

Lifelines

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Alexander Romanovich Luria's approach to neuropsychology has had a profound influence on my life's work. In the introduction to his final book, *The making of mind*¹ Luria wrote:

People come and go. Their ideas and actions remain. Nevertheless, a retrospect of one's life in science can be of certain value....It can reflect the atmosphere in which the scholar worked, the factors that influenced his work, the basic ideas that dominated during the period of his activity; and the influences of outstanding men he met¹. **[How do you feel about adding a footnote regarding the fact that we are preserving the original, non-gender inclusive language?]**

In keeping with this sentiment, I shall try to illustrate "the atmosphere" of my life.

The Beginning: Education in Denmark and the United States

In this chapter I shall describe fragments of the development of neuropsychology in Denmark, where I have lived my life and worked in the field since the late 1950s. Luria praised the "ascending to concreteness". **In contrast**; my own life started concrete, later it became more abstract.

The last part of my school years was marked by the German occupation of Denmark. German soldiers were marching and singing through the streets; our school was overtaken. Resistance was on our minds and took place in the dark. Graduation to the University of Copenhagen was a happy event coinciding with the liberation on the 5th of May, 1945. The overwhelming experience of freedom and peace continued during that summer. The borders were opened and we were full of hope and expectations for the future.

¹ Paula, please do this as wished for.

At the time, the first year in University consisted of obligatory courses called *Filosofikum* (an introduction to philosophy and sciences). I enrolled. I also married a fellow student, Niels Egmont Christensen, who had been my classmate for 5 years. However, this was much to our parents' concern; we were both 19. I embraced marriage and motherhood (our son Mads Egmont was born in 1947) with more enthusiasm than I did my studies **although we nevertheless each** completed *Filosofikum*. My husband continued in Philosophy and Logic. I would feel his strong influence on my way of thinking when, after devoting myself exclusively to the role of mother and housewife for 6 years, I reinitiated my studies.

I was divided between studying Literature and studying Psychology. It was the summer of 1952 and an institution called Nordic Summer University had its first meeting in Denmark. Eminent scientists, such as Niels Bohr and Mogens Fog, participated making the event very special. **The events that took place** at this summer university influenced my choice to study psychology.

The Gestalt psychologist Edgar Rubin, known for his work in figure-ground perception³, was the senior professor in the Psychology Department at the University of Copenhagen, which boasted of being the second experimental laboratory in Europe, founded in 1872 by Alfred Lehman. Traditional psychophysiology was the main discipline. However, a strong phenomenological ideology also prevailed. **This ideology** was expressed by the younger professors, among them Franz From, who wrote a book called *Experiencing the behavior of other people*⁴.

By 1954, my husband Niels had completed his degree. He received two grants, which enabled our small family to go to the United States and, of all places, to Harvard and Radcliffe. The world truly opened up to us. Mads attended an advanced, private school - Brown & Nichols - which influenced his later wish to attend the University of Southern California (USC) and study film. I had the good luck of being accepted at Radcliffe, even if my qualifications were sparse; this may have been due to the fact that it was shortly after the war. Courses with Talcott Parsons, Gordon Allport, Gardner Lindzey and George Mandler (Henry Murray was on sabbatical leave at the time) in the Department of Social Relations **provided me with new food for thought.**

My greatest influence in Cambridge, however, was Jerome S. Bruner. His and Jacqueline Goodnow's course about thinking took place in Memorial Hall⁵. I had read Wertheimer and Duncker, but attending the Bruner lectures fascinated me to an extent that I had never experienced before. Was it possible that a professor could stimulate my interest to such a degree? The early Bruner and Goodman paper, "Value and need as organizing factors in perception"⁶ had been on the curriculum in Copenhagen. This was the paper that started the New Look. In Jerome Bruner's autobiographical book, *In search of mind*⁷, there is a quotation from Matthew Erdelyi's 1974 paper, "A New Look at the New Look"⁸. The quotation states:

The proceedings, at least formally, started some quarter century ago with a series of publications (Bruner & Postman, 1947; McGinnies, 1949; Postman, Bruner, & McGinnies, 1948) which suggested that the perception of external stimuli is not free of the shackles of internal events: attitudes, values, expectancies, and psychodynamic defenses all impinge upon perception. This view became loosely known as the New Look. (p. 68)

Bruner adds⁹:

"It was psychophysics all right, but psychophysics in the market place rather than in the shielded laboratory where such matters were ordinarily conducted. Instead of having our "subjects" judge the magnitude of controlled, neutral "stimuli", we set them the task of estimating the sizes of coins, ordinary U.S. mintage right out of my pocket. And in place of "trained observers" as subjects, we used ten year-old school children. Their job was to adjust a patch of light to match the size of a nickel, a dime, a quarter, and a half dollar. That was all. Half of the kids were from schools in affluent parts of Boston; the others from the city's slums.

The findings had an almost Dickensian quality. The more valuable the coin, the greater the over-estimation, of its size. And the poorer children over-estimated more than the affluent ones.” (p.70)

There was more to it: New Look psychology did not consist of dry, experimental studies, but experiences from ordinary life. Bruner gave his lectures in a language that **expressed the meaningfulness of concrete, everyday life** and an unexpected, creative use of words and associations that was very much in tune with my thinking and expectancies of psychology. I had never experienced science in this way before, and listened with overwhelming joy.

The second semester I was invited to participate in a small, advanced seminar at Bruner's home about transfer of training. I had been asked to present my readings in German and forgot all of my materials on the bus. Everybody laughed sweetly and I did not understand why. After that experience, I realized the need to become acquainted with psychoanalysis (which had not been taught at the Psychology Department in Copenhagen). I took a course taught by Edwin Semrad, M.D. about analytic group procedures at Boston Psychopathic Hospital, where six to eight post-graduate students kindly welcomed me. I later learned that Dr. Semrad has been inspirational to several well-known group psychoanalysts.

The year at Harvard had changed my outlook on psychology. My horizons were broadened: I had made new friends, and had become inspired to widen the scope of the work that lay ahead of me.

When I returned to Denmark in 1955, I continued my studies and finished my degree in 1957. However, the need for further knowledge was imminent. I enrolled in a course given by Lise Oestergaard, Ph.D., who would become the first professor of clinical psychology at the University of Copenhagen. She became a giving but also a demanding friend. Years later, her support for the establishment of the Center for Rehabilitation of Brain Injury (CRBI) at the University of Copenhagen would be essential. At that time, Lise was head of Psychology at the University Hospital's Psychiatry Department, and encouraged me to do clinical work there while I took the course. This is the road I took into clinical psychology and psychiatry.

Continued Education in the Psychiatric, Neurological, and Neurosurgical Clinics

My husband had accepted a position at the University of Aarhus (Jutland) in 1959, where he became Chair of the Philosophy Department in 1968. The University was around 25 years old and represented a pioneering spirit. So we went there **and I secured** a position as clinical psychologist at the University's Psychiatric Hospital. The professor was Erik Strömngren, MD, one of the most influential European psychiatrists of his time. Through the years, until his death in 1993, he was a strong supporter of neuropsychology, and he would later play an active role as the Center's first Chairman of the Board.

After having worked in psychiatry for one year, however, I felt that I knew too little about the diagnostic symptoms of the patients I was asked to examine. I realized that intensive studies on the central nervous system, as manifested in neurology and neurosurgery, were a necessity. I succeeded in obtaining a medical position at the University's Neurological and Neurosurgical Departments, **although** there had never been a psychologist working there. A year later, I became the neuropsychologist on the neurosurgical staff, a position that lasted nine years. The head of the Department, was Richard Malmros, MD, a professor and neurosurgeon of the old tradition. He cared deeply for his patients, often visiting them in the middle of the night to check on their status. He investigated his patients' lives and looked after their personal needs, helping them when possible. For example, he made sure that wigs were immediately made available and left by the nightstand of the female patients who had undergone surgery. Dr. Malmros was also profoundly interested in neuropsychological findings and wanted me to accompany him on his rounds. He was research-oriented and innovative in his methods. I gained experience in various brain diseases and a close follow-up of patients with acute conditions of brain injury led to **my interest in** outcome research.

Once during these nine years, an Armenian professor from the Bourdenko Neurosurgical Institute in Moscow visited the department. While he was giving a presentation, someone asked him about the influence of neuropsychology on neurosurgery. He answered in his special brand of Russian humor by telling a story: "Imagine a water mill, where the flow of water had decreased. Then happily, a little mouse passes by the river and pees into the water. Suddenly the water flows again,

resulting in new prosperity. The little mouse is neuropsychology; neurosurgery is the water mill.”

Without neuropsychology, neurosurgery would not have flourished.

Initially, in these nine years, I participated in clinical work with patients, mainly in the area of assessment. I used traditional clinical psychological tests, but it soon became clear to me that these were not fit for examining patients in the acute stage. Then in 1966 I was asked to review the newly published English translation of A.R. Luria's *Higher cortical functions*.¹⁰ The meaningfulness of his method was clear to me and I realized that here was what I needed. In this book, Luria presented a theory of brain function that ingeniously combined the divergent ideas of narrow localization with Lashley's suggestions of mass activity and equipotentiality. Luria provided a thorough evaluation procedure of higher cortical functioning that could be used at the patient's bedside. The benefit of the approach was that the tasks were developed from a comprehensive theory of brain functioning. Thus, each task examined different aspects of brain functioning in a manner meaningful to the patient, while also providing a diagnostic summary consistent with the neurosurgeons' way of thinking. The method also made it possible to determine changes in functioning by delineating new areas of damage affecting the overall patterns of function, therefore allowing for evaluation of progression or healing. The method was difficult to perform as intended, however, without direct instruction. I therefore began to translate the theory and practical procedures into Danish for my own purposes in order to get further insight into the mechanisms of its application.

In the daily work at the department, attempts to apply the method gave rise to a common understanding among staff members. Everyone was involved in the treatment and care of the patients. Test results from the neuropsychological evaluation illuminated the understanding of the patients' reactions. Therefore, the patients' behavior could be understood. Feedback in relation to the patients' disturbances improved their insight at the same time that it increased the possibilities for a better treatment. The importance of neuropsychological assistance became clear.

One area of research in the Department was Parkinsonism. In a study about the sequelae of stereotaxic surgery, the psychological findings suggested no decline in intellectual functioning after surgery. In the publication, the Luria approach was combined with traditional testing.¹¹

A controlled study of a group of amateur boxers using the method was also conducted.¹² The results indicated that the method identified a pathology where the neurological examination did not. This study was conducted in collaboration with the staff neurologist, Palle Juul-Jensen, MD, who would become an important friend.

Visits to the Bourdenko Neurosurgical University Institute

In 1969, Luria attended the General Psychology Conference in London. Jerome Bruner was also present. Bruner had told me some years before that the right place to study higher cortical functions was in Luria's laboratory in Moscow. During the opening reception of the conference, he insisted that I introduce myself to Luria. I did so and told him about my early attempts at using his method. Luria asked, "Why don't you come to Moscow?" After that reception, he sustained a heart attack and his paper, "The origin and cerebral organization of man's conscious action,"¹³ was read by Hans Lukas Teuber. I did not see Luria again during the conference, but soon after received an official invitation to visit him in Moscow. I went in September of 1970. While there, I participated in his examination of patients at the Bourdenko Neurosurgical University Institute, and was presented with reprint after reprint to read during the evenings.

The neuropsychologist who was chosen to assist me in all possible ways – I did not speak any Russian – was Elkhonon ("Nick") Goldberg. He has been a very special friend and collaborator since that time. Nick came to the United States under difficult circumstances [**Would you like to explain the nature of these difficult circumstances**] but has proven himself to be an eminent neuropsychologist through his work and publications. Presently, he is director of the Institute of Neuropsychology and Cognitive Performance in New York, as well as Clinical Professor of Neurology at the New York University School of Medicine.

On that visit, I had brought along a copy of my Danish version of Luria's examination method. Professor Luria, as I addressed him (to all others he was Alexander Romanovich), exclaimed: "Of course it is a vulgarization. But I have always wanted someone to do what you have done." Professor Luria told me to return after I had completed an English translation of the manuscript, saying that "The world needs it."

Thus I paid him a second visit three years later, together with a group of 20 Danish neurosurgeons, neurologists and psychologists with whom I had a shared interest in Luria's work. Luria read the manuscript and suggested the title, *The Luria Neuropsychological Investigation* (LNI).¹⁴ He corrected and added to the manuscript, gave me a paper to translate as the first chapter, and also wrote the foreword.

When the LNI book was published, Luria was given a copy and wrote me a letter shortly thereafter, saying: "I was really delighted to have your book; you did a splendid job and it is really remarkable that you had done what we all could not manage in Russia!"

Insert Figure 1

When the textbook, manual, and cards were being published in 1975, a third visit **to Moscow** followed. Two Scandinavian neurophysiologists, pioneers in regional Cerebral Blood Flow Imaging (rCBF), David Ingvar from Lund and Niels Lassen from Copenhagen, had visited Luria in Moscow 2 months earlier. When I arrived in September, Luria's laboratory was plastered with pictures of imaging studies. The method provided a direct and clear verification of the concept of functional systems and was the first in the sequence of functional imaging methods that are available in brain-behavior research today. When I landed, Luria was waiting for me at the stairs to the plane and immediately told me that my book was being translated into Russian.

Reactions to Luria's Neuropsychological Investigation

The first presentation of the practical application of the Luria methodology was given at the International Neuropsychological Society (INS) conference in Noordwijkerhout, Holland in June of 1979. I had been invited by Kenneth Walsh, from Australia, to take part in a symposium called "Single Case Methodology". A subsequent publication came out in the *Journal of Clinical Neuropsychology*.¹⁴ The abstract stated:

Luria's (1966) theory about the working brain offers an approach that has proven effective in both diagnostic neuropsychological work and rehabilitation.

According to the theory, the significance of symptoms and signs can be understood only in the context of the notion of a functional system. A functional system in the brain consists of a number of parts. Each is very specific, particularly but not exclusively cortical, since fibral connections are included. The system operates in a concerted manner to form a substratum of psychological functions. The more complex the symptom, the more complicated the psychological function.

The main task of the neuropsychologist is to find ways to learn what each part of the brain contributes to the organization of a functional system. The way in which this can be done is through a thorough and careful analysis, that is, i.e., qualification of the symptoms. A main assumption is that these functional systems are dynamic and individual since they are developing in accordance with the brain's experience and its integrative processes.

The case report concerns a patient from the neurosurgical department operated **on** for a parietal tumor, localized in the secondary and tertiary areas of the right hemisphere. The common factor in this case was found to be disturbed projection of elements in space due to lack of predominance of the usual visual gestalts. (p. 241)

There seemed to be a general acceptance of the concrete illustration. A number of the well-known neuropsychologists who were present at the meeting later became close collaborators and friends, among them Edith Kaplan and Muriel Lezak, as well as Leonard Diller, whose support has been of extreme importance.

The LNI became known in the United States and elsewhere, and was translated into several languages. Two of the most extraordinary publications were in Zulu, by Shirley Tolman, Ph.D.¹⁵ and Japanese, by Tsuyoshi Nishimura, MD.¹⁶ Invitations to give presentations and lectures followed. Among them was an invitation to Ward 7D of the Veterans Administration (VA) Hospital in Boston. The Chief of Neurology was Norman Geschwind, MD. Edith Kaplan was his neuropsychology

collaborator. My first visit was the beginning of a close relationship with her. We would engage in stimulating discussions about similarities and differences between the process-oriented examination method and the LNI; her influence on my clinical work was significant. Participation in the supervision of her post-graduate students was a rewarding experience, often taking place around midnight.

My trips to Boston occurred at least once a year between 1981 and 1985, and I was often given the opportunity to teach Edith's class at Boston University. She repaid my visits by coming to Denmark or other places in Scandinavia to give lectures. Her visits were always extremely intense; they generated new knowledge and unexpected happenings.

One time while I was in Boston, we visited Clark University. I was introduced to Professor Donald Stein who, together with Stanley Finger, had just published the book: *Brain damage and recovery: Research and clinical perspectives*¹⁷, which he gave me after an almost day-long discussion about Luria's theory of brain function and development in neurosciences. Don has become a very important contributor to the CRBI rehabilitation programs, participating in the Center's international conferences, to which I shall return later. His personal friendship has been extremely valuable, both in support and critique.

Luria sent me a letter some time later that said: "By the way, have you seen Reitan's review...?" Ralph Reitan had published a review in *Contemporary Psychology*²⁰ called "Neuropsychology: The vulgarization that Luria always wanted", a title that had been taken from my foreword. He wrote: "Luria's procedures for neuropsychological evaluation seemed to come closer to the conventional neurological evaluation than to psychological assessment as it is customarily performed in the United States."**[need page number for this quote]** For Reitan, as he goes on to quote in the same review, Luria's neuropsychology opens up "new paths to answer the question of the inner structure of psychological processes." All the same, he continues, "Luria's approach is one in which he attempts to analyze the nature and interrelationship of deficits rather than measured abilities." In this way, Reitan fails to recognize the need for a qualitative analysis of the deficits in order to understand their impact on the patient's intact functions – the mental abilities.

In contrast, Kolb and Wishaw²¹ stress positive aspects of the LNI:

(a) it is based on the theoretical principles of neuropsychological functioning, making the interpretation a logical conclusion of the theory; (b) it is thorough, inexpensive, easy to administer, flexible, and brief, taking only about 1 hour to administer; and (c) measures the actual behavior of the subject rather than inferred cognitive processes, thus making interpretation more straightforward. The disadvantages are: (a) the scoring is subjective and based on clinical experience. It is unlikely that a novice to neuropsychology or neurology could easily master the interpretation without extensive training. On the other hand, experienced neuropsychologists or neurologists ought to find the battery easy to learn; (b) because the manual that accompanies the battery offers no validation studies, it must be taken on faith that the tests really do measure what Luria claims they do. This criticism is the most serious, because most Western neuropsychologists are likely to continue to use psychometric assessment tools reporting validation studies. **[need page numbers for this quote]**

Muriel Lezak commented on the LNI ²², stating that her concerns were (a) it is not comprehensive enough; (b) the lack of normative data creates difficulties in evaluating, especially subtle learning and memory deficits; and (c) certain tasks are not useful in detecting mild or diffuse impairments.

Much of the criticism regarding the LNI is related to the qualitative approach that it represents. This critique would apply to any approach that is primarily qualitative in orientation. The LNI method leads to a qualitative analysis of the patient's level of functioning. The examiner has the task of identifying the disturbed functions. In addition, the examiner is responsible for clarifying how a patient is trying to cope with the difficulties with which he or she is presented. Proper use of this method further allows for the formulation of very specific hypotheses about the fundamental defect, through

the selection of different tasks in which the defect is an essential component. The double dissociation principle suggested by Teuber and Weinstein is in accordance with this method.²³

The task analysis performed during the investigation can teach the neuropsychologist how to structure a task in order to make the patient use intact functions in the service of reorganization; in other words, how to compensate in the most effective way. A close therapeutic relationship between the patient and neuropsychologist in this process strengthens the effectiveness of cognitive training and provides emotional and social improvement. Since it is my conviction that neuropsychology needs to change its methods of assessment for rehabilitation to have future recognition and growth, I shall return to these matters at the end of the chapter.

Soon after these varied reviews appeared in the USA, Charles Golden and his group showed an interest in the LNI and even suggested a collaboration. Golden and his colleagues wanted to develop a quantitative **approach based on Luria's theory**. They wanted to standardize administration, set time limits, and create functional profiles. I firmly rejected their offer of collaboration because their proposition was in total contrast to Luria's method. The Luria-Nebraska Neuropsychological Battery was published in 1980, using the material developed in Denmark.¹⁸ My view of the publication, however, was supported in articles written by a number of distinguished neuropsychologists, among them Edith Kaplan and several of her former students.¹⁹

The Golden approach, all the same, overshadowed the LNI in these years. It met the American need for numbers and, as such, was in correspondence with the quantitative approach.

Teaching Neuropsychology

In 1969, I was offered a teaching position at the medical faculty of the University of Aarhus where I, as assistant professor, taught psychology to medical students during a period of ten years. My courses were a new addition to the medical curriculum; they were a success and have gradually expanded since then. Teaching appealed very much to me and led to the publication of a textbook: *Neuropsykologi: Klinisk praksis*.²⁴ The book also became part of the curriculum at the Psychology Department at the University in Copenhagen.

The professorship meant that I had to change departments and return to psychiatry. I proposed the establishment of a clinical psychological department. My proposal was accepted. In the following years, this department grew to include all branches of adult clinical psychology and neuropsychology, each reciprocally influencing and enriching each other. Close and stimulating collaboration with staff from the diverse medical areas generated research and publications.

Life had been full of inspiration and development throughout the 21 years that we spent in Aarhus. My son Mads had completed degrees in Copenhagen and USC and was working as a TV and film producer. That period ended abruptly with my husband's suicide in May of 1980. Niels had, in the beginning of the seventies, suffered bipolar psychiatric episodes. He had come to feel cured, and a return of the depression was unbearable for him.

The Return to Copenhagen

I returned to Copenhagen, where my first appointment was a research position in the department where I had started my clinical work 25 years earlier. The chief of the Clinical Psychological Department was Professor Alice Theilgaard; during my work in Aarhus, we had been in close contact and our collaboration now continued. I spent the years traveling and participating in the Department's clinical work, mainly engaged in the neuropsychological issues in psychiatry.

I was asked to present the LNI mainly in Europe and the United States, and was invited to Bergen, Norway where Halgrim Klöve, Ph.D. was professor of neuropsychology. We had met earlier and had become good friends. I returned to Bergen in 1982 for the INS meeting and met Lance Trexler, Ph.D., who was the initiator of the first rehabilitation conferences that took place in Indianapolis, Indiana. He invited me to participate in the second conference. These meetings were of great importance for the development of the field. Lance worked at the Community Hospital in Indianapolis at that time; he later started his own Center for Neuropsychological Rehabilitation (CNR). In the following years, we visited each other and exchanged ideas and methods. In 1983 he stayed at the CRBI for three months as a visiting professor, and to this day participates in the Center's research, and **we have** co-authored **several** papers.²⁵ I met George Prigatano, Ph.D. in Indianapolis and visited him in Oklahoma City and later in Phoenix. His influence and his friendship have been valuable.

The work I was doing generated interest and resulted in a grant from the Danish Egmont Foundation for the purpose of establishing a neuropsychological assessment and rehabilitation center. Yehuda Ben-Yishay, Ph.D. and Leonard Diller, Ph.D. offered their support during this period. The chairman of the Egmont Foundation, Esben Dragsted, was also in New York while I was there. He was invited to the NYU Rehabilitation Center in order to get acquainted with the Institute, and became so interested that he took part in the day's full program. In the evening, Leonard Diller had tickets for a Mozart opera at the Metropolitan – Esben Dragsted's favorite entertainment. His interest in our work continued and he provided strong support in many ways throughout all the years that he served as the Foundation's chairman.

The grant became, in the beginning, a little of a nightmare, however. The professors from the involved departments - psychiatry, neurology, and neurosurgery - at the University Hospital opposed the plan, stating that they did not believe in brain injury rehabilitation. The situation was solved ingeniously by asking the psychology faculty at the University of Copenhagen to accept the Center, which they did, although hesitantly at first.

The new institute was named the Center for Hjerneskade (CRBI). The name was chosen after much consideration; we wanted to communicate precisely what the center's concern was: brain injury. Initially, some of the brain injured patients and their families objected to the name, but it gradually came to be accepted because of the positive reputation that it achieved. The fact that the Center was at the University brought with it an unexpected advantage: the patients could say that they were "taking courses" at the University, which strengthened the self-images of the brain injured patients.

The grant was for 3.2 million Danish Kr., money that was allotted for the first three years. During this time, the Center was expected to prove effective enough to obtain funding for rehabilitation from the counties and municipalities, thereby becoming a publicly funded, privately run institution. We succeeded. A 3-year follow-up study, **using improved social functioning as an outcome variable, demonstrated the effectiveness of our training.** The areas evaluated were: living conditions, leisure activities, and return to work. Improvement was shown in the statistical results one year after completing the rehabilitation program. The 3-year follow-up showed that **these gains were**

maintained, as there was no statistically significant decline. At the same time, an evaluation conducted by a county research group showed economic gains for all involved parties - state, county, and municipalities.

The Center had a Board of Governors, established by the Egmont Foundation. Originally, the goal of the CRBI was described in the founding papers as follows: "The purpose of the institution is to undertake neuropsychological investigations in the service of rehabilitating brain injured persons and at the same time perform research and teaching within the area." Through experiences and research in the years that followed, gradual changes occurred. Research and teaching were still main tasks, but the rehabilitative goal broadened; some aspects were emphasized and some additions made. The main issue was to support brain injured individuals in regaining the ability to live their lives to the fullest and the ability to master the constant changes that are a part of human life: physically, socially and cognitively.

My Thirteen Years at the CRBI

During my thirteen years as director of the CRBI, 937 patients were examined and/or treated – 320 in the Center's comprehensive day program. The treatment was most often provided for one semester; there was group as well as individual training. All patients referred were initially neuropsychologically assessed using the LNI and other neuropsychological tests and thereafter either took part in the Center's day program, received individual treatment, or were advised for treatment elsewhere. All patients were followed to the extent needed. The staff consisted of neuropsychologists, clinical psychologists, speech therapists and special education teachers. The addition of physiotherapists **further advanced the effectiveness of the program**. Consults from neurology, neurosurgery, physiatry, and psychiatry were available and one member from each group participated in the referral team. The collaboration was interdisciplinary and the administrative staff was closely involved.

The daily work was always full of activity, open to creative ideas and at the same time, strictly structured. Events such as lectures, music performances, and sports provided additional stimulation and kept up motivation.

Advancement in the field owes much to the patients' need to overcome their difficulties and engage in life; as the patients learned, we all learned.

Members of the staff taught at the University and elsewhere. In 1992, I was appointed Professor of Neuropsychological Rehabilitation. The Center served as a clinic, where neuropsychology students could do their clinical practice. International collaboration provided the opportunity to also receive students from countries of the European Union. Guests from Denmark and abroad, from all disciplines in rehabilitation, came and stayed for either short or long periods of time. This diversity further enhanced the atmosphere of activity and optimism.

David Ellis, PhD, who had worked in rehabilitation for several years in Philadelphia, participated in the work the first four months. We had met at a Braintree conference, and David was interested in the planning of the new center and in gaining new experiences. We later co-edited a book called, *Neuropsychological treatment after brain injury*.²⁶

Research was essential, and a main part of the Center's image. Thomas Teasdale, PhD, was made head of our research in 1990. He fulfilled this task successfully: a significant number of papers and book chapters were published by members of the staff. Among the latest were two publications regarding the European Brain Injury Questionnaire (EBIQ), that was a result of the European collaboration; one was published by Teasdale²⁷ and the other by Gérard Deloche^{27a}. This contributed to the growth of knowledge and to the benefit of the patients. In 1995, Carla Caetano, Ph.D., from the United States, joined our staff and research group, co-authoring several papers and book chapters with me, among them a chapter for the book *Neuropsychological rehabilitation in the interdisciplinary team: The post-acute stage*.²⁸

Collaboration in Denmark has, through the years, taken place with eight new centers for post-acute treatment and two new ones for acute treatment, located throughout the country. Vejlebjerg, Jutland, established in 1985, was the first and its director at the time, Joergen Braemer, Ph.D., had been one of my close collaborators from Aarhus. Unfortunately, he died a few years later at the age of 41. Interaction with that center suffered for some years, however, due to political interference regarding the geographical position of a reference center.

A successful collaboration took place with the Danish Brain Injury Association, that was also started in 1985 by Aase Engberg. Her husband had suffered a severe head injury in 1973. Her experiences during his treatment made her leave a career as a clinical engineer to study medicine. She is now a neurologist with a doctorate in epidemiology. In collaboration with George Zitnay, PhD, of the International Brain Injury Association (IBIA), “The First International Brain Injury Conference” was held in Copenhagen in 1994. Collaboration with George still continues.

The 1985 European INS conference was the first of several international conferences that took place at the Center's initiative over the years. Nordic meetings were started by two Finnish neuropsychologists, Anna Ritta Putkonen and Ritva Laksoonen, in collaboration with Halgrim Klöve, Jarl Risberg and myself. These meetings continued, with varying intervals, until 1995, when the 5th meeting was taken over by the neuropsychological societies that had been established in each respective country.

Collaboration with Sweden was strong throughout all of this time. Professor Jarl Risberg was a member of the Center's Board of Governors, and patients from the CBRI were examined at his rCBF laboratory in Lund. In addition, I **began to** lecture on neuropsychological assessment and rehabilitation at Lund and Gothenberg Universities **and continued** for many years.

In 1990, in collaboration with the Psychology Laboratory at the University of Copenhagen, several Russian neuroscientists were invited to give a series of lectures, which were published in a book called *Luria lectures*.²⁹ One of the Russian guests was Elena, Luria's daughter, who was a doctor of medicine. **Elena wrote the first chapter of this book, describing her father.** She had earlier suffered depressive periods and, at Luria's request, we had sent her medicine that was unobtainable in Moscow. During the lecture series, she stayed in my home, enjoying the atmosphere of what she called “our fairy tale country.”

Collaboration with Russia has continued. I participated in a neurosurgical meeting in Moscow, arranged by Professor Alexander Potapov, from the Bourdenko Neurosurgical University Institute. I spent three days at the Institute working with the neuropsychologist Nathalia Gogitidze, who later visited the CRBI.

Most important, however, were three invited meetings, the third of which resulted in the *International handbook in neuropsychological rehabilitation*. Nathan Cope, MD, wrote in his foreword

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This handbook is the result of the most recent of a series of conferences held in Copenhagen, Denmark, at five year intervals over the past 15 years under the guidance and leadership of Dr. Anne-Lise Christensen and under the sponsorship of the Egmont Foundation, which must be acknowledged as well for its constant support of this international effort.

The participants in these conferences are all internationally renowned clinicians and scientists. These experts represent not only the area of neuropsychology, but disciplines ranging from fundamental neurophysiology and neuroanatomy, to medical and financial perspectives on neurological injury and recovery. The participants have, to a significant extent, remained remarkably constant over this period and this has allowed increasing intimacy among them, both professionally and personally. One felicitous result of this camaraderie has been that the conferences have evolved with an increased focus on topics of the broadest interest across disciplines. One aspect of such a continuing dialogue across disciplines is that specific areas of mutual interest are explored in depth, allowing cross-fertilization of ideas to occur. (p. ix)

I had turned seventy during the Third International Conference. A dinner was given in a small, beautiful castle overlooking the sound between Denmark and Sweden. It was a happy and joyful event; the Board of Governors, the staff from the CRBI and the invited guests participated, as well as my family. In accordance with Danish habit, some speeches were given. The trio of Yehuda Ben-Yishay, Don Stein, and George Prigatano performed elegantly. Yehuda's part was an analysis of the chemical compounds of my personality. This birthday, however, meant retirement. My successor was

not easily found; there were fourteen applicants - Danish, Swedish, German, and American. It would be the Chairman of the Board's decision. One member of the Board disagreed about how the process was carried out and withdrew from the Board. In the end, Mugge Pinner, Ph.D. was appointed in May of 1998. She had been a supporter of the establishment of the CRBI during the first years.

The years at the Center gave me much personal gratification. In 1989, I became a *Ridder af Dannebrog*, an honor bestowed on me by the Queen of Denmark, and in 1994 received the *Doctor Honoris Causa* title in Lund. I was made honorary member of many international neuropsychological societies and became the Neuropsychologist of the Year in 1998 in Sweden.

Retirement and Future Goals

Retiring from CRBI has not stopped my work and my interest in the field. **I continue to take on** new endeavors. For example, **I have been** appointed Senior Consultant at the Institute of Neuropsychology and Cognitive Performance in New York.

New horizons have also opened up for me. Shortly after retiring, I was invited to visit Brasilia and the SARAH Network of Hospitals for the Locomotor System, by the Network's Executive Director, Lucia Willadino Braga, Ph.D., who is also a neuropsychologist and by Aloysio Campos da Paz Jr., M.D., the President and Surgeon-in-Chief. I have been made an honorary member of the Board of Consultants. I encountered at SARAH an atmosphere of scientific knowledge and overall superior technical expertise, incorporated within a true humanistic approach. The Network is also characterized by an architecture that elevates mind and soul, and **that facilitates visualization of the** ideal rehabilitation institution.

Insert Figure 2 here.

The SARAH Network began as a single hospital complex. Over time, it developed and consolidated principles, concepts and methods that eventually led to the Center's edification of a national and international point of reference for quality care. The system reflects a dynamic ever expanding knowledge of spatial, architectural and function specificity concepts. What takes place at SARAH is in accordance with the winds that, at present, seem to be blowing medicine, psychology and rehabilitation towards a more humanistic, scientific viewpoint. A.R. Luria **believed that** one of the

most important and challenging tasks to solve was the old problem of the nomothetic versus the ideographic scientific approach. Luria formulated the dilemma as the crisis between 1) explanatory, physiological psychology and 2) a descriptive, phenomenological psychology of the higher psychological functions. The problem is still with us. SARAH's experience may be a bridge to achieving this final goal.

The Stork

The Danish author, Karen Blixen, has a story called "The Roads of Life", from her book *"My African Farm"*, about a little man, living in a little round house, with a round window, and a little triangular garden. It is a story from her childhood, and as the story is told to her she is shown a **drawing** that the storyteller creates right before her eyes. Each of the man's experiences results in a line being added to the **drawing**. **As he moves through the experiences of his life**, the tasks that are demanded of him, the obstacles **he encounters**, the hard work **he must perform**----he reacts with unceasing effort, never giving up. In the end, looking at the whole picture **crafted from the lines of his experience**, what does he see? **He perceives a picture of a stork emerging from these lifelines.**

If in your life there comes a moment when all the roads you have taken **converge** and allow you to see **your own** "stork," what experience could **possibly** surpass this? **An expanded theory of brain function, that is applicable to daily life and that may ultimately have the power to reinstate function**-----this, could make my lifelines converge and a stork appear.

[Would you please complete the reference information for the next draft-thanks.]

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double dissociation principle (Teuber and Weinstein)...

"The Origin and Cerebral Organization of Man's Conscious Action"

LEGENDS

Figure 1: photo of Luria letter

Legend 1: Letter of June 12, 1975 right after Luria received the book, "Luria's Neuropsychological Investigation" in Moscow

Figure 2: photo of SARAH-North Lake

Legend: The SARAH-North Lake, inaugurated in 2000 (Architect: João Filgueiras Lima – Lélé).

