that second toy was moved to the midline of the child. If the child took that toy, a third was offered and, if that was taken, a fourth. The four to five month old, if they could manage to take possession of one toy, were generally not able to cope with more, though the child might drop the first toy when attention was taken to another. Most often, the baby would take the toy to his mouth at four to five months, a behavior which decreased to almost never occurring by the time the child was fifteen to seventeen months old. During the same period the ability of the infant to "store" the toy developed, that is, he could put the object in his lap or on the arm of the chair progressively more often and more effectively as he grew older.

Another experiment was reported where the child, this time aged from six months through seventeen months, needed to use one hand to hold back a lid while using another to pick up a toy. As one might expect, the ability to accomplish this task improved with age, and the banging at the lid rather than opening it decreased accordingly. Various approaches to the problem were reported.

Data were presented on experiments where the infant had to reach around a screen, which Bruner called "detour reaching," and, of course, the ability improved with age.

In the last experiment reported, the baby, aged ten days to five months, was placed in the specially designed chair that supported him comfortably, in front of two side by side windows. A jeweled ball would be placed at timed intervals in each window, and the baby's visual activity was carefully monitored and recorded.

Bruner suggests,

> "...the management of skill may be considered as the first realization or embodiment of programs that will be used throughout the life of the organisms, not only for mastery of skilled tasks, but also for problem solving of a kind not usually thought of as skill in the bodily sense. Indeed, the proof of the matter is that, from the infant's perspective, it is difficult to say whether the tasks reported in these pages were instances of skill or of problem solving. Perhaps we would do well in the future to explore wherein they are identical, and what makes them separate. I cannot believe that is suffices to argue simply that thought is action internalized or rendered into symbolic form. The task, rather, is to explore the range of development from the attainment of skill in action to the attainment of acumen; in problem solving, to explore in detail the kinship between them and the discontinuities as well. I believe that the skill of the hand, given its place in evolutionary history, may provide the ideal vehicle for such a voyage of exploration."
>
> (Ibid.)

In this report, Bruner speaks also of 'intention' in the cognitive structure, and of the crucial issue in its regulation as being the comparison of the intention with the result, and the use of the difference as a basis for correction. He also refers to the "modular act."

> "It is when modularization is achieved and the act becomes smoothly organized that it goes through a process of being incorporated into new, more inclusive, and more complex serial patterns."
>
> (Ibid.)

He asks why modularization is so essential, and answers for the reader:

> "I believe it is a matter of attentional capacity. Prior to modularization, an act simply takes up all available attention...Once attention is freed, then a new pattern emerges."
>
> (Ibid.)

The research Bruner is doing with infants is more generally oriented toward experimental measurement than work he has done in many years; we have, in fact, to return to the period of Bruner's work on perception to find this kind of analysis and synthesis. The right hand, it would seem, has retained its function.

As we will see, Bruner was publishing steadily as ever during this period. He wrote a foreword to T. B. Brazelton's Infants and Mothers (Bruner, 1969b), and in Studies in Cognitive Development: Essays in Honor of Jean Piaget, Bruner published "Eye, Hand and Mind" (Bruner, 1969a). Here Bruner speaks of "reach, grasp, retrieve, mouth" activity pattern of the infant as he develops the capacities for each behavior. He tells us

> "An infant's visually guided prehensile career starts in the service of hand to mouth operations and gradually acquires a freedom for use in a variety of contexts that the environment has to offer."
>
> (Bruner, 1969b)

In Psychology Today, Bruner published "Up from Helplessness" (Bruner, 1969h), in which he presented the concept that

> "...the infant's behavior is intelligent, adaptive and flexible from the outset."
>
> (Bruner, 1969h)

and said, in more laymanesque terms, what he had said in his recent articles on infant development.

That Jerome Bruner spent a lot of time and energy with small humans in the late 1960's is clear; still, that was not all in which he was engaged, as we shall see in the next chapter.

REVOLUTION AND EVOLUTION: MAN IS NOT A NAKED APE

Nineteen hundred sixty eight was a year of mini skirts, the reading of the first chapter of Genesis by American astronauts while in orbit around the moon, riots, the deaths of national leaders, Joe Namath winning with the Jets, the film "The Graduate," and the invasion of Czechoslovakia. George Miller was President of the American Psychological Association. A woman carried a torch to the Olympics in Mexico City, and American winners, black gloved fists held aloft, bowed their heads during their national anthem. They were dismissed from the team and sent home. Jacqueline Kennedy decided to marry Greek shipping magnate Onassis. The Viet Nam war was TV fare during the dinner hour, the inhuman horrors played out in living color for small children to drink in with their evening milk.

Martin Luther King was killed in Memphis; Robert Kennedy was shot in Los Angeles, his wife, pregnant with their last child, beside him. A nation not yet recovered from the death of his brother stared in disbelief at more dying living color.

Eugene McCarthy won 42% of the vote in the New Hampshire Democratic primary elections, and Johnson announced he would not run for presidential office again. Governor Wallace of Alabama formed a new party, christened the American Independent Party, and threatened to split the electoral vote. The Republican Convention in Miami selected Richard Nixon and Spriro Agnew to the tune of riots costing three lives and involving 250 arrests. In Chicago, Mayor Daley shouted obsenities on camera but not on sound as the streets of the city filled with Yippees, 12,000 police, and 5,000 National

Guard and Army. Dan Rather, CBS News correspondent, found himself on the floor of the Convention Hall, having been summarily socked by an ostensible protector of the people. Humphrey and Muskie were nominated by the Democrats. In the end, Richard Nixon was elected President of the United States with 43.6% of the vote to Hubert Humphrey's 43.2%. To say that Jerome Bruner did not concur with the expressed will of this narrow majority would be to put it too lightly.

The late sixties saw the increase of citizen political activism, a sometimes civil, sometimes most uncivil disobedience, a growing consciousness and conscience about the involvement of the United States in Viet Nam, Cambodia and Laos, and a growing antipathy to participation. The universities were filled with angry and frustrated young people, unwilling to accept as their own the war they found they were required to fight and, in a state of apparently unrecognized dissonance, hostile at the materialistic and affluent society which, paradoxically, had brought them to the opportunity for education. It was this same affluent society which tolerated incredible poverty and enormous social injustice.

Liberalism was not enough; progressive efforts toward improvement of the society were too slow and too unequal for this generation. Their rebellion was revolutionary. The system, they argued, was rotten through and through, and needed to be overthown. The idea of free speech was interpreted to mean the more foul the curse, the more liberated the speech, and that the freedom for profanity was the basic meaning of the first amendment to the Constitution. Or at least so it seemed.

This was a generation with enormous need for tolerance of their activities, and a very short supply of tolerance for anyone who did not

agree to the word, however inconsistent that word might be. It was a generation full of energy and short of fuse, a trying combination to those who had for years been pressing steadily for societal reform and who, though they had accomplished nothing perfect, had made a considerable and standing improvement.

The movements that spread through the universities were a sort of organized anarchy. On the positive side, there was a growing caring about the environment, a concern for the fundamental necessities of clean air and water and uncontaminated food, and a caring for its inhabitants as there was a growing awareness of endangered species: eagles, whales, and, of course, man. It was a time of consciousness raising.

This was, in short, a generation with character. It was a character, however, that did not communicate easily with its elders, and especially the likes of Jerome Bruner and others like him who had played progressive and liberal roles in the society for many years. The support of the causes Bruner and his colleagues deemed reasonable among those proposed by the young activists was often obviated by the young because it lacked the proper tone of rebellious, anarchical commitment.

As each generation, in its time, learns, it is characteristic of the human condition that we blame the generation before us for the mess in which they left the world; we become more thoughtful only when we perceive that we have found the changing more difficult than we anticipated, and that we, indeed, are doing little better.

Bruner, too, was frustrated by the inadequacies of the "system." He was disappointed in the waning support by the government of the Headstart program, which he helped to create. He was, as we shall see in the next

chapter, aware of the deprivations in cognitive development suffered by children and imposed by deep poverty. And withal that Jerome Bruner still believed in the rule of law and in rationality, such as circumstances in the late 1960's afforded, he was one of few faculty members at Harvard who was able to negotiate between the antagonists during the Harvard "bust." It was a trying time, and rationality was not the order of the day on either side of the confrontation.

It must have been a disheartened Jerome Bruner who went about his work during this period. Still his publications continued to appear.

In 1968, Bruner wrote two forewords for books: one to the English translation of his good friend A. A. Luria's The Mind of a Mnemonist (Bruner, 1968b), and the other to M. R. Wescott's Toward a Contemporary Psychology of Intuition (Bruner, 1968c). He also did a review of Jean Piaget's Six Psychological Studies (1968e), in which Bruner discusses his high regard for Piaget. After comments about Piaget's forty years of work in Geneva, Bruner remarks,

> "For Piaget is only incidentally a psychologist. His trade, as he would put it, is that of genetic epistemologist who investigates philosophical issues by the empirical study of the growth of the mind...He has made a profound mark on modern psychology by refocusing attention on man's sources of rationality, on the processes by which he achieves that rationality, and by showing how human intelligence at all levels of development can be described precisely and rigorously in terms of the underlying logic of action through which intelligence expresses itself."
>
> (Bruner, 1968e)

In contrasting the contributions of Freud and Piaget, Bruner says,

> "Freud made us sensible to the continuity that exists in the development of man's desires and passions and brought down the ancient notion of childish innocence. Piaget, for his part, has established the deep continuity that exists from birth to maturity

in human rationality. If Freud stimulated in our culture an understanding respect for the sufferings and malaise of childhood, Piaget has surely stimulated a comparable respect for the intellectual yearnings and confusions of the growing mind."

(Ibid.)

Though in this author's view, the concept of "sources of rationality" is central to Jerome Bruner's life, this is the first time I have seen that particular phrase in his writing. It is of interest that it appears in reference to Piaget and to his work.

For the Saturday Review, Bruner wrote "Culture, Politics and Pedagogy" (1968a); it later appeared in The Relevance of Education. In it, Bruner tells his readers that there is no clearly defined and widely accepted theory of education, and goes on to note that a pedagogical kind of theory is different from the "usual type of scientific theory."

"A theory of instruction is a political theory in the proper sense that it derives from consensus concerning the distribution of power within the society — who shall be educated and to fulfill what roles?"

(Bruner, 1968a)

and he supports this contention by remarking on the different and often political uses to which the book Process of Education had been put in the various countries into whose language it had been translated. There is a distinct change in Bruner's approach to education in his writings; the winds of politics, the children of which we shall see in the next chapter, are not unconnected to this quieter approach. Bruner is convinced "the entire intellectual community must have a role in education;" and he supports the role of the theory:

"Knowledge, to be useful, must be compact, accessible, and manipulable. Theory is the form that has these properties. It should be the aim of our teaching."

(Ibid.)

Still, he insists that

> "...even if a pedagogical theory is correct, relevant, and manageable, it may be practically ineffective when it fails to relate to the urgencies of a society."
>
> (Ibid.)

Bruner proceeds to describe why theories tend often to be ineffective, and argues that we need to emphasize certain creative areas in our teaching, including, among others, research, development, art, and the supportive roles. "How," he asks, " can the power and substance of a culture be translated into an instructional form?" And he answers, in part, in the concluding paragraph of the article:

> "...one of the most crucial ways in which a culture provides aid in intellectual growth is through a dialogue between the more experienced and the less experienced, providing a means for the internalization of dialogue in thought. The courtesy of conversation may be the major ingredient in the courtesy of teaching."
>
> (Ibid.)

There were sad notes during these years. There was a personal loss to Jerome Bruner and a significant loss to psychology generally in the death of two extraordinary men: Gordon Allport and E. G. Boring. Bruner published a memorial note on Gordon Allport's life in the American Journal of Psychology in 1968, "Gordon Allport: 1897 - 1967" (Bruner, 1968f). Bruner reminisced about the meetings of what he addressed as "The Group Mind."

> "...the monthly research discussions of Allport's graduate students plus such visiting fellows as might attend, where one would report on work in progress and afterward consume doughnuts and cider. The conversation was lively, learned, and extraordinarily fair minded — a reflection of Allport's genuinely eclectic spirit."
>
> (Bruner, 1968f)

In 1977, Bruner spoke of his early mentor,

> *"Gordon Allport thought all that work in A Study of Thinking was kind of fooling around with little nonsenses while the world was burning ...maybe he was right...but on the other hand, Gordon Allport was the one who early on encouraged me to take a crack at things outside the regular domain..."*

"Edwin Garrigues Boring, Memorial Minute Adopted by the Faculty of Arts and Sciences, Harvard University, January 14, 1969" was carried in the Harvard University Gazette (Bruner, Herrnstein, Newman, Skinner, and Stevens, 1969). The loss of this revered psychologist and historian of psychology was one more sign of a changing era at Harvard.

> *"I was very close to Gary Boring. We had a very close personal relationship...we could talk about anything. I could always count on his Quaker honesty coming through, and we respected each other tremendously, and battled about different points of view...I've never seen Gary Boring have a shoddy idea..."*

The authors of the "Memorial Minute" express well the place Edwin Boring has in the annals of psychology:

> "By writing its history, Boring became the curator of continuity in psychology, giving its students a sense of the structured past and an appreciation of how the past created the present. The effectiveness of his writing made Boring not only the chronicler, but also the historical conscience of psychology."
>
> (Bruner, et al., 1969)

The joyous, intense, unique Harvard of Jerome Bruner's youth was now forever gone. It is sometimes a great pity that none of us can go home again.

For the Phi Beta Kappa Lecture at Rockefeller University in 1969, Bruner presented "The Psychobiology of Pedagogy," which he published finally "...with a certain reluctance" in The Relevance of Education

(1971a:118-131). Bruner says of this essay in his introduction to it that it is a "curious" one

> "...in which, plainly, the author is caught between trying to understand man biologically as a culture using organism, and at the same time trying to understand him as a product of the very culture he creates as external to himself."
>
> (Bruner, 1971a:118-131)

Bruner further develops this concept in the essay,

> "Man not only creates his own environment, but in so doing eventually presides over the programming and realization of his own evolution — however inadvertent and stumbling he may be about it.
>
> "How one manages to time the steps in pedagogy to match unfolding capacities, how one manages to instruct without making the learner dependent, and how one manages to do both of these while keeping alive zest for further learning — these are very complicated questions that do not yield easy answers."
>
> (Ibid.)

Bruner notes the need to develop strategies to cope with information based on the limitations of the processing of that information by the nervous system. We see here a familiar theme repeated.

> "Theories, models, myths, cause and effect accounts, ways of looking and seeing as well as thinking are probably <u>the</u> prime prosthetic devices for assisting nervous systems beyond their naked limits... theories quickly become the valued property of a culture, constantly undergoing revision and often refinement toward greater abstraction as they find more compact restatement in the arts and in myth as well as in the formalism of science."
>
> (Ibid.)

Bruner insists that

> "Man is not a naked ape but a culture-clothed human being, hopelessly ineffective without the prosthesis provided by culture."
>
> (Ibid.)

Bruner still sustains this conviction; in 1977, when speaking of the sources of rationality, he said

*"...there are things like strategies, things like perceptual selectivity...they are all a part of it. I'm absolutely committed to the idea that man is not a naked ape..."*

Bruner concluded the essay on "The Psychobiology of Pedagogy" saying of man,

> "The very nature of his characteristics as a species provides a guide to appropriate pedagogy, and the nature of his nervous system and its constraints provides a basis for devising reasonable if not inevitable principles for designing a testable pedagogy."
>
> (Bruner, 1971:118-131)

Bruner wrote a chapter called "Modalities of Memory" in The Pathology of Memory, edited by Talland and Waugh (Bruner, 1969c), "The Nature of Learning in Childhood" (Bruner, 1969d) for the 25th Anniversary Issue of Rehovot for the Weizmann Institute of Science in Israel, and he presented "The Origins of Problem Solving Strategies in Skill Acquisition" (Bruner, 1969e) at the 19th International Congress of Psychology in London in July of 1969.

"Modalities of Memory" came to be actually through Bruner's participation in a symposium, and the book in which it became a chapter was evidently a form of Proceedings. In it, Bruner notes that it is necessary to make a distinction between

> "...what may be called memory with record, where specific events are recoverable, and memory without record, in which encounters are converted into some process that changes the nature of the organism, changes his skills, or changes the rules by which he operates but which are virtually inaccessible in memory as specific encounters. The person who learns to play tennis with great expertness cannot give you a specific set of instances that led to the perfection of an aggressive backhand."
>
> (Bruner, 1969c)

In discussing "storage without record," and the development of skill, he says

> "I rather suspect that it is the enactive representations of specific instances that become converted into generative skills of the kind we were considering."
>
> (Ibid)

and he refers also to spatio-temporal schema, that is, "one's working image of a room, a city, or a cockpit," and to the storage of rules as a form of generalizing.

In 1969, Bruner was a recipient of the Joint Award of the American Editorial Research Association and the American Editorial Publisher's Institute. (Was this award given, one might wonder, for Jerome Bruner's proclivity for keeping publishers busy?) Bruner was also awarded several honorary degrees: one from the University of New Brunswick, one from Northern Michigan University, and one from his alma mater, Duke.

In the summer of this year, Bruner attended a meeting convened by the Nobel Prize Foundation intended to bring together scholars, scientists, and a panel of university students. "Reason, Prejudice and Intuition" (Bruner 1970c) was published in the conference proceedings, a book entitled, The Place of Value in a World of Facts: Nobel Symposium 14.

Still continuing at his incredible pace, Bruner, in late 1969, prepared "The Relevance of Skill or the Skill of Relevance" (Bruner, 1971a:108-117) for presentation at the Encyclopedia Britanica's symposium in London, "Education in the '70's;" the paper also appeared in the Saturday Review in April, 1970, and in The Relevance of Education in 1971. Bruner speaks of this essay as having an emphasis as much "on doing as on knowing." "Good problems," he says, "are the chief vehicle for good

curricula." He also notes the importance of making the subject under study "ones own," that is, he sees "competence as the objective of education," and goal setting as mandatory to accomplish this end. He blames "wrongly focused theories of learning that lost sight of the forest of skilled competence for the trees of perfected performances" in part for the current confusion in educational practices.

> "...the exercise of skill is governed by an intention and feedback on the relation between what one has intended and what one has achieved thus far — 'knowledge of results.' Without it, the generativeness of skilled operations is lost."
>
> (Bruner, 1970a:108-117)

Bruner approaches relevance in education in both social and personal arenas.

> "Relevance, in either of its senses, depends upon what you know that permits you to move toward goals you care about."
>
> (Ibid.)

He speaks again of knowledge as power and of the need for knowledge to be enactive and committed. He says,

> "Let the skills of problem solving be given a chance to develop on problems that have an inherent passion..."
>
> (Ibid.)

We heard this back in the paper on "Learning and Thinking" (Bruner, 1959d) published more than a decade before. The theme of passion in learning is one, it seems to this author, which was a preliminary stand of Bruner's discovered during the period of his new awareness of his own "lefthandedness." That is was retained in 1970 would indicate that this philosophy was well integrated into the thinking of the philosopically ambidextrous Jerome Bruner.

Bruner had other suggestions for the revision of pedagogy. He says,

> "...education must concentrate more on the unknown and the speculative, using the known and established as a basis for extrapolation."
>
> (Ibid.)

He notes that difficulties for the authoritarian instructor could easily ensue from this approach, the authority of the teacher as "knower" would be undermined, and the teacher would be a "seeker" right along with the student. And it is his contention that the process of education should be shared with the learner. He considers the individuality of learning when he reminds us the "reward of mastering something is mastery." Bruner would combine the best in our current school curricula and an experimental view. He says,

> "I have wanted to highlight the role of intention and goal directedness in learning and the acquisition of knowledge, and the conversion of skill into the management of one's own enterprises."
>
> (Ibid.)

He sums up the article with,

> "The objective is to produce skill in our citizens, skill in the achieving of goals of personal significance, and of assuring a society in which personal significance can still be possible."
>
> (Ibid.)

It is Bruner's contention that politics and pedagogy cannot be separated; surely this is a poltical as well as a pedagogical summary.

The year 1970 brought a Sabbatical Leave and, once again, London. It also brought an honorary D.Sc. from the University of Sheffield. Invitations to do prefaces and reviews were coming along now with increasing regularity; in 1970 there were two prefaces to books published: one, edited by J. Hellmuth, was Cognitive Studies, Volume I (Bruner 1970g),

and the other was to D. R. Olson's Cognitive Development: The Child's Acquisition of Diagonality (Bruner, 1970h). Contemporary Psychology published a review of Bruner's; it was of Ulric Neisser's Cognitive Psychology. Neisser, then a professor at Cornell, had graduated with his Ph.D. from Harvard. His book was one Bruner used as a text in classes and, he said, subjected it as well to "the scant mercies of a graduate seminar." (Bruner, 1970f)

N. H. Mackworth and Bruner published a paper Bruner considered to be of particular importance, "How Adults and Children Search and Recognize Pictures" (Mackworth and Bruner, 1970) in Human Development. In the experiments described, twenty young adults and twenty six year old children were shown series of pictures which were very blurred, somewhat blurry, or sharp, and the eye fixations of the subjects were recorded as each tried to decipher what it was at which he was looking. The data tell us that adult fixation times increased 40% when it was necessary to understand what the blurred displays were over the fixation when the subject was just looking over the picture.

> "The aims of the present study were to determine the nature of the visual selection during the process of trying to identify pictures, and how it changes with age."
>
> (Mackworth and Bruner, 1970)

Though fixations were longest for all and the gaze was most concentrated in the most blurred pictures, if the subject knew the picture would be blurred beforehand, the fixation times were less. There were considerable differences between children and adults. Concentration was less area-specific for chidlren, and the areas of concentration were less informative. Track lengths were shorter for children, and there were

twice as many trackings during the first second of blurred displays.

> "The pattern of looking...partly depends on the mental schemata that the organism has established...looking is not the same as perceiving. The sensory input is but one set of threads in the whole rich fabric of thought. The brain itself must supply and weave the strands running in the other direction."
>
> (Ibid.)

Bruner's publications continued, showing little sign of the effects on him of the turmoil of events during these years. Bit by bit, however, Bruner appears to have been growing apart from Harvard. A distance between him and his graduate students, born of the times; the deaths of Gordon Allport and of Edwin Boring; an administration at Harvard which apparently did not keep touch with its faculty and its students; the election of Richard Nixon to the White House — all these had an effect which appears to be collective on Bruner. As to the tenor of the times, Bruner mused on his outlook on societal structure (or lack of structure) and the place of the individual in the scheme of things. When asked about his "guiding myths" he replied,

> *"They tend to be made up of an enormous amount of concern with the recognition of individual dignity...the feeling somehow that each individual has got to be an end in himself...it is a very powerful notion.*
>
> *"I was very impressed in my freshman year of college with the Quaker belief of God being embodied in each individual...the idea that killing another man was killing God."*

Bruner went on to say,

> *"Life is impossible unless you accept certain underlying principles ...I see the law as a kind of surface manifestation or a surface realization of some sort of a deep structure of agreed upon morality, not just agreed upon for convenience. Somebody can say, 'Yes, but if you take the view ...that its all a big con game to keep people exploited...' then I say it may very well be a con game to keep people exploited, but the moment you say that the con game has no*

*correction factor for people to emerge and present their view and form a new, coherent, underlying set of values and structures and rules for society; the moment you say you can't do that, then we are not playing the same game, because what you are doing is tearing my society apart, and I'll protect it and die for it."*

Bruner spoke of a concept which

*"has troubled me very deeply about America...everybody's doing their own thing...I just don't think societies work that way. I deeply believe in the notion of responsbility to some sort of basic axioms as to what you're going to cooperate by...what set of rules...I tend to be quite stern on the subject...otherwise the world will fall into a state of anarchy which may very well be what one wants. But if you get anarchy, you should get it because you want it, not because you slipped into it for lack of concern."*

For a man with these convictions, especially one engaged in academe, the years of the late 1960's and early 1970's must have been most trying. And among the most trying things about those years were the engagements of politics with poverty.

POVERTY AND POLITICS

Jerome Bruner was highly involved with the creation of the Headstart Program, a pre-school educational supplement designed to do just what it sounds like...to give a head start to children deprived by virtue of poverty and its culture from beginning school life on an even footing with his middle class American peer. A good deal of the staffing for Headstart was volunteered, the program was largely dependent upon community participation. Though the parents of children involved in the program appeared, in a more than 80% majority, to believe their children were being helped, the organization of Headstart had been quickly implemented (possibly with enthusiasm outweighing planning), and a highly influential evaluation, the Westinghouse Report, proved damning. The Headstart Program, begun during a Democratic administration, almost fell victim to the Nixon Administration[1]. The disappointment was deep.

Bruner had seen the difficulty of change in the lives of very young children of the ghettos and of poverty level communities; in his view, change was mandatory if such children were to get a fair shake educationally. Though Bruner was convinced that extremism was not the answer, he was also convinced that a solid political block, steady and clear sighted, was needed to move the political system.

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[1] Gertrude Harmon, LVN, who has worked with Headstart in Los Angeles for eight years, tells me that the program is alive and well, and that it is functioning with 14 agencies in California alone. In the Los Angeles Agency in 1978, there are ten schools involved, in which are conducted a total of 21 classes (Personal Communication, Gertrude Harmon, 1978).

In 1969, Bruner was a member of the White House Panel on Educational Research and Development, and a Director for the J. F. Kennedy Center for Research on Human Development.

In December, 1969, the American Association for the Advancement of Science sponsored a Symposium on Education of the Infant and Young Child in Boston, Massachusetts. In the Proceedings of this symposium, Bruner published "Discussion: Infant Education as Viewed by a Psychologist" (Bruner, 1970e). He was asked to prepare a summary of reports on major programs of intervention. In his paper, "Poverty and Childhood" (Bruner, 1971a:132-161), Bruner tells of of several themes he found common to the reports in this conference (Ibid, p. 156). For example, the enormous influence of the mother, or whoever was the "day-to-day caretaker," was made clear. Bruner noted "She had to be worked with, not compensated for." Other prominent themes included the small "step-wise" quality of development of competence, the involvement with cognitive development of such related factors as "confidence, the capacity to control one's environment, hope in the future, and the like," the need to help the child to be "on his own," and, finally, the wide range of possible intervention programs, "the provision for success being that they produce opportunities for mother and child to carry out activities that have some structure to them." This reaffirmation of themes which consider the child's relationship with his parent(s) and his general environment as essentially influential in his development emphasizes the difference between the culture of the middle class (if there is one such) and that of the poor: the middle class parent has, as a rule, some consciousness of the parental role whereas, as we will see in some of Bruner's papers, the parent in poverty is much less likely to have this insight.

In his preface to The Relevance of Education, Bruner says of the essay, "Poverty and Childhood," that it

> "...was prepared in 1970 when I was on sabbatical leave, presumably working on theories of motor development in early infancy. I did work on that topic but I could not do so for long during that troubled year with much conviction. I wrote the essay in London and it was given at the Inglis Lecture at Harvard. Another version was presented on the occasion of receiving the Annual Award of the Merrill-Palmer Institute in Detroit."[2]
>
> (Bruner, 1971a)

"Poverty and Childhood" is indicative of a changed Brunerian approach to education. He had lost his innocence in the arena of political accomplishment for educational purposes. It was no doubt a painful maturing for a man whose goal is the sources of rationality to have found again (in his own spiral curriculum) that man, when it is most incumbent on him to behave rationally, does not. And so it is with education in the United States. Surely, Bruner must have thought, if you give society a better way to educate its young, it will do it that way. Headstart was a rich beginning; the Westinghouse Report and the Nixon Administration all but killed the program.

There is another matter, a point of my own conjecture about this paper on poverty and about Jerome Bruner's response to a real exposure to the poor. Jerome Bruner, never mind his denial of pain, is a kind human being. He is not a totally insensitive sort, nor is he an "ivory tower" academic. But poverty had not ever been his personal millieu. When he studied the poor and their children, he saw things that made no sense to kind and rational humanity. Bruner as an infant had struggled through his own

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[2] The Merrill Palmer Award was presented to Jerome Bruner in 1970.

blindness, and later he had occasion to support others through illnesses and, on at least one occasion, through death. But we can presume that he had never seen anything like the hopelessness and desolation of the forever poor. It is my speculation that it was the impact of the realization of the degradation of poverty that modified his writing thereafter in any area which he perceived to touch on such poverty, and specifically in the area of education. I think Jerome Bruner was shocked by the realities of poverty, and I think he was even more shocked that he, so thorough in his research of each subject he undertakes, had not seen it clearly before. Bruner, we remember, had early on done a paper on comparison of children who were well off with children who were from poorer neighborhoods in their perceptions of the sizes of coins; here perception was the issue, not poverty. One does not have any sense in the paper on coin comparison of any reality of poor-ness.

In his work with "Man, A Course of Study," Bruner had been able to effect some powerful changes in his own personal environment in education, that is, within an upper middle class group, through a difference in pedagogical approach. But his efforts against pre-school poverty were a drop in the bucket; in the main, he found himself in an arena in which he was powerless. Reason was not effective. He could not turn society "around on itself;" it would not partake of the spiral curriculum and it would not learn by its own errors. Bruner could, however, advocate that society <u>attend</u> to its own needs, and in "Poverty and Childhood" (Bruner 1970b) did exactly that. In introducing the paper he says,

"The focus will be upon the manner in which social and cultural background affects upbringing and thereby affects intellectual functioning. Within that wide compass, I shall limit myself further by concentrating principally upon the impact of poverty and dispossession.

"...the charge has been made...that educational and socializing practice, before the school years as after, reflects and reinforces the inequities of a class system. This it does by limiting access to knowledge for the poor while facilitating it for those better off. The charge is even more serious: that our practice of education, both in and out of school, assures uneven distribution not only of knowledge but also of competence to profit from knowledge. It does so by limiting and starving the capabilities of the children of the poor by leading them into failure until they are convinced that it is not worth their while to think about school-like things."

(Bruner, 1970b)

This sounds, does it not, like the days of Dickens, like the class structure of 18th and 19th century England. But it is 20th Century America of which Bruner speaks, and the sources of the accusations he presents are not just the New Left, but Royal Commissions and advisers to presidents as well. The faces and the technologies of the societies differ widely, but the wearying stratification due to poverty is distressingly similar between Dicken's England and our present United States with respect to the effect on the character of opportunity.

Bruner explains the sociological implications of this breach:

"Bloom's (1964)[3] careful and well-known work strongly suggests that a very major proportion of the variance in adult intellectual achievement, measured by a wide variety of procedures, is already accounted for by the time the child reaches the usual school-starting age of five...there are enough studies to indicate...that certain possibly critical emotional, linguistic, and cognitive patterns associated with social background are already present by age three."

(Ibid.)

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[3] Bruner refers here to B. S. Bloom's 1964 book, Stability and Change in Human Characteristics (Wiley, New York).

Bruner sets the tasks of the paper: to examine "the effects of poverty on child development in our contemporary Western culture," and "what it is that poverty and its attendant sense of powerlessness may do to the pattern of growth in children." The emphasis on powerlessness is significant, I believe, to Bruner's particular way of looking at poverty; we sense, by the time we finish reviewing this paper, that this is one sense in which Jerome Bruner can identify with the poor. He is powerless to do anything about poverty and its devastating effects, just as powerless as are the poor themselves. Bruner includes in the tasks of the paper the assessment of theories of development in the light of the impact of culture, and particularly of poverty, on growth, as well as the examination of the implications of these findings for "public policy and for the conduct of early education."

> "Most of the work that compares children from different socio-economic backgrounds points to three interconnected influences associated with poverty. The first relates to the opportunity for the encouragement of, and the management of goal seeking and problem solving; it reflects differences in the degree to which one feels powerless or powerful, and in the realisitic expectation of reward for effort. What the child strives for, how he goes about the task of means-end analysis, his expectations of success and failure, his approach to the delay of gratification, his pacing of goal setting — these are not only crucial but they also affect how he uses language, deploys attention, processes information, and so on. The second influence is linguistic: by exposure to many situations and through the application of many demands, children come to use language in different ways, particularly as an instrument of thought, of social control and interaction, of planning, and the like. The third influence comes from the pattern of reciprocity into which the child moves, whether middle class or poor and dispossessed. What parents expect, what teachers demand, what peers anticipate — all of these operate to shape outlook and approach in the young. We must consider each of these in turn."
>
> (Ibid.)

Bruner refers to Hess's 1969 study of the relation between maternal variables and the development of intelligence (see Hess and Shipman, 1965,

Hess and Shipman, 1968, and R. D. Hess, et al., 1969). Bruner notes that these studies

> "show that the more a mother feels externally controlled when her child is four years old, the more likely the child is to have a low I.Q. and a poor academic record at age six or seven."
>
> (Ibid.)

Bruner reports the work of other investigators, and the sum is a considerable difference in the relationship between poverty and middle class mothers and their children. Briefly, it appears that middle class mothers are, in general, much "more attentive to the flow of goal directed action." They allow the child more autonomy with regard to pace and decisions, are less intrusive as the child solves problems, and ask questions that will help the child in his search for clues and for answers. The middle class parent tends as well to attend more to the task than to the individual parts of the task, and is more positively reinforcing, that is, praising success and giving less attention to failure than would the poorer counterpart. And, Bruner says, "the evidence points to a magnification of (the effects of poverty) when poverty moves to the city."

Bruner, referring to the work of Helen Bee and her colleagues (Bee, et al., 1969), as well as that of Hess and Shipman (1965), explains that middle class mothers ask questions in verbalizing with their children, where poorer mothers tend to demand and command, and to make evaluative statements.

> "In lower class discourse, mothers more often order, or plead, or complain, than set up a problem or give feedback...What is most lacking in the less-advantaged mother's use of language is analysis-synthesis: the dissection of relevant features in a task and their appropirate recombinations in terms of connection, cause-and effect, and so on."
>
> (Ibid.)

With regard to the manner in which the poorer mother uses language as against the manner in which the more advantaged mother speaks, Bruner notes,

> "Lower-class language, in contrast (to middle class language) is more affective and metaphoric than formal or analytic in its use, more given to narrative than to casual or generic form. It is more tied to place and affiliation, serving the interests of concrete familiarity rather than generality, more tied to finding than to seeking."
>
> (Ibid.)

Bruner sees the poor, not as "victims" of the system though, he says,

> "— they are, but so is everybody else in some way. It is rather that a set of values, a way of goal seeking, a way of dealing with means and ends become associated with poverty.
>
> "Being socio-economically disadvantaged is no simple matter of deficit, of suffering a cultural avitaminosis that can be dosed by suitable inputs of compensation...The setting is a neighborhood that has adapted itself often with much human bravura to 'being at the bottom,' with little by way of long range perspective or hope, often alienated by a sense of ethnic separation from the main culture."
>
> (Ibid.)

We see here the root of the sort of inner city in-group ethnicity that provides almost a pride in poverty, or at least the appearance thereof; and the maintenance of that pride appears to be dependent, in the observations of this author, not exceeding the expectations of one's peers. The maintenance of poverty then takes on a kind of aura of "this is the way it is supposed to be" with those better off becoming "the enemy." The child in this culture learns a different set of rules for survival than the child of the middle class, and he learns a different linguistic approach to life as well. Bruner states his philosophical view,

> "I am <u>not</u> arguing that middle-class culture is good for all or even good for the middle-class. Indeed, its denial of the problem of dispossession, poverty, and privilege make it contemptible in the eyes of even compassionate critics. Nor do I argue that the culture of the dispossessed is not rich and varied within its limits...But, in effect. insofar as a subculture represents a reaction to defeat and insofar as it is caught up by a sense of powerlessness, it suppresses the

> potential of those who grow up under its sway by discouraging problem solving. The source of powerlessness that such a subculture generates, no matter how moving its byproducts, produces instability in the society and unfulfilled promise in human beings."
>
> (Ibid.)

Bruner speaks of the need for pre-school care and the lack of its adequate provision, of Headstart and programs of intervention generally, and he speaks of theories of development, saying that one "that specifies nothing about intervention is blind to culture. One that specifies only intervention is blind to man's biological inheritance."

Bruner concludes this paper by explaining

> "Persistent poverty over generations creates a culture of survival. Goals are short range, restricted. The outsider and the outside are suspect. One stays inside and gets what one can. Beating the system takes the place of using the system.
>
> "The issue is certainly not cultural deprivation, to be handled, like avitaminosis, with a massive dose of compensatory enrichment...Rather the issue is to make it possible for the poor to gain a sense of their own power — through jobs, through community activation, through creating a sense of project in the future."
>
> (Ibid.)

I offer the reader an apology for the extensive quotation of "Poverty and Childhood," but I am convinced that this is among the most significant of Jerome Bruner's social commentaries, and it is one which lends itself less to evaluative narrative or to paraphrase than most of his work. I see Bruner here making a truly noble effort to be understanding and not in any way to take on the appearance of condescension; poverty is a problem of society, albeit a particularly complex one, which needs to be solved. And I see, as well, a man incredulous at the unwilliness of society to attack the problem. It is my personal opinion, not confirmed by Professor Bruner, that these studies and the work that he did to do

with the Headstart Program were sadly enlightening, and that these experiences effected a considerable change in Bruner's educational philosophy (perhaps his political philosophy as well) to such a degree, perhaps, that he turned his interests and his commitments away from education per se, preferring to spend more time with research in the development of language, an area which has application in the broader picture to social issues, but in which, generally, he would not have to suffer exposure to the frustration of irresolution and the discomfort of the face of poverty about which there was so little he could do. The sense I get at this period of Jerome Bruner's life is one of powerlessness. Perhaps, in part, it is because he uses the word so often in his description of the poor and the disadvantaged. He is, I get the impression, unable to cope with the radical political movements which are so willing to destroy an orderly society; he seems more than willing to see that society change, but he would much prefer it be through the system rather than by destroying the system. He is helpless to change administrations not to his liking, both in his academic surrounding and on the national scene. He cannot cram into the consciousness of enough of the powerful the need to incite a real war on poverty (to use what he terms President Lyndon Johnson's "bellicose" term), and so, it seems to me, he must sheath his sword and withdraw. To sense in Jerome Bruner during the early seventies a kind of powerlessness is not to indicate a sense of defeat; I am not sure that Jerome Bruner has any concept of that term. Rather, I see a predictable transition to more acceptable and viable environments: in his work, to language and the development involved therein; and that to be done soon at Oxford rather than Harvard, solving administrative difficulties on several counts (never mind the new ones to

emerge), and then, as we will discuss later, to the delightful pleasures of Ireland.

Though my conjecture is my own, I am certain it was influenced by Jerome Bruner's remarks to Elizabeth Hall in his interview with her as recorded in Psychology Today (Hall, 1970). He said to her,

> "My last six month's work on early education and social class convinces me that the educational system is in effect our way of maintaining a social class system in a group at the bottom...I think it is so bad that I'm ready to call a moritorium on the development of problem solving curricula for our more intelligent kids. Our warping of the children at the bottom is ever so much more urgent a problem. In times like this I get restive about being an academic or — as my son once put it rather angrily — 'one of those godamned Cambridge intellectuals.' At this point in history and perhaps at this time in my life, I am looking for the social intervention, however radical, that would make it possible for people to work together on our massive problems of poverty, urban live, learning to use technology effectively."
>
> (Hall, 1970)

"This time" in his life was 55 years of age for Jerome Bruner. He was finding it "extremely difficult to go on with science as usual." He suggested the re-examination of the role of the universtity in society, and noted,

> "You don't get immune from crises in your career just because you are reaching the mid fifties. In some ways they get more severe."
>
> (Ibid.)

Bruner, whose academic differences with B. F. Skinner are by now well known, makes some delightful and pointed comments touching on politics and pedagogy:

> "I delight in my colleague Fred Skinner because he is so candidly a political man. I seldom agree with his image of utopia but I admire his willingness to commit himself. I wish more of us would at least cut bait."
>
> (Ibid.)

and later in the interview, he says,

> "My chief worry about behavior modifiers is that they often forget that in life the very melee for the control of behavior guarantees a curious kind of freedom. Human beings learn from the consequences of their acts very quickly, and they can do comparison shopping among the consequences of different acts. So godspeed to those who create paradigms for learning based on isolated pigeons..."
>
> (Ibid.)

One notices (and we will again in the Herbert Spencer Lecture) a certain goodness of nature and humor that speaking of Skinner and his work brings out in Jerome Bruner; it is clear that there is no love lost between them, but Bruner, though critical of his colleague, is neither unkind nor ungenerous. Professor Skinner, conversely, during our interview in 1978, took on a tone of being rather more annoyed with "Jerry" and his charisma than charmed.

As to being a political person, Bruner says of himself,

> *"You see, I'm not by any means an apolitical person...because I think intuitively psychological theories have political consequences."*

In December, 1971, President Nixon vetoed the Child Development Act of 1971, and thus inspired Urie Bronfenbrenner and Jerome Bruner to publish, in the New York Times, an article entitled, "The President and the Children" (Bronfenbrenner and Bruner, 1972). Nixon presented as an alternative H.R. 1, a bill which the authors were convinced would not only break the family apart, but would force mothers of small children to work or off the welfare rolls. The authors said it was a "put-them-to-work-bill," not a child development bill. They quoted 1971 statistics stating that of all mothers of children under six, ten percent (1.3 million) were single parents, and that half of these mothers were working women; that there were nearly six

million preschool children whose mothers worked, and that one million of these were below the poverty line in income. The authors condemned Nixon for not responding to his own White House Conference on Children's recommendations, and their indignation was clear as they insisted that the Congress take some action. Another demonstration of the inability of one man or of a few to get response from their government on issues urgent to the well being of the country. The sense of helplessness was surely not unique to Bruner and his colleagues; it was the sense that pervaded the country. A sense that big business elected presidents, that multicorporations ran not only the country but probably the world, that big government was big brother, and that the individual accounted for little or nothing. The worth of the individual, the basis of the American Dream, was apparently diminishing in such proportions as to create the American Nightmare. And the poor, it began to be apparent, we have always with us.

I asked Professor Bruner in 1977 if he saw any solution then, several years after the time about which we have been writing, to the problems of the elimination of the results of poverty. He replied,

> *"Well I see the problem now more in terms of resistance to change, because I think we know perfectly well how profound a change you have to make in a society in order to make a group feel hopeful and it's a deep, deep change. And even how you make the small changes against the tremendous amount of resistance that exists, I don't really know."*

He went on to describe his current work in education with the Oxford Education Research Group, *"a sort of stimulating new look the Oxfordshire schools,"* and other activities in England, and that though he was keeping his hand in, so to speak, *"It isn't where my passion is."* He went on to say,

*"If you ask me whether this is what I would fight or die for, the answer is no. I mean if it were the only thing I had to do...I would do as much as I could, but I would rapidly start thinking about making a cruise to the Azores to take a look at the last of the whale fishing that's going on there...I'm not as public spirited as I used to be...I still do a lot..."*

And anyone who sees this man move about his daily schedule must agree that he still does a lot, both for benefit of education and of research. We do not, however, see him making that noble effort to change the world for the poor; it is a battlefield from which he has apparently withdrawn.

A HARVARD CHANGED -- A CHOICE TO BE MADE

Nathan Pusey[1] was Harvard's President during these years; he and Jerome Bruner did not get on well. A particular incident stands out. In the late 1960's, Jerome Kagan[2] and Jerome Bruner had established all the preliminary work (including funding of a joint federal and community nature) for a pilot daycare center in Cambridge. Since the community surrounding a college is not always delighted with students moving in for four or so years, voting, and otherwise making their mark on the town, and then not staying around to manage the results of their actions, it seemed a real accomplishment to set up this cooperative arrangement. It was one which would help both the community and the university. Nathan Pusey turned the project down. To add insult to injury, he simply refused to discuss the matter with Bruner. It was an action that did not help Harvard's standing in the community, and it certainly did not enhance Jerome Bruner's view of that particular Harvard administration.

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[1] Nathan Marsh Pusey (April 4, 1907- )
Pusey received his doctorate from Harvard in 1937. He succeeded James B. Conant as President of Harvard on October 13, 1953. He was Harvard's 24th president.

[2] Jerome Kagan is a child psychologist who received his Ph.D. from Yale. For an autobiographical study, see Jerome Kagan, "A Psychologist's Account Mid-Career" in T. S. Krawie (ed.), The Psychologists, Volume I:136-165, Oxford University Press, London, 1972. Kagan has published widely; of particular interest are Mussen, P. H., J. J. Conger and J. Kagan, Readings in Child Development and Personality, Second Edition, Harper and Row, New York, 1970, and Jerome Kagan's Understanding Children, Harcourt Brace Jovanovich, New York, 1971.

When the suggestion was made to Bruner that Pusey had overused his power in the Cambridge day care center incident, Bruner said,

> *"That wasn't because of administrative excess...it was a whole difference in values."*

Pusey's denial of the center, then, was simply *"an expression of that difference."*

We have seen in the past few chapters a progressive difference in Jerome Bruner's approach to education; he is now no longer committed to curricula per se as the vehicle for change in education, rather the underlying changes must be political, social and philsophical. Then there will be time enough for specific curriculum changes. Without the fundamental underlying changes there seems no possibility for a lasting change in approach to education through curricula.

Bruner's writing during this period is full of revisiting themes upon which he has concentrated recently; perhaps we must bear with a certain redundancy for the purpose of emphasis.

"The Process of Education Reconsidered" was presented at the 1971 Association for Supervision of Curriculum Development Conference in St. Louis, Missouri (March 6-10, 1971). It was published in a little booklet entitled, Dare To Care/Dare To Act: Racism and Education. Bruner recalls the Woods Hole Conference so many years ago, and The Process of Education.

> "At Woods Hole and after there was...great emphasis on active learning, poking into things yourself...rather than upon... passive consumption of knowledge..."
>
> (Bruner, 1971b)

Bruner noted that when The Process of Education was written, student motivation to learn was simply taken for granted; with current "disengagement," Bruner did not find it still to be the case.

> "By 1970, the concern was no longer to change schools from within by curriculum, but to refit them altogether to the needs of society, to change them as institutions. It is no longer reform but revolution that has come to challenge us.
>
> "A decade later, we realize that The Process of Education was the beginning of a revolution, and one cannot yet know how far it will go. Reform of curriculum is not enough. Reform of the school is probably not enough. The issue is one of man's capacity for creating a culture, society, and technology that not only feed him but keep him caring and belonging."
>
> (Ibid.)

The themes of powerlessness in poverty cultures, and the issues of problem solving and goal setting, of language and of expectations with regard to poverty were again put forward in Bruner's "Overview on Development and Day Care," which appeared as Chapter 3 in Grotberg's Day Care: Resources for Decisions (Bruner, 1971c) developed for the Office of Economic Opportunity (1971).

On March 30, 1971, Bruner presented "Competence in Infants" (Bruner, 1971d) at the Meeting of the Society for Research in Child Development in Minneapolis, Minnesota. (It was subsequently among those articles chosen by Jeremy Anglin for his book of Bruner's writings, Beyond the Information Given.) In "Competence in Infants," Bruner emphasized the themes of growth of competence in infants, of intention, of feedback (prior to, during, and after action), and patterns of action which mediate between intention and feedback. He notes five "competencies" of the first year of life: feeding, perceiving (or

attending), manipulating the world in certain ways, interacting with members of the species, and control of internal state. Bruner discusses the role of play in learning (we will see more of this), and the role of modeling. He also speaks of the difference in the way a child is communicated with, and the differences in expectancies, in a middle class home versus an economically depressed home. These are all issues that appear in other work of Bruner's; they are put together here in a manner that gives us a sense of the interrelatedness of many of Bruner's themes.

Michael Cole and Bruner wrote a paper published in the American Psychologist on "Cultural Differences and Inferences about Psychological Processes" (Cole and Bruner, 1971) in which they describe what they term the deficit theory. It is the theory that poverty (and the presumption is that minority communities are a part of the poverty picture) communities are disorganized, and that the disorganization produces such deficits as a missing father model, a deficit in mothering, a deficit in symbolism and linguistics, as well as in a number of other areas. Bruner refers to this as the "avitaminosis" approach, and he and Cole propose that no such deficit really exists in minority and/or poverty children.

> "The central thesis derives from a re-examination of the distinction between competence and performance...One must inquire, first, whether a competence is expressed in a particular situation and, second, what the significance of that situation is for the person's ability to cope with his own life in his own millieu."
>
> (Cole and Bruner, 1971)

The authors remind the reader,

> "In the present social context of the United States, the great power of the middle class has rendered differences into deficits because middle class behavior is the yardstick of success..."
>
> (Ibid.)

Bruner served on the Executive Council of the Developmental Sciences Trust, whose purpose it was to promote the growth of knowledge about the development of human behavior and the factors that influence it, to foster a multidisciplinary perspective on human nature, and to apply this information to the problems of humans, both in prevention of problems and in everyday coping. The Trust held a study group on the growth of competence jointly with Ciba Foundation in London in January, 1972. The Proceedings of that conference was published, along with additional papers, in 1974 under the title The Growth of Competence. It was edited by K. J. Connolly and Jerome Bruner. The group whose papers were recorded in this book consisted of fifteen scientists, most of whom were psychologists, who met for five days at the Ciba Foundation in London; the Carnegie Foundation in New York provided a grant so that all the participants could get to London. The editors noted that the concept of competence "is less a scientific notion than it is a social and educational one," and saw as one of the purposes in the publication of such a book as to to do with "the need to establish real links between basic scientific research and educational and social policy." When they speak of competence, the editors insist that they are talking about knowing how, rather than knowing that,

> "For competence implies action, changing the environment as well as adapting to the environment."
>
> (Connolly and Bruner, 1974)

Competence implied to these authors selecting appropriate features of the environment and forming a course of action, starting the sequences of activities, and making use of what had been learned.

We see Bruner's theme concerning poverty and its effects on the child as the authors, in the introduction, consider the effects of the home on education:

> "General skills, cognitive and emotional, appear to depend on what has properly been called a 'hidden curriculum' in the home...We must go beyond the home of the individual child to the economic realities in which the child and his family find themselves. If it is not true that there are cultures of poverty, at least it can be said that there are sub-cultures of despair in which groups appear to have given up trying, appear to have given up the possibility that they may be able to achieve power over their own destiny."
>
> (Ibid.)

The editors introduce the book with a paper called, "Competence: Its Nature and Nurture" and the remaining fifteen papers are divided into sections which include "An Evolutionary Perspective" (Bruner's "Nature and Uses of Immaturity" is in this section), "Mothers and Infants" (describing the interaction between them), "The Growth of Skills," "Language Acquisition and Development," "Personality and Social Competence," and, to complete the book, "Implications and Applications." Under this last heading is a paper by Bruner and Connolly, "Competence and the Growth of the Person," which provides a sort of postscript to the conference. They note that one must look at the functions of immaturity and discover its place in the life cycle; they ponder social responsibility for the developmental scientist, and the relationship between this responsibility and a democratic society, and they see the school as part of the problem with regard to the instilling in the young necessary skills and competence, rather than a reliable solution to that problem.

This book is an effort to bring the abstract into the realm of the practical; to bring basic research to application in educational and social policies.

Bruner's world had changed drastically in the past few years. Of his closest colleagues, some had died, and others had left Harvard for positions at other universities. Bruner's dissatisfaction with administrative policies had grown. The last thin vestiges of Harvard's wonderful esprit d'corps had taken their leave with the student protests, and it was clear that the change that had taken place in Harvard was irreversible.

Bruner had been invited, throughout the years, to join various faculties; Stanford had invited him, so had UCLA (conversation with Nowell Jones, 1977), and several others. But it was in the world of the changed Harvard that he received a call from Oxford asking if he would decline if elected to Wolfson College as the first Watts Professor of Psychology. Bruner was in his mid fifties; it was also a time in his life when he was aware that he was at a turning point. This was an invitation he had to take seriously.

Among the considerations was the fact that Bruner would take about a fifty percent cut in pay; this, however, would be mitigated by Blanche Bruner's private income which would supplement the family funds. He had lived abroad on sabbatical leaves and the like, but this was not just a temporary decision; it was a long term commitment. Considering all, he decided to accept Oxford's invitation, and he and Blanche, their children grown, prepared to cross the seas.

TO ENGLAND

The Trip...

In 1972, Jerome Bruner's life was to change enormously. It was a year of great adventure, of parting with Harvard and of renewing old friendships in Britain. It was a year to set up a new home in a new land.

Jerome and Blanche Bruner set out from Boston, with friends as their crew, in their sailboat, the "Wester Till," on June 17, 1972, to cross the Atlantic[1]. They were at St. Johns in Newfoundland by June 24th, there to exchange one crew of friends for another, but they were fogged in, and the second crew could not get into St. Johns as they could not get out. So there was nothing to do but wait. They stocked up on cod, salted and fresh, and got to know the others who were unable to leave St. Johns, collecting wonderful anecdotes. Their spirits were not dampened; the fog lifted, the new crew arrived and those who were not to make the crossing departed, and they set sail on June 28 for the long crossing of the Atlantic. They were good an experienced sailors.

The salted cod took on such an odor that Jerome Bruner would cheerfully have sent it to its original home in the deep, but Blanche saved it in time and, marvelous cook that she is, dished up a tasty feast of codfish cakes, much to the surprise of her spouse.

The journey is recorded on the map of Figure 6, taken from a card prepared by the Bruners to commemorate the days at sea.

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[1] Bruner is a member of the Cruising Club of America, and an Honorary Member of the Royal Cruising Club as well.

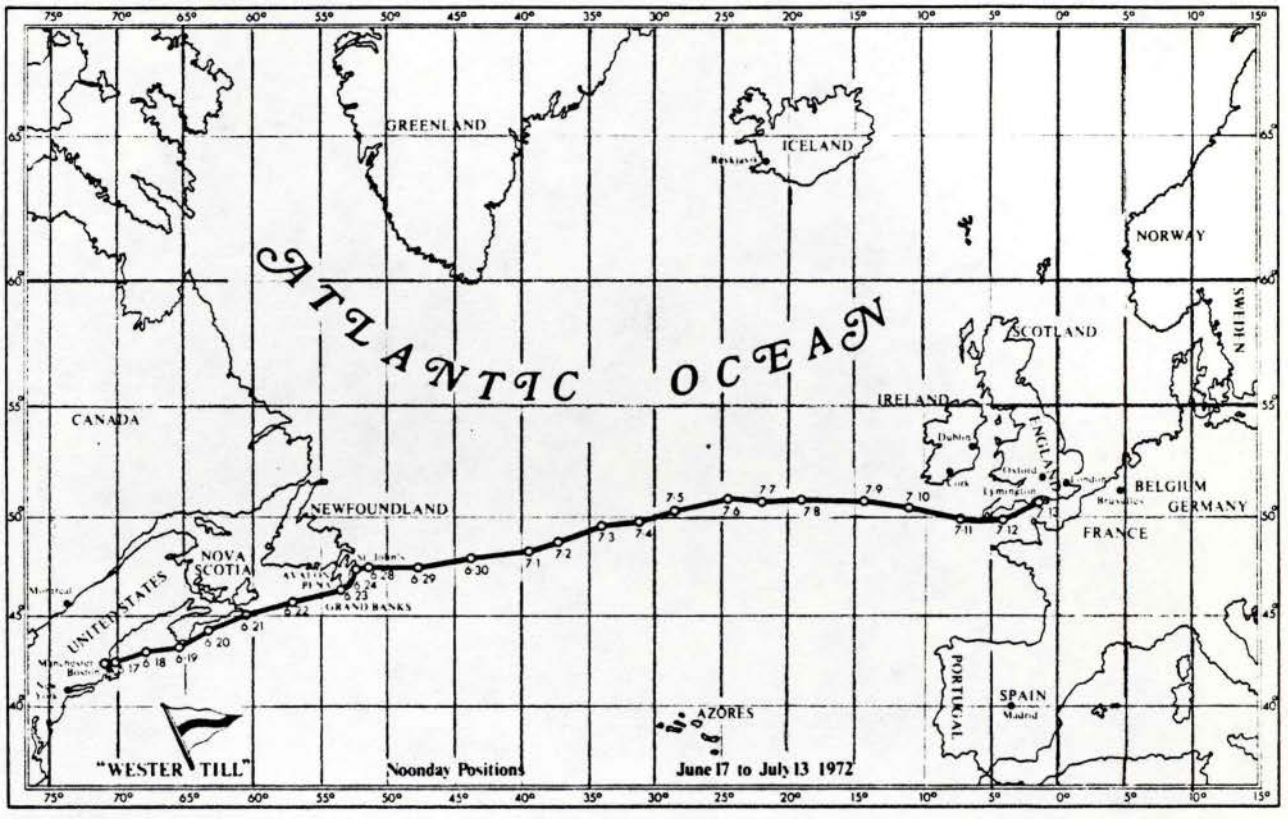


FIGURE 6 THE ATLANTIC CROSSING OF THE "WESTER TILL" JUNE 17 TO JULY 13, 1972

Oxford...

Jerome Bruner's research at Oxford takes place not in Wolfson College itself, where he is Watts Professor of Psychology, but rather in the Department of Psychology housed in a concrete edifice on South Parks Road called the Department of Zoology and Experimental Psychology building. It stands in the science area of Oxford University, many blocks away from the grand old buildings of High Street with their ancient deep walls and peaceful interiors.

The University was established in 1214 in the town where oxen could ford the river (hence Oxanforda and then Oxford) in a city which began with the foundation of a nunnery in the 8th century (Illustrated Guide to Britain, 1973; see also Alden's Oxford Guide, 1969 and Lise Millar's Introducing Oxford, 1977). The Thames, which the Romans called Thamesis, is called the Isis in Oxford, and is joined by the Cherwell just south of Folly Bridge. It is on the shores of the Cherwell that Jerome and Blanche Bruner have their home.

Oxford University presently consists of many colleges, each with a certain autonomy; Wolfson is one of the 19th century additions. Most of the colleges were established somewhere between the 13th and 18th centuries.

The Oxford academic system is much different from that at Harvard, or from the American scholastic systems in general (with the possible exception of the innovative programs coming into being since the advent of the University Without Walls concept supported by the Department of Health Education and Welfare with "seed money" within the last decade).

The school terms are divided into eight week trimesters, with a long vacation (June to October) in the summer. Because of the selective educational process at the lower grades in Britain, the students are rightly presumed to be the "cream of the crop" by the time they have been accepted at Oxford. Each student is assigned a mentor, known as a "don,"[2] who meets with him individually on a weekly basis and guides him in a program developed specifically for him.

The student is offered an opportunity to learn, and it is presumed that he is there to learn, and that the professors and the other dons are there to facilitate that learning. There is no "roll taking" in classes; there is no requirement to attend any particular lecture or series of lectures or be a part of any seminar; the student must simply, by the time of his examinations, be able to prove a particular body of knowledge to his or her committee. Lectures are attended because the student is interested in the subject and because that particular lecture or series of lectures will assist the student in the areas of his or her interests. The student takes his examinations when he or she and the assigned don deem he/she is ready. It is a long and arduous process. The student passes on one of several levels; seldom does the University have to deal with an academic failure.

What Bruner was looking for at Oxford seems to have been a home of the spirit. He says freely that at Oxford he has not found it. He has had

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[2] "Don" is a nickname for "dominus," Latin for "master." It is applied to professors, readers, lecturers, and fellows of the colleges of Oxford.

several years of productive work as he nears retirement from the Watts Professorship (which will come about in 1979), but of esprit d'corps, he claims it can be found in bits within the department, for example in his end of the corridor, or in someone else's end, but in the main he evaluates the Department of Psychology at Oxford as being unique in that the sum of its parts is more than its whole! (Interview, 1977).

And The Work Goes On...

Most of the work published in 1972 was at least begun at Harvard. We see a great emphasis on the infant, what he is and how he manages his world.

Bruner wrote "The Uses of Immaturity" for a National Institutes of Health publication (Bruner 1972c), and "Immaturity — Its Uses, Nature and Management"(Bruner 1972d) published in the London Times Educational Supplement in October, 1972. He wrote "Human Development" (Bruner, 1972a) for Lycidas (The Magazine of Wolfson College), and, with E. Stevens, "Media, Messages and Children" (Bruner and Stevens, 1972) for Britannica Roundtable. "Infant Sucking in Response to Variations in Schedules of Feeding Reinforcement"was authored by Donald Hillman and Jerome Bruner, and was based on Hillman's Ph.D. dissertation.

Bruner and Barbara Koslowski (1972) wrote "Visually Preadapted Constituents of Manipulatory Action" for Perception. These studies suggest that even before the child was able to reach, there was coordination developing between vision and the activity of grasping. The child would make primary grasping motions only at a ball which was small enough to be held.

The same authors wrote "Learning to Use a Lever" (Koslowski and Bruner, 1972) for Child Development. In this paper, children from 12 to 24 months were divided into three age groups and assigned the task of reaching a toy by the rotation of a "Lazy Susan" kind of lever. The strategies they used were closely associated with the age group (there were five general strategies evident) and the authors concluded that not only did the child solve the problem, but that learning transfer was built in, and the solution could be readily transferred, once they had been accomplished, to other problems.

Bruner wrote a book review of the Gartner, Kohler and Riessman book, Children Teach Children, entitled, "Toward a Sense of Community," in which he noted,

> "It has long been obvious that children learn from their peers, but a more significant observation is that children learn more from teaching other children."
>
> (Bruner, 1972e)

Bruner, with his penchant for picking out the courageous, describes this as "a brave little book," and says the "real reason" for adopting this kind of plan

> "should be to get us an inch on the way toward making the helper and the helped the universal unit of exchange within a culture that continues to produce lonely crowds, lonelier than ever."
>
> (Ibid.)

Bruner and his colleagues produced two films during 1972: "Cup to Lip" was done by Bruner and A. May, and "The Intention to Take" by Bruner, May and Koslowski.

"Nature and Uses of Immaturity" (Bruner, 1972b) was a major paper. It was prepared for a study group on early competence, and was presented as an invited address to the XXth International Congress of Psychology in Tokyo in August, 1972, the month after Bruner arrived in England. Parts of this paper were presented as the Haynes Foundation Lectures at the California Institute of Technology, and parts as the Compton Lectures at the Massachusetts Institute of Technology. The paper appeared also in the American Psychologist, and in Bruner's books The Growth of Competence and Play: Its Role in Evolution and Development.

> "To understand the nature of any species fully we need to know more than the ways of its adults. We need to know how its young are brought from...infantile inadequacy to mature, species-typical functioning...The nature and uses of immaturity are themselves subject to evaluation, and their variations are subject to natural selection, just as any morphological varient would be."
>
> (Bruner, 1972b)

Bruner described man in his four to five million year evolutionary process, the inherent adaptation (noting that adaptation "depends heavily on opportunities for learning") and his own interest in "the evolution of educability." He noted particular interest in the nature and evolution of social organization, the evolution of primate structure of skill to tool using, the roles of play and imitation and especially of language and its involvement in the incorporation of the young into the species.

In some detail, Bruner discussed research on other primates. He also described Levi-Strauss's classifications of exchanges among humans: the exchange of symbols, myths and knowledge; the exchange of affectional or affiliative bonds, and the exchange of goods and services.

> "...the emergence of a more flexible form of social bonding in primate groups seems to be accompanied by the emergence of a new capacity for learning by observation."
>
> (Ibid.)

Bruner still sees

> "...a great gap...between...behavior of grouping of great apes...and structuring of a human society."
>
> (Ibid.)

Modelling behavior seems, to Bruner, to be dependent upon two prerequisites: the ability to see oneself and one's own performance as separate from another's (a reference to deixis, that is, the separation of the "I" that is me from the "I" that is you), and the ability for ordering of proper subroutines to put together a pattern of action.

Bruner speaks of modeling behavior, of play which is, in reality quite serious:

> "...imitation as 'serious play' (...directed toward an intelligent end) must ...depend on 'matching the model'...and must be concerned with the kind of dietic anchoring that permits one to distinguish and relate what is analogous in my behavior and in that of another member of the species."
>
> (Ibid.)

Bruner discussed tool using, and the presentation of a less risky situation when play is used for learning. That is, the consequences are minimized, and there is a chance to try behavior combinations that one would not dare attempt under conditions of reality. He says,

> "Play given its concommitant freedom from reinforcement and its setting in a relatively pressureless environment, can produce the flexibility that makes tool using possible."
>
> (Ibid.)

Bruner makes an interesting observation with regard to laughter and fear:

"...at all ages, the capers most likely to produce laughter when performed by the mother are the ones most likely to produce tears when performed by a stranger. The mother seems to bring the young, so to speak, to the edge of terror.

"...among birds as well as mammals, the presence of the mother reduces fear of novel stimuli and provides the assurance necessary for exploratory behavior. But it is only among humans that the adult introduces the novel, inducts the young into new, challenging, and frightening situations — sometimes in a highly ritualistic way, as with rites de passage."

(Ibid.)

We find Bruner bringing up the subject of play and its function more and more often:

"Play can serve as a vehicle for teaching the nature of a society's conventions, and it can also teach about the nature of convention per se."

(Ibid.)

He speaks of language, and of the power "inherent in decontextualized knowledge," that is,

"...knowledge represented in a form that is relatively free from the uses to which it is put or to which it has been put in the past."

(Ibid.)

Bruner returns to a discussion of play, and introduces the subject of "deep play." This phrase is taken from Jeremy Bentham's Theory of Legislation (1840). Bruner explains that Bentham meant by deep play that

"play in which the stakes are so high that it is irrational for men to engage in it at all — a situation in which the marginal utility of what one stands to win is clearly less than the marginal disutility of what one stands to lose."

(Ibid.)

Bruner calls "deep play" playing with fire, and expresses distress at its increase in the adolescent in the 1962-1972 decade. He says,

"Russian Roulette is the worst bargain to be had in deep play...When one finds deep play, the inference must be that there are deep and unresolved problems in the culture."

(Ibid.)

Bruner concludes this paper with the assertion that,

"We cannot adapt to everything, and in designing a way to the future we would do well to examine again what we are and what our limits are. Such a course does not mean opposition to change, but, rather, using man's natural modes of adapting to render change as both intelligent and as stable as possible."

(Ibid.)

Bruner's personal change was now well under way. He and Blanche Bruner were getting established in Oxford by the end of 1972.

OLD THEMES RENEWED

In 1973, Bruner was, as ever, producing literature to fill the libraries!

In Developmental Psychobiology, Bruner published "Pacifier-Produced Visual Buffering in Human Infants" (Bruner, 1973a), in which he described buffering as including

> "...sleep mechanisms, crying, gaze aversion, and various other ways in which the infant seems to be able to break off encounters with the impinging world of stimulation coming from without and within...One of the most subtle forms of buffering in the human infant is non-nutritive sucking, the use of pacifiers or fingers or other appropriate objects by the baby as though to reduce discomfort."
>
> (Bruner, 1973a)

This paper states that infants nine to thirteen weeks of age produced buffering by reducing the visual scanning movements, and that scanning is correlated with movement in a display without the presence of sucking to buffer it.

Bruner wrote an Introduction to J. Gay's Red Dust on the Green Leaves (Bruner, 1973d), and a review of H. J. Eysenck's The Inequality of Man. Bruner entitled the review, "Advocate Eysenck Versus Scientist Eysenck — The Compleat Environmentalist" (Bruner 1973e). Bruner was critical of Eysenck's effort, as both a scientist and a lawyer, to use I.Q. as a determinant in genetic inequality; Bruner, as have others, finds I.Q. a quality not accurately measurable.

In "Organization of Early Skilled Action," we find that early skills are dependent upon the arousal of intention, the specification of an end state, and minimal directions concerning means. The inclusion of feedback shapes patterns which are initially awkward, so that less attention

is required, allowing further task analysis for a more evolved direction of action, thus organizing the skill into a higher order. A sort of "spiral curriculum" of early skill learning, one might say. Bruner includes play and modeling:

> "Play has the effect of maturing some modular routines for later incorporation in more encompassing programs of action.
>
> "Modelling is a powerful means for transmitting highly patterned behavior."
>
> (Bruner, 1973c)

Bruner does not ignore the issue of poverty versus middle class settings:

> "We would do well, now, to examine by experimental means not only the factors that affect the kind of skill acquisition that has concerned us, but also the social ecology that sustains or impedes it."
>
> (Ibid.)

In this paper we see recent themes stated clearly. Action is organized by intention directed toward goals through means; feedback leads to the analysis of the task, which leads to starting the cycle again, at a higher level. The catalysts in the cycle are play, modeling, and the environment of the learner.

There is no doubt that Bruner influenced the lives of a number of students; it is part of the situation in which a professor finds himself or herself. Occasionally an acknowledgement is made in an article or a book, and one finds Bruner's name in such places during general reading in the field of psychology. One of these appears in Stanley Milgram's famous book, Obedience to Authority (Milgram, 1975), in which Milgram described his experiments on the lengths to which certain of us will go

when convinced the requestor is indeed in authority. Milgram, in his section on acknowledgements, thanked Bruner for his encouragement and support (Paris, April 2, 1973). A brief review of the book by Bruner appears on the cover of the pocket edition; he calls Obedience to Authority "A major contribution to our knowledge of man's behavior," and of Milgram he says, "It establishes him in the front rank of social scientists in this generation."

For Gerbner, Gross and Melody's Communications Technology and Social Policy, Jerome Bruner and D. R. Olson wrote, "Learning through Experience and Learning through Media" (Bruner and Olson, 1973). This article also appeared in other publications, including the 73rd Yearbook of the National Society for the Study of Education. The paper addressed direct experience and mediated experience as separate and substitutable kinds of experiences, and there was a discussion of their separate and combined roles in the development of the child. The authors defined mediated experience to mean vicarious experience of some kind, and to include as well "symbolically coded information," that is, the spoken or printed word, a diagram, and so on. The authors explain,

> "It is learning through media that most readily substitutes for direct experience in formal schooling...Language, then provides the best opportunity for acquiring knowledge by criteria other than its usefulness in a particular line of action. It is the medium that most directly lends itself to ordering of knowledge in terms of the rules of abstract thought."
>
> (Bruner and Olson, 1973)

The authors mention other media, including graphs, diagrams, numbers, and even mime, and they indicate the need for literacy in whichever medium is used; the issue then is "deciding which skill one wishes to cultivate."

First published in the London Times Educational Supplement, "Continuity of Learning" (Bruner 1973c) was adapted for the Saturday Review of Education. In this article, Bruner comments on the quandry of the student. There is, he says, a

> "deep, unrecognized, but anxious sense of impending change that pervades the thinking of students, a feeling of uncertainty about the future...They are searching, I think, not only for a sense of what has happened to the world but a sense of what their own role in it is to be. Neither vocational training nor training in the general skills of mind seem to solve their doubts."
>
> (Bruner, 1973c)

Bruner's proposal for a solution for this uneasiness is a different concept of the role of schooling, in particular that education be "conceived not just as the preparation but as a form of enablement selectively available throughout the life cycle." He heralds England's Open University as "a very lively camel's nose under the academic tent."

A publication of substance in 1973 is to be found under the name of Jeremy M. Anglin; Anglin edited a book he entitled Beyond the Information Given (from one of Bruner's articles of nearly the same name). The book is a particularly well done compilation of Bruner's publications, sorted into five major divisions, and with divisional commentaries by Anglin. Anglin calls it a collection "in one place and in an instructive sequence some of Jerome S. Bruner's major ideas in the psychology of knowing." The papers themselves have been discussed in this thesis as they appeared in the literature chronologically, so we will not review them here. Some of Jeremy Anglin's notes are of interest, however. In the first three sections of the book (Perception, Thought, and Skill in Infancy, in that order), Anglin sees the unifying theme as the idea of an internal model or system

of representation. In the fourth section (Representation in Childhood), he suggests,

> "the concept of representation is differentiated and the successive modes of representation in the child's development are described."
>
> (Anglin, 1973)

In the final section, which is on education, Anglin sees the "dominant theme" as concerning

> "the advantages of tailoring course material in a way that acknowledges the development of the modes of representation."
>
> (Ibid.)

Anglin has come up with an amazing datum: he notes that Jerome Bruner has roughly averaged a publication every two months since his doctorate was awarded! Anglin reviews Bruner's career in the introduction to the book, and compares and contrasts Bruner's work with Bartlett's and with Piaget's. Anglin remarks as well on recent traditions in psychology, including the behavioristic school, and says,

> "In contrast, Bruner's view of man as an information processor, a thinker, and creator emphasizes both the rationality and the dignity of which human beings are capable."
>
> (Ibid.)

Ilze V. Kalnins and Bruner published "The Coordination of Visual Observation and Instrumental Behavior in Early Infancy" (Kalnins and Bruner, 1973); it was a paper which dealt with the control of clarity or of blurriness of an image by an infant through sucking, using subjects from five to twelve weeks old. The infants appeared to be more able to control the picture by sucking toward clarity than to get a clear picture by cessation of sucking.

On May 25, 1973, Bruner gave his Innaugural Lecture before the University of Oxford; it was entitled, "Patterns of Growth" (Bruner, 1974a). In it he says,

> "The study of human behavior, and even more so the study of its development, is not entirely a descriptive enterprise...the study of human development, for all that it may be a descriptive science, is a policy science as well, much as economics is. I take a policy science to be one in which the formulations of problems, the framing of hypotheses, and the kind of research carried out reflect the requirements of making decisions among feasibile courses of action. And in the nurturing of the young, a society is required to make a continual series of decisions about such courses of action."
>
> (Bruner, 1974a)

Bruner notes that the central issue is growth, and that growth is organized around skill and that, among other features, skill is involved with the culture.

> "So, culture and the learning of cultural rules thus become crucial to human development.
>
> "Pedagogy is not an isolated feature, but a universal of the species — surely as widely distributed as the incest taboo."
>
> (Ibid.)

An interesting comment...and probably true, since taboos must be taught!

Bruner speaks of the development of attention and of the function of play. He talks about language and its relation to organized fields of knowledge, and about the inability of school systems to make equal what society has made unequal.

The theme which shows us society as an holistic entity appears again here as Bruner argues,

> "...neither the study of development nor its application in pedagogy can...be divorced from the pervasive political, social and economic forces that shape society and thereby shape the conditions of growth."
>
> (Ibid.)

November 7-9, 1973, the Council of Europe, Council for Cultural Cooperation, Committee for Educational Research in the Second Colloquium of Directors of Educational Research Organizations met in Paris. Bruner presented "The Role of the Researcher as an Adviser to the Educational Policy Maker"(Bruner, 1973f), and in 1974, Bruner was awarded the Doctorate, Honoris Causa from the Sorbonne. He was also the recipient of the Ciba Gold Medal for Contributions to Biology and Medicine[1].

"Child's Play" was published in the New Scientist (Bruner, 1974b) under the title "Importance of Play" in Roger Lewin's Child Alive, and in Psychology Today, an article based on "Child's Play" was entitled "Play is Serious Business." Bruner argues in this article that

> "Play...is the precursor to adult competence.
>
> "We now know that play is serious business, indeed, the principle business of childhood. It is the vehicle of improvisation and combination, the first carrier of rule systems through which a world of cultural restraint replaces the operation of childish impulse."
>
> (Bruner, 1974b)

Bruner wrote only one book review in 1974; it was "Review of Bower: Starting with An Open Mind" (Bruner, 1974d).

On June 19, 1974, Bruner delivered a paper at Ciba Foundation for their 25th Anniversary Lecture, Royal College of Physicians. It was entitled, "The Beginnings of Intellectual Skill." This author has been

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[1] This was the first time in its 25 year history that the award did not go to a chemist or to a physician (Psychology Today, page 83, January, 1975).

unable to obtain a copy of this paper, however the same title was used for a different paper, and the review of that paper is in the following chapter in this thesis, "Primary Communications — Language and Before."

We see Bruner's papers during these years serving many purposes, emphasizing and enlarging on themes he had developed over time; there is nothing particularly startling or new in any of these papers, through there are new formats for ideas we have seen before. In his writing henceforth, we will see considerable attention to the function of play, we will see research on infant behavior, articles on education and on Bruner's general philosophy of science, but in the main, the subject will be language and its precursors. The following chapter will be devoted to important papers on this issue.

> *"Just as the medium very, very deeply affects the message that goes across it by nature of the way it is put together, and the same way as a tool affects the activity in which it is used, so I am interested in problems of tool use. And one of the major tools is language..."*

Jerome Bruner sees himself as working his way back toward social psychology. In the process, he says

> *"I find myself becoming interested more in transaction."*

We will see significant indication of this interest in this chapter, as Jerome Bruner pursues linguistic ideas. As there is the sense in which Bruner never left the social psychology to which he is returning, there is also a sense in which language and its study has long been a part of his work. He completes the paradox with

> *"I don't feel as though I've moved into language...I've always been there."*

Several of Jerome Bruner's colleagues have been greatly involved in the study of language, and Bruner has tried one and then another theory on *"for size."*

> *"It never fit. It just couldn't be that language operated that way, that basically you were mastering a syntax, that somehow the whole process of acquisition couldn't look ...neat and sterile. Then, one after another, the Gods that they worshiped died. It couldn't be that on the syntactic side; it couldn't be that on the semantic side, so gradually it got more toward pragmatics and interaction."*

And it is with pragmatics and interaction that Jerome Bruner's view of linguistic development is concerned. The interaction takes

place among three systems: the cognitive system, the communicative system, and a social system (Bruner, Interview, 1977).

In this chapter it will be necessary once again to ignore somewhat the chronology in order that we may consider the major papers dealing with language which were written and presented by Jerome Bruner over the years 1974 through 1977. Those papers touching on other subjects as their main topics have been covered in the previous chapter, or will be commented upon in the one which follows.

"The Ontogenesis of Speech Acts" (Bruner 1975h) was delivered at a symposium honoring Niko Tinbergen on the receipt of the Swammerdam Medal in Amsterdam (December 7, 1973), again at the NATO Conference in Catania, a provincial capital on the eastern coast of Sicily (September, 1974), and was published in 1975 in The Journal of Child Language, and in 1976 in Oxford by Blackwell in a book editied by P. R. Collett, Social Rules and Social Behavior.

We must note here that we have seen develop over the past several years the appearance of a particular publication in several places; occasionally a presentation or publication will appear here and there for different occasions in a slightly altered form from the original presentation. This is not to say that Bruner was breaking any rules about novelty; it does not appear that he did. One must assume that even one with Jerome Bruner's incredible energy has certain limitations, especially when asked to speak again and again on the same topic.

We now find Jerome Bruner deeply involved in linguistics. In particular his interest is in that time of life just before, and just after, the child has begun to speak. The transitional moment, however long that moment may be, is the phase of communication development which has caught Bruner's attention.

In "The Ontogenesis of Speech Acts" (Bruner, 1975h), his emphasis is on "the use of language, rather than its form," and on "language in relation to behavior generally." To facilitate this emphasis, Bruner uses a "speech act approach to the transition from pre-linguistic to linguistic communication" (see John R. Searle's Speech Acts: An Essay in the Philosophy of Language, Cambridge University Press, 1969).

Ever the functionalist, Bruner is convinced that it is the uses to which language is put that determine how it is acquired, and in line with this conviction, he does not see linguistic innateness as part of language acquisition, but rather proposes that there are

> "some special features of human action and human attention that permit language to be decoded by the uses to which it is put."
>
> (Bruner, 1975h)

The transition from non verbal to verbal behavior, Bruner argues, must be viewed "as a transformation of modes assuring co-operation."

In Bruner's review of the literature of language, he points out in particular Searle's (Searle, 1969) emphasis on the conventions of language which find us not literally saying what we mean. For example,

> "The request 'Would you be so kind as to pass the salt?' is not a request for information about the listener's limits of compassion, but an utterance that follows the convention of leaving a potential donor an apparent option in fulfilling a request, in order that the utterance be not interpreted as a command...the speaker must understand in some simpler, non linguistic way before he is likely to comprehend or to use such utterances appropriately."
>
> (Ibid.)

All languages, Bruner says, "exhibit topic-comment structure," that is, each has a subject-predicate grammar. This grammar is defined as predication.

In his analysis of language structure, and the manner in which it corresponds with psychological events, Bruner sees two issues: a likeness between predication and the nature of human processing, and a relation between linguistic case structure and "the organization of action." He argues,

> "The primitive categories of grammar refer...to actions as carried out by agents and having effects of particular kinds in particular places, etc. And these categories...are particularly important in the early acquisition of language."
>
> (Ibid.)

Bruner cites the literature freely throughout this paper; he quotes from Neisser (1967), from Roger Brown (1973), from Greenfield, et al. (then in press, Communication and the Beginnings of Language: The Development of Semantic Structure in One-Word Speech and Beyond, Academic Press), and many others. He concludes, for instance, from Greenfield's data,

> "These various sets of data suggest that the child, in using language initially, is very much oriented towards pursuing (or commenting upon) action being undertaken by himself and another."
>
> (Ibid.)

Bruner discusses in detail joint actions of the infant and the caretaker (usually the mother). He pays particular attention to the early capacity of the infant (4 months) to follow the line of regard (that being when the infant and the mother have eye contact, the mother looks away at something, and the infant "follows the line of regard" of the mother by looking in the same direction). This is surely an early form of communication.

As in learning, here in language, Bruner discusses the function of play.

> "There is a crucual point here. It is that play has the effect of drawing the child's attention to communication itself, and to the structure of the acts in which communication is taking place."
>
> (Ibid.)

He discusses pilot studies in the relation between the joint enterprises of parent and child and the ensuing linguistic and non-linguistic forms of communication.

> "...joint experience and joint action are...full of hints as to how we should proceed from sense to sound."
>
> (Ibid.)

On January 11, 1975, Bruner presented parts of a paper dedicated to the 80th birthday of Roman Jakobson[1] to a meeting of the Scottish Branch of the British Psychological Society at the University of Stirling. This paper would also appear in The Social Context of Language (edited by Ivana Markova, 1976), and in the journal Cognition in 1975. The paper had the title, "From Communication to Language: A Psychological Perspective" (Bruner, 1975c).

In addition to the use of papers to serve several functions, we see Jerome Bruner producing breadth, "state of the art" works; this is another of those. In the background section of this paper, Bruner discusses Chomsky, Piaget, Sugarman, Sinclair, Cromer, and many others.

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[1] The reader may recall that on the occasion of Roman Jakobson's 70th birthday, Jerome Bruner dedicated a paper entitled, "The Ontogenesis of Symbols" (Bruner, 1967).

This paper gives one an excellent view of the literature in linguistics.

Bruner argues for a proper place in linguistics for prespeech communication:

> "Any realistic account of language acquisition must take into account the manner in which the child passes from pre-speech communication to the use of language proper. For it can be shown that many of the major organizing features of syntax, semantics, pragmatics, and even phonology have important precursors and prerequisities in the pre-speech communicative acts of infants."
>
> (Bruner, 1975c)

Bruner presents four problems concerning the transition from communication to early language: communicative intent, early reference, language to regulate joint action, and precursors of predication.

Regarding Noam Chomsky's work, Bruner proposes that

> "The initial optimism that grew out of Chomsky's formulation of generative-transformational grammar has not been sustained by the torrent of work that it provoked...a powerful idea, one that we will want to revisit...the central notion — that the child in some sense 'has a knowledge' of the rules of language and that he is attempting to generate from this knowledge hypothesis about a local language — while boldly suggestive, is plainly insufficient."
>
> (Ibid.)

He goes on to state,

> "The brunt of my argument has been that one cannot understand the transition from prelinguistic to linguistic communication without taking into account the uses of communications as speech acts. I have, accordingly placed greater emphasis on the importance of pragmatics in this transition — the directive function of speech through which speakers affect the behavior of others in trying to carry out their intentions."
>
> (Ibid.)

and sums up,

> "...language acquisition occurs in the context of an 'action dialogue' in which joint action is being undertaken by the infant and the adult. The joint enterprise sets the deictic limits that govern joint reference, determines the need for a referential

> taxonomy, establishes the need for signalling intent, and provides a context for the development of explicit predication. The evolution of language itself, notably its universal structures, probably reflects the requirements of joint action and it is probably because of that evolutionary history that its use is mastered with such relative ease, though its theoretical application still eludes us."
>
> (Ibid.)

Jerome Bruner was giving talks on early language all over Britain. On the 27th of February, 1975, at the University of London, he spoke on "Early Language Curriculum" for the Doris Lee Lecture. This lecture, though unpublished, is taken from the material used in "Entry into Early Language: A Spiral Curriculum" (Bruner, 1975e), which was presented for the Charles Gittins Memorial Lecture at the University College of Swansea on Marcy 13, 1975. At the International Society for the Study of Behavioral Development Biennial Conference held July 13-17, he spoke on "Early Entry into Language". This conference was held in Guildford, Surrey, as was the 137th Annual Meeting of the British Association August 27 through September 3, 1975, at which Bruner presented essentially the same material.

We will look at just one of these lectures, the version presented as the Charles Gittens Memorial Lecture. Bruner introduces the lecture with,

> "What I should like to do is to consider the nature of early first language learning, and to explore in what manner it throws light on the nature of instruction or, if you please, on instructed learning. By instructed learning, I mean simply learning in which a less expert or less 'mature' usually younger organism learns something by virtue of interaction with a more expert, mature, and usually older one. The devices employed in such instructional encounters will vary widely — modelling and imitation, various forms of scaffolding by the abler member on behalf of the less able to make the task easier or clearer, simply telling, shielding from distraction or from tempting errors, provision of feedback and/or

reinforcement, marking critical features, etc. And indeed, the intent of the pair involved in the transaction may or may not be pedagogic, and may or may not even be serious. For much instruction often takes place unintentionally or even in the spirit of playing."

(Bruner, 1975e)

Bruner explains that he has included the concept "'spiral curriculum,' a term more usually associated with school pedagogy than with linguistics or psychology" because

"in studying the run-up in human infancy from prelinguistic to proper linguistic communication, I have been struck again by the applicability of the metaphoric spiral. It is with this spiral of early language learning that I shall be concerned here, and with the implicit pedagogy of the adult transmitter of language in aiding the child up the spiral."

(Ibid.)

Bruner describes as one of the difficulties in examining the precursors of language, and the relation between prelinguistic language and language communication

"...the insistence of the claim of discontinuity, that language is an autonomous domain that has no precursors and is served only by an innately tuned Language Acquisition Device whose input-output laws are governed by the universals of grammar."

(Ibid.)

The Language Acquisition Device (LAD) is, of course, in reference to Noam Chomsky's theory, in which language is described as an innate function. Bruner insists that he is "not against innateness or even against the discontinuity hypothesis." Still,

"To research the onset of language, one must examine the prerequisite sensory, motor, conceptual and social skills whose coordination makes language possible. To do so, however, we must abandon in large part the grammar-writing procedures of the developmental linguist. For it no longer suffices to collect a corpus of spoken language for which successive grammars may be written...Instead one must find ways of investigating the constituent skills involved in language. And typically one begins well <u>before</u> language begins..."

(Ibid.)

Bruner assures us

> "...that there is nothing in Chomsky's writings that would in any sense deny the role of prelingusitic precursors or prerequisites in aiding the acquisition of language. Indeed, it would be absurd to imagine that the Chomskean Language Acquisition Device could operate without considerable pre-tuning achieved during the period that precedes the use of articulate phonetic grammatical speech."
>
> (Ibid.)

Bruner does note, however, that

> "...until we discern more clearly the contribution of prelinguistic concepts it is premature to conclude that inanate or even acquired ideas about grammar are all that operate."
>
> (Ibid.)

Bruner reviews, in considerable detail and with abundant citation of the literature, the issues of intention, reference, and the use of language in joint action.

In addressing the issue of intent, that is, the purpose of the communication, Bruner includes Joanna Ryan's adaptation of J. L. Austin's classification of the cues the mother uses, that is, "aspects of the utterance," "accompaniments of the utterance," and the "circumstance of the utterance" (Ryan, 1974).

Bruner then discusses the use of reference, or the idea that "a given sound, word, or gesture 'stands for' something in the extralinguistic environment." He reviews the concepts of indicating (bringing attention to), deixis (the discerning idea of the difference between the "I" that is me and the "I" that is you, between here and there, and so on), and naming, meaning the development of "standard lexical terms" standing for something.

Bruner noted, during our interviews in 1977, that blind children seem to have particular problems with deixis, that is, with the spatial/temporal concept of joint reference of the "I" that is me and the "I" that is you,

and with the proximal concept of here and the distal concept of there. His own early blindness does not seem to have affected in any major way his concepts of who is who and where is here, however he finds that in testing his spatial analysis capabilities are more limited than his verbal propensities. (Interview, 1977).

Bruner, in "Entry into Early Language: A Spiral Curriculum," decries "syntactic preoccupation" when reviewing linguistic competence. He suggests,

> "Perhaps the best antidote to syntactic preoccupation is to examine closely how the infant masters the task of communicating to others his needs, wishes and objectives in order to assure either assistance or joint action. It is this that constitutes the beginnings of the more elaborated speech acts that are developed to 'get things done with words.'"
>
> (Bruner, 1975ℓ)

In reviewing language and joint action, Bruner describes means of communication in the order of their appearance in the maturing child (with the presumption that the child has a responsive caretaker). The first kind of communication Bruner calls the demand mode; the second, which occurs after the infant has experienced response consistently to his needs, is called the request mode, and then, finally, the exchange mode.

> "The exchange mode is gradually transformed into what we may call a reciprocal mode. Interactions are now organized around a task that posesses exteriority, constraint, and division of labor.
>
> "The progress from demand to request to exchange to reciprocity during the first year is, I believe, of central importance to the development of speech acts (or more properly, communicative acts) and, as well, to the establishment of a ground work for the later grasping of case in language."
>
> (Ibid.)

Bruner reminds us that,

> "an 'intuitive' grasp of an idea precedes its more formal comprehension as part of a structured set of conceptual relationships. Language learning, then, is virtually the model of a spiral curriculum."
>
> (Ibid.)

He tells us then that the concept of the spiral curriculum issue must be

> "taken in conjuction with a second one. It concerns the interplay of syntactic, semantic, and pragmatic elements in the process of mastering a language. Language learning occurs in a context of use and interaction."
>
> (Ibid.)

Bruner makes one further note that harkens back to his early days in educational psychology when he speaks of a lesson to be drawn from language acquisition:

> "Its 'motivation' is almost prototypically intrinsic. The motive for learning language is to learn language — whatever other uses it may fulfill."
>
> (Ibid)

He goes on to say,

> "The object of making an utterance is not simply to achieve a well formed utterance, but to achieve one that gets things done in the real, extralinguistic world."
>
> (Ibid.)

The general philosophy which Bruner has developed over the years of his experience in concepts in cognition and education, and, of course, in development, have clearly influenced his approach to the study of language: the spiral curriculum, learning for the sake of learning rather than for some extrinsic reward, and the idea of enactiveness, these are but a few of the early ideas accounted for in this paper.

"Language as an Instrument of Thought" (originally titled "On Analytic Competence") by Bruner and K. Peterson (1975)(and Bruner, 1965f), appeared in Problems of Language and Learning, edited by A. Davies; it also appeared in The Ontogeny of Language published by the University of Hawaii. This author, unfortunately, has not obtained this paper in any of its forms.

"The Beginnings of Intellectual Skill" was a title used for two separate papers, one which was delivered to Loch Lommond Symposium at the University of Strathclyde in September, 1975, and another which appeared in two parts in New Behavior (Bruner, 1975b). Part I appeared in the October 2, 1975 issue, and Part II in the issue one week later, October 9. Part I deals with the development of pre-linguistic action, and Part II with the "transition to the use of language."

In Part I of this paper, Bruner develops his view of the importance of the culture and evolutionary history in development, and the physiological involvement in development. Biological processes, including the results on experiments on infant sucking as a buffering agent and as a vehicle for environmental change (clearing the image of a screened picture), are reported on, as well as interrelations with others, and the effects of these issues on language development, attention, expectancy, and object permanence. So we see the integration here of Bruner's earlier work on child development with his work on lingustics.

In Part II, Bruner discusses pre-verbal communication based on the infant-mother relationship, language in general, and Chomsky's Language Acquisition Device in particular. He also presents issues concerning reference, predication, language and joint action and, of course, play.

Of play, he says,

> "...let me note that the kinds of behaviour to which we have been referring take place principally in what can only be called a playful ambience. When things become too 'serious' and intention bound, communication regresses to the level of demand and counter-demand. The simulative, conventionalised (sic), and rule sensitive spirit of play seems to be a sine qua non for language learning."
>
> (Bruner, 1975b)

Jerome Bruner, Eileen Caudill and Anat Ninio prepared "Language and Experience," the John Dewey Lecture, presented in London on October 29, 1975.

> "Let me begin," the lecturer says, "with a Dewey theme. It is that the shape and structure of human experience and human action are reflected in the very nature of language, that language is not by itself a system of logic, and that more precisely, the uses to which language is put by any given individual, the linguistic procedures he will employ, necessarily reflect the circumstances in which he had lived and how he has coped with them...language is never to be understood as context independent."
>
> (Bruner, Caudill and Ninio, 1976)

The authors include in this paper an anecdote worth repeating:

> "Alfred North Whitehead, saluting Lord Russell for a talk he had just given at Harvard on the meaning of the quantum theory for the philosophy of science, ended by thanking him for a lucid account that had managed not to obscure the great darkness of the subject."
>
> (Ibid.)

In an effort to shed some light on their subject, the authors of "Language and Experience" note that

> "The process of acquiring language is very strongly mediated by a push to manage various extralinguistic functions — regulating joint attention, relating to others, getting certain tasks completed. The child manages these initially by a diversity of communicative procedures...Communication works because it evokes a function to be fulfilled in the child."
>
> (Ibid.)

"Learning How to Do Things with Words" (Bruner, 1976a) was presented March 2, 1976, as part of the Wolfson College Lecture Series. The Series was published in Quaderni di Psicologia, Milan, Italy. In this paper, Bruner introduces his subject as

> "how the human infant learns to use language in a fashion that meets the requirements of social living as a member of a culture-using species."
>
> (Bruner, 1976a)

As a linguistic example, he presents us with,

> "'How would you feel about a breath of fresh air?'is not interpreted as inquiring into one's naive theory of respiratory physiology but as an invitation to go for a walk."
>
> (Ibid.)

He again mentions Chomsky's Language Acquisition Device:

> "I must now intone a necrology in order to set the background...So though we come to bury LAD, we must not be so foolish as to withhold all praise..."
>
> (Ibid.)

Bruner reviews the themes of prelinguistic action, reference, and joint action, and declares,

> "I would take the view that the child's knowledge of prelingusitic communication related as it is to the world of action and interaction, provides him with tell-tale clues for constructing and testing hypotheses about the meaning and structure of the discourse into which he quickly enters. He does, as LAD would have us believe, have a stunning capacity to infer and to generate rules, indeed to over-generalize them...There may indeed be something innate about the child's ability so swiftly to crack the lingusitic code, but there is almost certainly something innate about the mother's ability to help him do so."
>
> (Ibid.)

For the University of Strathclyde Loch Lomond Symposium, Studies in Mother-Infant Interaction, Bruner wrote "Early Social Interaction and

Acquisition," in which he emphasized again that give and take formats

> "...serve as a firm foundation for other more complex and elaborate task structures," and that "language acquisition occurs in the context of an 'action dialogue' in which joint undertakings are being regulated by infant and adult."
>
> (Bruner, 1976b)

We have seen once again the logical progression from the reaching and, for that matter, the sucking communication behavior of the infant before the advent of language through a kind of spiral curriculum to language itself. And we see again, Jerome Bruner's own spiral curriculum in his return through language to a kind of social psychology. He has indeed, in this writer's opinion, come the full circle.

Bruner will spend the 1978-79 academic year on Sabbatical Leave studying language at the Netherlands Institute for Advanced Study in Wassenaar. Bruner's sabbatical leaves seem often to be very productive, and sometimes, as in 1955-56, to be turning points in his life and his work. One can only wonder what this year will bring.

BESIDE LANGUAGE...

During the same years Jerome Bruner concentrated his writing on language, he was also producing words on a number of other subjects, including his general philosophy of psychology, education, and research in general, as well as studies of infant behavior, decision making, tutoring and play.

In 1975, Bruner was awarded two more honorary degrees: one from England and the other from the United States. Bristol University presented him with a D.Sc., and from Yale he received a D.Soc.Sci.

M. Scaife and J. S. Bruner published "The Capacity for Joint Visual Attention in the Infant" (Scaife and Bruner, 1975) in late January, 1975, in Nature. It reported "a preliminary investigation of the extent of the infant's ability to follow changes in adult gaze direction during the first year of life. The investigators videotaped the eye-to-eye contact of infants who were from two to fourteen months of age, and found that while an infant from 2-4 months old would follow the "line of regard" of the experimenter in one or both of two trials only 30% of the time, but the time the baby was 11 to 14 months old, he would always look in the same direction as the experimenter who turned his head after establishing eye contact with the child.

Bruner wrote "The Role of the Researcher as Adviser to the Educational Policy Maker" (Bruner, 1975i) for the Oxford Review of Education; this author has not obtained a copy of the paper.

For Barbara Tizard's Early Childhood Education, Bruner wrote "Doing Research that Might Make a Difference" (Bruner, 1975d). He remarked on certain difficulties with the research process:

> "The trouble appears to be with the research process itself, its separateness from the concerns of those who would use specialized knowledge to guide their conduct of affairs.
>
> "The deep problem, I think, inheres in the use of research in human situations generally...It seems from the profoundly subtle task of generating knowledge that in a general sense is useful but which, at the same time, is seen by those who must use it as not only useful but relevant to them and to their own conduct of the enterprise."
>
> (Bruner, 1975d)

Bruner distinguishes, as he has before in publications, among troubles, problems and puzzles; he also discusses theory making, defining a theory as

> "...a canny way of taking account of a great deal of complexity whilst actually keeping very little in mind."
>
> (Ibid.)

As to what really counts in research, Bruner explains

> "The rewards within the research community are for generality and for elegant simplicity."
>
> (Ibid.)

Regarding the difficulties involved with modeling the 'human sciences,' Bruner suggests a possible "reformulation of the research process" for these issues, and a more full an open reportage, especially to the lay public.

On September 2, 1975, Bruner accepted the G. Stanley Hall Medal from the American Psychological Association with a speech entitled, "The Objectives of Developmental Psychology" (Bruner, 1975g)[1]. Bruner noted, with regard to methods of conducting research, the tendency to focus on phenomena which are defined quite narrowly, and the lack of attention to work differing a bit from certain hypotheses and paradigms. In these lights, Bruner discussed child development with respect to "line of regard," to play and its functions, and to mastery in general. He proposed a program of research which would optimally use its human resources (an ideal to which most researchers subscribe, but which is not always easy to fulfill).

In 1976, Bruner received the Doctorate, Honoris Causa from Leuven (in Belgium).

On February 20, 1976, Bruner presented "Decision Making as Discourse" (Bruner, 1976c) at the Rob Roy Symposium on Decision Making (in celebration of the Johns Hopkins Centennial). He declared about decision making as a subject,

> "...it is a topic that, formally defined, has achieved its own numbered section in the library, has developed its own theorists and, indeed, even its own revisionists...I have never self-consciously contributed to their ...enterprise."
>
> (Bruner, 1976c)

Bruner's approach to decision making is, not surprisingly, through the portal of language:

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[1] Bruner was unable to deliver the speech himself, as on that date he was presenting "Early Entry into Language" to the British Association Meeting in Guildford, Surrey, England.

"most decision processes I had observed were highly verbal affairs"

(Ibid.)

he said, and remarked that he, like most academics, "had been concerned principally with the advisory side of decision making." He went on to comment that,

> "...the major part of human decision making surely involves what we <u>say</u> as much as it involves what we do."
>
> (Ibid.)

Bruner establishes his view:

> "I want to argue that the making of decisions must be regarded not only as an individual intrapsychic process but also as a way of communicating something in a social context. Viewed narrowly — in the same spirit as syntactical analysis is viewed narrowly — decision theory tends to concentrate upon those cognitive processes that operate in the mind of a detached speaker to guide him into a well-formed performance: knowing the alternatives, knowing their estimated values and likelihoods, knowing the kinds of payoff matrices that govern choice, being able to make Bayesian transformations of empirical probabilities, etc., but I wish to argue that a social or political decision is <u>not</u> made with the rational considerations as sole or even primary objectives. Rather, it is made as a vehicle for carrying out the intentions of those empowered to make the decision, and the process of reaching a decision among those involved is more like a conversation than like the rational calculus. It usually results from the interaction of a set of speech acts."
>
> (Ibid.)

He follows up the linguistic point of view concerning decision making with the comment,

> "Decision processes involving social issues are shot through with attempts to resolve the differences between these three aspects of utterances: what are you literally asking for, what do you intend to get or hope for, and what will be the effect of what you are asking?"
>
> (Ibid.)

Bruner does not subscribe to those theories that make decision processes look "altogether too instantaneous." He says,

> "The nature of communication affects the social reality of those involved and the possibilities of resolving differences. The decision process, in a word, is a dialogue involving the interaction of speech acts, governed by cooperative principles or maxims or conventions."
>
> (Ibid.)

It was in 1976 as well that Bruner's "The Styles of Teaching" appeared in New Society; this author was unable to obtain a copy of this paper (Bruner, 1976d).

We find ourselves quickly back with the issues of education when we encounter the David Wood, Jerome Bruner and Gail Ross publication, "The Role of Tutoring in Problem Solving" (Wood, Bruner and Ross, 1976) in the Journal of Child Psychology and Psychiatry. The paper deals with the tutoring of three, four, and five year olds to construct a pyramid with blocks which lock together. Rather than an imitation or a modeling process, the authors contend that tutoring

> "involves a kind of 'scaffolding' process that enables a child or novice to solve a problem, carry out a task or achieve a goal which would be beyond his unassisted efforts. This scaffolding consists essentially of the adult 'controlling' those elements of the task that are initally beyond the learner's capacity, thus permitting him to concentrate upon and complete only those elements that are within his range of competence."
>
> (Wood, Bruner and Ross, 1976)

The authors found that the task of the tutor differed considerably with the different ages. With the three year old, the task was "enlisting the child as a tutoring partner." With the four year old, the tutor was more the "verbal prodder and corrector." For the five year old, the tutor behaved in the main as "a confirmer or checker of constructions."

The investigators found that children imitated only where they could already do the task fairly well:

> "...the study taught us little about imitation save that its occurrence depends upon the child's prior comprehension of the place of the act in the task."
>
> (Ibid.)

Jerome Bruner and Virginia Sherwood authored "Early Rule Structure: The Case of Peekaboo," which was published as a chapter (8) in Life Sentences: Aspects of the Social Language. This article also appeared in Play: Its Role in Evolution and Development (Bruner, Jolly and Sylva, eds., 1976), of which we will say more shortly. The authors say,

> "Peekaboo surely must rate as one of the most universal forms of play between adults and infants...the very playing of the game depends upon the child having some degree of mastery of object permanence, the capacity to recognize the continued existence of an object when it is out of sight."
>
> (Bruner and Sherwood, 1976)

Infants were followed each two weeks from seven to seventeen months of age for a "game playing session" (quotes mine) which was videotaped. The data were subsequently analyzed and reduced. The basic peekaboo game was initial contact, disappearance, reappearance, and re-established contact. The infant learns through this process the conventions of play as well as the difference between "real" and "make believe."

For some years now, we have seen a reference to the utility of play in publications authored or co-authored by Jerome Bruner. In 1976, he and Alison Jolly and Kathy Sylva edited the book Play: Its Role in Evolution and Development (Bruner, Jolly and Sylva, eds., 1976).

The book comprises some 71 papers in all, and includes among its writers such familiar names as Konrad Lorenz, Jean Piaget, Jane van Lawick-Goodall, Harry Harlow, Simone de Beauvoir, L. S. Vygotsky, Dylan Thomas, Arthur Koestler, and Erik Erikson are but a few. The editors contributed several articles to the book as well.

Play is organized into four major parts: The Evolutionary Context, Play and the World of Objects and Tools, Play and the Social World, and Play and the World of Symbols.

In the Introduction, the editors speak of play as an anti-topic. They refer to Harold Schlosberg's (1947) insistence that

> "since play could not even be properly defined, it could scarcely be a manageable topic for experimental research."
>
> (Bruner, Jolly and Sylva, 1976)

The editors speak of "metasignalling" in subhuman primates, a signing which lets the other party know that the order of the day is play. If the metasignal does not get across, a real fight is likely to emerge.

The aim of the book is to bring together a literature on play, and surely it does so, though with an admitted bias.

> "We have tried to edit the papers in such a way that they could be enjoyed by the reader and yet contain sufficient description of research methods and data analysis to satisfy the technical student of animal or human behavior."
>
> (Ibid.)

This author has made a similar attempt with the work of Jerome Bruner.

"The Role of Play in the Problem Solving of Children" is a contribution to Play by Kathy Sylva, Bruner, and Paul Genova. In describing the characteristics of play, they say,

> "The essence of play is in the dominance of means over ends...in play the process is more important than the product. Freed from the tyranny of a tightly held goal, the player can substitute, elaborate and invent."
>
> (Ibid.)

Among other characteristics of play, the authors list the lessening of risk of failure, a temporary moratorium on frustration, the freedom to notice seemingly irrelevant detail, and self initiation (that is, that play is voluntary but its nature).

Bruner provides a brief essay on "Surprise, Craft and Creativity" in Play; in it he states that the unique quality about creativity is surprise. He insists as well that "the production of creative surprise demands a masterful control of the medium."

The issue of play has emerged often before; this book seems finally to have brought to fulfillment this particular emphasis for Bruner.

In December, 1976, Jerome Bruner presented the Herbert Spencer Lecture at Oxford: "Psychology and the Image of Man" (Bruner, 1977). In this lecture, Bruner decries the lack of influence of psychology on humanity's condition, and takes to task B. F. Skinner in the following manner:

> "...the most conspicuous public voice on psychology has been radically Utopian and reductionist, motivated by the assertion that scientific psychology shows that the human enterprise is altogether wrongly conceived, that it would be better managed by human engineers than by law, and that when ordinary people acted human they were muddled by notions like choice, freedom, dignity, intention, expectations, goals, and the like. B. F. Skinner in his Herbert Spencer Lecture two years ago, implied indeed that human affairs so conceived could be shown to be 'wrong' in much the same way as the heliocentric universe was 'wrong.'"
>
> (Bruner, 1977)

Bruner also remarked that behaviorism was "flickering to a close in the polemics of Professor Skinner."

It is fitting that this should be the last paper of Jerome Bruner's to be reviewed in this document, as the Herbert Spencer Lecture in many ways defines the philosophies of Bruner's that brought this present work into being. In this lecture, Bruner expresses the need for psychology to approach man in a more total way than merely the reductionistic fashion made mandatory by the efforts of early psychologists to establish a science of the nature of man. Bruner insists on the inclusion of culture, and of intention, both "hidden" intent, in the Freudian sense, and "manifest" intent. Bruner puts it this way,

> "...if you think responses are all and mind is a nonsense, if you do not take into account the structural complexity of what it is that men respond to, and if you take man to be a creature of biology tempered by a certain amount of learning, then it is a very dim picture indeed that one offers in the debate about man's nature."
>
> (Ibid.)

Bruner refers to Noam Chomsky's notion of structural dependency, that is, that the position of the feature in a structure determines its significance. It is Bruner's goal in this lecture to discuss how common sense had affected psychology, or the other way about. I am not certain that the goal was accomplished, but most certainly the paper is an expression of Bruner's general philosophy of psychology; perhaps in Bruner's mind these are the same.

Bruner does not subscribe to the elimination of science in favor of culture as an approach to psychology; he insists, rather,

> "...that educated human beings, given their intrinsic "science-making" or theory making capacities, know how to do things and know that they do them. A theory of human behavior that fails to make

> contact with man's conceptions of his world and his way of knowing, that sets these aside as epiphenomena, will neither be an adequate theory of human behaviour nor will it prevail in common sense."
>
> (Ibid.)

One would not suppose that the attack launched in this lecture on the concept of the lively septuagenarian, B. F. Skinner, would go unanswered; nor did it. Skinner took up the gauntlet in the London Times Literary Supplement (where the Herbert Spencer Lecture had been published). It is not surprising that Skinner saw fit to controvert the comment that behaviorism was "flickering to a close in the polemics of Professor Skinner!"

Skinner noted, among other things, that the "death of behaviorism" had "been announced with ...remarkable regularity for more than three decades." Skinner defended reinforcement contingencies. He said his theories were

> "...now in operation in hundreds of hospitals, where tens of thousands of people are enjoying greater feelings of <u>freedom</u> <u>and dignity</u> and returning to the outside world in greater numbers"
>
> (Skinner, 1977)
> (Underlining mine)

Skinner goes on to justify behavioristic theories, in particular contingencies of reinforcement, by citing their active use in prison settings, in education, and in the political arena. Skinner ends his comments with the regret that Bruner had not adequately acknowledged the successes of behaviorism.

> "When it comes to psychology in public affairs I can only say, '<u>Pends toi, brave Bruner; nous avons cambattu à Arques et tu n'y étais pas</u>.'"[1]
>
> (Ibid.)

---

[1] Skinner noted (Interview, 1978) that the source for this quotation may be found in the <u>Oxford Book of Quotations</u>.

Professor Skinner roughly translated the French for me in April, 1978, to read,

> "Hang yourself, brave Bruner; we fought at Arques and you were not there."
>
> (Skinner, Interview, 1978)

Clearly, Jerome Bruner had also to rise to the challenge of Skinner's retort. He responded,

> "Obviously 'contingent reinforcement' helps. What student of natural or artificial intelligence would want to ban feedback! But its role is most often as a clue for organizing information into usable knowledge."
>
> (Bruner, Times Supplement, 1977)

One can see the half-friendly rivalry of the intellectual jousting to which they both have evidently grown accustomed after more than thirty years of association (and disagreement!):

> "How curious the final lines in Professor Skinner's letter. Surely he hadn't expected to see me on his side at Arques, brave Burrhus IV."
>
> (Ibid.)

On February 4, 1977, The London Times Supplement carried one more letter from Skinner, in which he objected to the equation of feedback with reinforcement. He puns wryly that behavioral principles are

> "...being moved with such surprising speed from rat or pigeon box to box populi, if not box dei."
>
> (Skinner, February 4, 1977)

In the main, Bruner tells us, he finds no particular joy in the adversary relationship, though he clearly had some fun with this

dialogue. He would, however, in general, rather allow anyone who seems to exhibit a certain lack of fondness considerable room. He says,

> *"I really do run my own race. I don't like the opponent process; I don't like debating. I may be a controversial character, but I do it on my own. The idea is that things get debated out, but that's not the way I've seen debates go; I don't think they settle anything."*

In 1977, Bruner received two more honorary degrees, one from the University of Ghent (Doctor Honoris Causa), and another from Geneva. He worked on a book on children under five, lectured at Oxford, continued his research and the guidance of his graduate students...all this in a department in which he feels a bit at odds.

Of England, for which he still retains a great love, he speaks of a "dear people" who

> *"get so worried about equity...I've coined a phrase which is called 'the din of inequity'...everybody's worried about the equal amounts of something..."*

Bruner is off for the sabbatical year in the Netherlands which will include the Netherlands Institute for Advanced Study in Nijmegen and the Max Planck Gesellschaft; when he returns to Oxford, he will relinquish the Watts Professorship, probably to continue some research, but for all practical purposes it would appear that Jerome Bruner will be retired. He would like, he says pensively, to write a book about Ireland. He has more to do should he retire than most of us at full working years.

> *"I'm involved in a great many things that keep my nose to the grindstone and it makes me very restive..."*

MOMENTS IN REAL TIME: IRELAND[1]

There is a sense of wonder that follows the creative; it is a kind of joyousness on happening upon small unexpectancies in life, or on a different perception of something long since familiar. Bruner still has it. You hear it when he speaks of Ireland. It is a sort of combination of the "Aha!" of discovery and the "I am" of the Zen. Like "Aha!" and "I am," the sense of wonder exists only in "real time." And it is being in "real time" that so enchants Bruner with Ireland as to make his face light up and his voice take on a different timbre when he speaks of that land.

When Oxford is closed for the summer, Jerome Bruner and his wife, and sometimes others, go off to his home on the Southwest Coast of Ireland, near Rosscarbery, in County Cork. He spent the summer of 1977 there...some days sailing, some writing his autobiography[2].

I said to Jerome Bruner,

> "We've talked a bit about your place in Ireland; you haven't told me much about what it looks like or what it means to you, except that you do a good number of things there beyond writing and refreshing..."
>
> (Interview, 1977)

---

[1] In this chapter, the author admits to a certain presumption of editorial, though not poetic, license. The sense of such commentary as I have made here is derived from the last session of interview with Jerome Bruner in October, 1977. It was a quiet conversation after dinner in the living room of the house on the River Cherwell in Oxford. Much of what we spoke of has already been recorded on earlier pages. It was, however, a very different man who spoke of Ireland.

[2] To be submitted to History of Psychology in Autobiography.

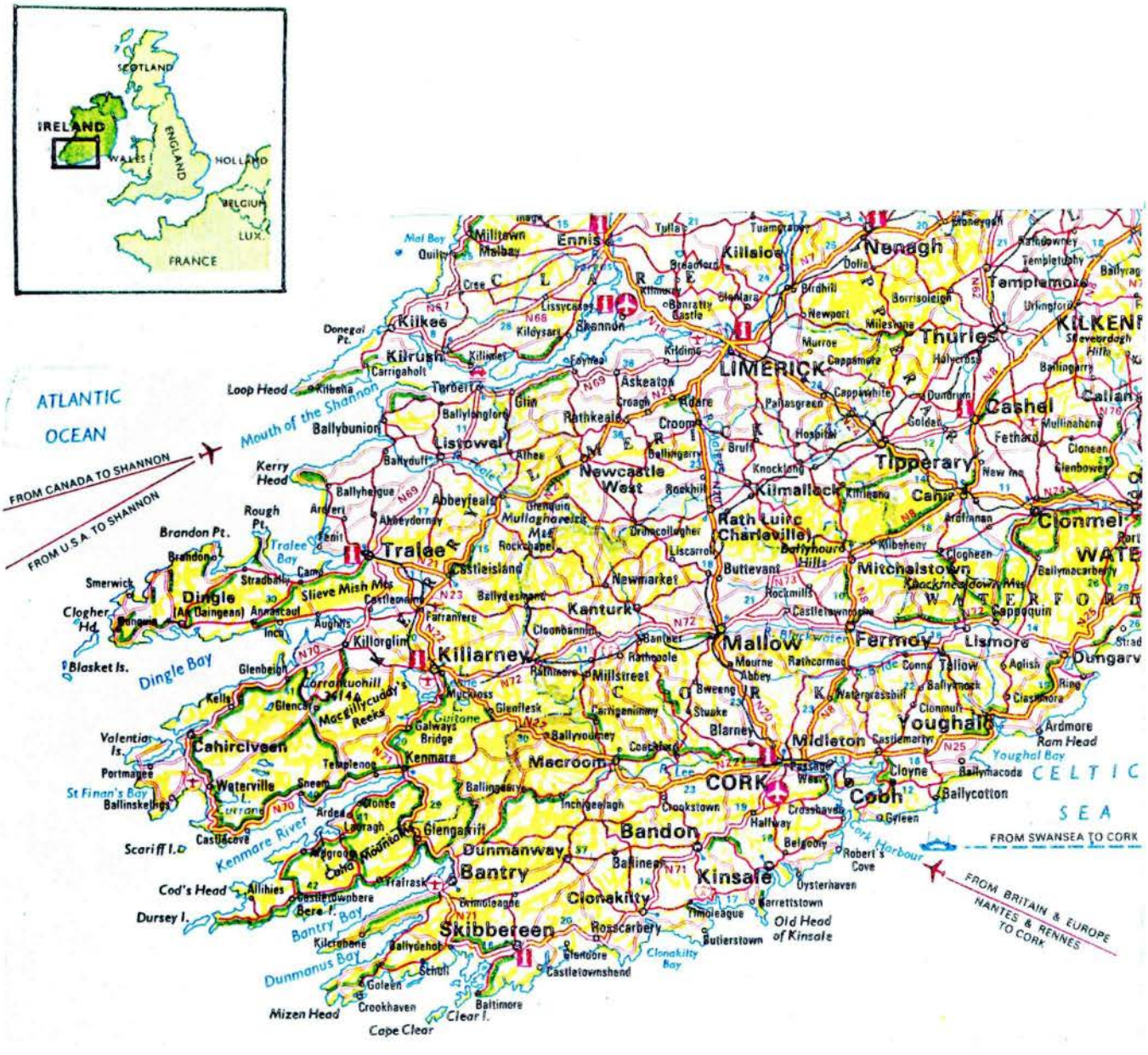


FIGURE 7 MAP OF SOUTHWEST IRELAND

*"I love the simplicity and the immediacy of it. In fact, as I sometimes say to Blanche, who laughs when I say it, and I say it to other people as well, the great thing about Ireland is that it occurs in real time. And real time activity is something that we don't often have, you see. Isn't it curious because most of the time I'm busily working on something that will appear in a book form six years from now...that's not real time. It's a funny kind of thing. When I go down...I go down to Tim Anderson's forge...and I have a little conversation with Tim as to what I need by way of metal to get my cow gate fixed, then I go into Klonakilty and get the metal, and I bring it to Tim and he makes the cowgate, and I take it back and mount it then and there. Or I break my boat hook and I take it over to Donald Donovan in Union Hall and he carves me an oak pole right then and there, you see. And that's all great."*

There is a kind of "out of synchronicity" in academic life: The lecture is prepared at one time and given at another, and summarized for preparation for an examination at still another time. In research, one must look back at the completion of an experiment after the reduction of the data and re-evaluate the design with which one began. Then one writes up the results, and it is a year or two after submission before the world of science knows what you have been doing, and longer yet, if ever, for the world at large to know. There is an even longer lag time with books; Bruner's mention of six years from first draft to publication is not excessive. The feedback is minimal, and it is late. It is an irony that for educators, and particularly for psychologists, who are most aware of the need for prompt feedback, the loop is so slow to close!

Bruner speaks of the house in Ireland:

*"...and I want all that house to be sort of a feeling that it is an extension of us, that we all know it and have worked on it. When I say we, I mean not only me, not only Blanche, but our friends and our kids and the rest of it. It is a place away...it has tremendous grace...and it has a community of the most extraordinary people around."*

The first ambassador from the Republic of Ireland to the United States was born just *"out at the side of the house."*

> *"...born a poor boy out on this barren cliff...I want to clear away all those stones and set up his old hearth now, looking out to the southwest toward the Stags and Cape Clear Island...and I want to see what's in all of that ground...put those stone walls back, and the rest of it..."*

Bruner speaks of

> *"...hard driving Pat Donovan, a neighbor who is raising fat cattle on the inflated prices that Ireland gets from the EEC"* [3]

and of

> *"Peter Jay, and Margaret, our ambassador to Washington and the Prime Minister's daughter, who got us there in the first place..."*

and of

> *"funny, lugubrious Mr. Kelly, who runs the hardware and paint shop in Rosscarbery, and Bridey Murphy* ('who really does exist?'), *who really exists, and has got the creamery down the road.*
>
> *"And it all takes place with a kind of immediacy, and its an oral tradition...I guess its a thirst for some kind of personal immediacy."*

Bruner commented that England had difficulty with personal immediacy. He speaks of Ireland being

> *"incredibly beautiful...full of kind of haunted memories...it unkinks my spine."*

Jerome Bruner clearly has a great love for the history of Ireland as well as for its current beauty. He tells, with the ease of an experienced story teller, of an Elizabethan plunderer, one named Coppinger, if I heard the name correctly, who came over in 1620. A mile from Bruner's house,

> *"...there with its three foot walls...it's a little farm cottage. And he set up this fortified house...beautiful Elizabethan style...*

---

[3] European Economic Community

*God, the shell is still standing, sort of held together by Virginia Creeper..."*

He tells another story, rambling, but so full of the energy of the tale that one could not help but be enchanted as well.

*"There was a little armada that came in to Castletownshend in 1601, having been driven out in 1588 they came back to see whether they could find a back door through Ireland...and they've always been trying to find back doors, the French and the Spaniards...They came back in 1601 and by God they got in to Castletownshend. They were to join up with the O'Driscoll's, but then the O'Neill's, who hated the O'Driscoll's guts like mad, somehow fixed it so that they couldn't quite bring it off because when the wind turned and came from the southeast, they couldn't tack out of the harbor there. And I understand why, because it's damned hard to do because it's pretty shallow water in there. And by God there were three Spanish galleons caught in there, and the O'Neill's brought up their cannons up on a hill top...and blew the rigging out of those Spanish boats and right there, underneath my house, a mile out to sea, there are Spanish graves on (the) island."*

Bruner spoke of sailing the same course, around Scotland and through the Irish Sea, down to the West Coast of Ireland, just as the galleons had. He made the voyage with a friend who was the former Commadore of the Irish Cruising Club, and had sailed the waters all his life (then being seventy).

*"...they'd worked their way down through a passage without charts which, in Wester Till, which is a much more maneuverable boat than a Spanish galleon, absolutely made my hair stand on end!"*

One may recall how, very early in his life, Jerome Bruner would see his father off to voyages to Europe, and that he had always felt as though he had some real connection with Europe; he called it "my Europeaness." He says of his feeling of Ireland that

*"...there's something about the continuity that joins me to the history of Europe in a fashion which I find remarkable...you get*

*the feeling of struggle, and the extent to which 16th century Ireland was a part of this thing...it was a great open thing...and there was a university, one of the great universities in Europe was right there in Rosscarbery, three miles over the hill from me. There's no sign of it now, except an old...monastery..."*

Bruner speaks of a Druidic circle one-half mile from his door, where the stones point to the vernal equinox. *"I love that place,"* he says, and it is clear that he means it.

Bridey Murphy, who has the creamery, is sixty five, a farmer's wife, and "tough as nails." She lives in a hamlet of Rosscarbery, and judges the people with whom she lives and deals with shrewdness and care. Bruner imitated her, proving that with his well developed accent, if he ever decided to be done with "professing," he could easily go on the stage.

*"She was marvelous...she absolutely radiated...(and) she stank. She stank of, you know, the way milk (does) when it begins to go bad, clinging around her coat... but my God! She really was something! She had that fantastic Irish sophistication, that simple sophistication that comes out of all tradition and living for 600 years under an ascendancy of outsiders."*

When he speaks of living in Ireland, Bruner says that you learn some very unique things about character,

*"...but you have to live it in detail...you have to do it quietly."*

Bruner tells of dealing with character by means of anecdote. Joe is a very quiet, easy going, fellow, who sits around a great deal; Donal (and it is Donal, not Donald, as Bruner spelled it out) is a somewhat too lively and busy soul to maintain the quietude to which Joe has become comfortably accustomed. One day, Joe says,

"Donal, could you help me?"

Donal said,

"Sure I'll help you. What are you doing?"

"Nothing," replied Joe, "and that's exactly it!"

*"They keep telling that story around there...I feel that along the way we might lose track of all that this means from the point of view of the way in which things and people are put together. It has to do with plight.*

*"Plight is your sense of what society's about...what your place is. It also has to do with what your power is...what you're capable of doing. All these things are the framework which we throw away in psychology. We don't look at these things. We don't have concepts like this. We want them narrow and maneuverable. We can have them narrow and maneuverable, but unless you have them of a context, they're not there. They just don't make any sense. They don't add up to anything except triviality."*

IN SUM...

> "And no man answers easily the questions: Who am I, where do I belong, and of what am I capable?"
>
> (Bruner, 1962c:43-57)

Surely, then, when one attempts to describe the themes of another's life, one must do so with a certain mandatory humility, if for no other reason than that we do, indeed, bring our limited selves to the perception of our fellows. It is in this spirit that we conclude this thesis.

First, we will try to sum up the themes of Jerome Bruner's work for, as Ernest Hilgard puts it, "One's work is, in a sense, one's biography." (Interview, 1978). Then we will look at some of the underlying personal themes which seem to be interwoven into the structure of Jerome Bruner's life.

Bruner is primarily a psychologist. In his Inaugural Lecture at Oxford, he presented his definition of psychology:

> "Psychology is one of the sciences of culture, and it must be engaged in culture. It is also a natural science and must be able in detachment to explore the mediating process — behavioral, neural, biochemical. And finally, it is a science of the artificial, and as such must contribute to the man-made design of man's environment, to ensure that man can grow to the fullness of his powers."
>
> (Bruner, 1974a)

We must look first at the philosophy with which Jerome Bruner approached his studies in psychology. In particular, his outlook was influenced early both by McDougall at Duke and by Gordon Allport at Harvard. McDougall had strong and negative feelings about mechanistic and simplistic views of psychology, and equally strong and positive philosophies about intention and directionality as valid ways of looking at the behavior of man. Allport was famed for his philosophy of functional autonomy, and for his high regard for the psychology of the individual. And it is in the light of this functionalistic and individualistic approach that we must look at the development of Jerome Bruner's work.

As to Bruner's application of his energies to the investigation of psychology, he explains,

> *"I am a terrible imperialist...I know damned well in general what I'm interested in; I don't know where it is going to pop up next...What I'm interested in is basically the sources of rationality."*

We will look now at the areas of study of human behavior which drew Bruner's attention in his search, and at the particular themes he addressed in each.

In social psychology, Bruner's themes had to do with propaganda, with political surveys (Hilgard once referred to this period as that in which Bruner was a "survey psychologist"), and with the opinions of people, how they were formed and how they were acted upon. In the course of the pursuits of these interests, Bruner came to have both a national and an international view. The international involvements came about in part because it was his natural bent, as we will

mention later, and we can guess that his service in France during World War II may have lent to his professional expression of internationalism. He was involved as well in international organizations and in efforts directed toward the work of the United Nations.

In perception, the main theme had to do with bringing the person to the perception; the ramifications took many forms. Bruner was largely responsible, with his colleague, Leo Postman, and others, for the development of what came to be called the "New Look" in perception. These investigators insisted on quantifying constant errors, and having a look at what was really happening. They looked at the effect of social values, of expectancy, of the current emotional set of the perceiver, and at others of these kinds of issues in measuring what was perceived. They investigated the ability of persons to perceive the feelings of others about them, and they looked at perception as a form of adaptive behavior. Bruner insisted that every performance of the person was an expression of the whole personality. In commenting on the reception of the ideas of the "New Look" in psychology's more conventional and hallowed halls, Bruner remarked

> *"The first response of people who wanted the field of perception to be left alone (was) enough of these mad dogs talking about motivation and intentional and social values!"*

"Knowing," Bruner said, "has many faces and it is a linguistic pity that the word is a singular gerund" (Bruner, 1962c). Bruner's study of thinking, of learning, of cognition, carried with it such themes as strategies and categories (or generalities). One needed to learn something in a generic way, Bruner proposed, to "leap the

barrier" to thinking. He later spoke of thinking as "that an organism has freed itself from domination by stimulus" (Bruner, 1964c), and later still as "the achievement, retention and storage of information" (Bruner, 1968d).

The themes of modes of representation, enactive, ikonic and symbolic, are often found in Bruner's writings; they are enlarged upon with the passage of time and additional studies. His work in cognition still appears to receive considerable attention. He reports,

> *"The most widely quoted work...one that seems to go on and on, published in 1956, is A Study of Thinking. It's incredible. What it did was to change the pattern of research in psychology and introduce the concept of strategy (and) dealt with the formal description of the domain, something other than size, shape, and various other dimensions."*

Bruner's functionalist approach is apparent when he says, "It matters not what we have learned; it is what we can do with what we have learned; this is the issue" (Bruner, 1959d). Because thinking and learning have so much to do with education, there are some fuzzy edges to the idea of the themes involved. One outstanding message which Jerome Bruner tried to put across was that any subject may be taught to anybody at any age in some honest form (Bruner, 1960e). Then there was the powerful notion of the spiral curriculum. The ideas of transformation, of transfer, and of generalization which have to do with thinking, learning and education all were prominent in Bruner's writings on this subject. The complementary issues of simplicity and complexity are expressed in such notations as,

"To understand something is to sense wherein it is simple."

(Bruner, 1960d)

and, conversely, his agreement with George Miller that there is no reason to believe that God issued us an insurance policy against complexity (Bruner, 1960c). There is the idea of scaffolding, which Bruner and his colleagues suggest obviates modelling and imitation as learning functions in tutoring (Wood, Bruner and Moss, 1976).

Another deep theme in Bruner's work on education is that of the role of culture.

> "You cannot consider education without taking into account how a culture gets passed on."
>
> (Bruner, 1966e)

The proper subject of education is considered by Bruner to be the manner in which culture is transmitted (Bruner, 1966f:149-171).

Bruner addressed the plight of the problem learner, and found that often he or she suffered from the pre-emptive metaphor. The prospective learner, through the vehicle of the re-emptive metaphor, generalizes a negativity in such a manner as to put himself into

> "...the classic case of double bind — he's damned if he succeeds and he's damned if he fails."
>
> (Bruner, 1966f)

Bruner devoted an essay to the themes of coping and defending with regard to problems in learning, and remarked on the particular importance of how learning takes place through play when one is dealing with learning problems. He emphasized also the importance of play in general in learning, noting the lessening of pressure on the learner in an atmosphere of play.

Bruner sought innovative methods of teaching, for example in "Man, A Course of Study," and in Diene's creative work in mathematical

explanations, and found some good news and some bad. The children responded well, but there was a point at which some of the U. S. Congress did not. And then there was the inseparableness of pedagogy and politics, and the interrelationship of poverty with the two. Included here must be the Headstart Program, along with Bruner's other efforts. There seems a great sadness in Bruner concerning the evident intractability of educational procedures:

> *"I thought...if you gave some good models it would drive out the bad, that people would want them. It was very naive."*
>
> And there was the theme,
>
> "The process and the goal of education are the same thing. The goal of education is disciplined understanding. That is the process as well."
>
> (Bruner, 1961c)

What of Jerome Bruner's work in human development? There was the good relation with Inhelder, and the less than enthusiastic one, over time, with Piaget. Some of Bruner's work in development seems to be foiled against that of the "Geneva School," for example, the work in conservation and in equivalence. One theme had to do with infant sucking, its uses for nourishment, comfort and communication, and its changes with maturity. What is it at which the infant looks, and his increasing capacity to follow the "line of regard" are important issues. Eye skills, hand skills, and eye hand coordination and interaction...intention, modular acts, mutual expectancy of the parent and the child...all these are themes in development. Bruner emphasizes the fascinating interaction between the infant and the adult which will eventually lead us to language, and he pays particular attention to the function of play in development.

We have now come to Bruner's work on language. Just as Bruner says he never left social psychology, he also says he has always been with language. His own literature supports this contention.

We see considerable emphasis on language in Brown's relating language to culture in A Study of Thinking (Bruner, Goodnow and Austin, 1956). A formal reference to language appears when Bruner says that Benjamin Lee Whorf inspired the view that the structure of language influences what one notices in the world, that is, influences one's perception ("Social Psychology and Perception," Bruner, 1958d). Bruner showed his interest in language in his preface to Vygotsky's Thought and Language (Bruner, 1962d), which was followed by his remark in "Man, A Course of Study" (Bruner, 1965c) that "The very essence of being human lies in the use of symbols," language being the major symbolic mode of representation. "Natural language," Bruner described as a prime example of an "intellectual prosthetic device, a tool provided by the culture" (Bruner, 1966d). In Studies in Cognitive Growth, Bruner referred to the arbitrariness of symbol reference, and commented on the holophrase and its development to more mature forms of communication. Bruner questioned in particular how language affects the cognitive process. "Language," he insisted, "is a major instrument of thought" (Bruner, 1966f). The syntactic development of "sticky all gone" appears in 1966, and in 1967, the "Ontogenesis of Symbols" (Bruner 1967) starts Bruner's serious approach to language. The great flow of papers on linguistics begins in 1975, with "The Ontogenesis of Speech Acts" (Bruner, 1975h).

The emphases are the precursors of language, preverbal communication, and the transitions therefrom to early language. We see other themes in intent, joint action, predication, the metaphoric spiral, indication, deixis, naming, and the modes of demand, request and exchange in the preverbal child. Once again, the functionalist view emerges:

> "Once cannot understand transition from pre-language to language without taking into account the uses of communication as speech acts."
>
> (Bruner, 1975c)

The themes in Bruner's work are interwoven. When we ask about the threads of his work, Bruner suggests we

> *"Don't be so damned conscious about your threads. Because frequently you find that when you undertake something, lo and behold, you are on to something new but continuous with what you did before. You've got to have nerve in that respect."*

One needs, in fact, to follow one's passions. It is no doubt less clear on the approach than it is as we look back on the work. The threads are woven clearly in retrospect; the journey is not so well marked on the way.

What about Jerome Bruner's personal themes? What about his view of "In Sum?"

> *"The 'in sum' is a shrug. It is not within any man's control. You launch it, and there it is. It's like your children. There they are. You do your best. Life in a sense, you know, sets up a series of reverberating myths..."*

Let us look at some of Bruner's reverberating myths, those themes that seem to appear again and again in his life.

Among the themes which emerge is Jerome Bruner's clear preference for an historical view of his world, one which includes a personal involvement in that history:

*"I think of continuity...I've always cherished Lichtenstein's image of a rope being made up of strands no matter how long...no one strand was bigger than that...and there was some way of joining them together, which is what makes a community, what makes a sodality...and caring about the rope, as opposed to just caring about your strand is what matters...Don't ask for whom the strand tolls...it tolls for the rope!"*

Bruner makes frequent reference to evolution in his writing, to anthropology, and throughout the years, to various cultures. He studied the Cherokee culture with Leonard Broom in 1939, the Navajo and Zuni tribes in 1954, and the !Kung Bushmen of the Kalahari Desert in Africa in 1965. He was, of course, close to the greatest psychological historian of our time, E. G. Boring, and was surely greatly influenced by him. The "left hand" papers were replete with references to historical moments, and the emphasis on culture is present throughout Bruner's writings for many years. He considers guiding myths a latent culture, and thus a form of behavioral control (Bruner, 1962c). In particular we see an enthusiasm for history when Bruner speaks of Ireland.

Hinged to his sense of history is a kind of fatalism:

*"I think it's important to accept the idea that some things are fate, because it arms you in a way. If you must assume that everything is accident, that everything can be proved, you should not put up with it. This may sound as if it is not truly part of my view of the world, but it's very much a part of my view of the world...that somehow you've got to take some limit on things."*

Bruner has a sense of history with regard to his fields of research as well. His work includes sound "state of the art" papers which bring us up through the historical issues of the subject at hand. He did a survey paper on social psychology (Bruner and Allport, 1940) with Gordon Allport that covered half a century. In "An Approach to Social

Perception" (Bruner and Postman, 1948), he presented the background literature for the research he would do in the field. "The Course of Cognitive Growth" (Bruner, 1964a) provided a breadth look at the areas of development and cognition in the sense in which Bruner would write about them. In language, there were two major "state of the art" papers, "Ontogenesis of Symbols" (Bruner, 1967), and, seven years later, "From Communication to Language: A Psychological Perspective" (Bruner, 1975c).

Another subject which appears again and again in Bruner's writing is the issue of what some of us call the "human condition."

> *"...the world deals out some pretty nasty plights...in general, given the shortness of man's life on earth and the longness of art and the slowness of learning, it's a pretty tough show all around."*

What, we might speculate, were the effects of Bruner's own personal plight of blindness as an infant? Some suggest that his choice to study perception might be based on this early perceptive deprivation; he says that this is surely not a conscious basis of choice. He does, however, note that he has some difficulty with spatial concepts, and mentions that when he, along with thirteen other psychologists and eight anthropologists were used as subjects for Anne Roe's monograph, "A Psychological Study of Eminent Psychologists and Anthropologists and a Comparison with Biological and Physical Scientists" (Roe, 1953), he came out

> *"moderately on spatial abilities, like most psychologists. It was very interesting to me how well I could do on spatial things, actually, given the fact that I started out with a kind of haptic space."*

Human plights and the human dilemma: Bruner sometimes seems to deal with these concepts with one superceding theme, that of courage. We see it here and there — of Broadbent, "Donald, you are very brave;" "you've got to have nerve..." and of a small innovative report, "a brave little book." His commentary on courage in certain historical Irish incidents is both dramatic and moving. He presents other solutions: mastery, excellence, competence. Anything but mediocrity. Even failing well. About experimental schools, for example, he says

> *"...the question shouldn't be about their success. The question should really be about how well they failed. I think that if they are good, they are bound to fail, because the main thing in an experiment in education is that you must push to the edge of the possible, and you don't know the edge of the possible until you've gone beyond it, so you fail. So then comes the question: Does the failure somehow raise consciousness to a degree of clarity about possibilities, so that you then really kind of look afresh at how you garden for blooms, and these things are blooms, these great moments, you know..."*

Bruner insists as well that you have to

> *"...fail in public...private failures, the economy of embarrassment, is not good."*

Bruner deals often, especially during the years of his early forties, with myth and with metaphor. He deals also here with courage, especially with a kind of academic courage not to water things down, to allow historical realities to have passion and power. Once senses a real drama about many Brunerian concepts.

From whence did these views of the world come? A number of them were from Jerome Bruner's father. Jewishness was not a religious commitment in the Bruner household, so one cannot hold up the religious

ethnic as a strong influence. Bruner's father had a breadth of interests which he bequeathed to his son. Among the views Jerome Bruner appears to have inherited is a sense of political liberalism and of political responsibility. These are clearly evident throughout Bruner's life. His sense of social responsibility, inspired by his father, shows in many places: the insistence by his father that he not buy the paper of a publisher perceived to be unethical graduates to Bruner's own struggles with the government about poverty, politics and pedagogy. Beginning during the time of his work with propaganda, Bruner spent time in Washington, and he was involved with politics throughout the ensuing years. His refusal to sign the loyalty oath and his efforts to get the requirement removed from dealings with the Veterans Administration were part of his commitment to his political and social values, as was his refusal to move toward anarchy in the rebellions of the late sixties. It was Bruner's desire to work through the system rather than to destroy it, for it is his firm belief that society must have some rules to be viable.

Another theme which runs through Bruner's life may be credited to his father, at least for its inception: it is his "European-ness." It was, after all, seeing his father off to Europe as a small child which influenced him so much, and which gave him the sense of a tie to Europe. We see him doing propaganda studies in the European community, and generally ignoring the Pacific theatre, during the war. His first visit to Europe was at the beginning of the war, and he got out only at the last minute. There was his international approach in social

psychology, and there were his visits to England, sabbaticals abroad, and so on, and finally his settlement in England, with one foot in his loved spot in Ireland, a kind of fulfillment of that "European-ness" at last.

Bruner is an elitist, admited and observable. We look at the Harvard of his youth and early teaching years, and find ourselves hard put to find a more elite society of psychologists. The company of his dinner friends who met in groups at regular intervals, most of whom were acknowleged experts in their fields, was another show of elitism; among his close friends Bruner counts more than one Nobel Prize winner, and among his acquaintances, many. Esprit d'corp is important; he remarks on the lack of it at Oxford.

Bruner mentions once that his son on one occasion accused him of being one of those "goddamned Cambridge intellectuals," a comment which appeared to amuse Bruner more than to offend him. We see consistently in Jerome Bruner a distinct sense of personal responsibility, and long after the remark by his son, we hear him address the issue of intellectualism.

> *"I think of the essence of an intellectual as somebody who takes seriously for his own life the consequences of his own reflection. That to me is the essence of an intellectual."*

Bruner speaks of individual rights, of principles of law, and of the necessity for those principles. He speaks of running his own race, of not liking the opponent process, and of giving a broad berth to his adversaries if they so consider themselves. He is convinced that

competence is its own reward and that the rewards of education are intrinsic. He speaks of creativity as "effective surprise." Bruner seems to work and to teach well in situations where there is a free flow of ideas, for example the Bow Street Seminars, and the weekly dinners with those from different disciplines.

Among the most important of Jerome Bruner's world views, one of the concepts which most influenced his thinking, is Neils Bohr's theory of complementarity. This theme appeared in paper after paper, year after year. Even when describing the work of Sigmund Freud, Bruner speaks of his complementarities and his continuities.

Bruner has been honored much and often; of this he comments,

> *"It's nice not to have to brood about the fact that you haven't been honored, in a sense, but I've always had sort of a conviction that you use it for something...and I'm sure I get that goddamned compulsion from my father...I have always had the feeling...that every time your clout increases, in some odd way you take on more responsibilities to fight for things that matter to you."*

One does not get from Jerome Bruner any sense that there should be any kind of "free ride" through life; quite the contrary. Rather one finds a clear regard for responsibility and for the concept of consequences for one's actions. Bruner says

> *"I get a fair amount of pleasure out of life...as much as I deserve, whatever that is! I have a very rich life. There's no question about it, and I work very hard."*

Bruner does try to pace himself with his work, and to relax with physical outlets whenever he is able. He rides his bicycle, plays squash, sails, and remarks of some of his non-academic abilities,

*"I've got a lot of skills that I'm proud of. I can take an engine apart and put it together again. There's no part of a sailboat that I can't take apart and put back together again. I know what it needs, and I know how to take care of it. And I don't let anybody do anything to the boat that I don't see, because I like to do it. I like to be able to do it; I like to be able to do it under duress."*

We hear again the themes in all walks of life of excellence, of competency, of mastery. These are major themes, and they recur again and again.

There have clearly been some times of transition, of emotional and of professional development, which stand out in Jerome Bruner's life. Blindness and recovery as an infant was followed by a childhood of walks in the marshes, of companionship with a loving father, and distance from a less interested mother, of coming to terms with schools, then with dealing with the death of the adored father. The developments which brought about Bruner's strong sense of identity, the remarkable change from childhood to young manhood, took place at Duke where he came to terms of acceptance with the emotional distance from his mother and the grief at the loss of his father, and where he developed a sense of his own destiny in psychology. He became a part of a new family at Harvard, one which agreed with and encouraged excellence as a primary standard, and which promoted the kind of intellectual curiosity which had been instigated by Bruner's father. Bruner married, had children, established a career, and began a freshly invigorated intellectual life at Princeton with his exposure to Oppenheimer and others. In particular, Bruner's discovery of complementarity was significant, and this theme is ubiquitous in his work. The resolution of dualities was a major move.

In mid-life, he turned to the left hand, a significant love affair, and to turmoil, tumult, plights, and powerful themes which touched all that he wrote and probably all that he did. He married again and appeared to consolidate his world. The strongest periods of experimental psychology appeared when he worked in perception, and again after the period of consolidation, when he began work with development and with pre-verbal and early linguistic communication. The career crisis that took place in his mid-fifties had to do with societal changes and with changes in his academic environment that had been drastic, and beyond his control; they were not changes internal to him, except, perhaps, the discouraging insights he gained into the sense of futility involved with the world of the poor. He appeared, rather, in the main to remain stable in the face of the changes around him, and simply to disengage when circumstances became sufficiently uncomfortable. The discovery of real time in Ireland gives us a sense of Jerome Bruner's present state, and it appears to be a contented one, not without a kind of liveliness.

There is a noticeable tendency in Bruner's style on which we might remark; it is that when things seem to stop in their forward motion for Bruner, or when confusion enters the scene, he will pause, regroup, and then find a rounte by which he can again go forward; witness 1955 and again, 1972 when he left Harvard as only two examples. There is a sort of consolidating and regrouping in his academic pursuits as well which shows itself in the state of the art papers we find when Bruner embarks on a new field of interest.

Since writing has been an integral part of Jerome Bruner's academic as well as his private life, some comment seems indicated. He writes poetry, in addition to his abundant prose, and often writes as to a friend who might be seated across the desk from him.

> *"I find the written language a way of getting my thoughts clear about things. It's tremendously important to me to write...It's almost a part of my thinking...it really is.*
>
> *"I love language...I love its muscle and its quality...it can do all sorts of things, but the great thing that it can do is it can make things clear. Then it can not only make things clear, but it can also make them vivid. So I suppose in the 18th Century I would have been an essayist."*

In this author's opinion, he did a fair job of being an essayist in this century! Perhaps Bruner's most delightful comment on language is

> *"I have the feeling that since thought is transactional to some extent, it is very important the manner in which you encapsulate it. Not just from the point of view of thought, but the manner in which it is a gift to somebody else."*

Jerome Bruner is a remarkable story teller, and a lively lecturer. He tells a tale he heard from one of his graduate students years ago, purported to have been told originally by Martin Buber[1]:

> *"There's one marvelous story about a rabbi by the name of Reb Moshe. And Reb Moshe comes to heaven and is met by St. Peter and a couple of assistants, and almost before St Peter can open his mouth, he says to St. Peter, 'St. Peter, I'm most eager to get into heaven. I know its not quite as its done to speak for your own advocacy, but*

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[1] Martin Buber (1878 - 1965)
Buber was a Jewish philosopher, theologian and scholar of Hasidism. He was born in Austria, and lived in Israel from 1938 until the time of his death. (Random House Dictionary, 1966)

*I know my shortcomings...I've not been the kind of man that Albert Schweitzer was, who at the same time could transcribe the Bach organ fugues, go out into the jungle and suffer...and I have not been an Albert Einstein, who could pierce the secrets of the world, and I've not been a Spinoza, who thought deeply about the nature of thought so that he increased man's reflection...' And St. Peter puts up his hand and says, 'Those aren't really the questions we wanted to ask you, Reb Moshe. Our worry was, why haven't you been more Reb Moshe?'"*

One cannot imagine Jerome Bruner being any more Jerome Bruner. Perhaps St. Peter will have a different question of him.

"In any man's intellectual life there are only a few topics, only a limited set of persistent queries and themes."

(Bruner, 1962c, Introduction)

We have tried to present the themes of Bruner's life as we have seen them in the study of his work. It has been a task filled with delight and with personal discovery. My own themes have become more clear, and in some instances confirmed and in others enhanced. There is no doubt in this author's mind of the intrinsic value of this study.

The reward, indeed, has been in the doing.

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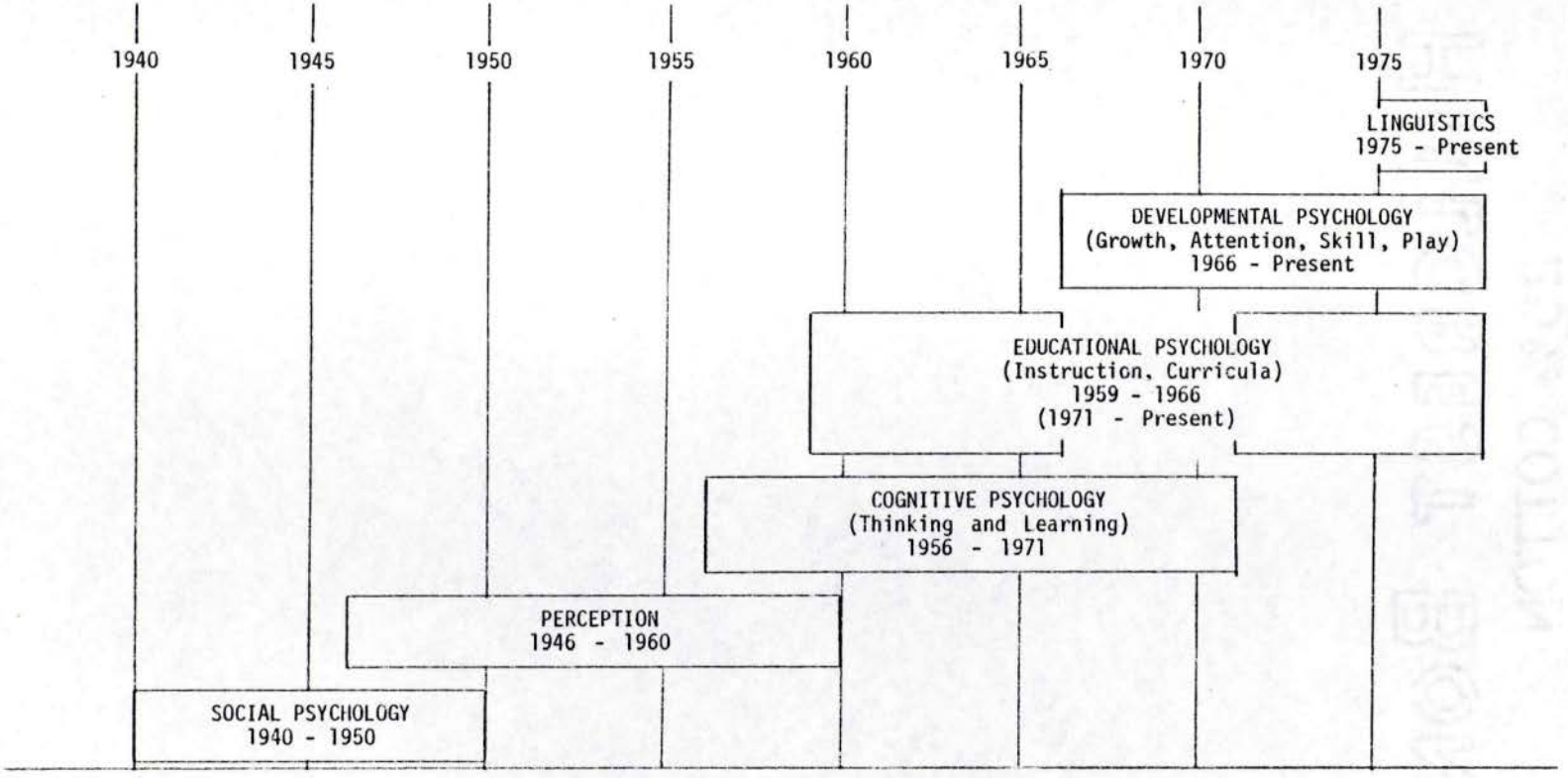
# APPENDIX I

## MAJOR PUBLICATION PHASES IN THE WORK OF JEROME BRUNER




MAJOR PUBLICATION PHASES IN THE WORK OF JEROME BRUNER

JEROME SEYMOUR BRUNER

Born: October 1, 1915
New York
B.A.: Duke University, 1937
A.M.: Harvard University, 1939
Ph.D.: Harvard University, 1941

Princeton: Office of Public Opinion Research, 1942 - 1944
Harvard: Instructor through Professor, 1945 - 1972
Oxford: Watts Professor of Psychology
Fellow, Wolfson College
1972 - Present

*"What I am interested in is, basically, the sources of rationality..."*
*Jerome Bruner*

*October 10, 1977*
*Oxford, England*