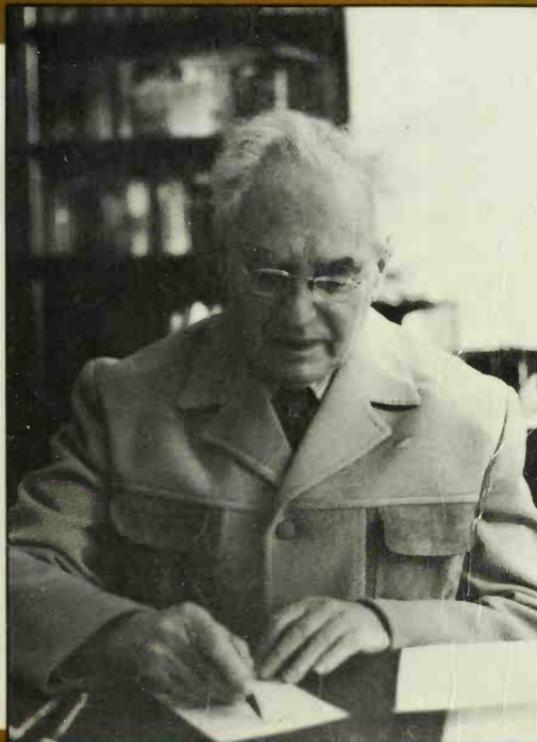


The Man WITH A Shattered World

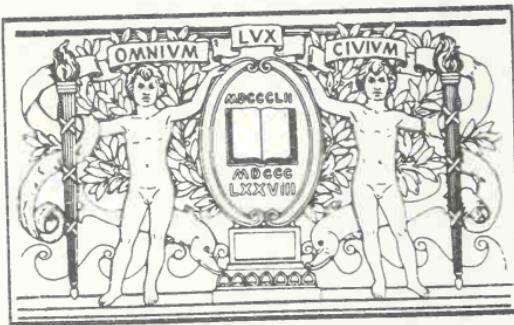


THE
HISTORY
OF A
BRAIN
WOUND

A. R. LURIA

WITH A FOREWORD BY

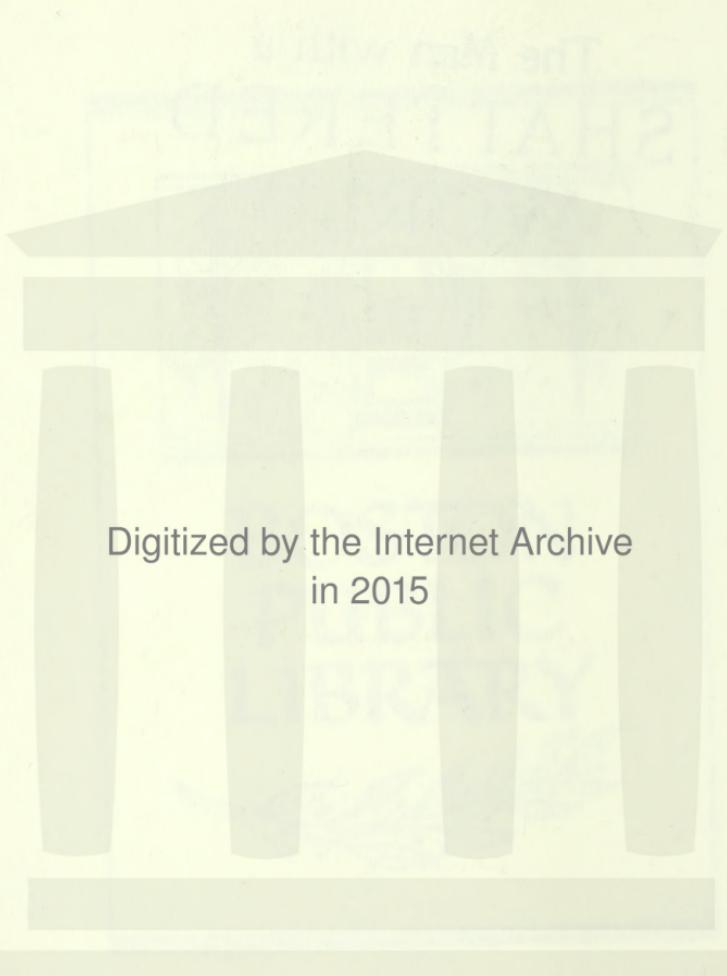
Oliver Sacks



BOSTON PUBLIC LIBRARY



The Man with a
SHATTERED
WORLD



Digitized by the Internet Archive
in 2015

The History of a Brain Wound

The Man with a

S H A T T E R E D
W O R L D

A. R. Luria

Translated from the Russian by

Lynn Solotaroff

With a foreword by

Oliver Sacks

HARVARD UNIVERSITY PRESS
CAMBRIDGE, MASSACHUSETTS

Copyright © 1972 by Michael Cole
Foreword copyright © 1987 by Oliver Sacks
All rights reserved.

Printed in the United States of America

10 9 8 7 6 5 4 3 2

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA

Luria, A. R. (Aleksandr Romanovich), 1902–
The man with a shattered world.

Translation of: Poteriannyi i vozvrashchennyi mir.

Reprint. Originally published: New York : Basic Books, Inc.,
1972. With new introd.

Includes index.

1. Zasetskiĭ, Leva—Health.
 2. Brain—Wounds and injuries—Patients—Soviet Union—Biography.
 3. Brain—Wounds and injuries—Complications and sequelae.
 4. Perception, Disorders of—Patients—Soviet Union—Biography.
 5. World War, 1939–1945—Personal narratives, Russian.
- I. Title.

RD594.Z38L8713 1987 617'.481044'0924 [B] 86-31866

ISBN 0-674-54625-3

Contents

Foreword by Oliver Sacks	vii
Concerning the Book and Its Author	xix
From the Author	xxi
The Past	3
War	6
After Being Wounded	8
The Rehabilitation Hospital	14
Our First Meeting	17
Excerpt from Case History No. 3712	21
A Brief Summary of Brain Anatomy (<i>The First Digression</i>)	22
First Steps in a Shattered World	36
His Vision	36
His Body	41
Space	46
Reading	61
A Student Again	65
Writing, the Turning Point	71
“The Story of a Terrible Brain Injury”	76

Why Did He Write?	83
"My World Has No Memories"	87
"My Memories Came Back from the Wrong End"	95
The Peculiar Features of His "Speech-Memory"	101
On Recollecting Words (<i>The Second Digression</i>)	
	109
Restricted to Undeciphered Images, Disembodied Ideas	115
Grammatical Constructions (<i>The Third Digression</i>)	122
"All My Knowledge Is Gone"	139
A Story That Has No Ending	157
"Were It Not for War . . ." (<i>In Place of an Epilogue</i>)	159
Index	161

Foreword to the 1987 Edition

Oliver Sacks

Aleksandr Romanovich Luria's extraordinarily productive life spanned the greater part of this century (1902–1977) and saw the profoundest changes in our approaches to brain and mind. His own lifetime endeavor was to explore the texture of human thought, perception, and action, the ways in which it could be damaged or disordered, and the ways in which it could be reconstituted after the ravages of injury or disease. His interests ranged very widely, and in the course of fifty-five incessantly productive years (his first book, on psychoanalysis, was published in 1922; his last books, on memory, language, and cognitive development, were all published in the last year of his life) he gave us profound explorations of subjects as diverse as neurosis, Parkinsonism, language disorders, disorders of will and action, behavioral and cognitive disorders in children, complex forms of "mental blindness," and—what I suspect was his favorite subject—the nature of memory and imagination. He wrote a score of books and some hundreds of articles, all marked by a crystalline transparency of thought and style, passionate honesty, and, above all, love for his work. He was the most significant and fertile neuropsychologist of his

time and raised neuropsychology to a subtlety and simplicity which could not have been imagined fifty years ago.

What was distinctive in his approach from the start, and formed a constant thread in all his explorations, was his sense that even the most elemental functions of brain and mind were not wholly biological in nature but conditioned by the experiences, the interactions, the culture, of the individual—his belief that human faculties could not be studied or understood in isolation, but always had to be understood in relation to living and formative influences. This “social” viewpoint was especially shared with his great teacher Lev Vygotsky, and Luria often spoke of his work as an extension of Vygotsky’s. Other influences, notably those of Freud and Pavlov, were highly significant for him at different times; but above all Luria was an original who thought in his own way.

His earlier studies—on the development of language and mind in the child, on play, and on cross-cultural cognitive development—were, indeed, essentially “Vygotskian.” But then, feeling that studies of the development of mental function needed to be supplemented by studies of their breakdown, Luria turned in the late 1930s to the classical method of clinical analysis, which was to occupy him for the remainder of his life. Looking at the effects of brain lesions (such as injuries, strokes, and tumors) on perception, memory, imagery, language, “mind”—all the mental qualities of the afflicted—has always been the staple method of

classical neurology. But through Luria's radically new concepts of and approaches to brain and mental functioning, new ways of understanding neurological processes were opened up, ways which were also, potentially, therapeutic (in contrast to the "old" neurology, which had no power to *do* anything).

The Second World War, with its tragic incidence of severe brain injuries, provided an enormous testing ground for the new neuropsychology, and Luria's work *The Restoration of Function after Brain-Injury* gave new understanding and hope in the treatment of such patients. After the war, and most especially in relation to cerebral aneurysms and tumors (the casualties of civilian life), his studies expanded, became more focused and intense, leading to the most comprehensive explorations of language, memory, perception, imagery, judgment—all the functions that constitute, or take part in, Mind. These studies are to be found in a series of important books: *Human Brain and Psychological Processes*, *Traumatic Aphasia*, *Basic Problems of Neuro-linguistics*, *The Neuropsychology of Memory*, and, most monumental of all, *Higher Cortical Functions in Man*.

This is the grand, "classical" side of Luria, but there is another side equally important—he liked to speak of this as "Romantic Science." Luria contrasts "classical" and "romantic" science in this way:

Classical scholars are those who look upon events in terms of their constituent parts. Step by step they single out important units and elements until they can formulate abstract, general laws.

One outcome of this approach is the reduction of living reality with all its richness of detail to abstract schemas. The properties of the living whole are lost, which provoked Goethe to pen, "Gray is every theory, but ever green is the tree of life."

Romantic scholars' traits, attitudes, and strategies are just the opposite. They do not follow the path of reductionism, which is the leading philosophy of the classical group. Romantics in science want neither to split living reality into its elementary components nor to represent the wealth of life's concrete events in abstract models that lose the properties of the phenomena themselves. It is of the utmost importance to romantics to preserve the wealth of living reality, and they aspire to a science that retains this richness. (*The Making of Mind*, p. 174)

This notion of "Romantic Science," which haunted him from his earliest years, only found full expression in the last years of his life, in his two extraordinary "neurological novels": *The Mind of a Mnemonist* and *The Man with a Shattered World*.

When *Shattered World* was first published, I was so excited by it that I wrote a review which turned into an essay on Luria.* It was an even greater excitement when he sent me a reply (getting a letter from Luria was like getting a letter from Freud!) defining, among other things, his attitude to his own work:

*"The Mind of A. R. Luria," *Listener*, June 28, 1973.

Frankly said, I myself like very much the type of "biographical" study, such as on Shereshevsky (the Mnemonist) and Zazetski . . . firstly because it is a kind of "Romantic Science" which I wanted to introduce, partly because I am strongly *against* a formal statistical approach and *for* a qualitative study of personality, *for* every attempt to find *factors* underlying the structure of personality . . . only the *style* of these two books is different from the others; the *principle* remains the same. (letter of July 19, 1973)

And, in another letter, a few days later:

I was ever conscious and sure that a good clinical description of cases plays a leading role in medicine, especially in Neurology and Psychiatry. Unfortunately, the ability to describe which was so common to the great Neurologists and Psychiatrists of the 19th century . . . is almost lost now. (letter of July 25, 1973)

Luria saw his own task (one of his two life tasks) as the refounding of a romantic science (the other being the founding of neuropsychology, a new analytical science). The two enterprises were not antithetical, but complementary at every point. Thus he spoke of his need to write two sorts of books: "systematic" books (like *Higher Cortical Functions*), and "biographical" or "romantic" books (like *The Mnemonist* and *Shattered World*). He saw the latter not as being "lightweight," or less important than the former, but as a different (and, in its way, equally rigorous) form of science, as necessary as the classical, and complementary to it. That it

was eminently readable and accessible was not just by chance, but followed from the nature of the enterprise, which was to present a patient, a man, in his wholeness, while delineating simultaneously the intimate structure of his being, that fusion of painting and anatomy of which Hume dreamed.

Such an enterprise—picturing and at the same time anatomizing a man, the dream of a novelist and a scientist combined—was first realized by Freud; and Freud's magnificent case histories instantly spring to mind when one reads Luria. Luria's case histories, indeed, can only be compared to Freud's in their precision, their vitality, their wealth and depth of detail (though, of course, they are also quite different, as neuropsychology is different from psychoanalysis). Both explore, fundamentally, the nature of man; both are new ways of thinking about human nature.

Luria's "biographies" are further distinguished by being case histories *thirty years in length*—neither Freud nor anyone else has ever given us a case history of this length. But their real uniqueness lies in their style, the combination of rigorous, analytical description with a deeply personal, empathetic feeling for the subjects. The rigorous analysis serves to delineate a "syndrome," the totality of disease or disposition or altered function; but the syndrome, thus anatomized, is embedded in a person, an individual presented with almost novelistic ease and force. And these are conjoined—the syndrome is always related to the person, and the person to the syndrome—the personal and the

scientific are always, hopefully, fused. Whether Luria succeeds in this fusion is up to the reader to judge; what must be stressed is that the *enterprise* was bold and new. No one had conceived a neurological "novel" before Luria.

"I have tried to follow," Luria writes, "in the steps of Walter Pater in *Imaginary Portraits* . . . except that my books were *unimagined* portraits." Unimagined, but not unimaginative, for a tremendous act of creative synthesis and imagination was needed to transform the bare facts about Shereshevsky and Zazetsky to the powerfully alive and beautiful case histories Luria finally gives us. These are, not unnaturally, case histories of extremes, for it is extremes which are exemplary and uniquely instructive, whether these deal with the hypertrophy of particular powers (as in the Mnemonist's enormously powerful imagery and memory), or the devastating breakdown of specific brain and mind functions, as in the afflicted, brain-wounded Zazetsky.

A great physician of a former era, Ivy McKenzie, wrote: "The physician is concerned (unlike the naturalist) . . . with a single organism, the human subject, striving to preserve its identity under adverse circumstances." As a neuropsychologist, Luria studies diseases and syndromes, the makeup and breakup of brain and mind; but as a romantic scientist and physician he is always and centrally concerned with identity, feeling it, seeing its vicissitudes, caring for it, fortifying it, as it struggles with adversity. Thus his "biographic"

works, beyond their specifics, are first and last studies and stories of individuals as a whole—their minds, their lives, their worlds, their *survival*.

In *The Mind of a Mnemonist*, Luria not only provides us with a dazzling analysis of the Mnemonist's mind, but shows a deep concern for the human plight of the Mnemonist. This sense of concern and compassion is still more evident in *The Man with a Shattered World*, where the plight of the patient is so excruciating and intense.

Both books, as Jerome Bruner emphasizes in his foreword to *The Mind of a Mnemonist*, go beyond a purely medical or scientific form and establish a new literary genre, one marked by an overarching conception of the narrative as a whole, and a language as unself-consciously beautiful as it is lucid. In *Shattered World* the sense of dramatic tension, of a story, is present from the start (though, as in most true stories, it is a story with no ending). Although the author of this life story, Luria tells us, is its hero, Zazetsky, we should in fact see them as coauthors and collaborators at every point. One can think of no precedents in this century for such a book; one has to return to the nineteenth-century, anonymous *Confessions of a Ticqueur*, interlarded with comments by his physicians, which begins Meige and Feindel's book on tics. Luria looks back to this older tradition but revives it in a form which is radically new.

Zazetsky is severely wounded by shell fragments in 1942, with massive damage to the left occipito-parietal

region of his brain (interweaving with the narrative voices of Zazetsky and Luria are a number of "digressions" on neuroanatomy and cerebral function, so lucid and simple they cannot be bettered). This fragmentation affects all aspects of his life: he suffers an intolerable, constantly shifting visual chaos—objects in his visual fields (what remains of his visual fields) are unstable, glimmer fitfully, get displaced, so that everything appears in a state of flux. It is impossible for him to see, or even imagine, the right side of his body—the sense of "a right side" has disappeared both from the outer world and his own self. He is subject to continual, almost unimaginable, uncertainties about his body: sometimes he thinks parts of it have changed, that his head has become inordinately large, his torso extremely small, his legs displaced . . . Sometimes he thinks his right leg is somewhere above his shoulder, possibly above his head. He also forgets how parts of his body function—thus, when he needs to defecate, he cannot remember his own anus.

But above all, and infinitely more serious than all these, are the devastations of memory, language, and thought: "My memory's a blank. I can't think of a single word . . . Whatever I do remember is scattered, broken down into disconnected bits and pieces." With this he feels like "some terrible baby," or like someone bewitched or lost in a hideous dream, although "A dream can't last this long or be so monotonous. That means I've actually been experiencing this all these years . . . How horrible this illness is!" At times he

even believes he has been killed, because the old Zazetsky, his former self and his world, has been "lost." But yet, because his frontal lobes are intact, he is wholly aware of his situation and capable of the most determined and resourceful efforts to improve it. The book is a story of these efforts, in which patient and physician combine in the most intimate, creative, and involved relationship, a sense of relationship beyond anything in *The Mnemonist*, a relationship—never mentioned, invisible, but ubiquitous—which is the very essence of Medicine, of Care, and which suffuses this book with a special warmth, feeling, and moral beauty; it is a story of these efforts no less than a story of damage and deficits. Thus it becomes a story of *survival*—survival, and more, a kind of transcendence.

Side by side with Zazetsky's hopelessness and despair is a fierce and indomitable will to improve, to do everything possible to recover, to return *sense* to his life. Military metaphors abound here, both in Zazetsky's and Luria's language. The original title of the book, Zazetsky's title, was *I'll Fight On*, and from first to last Luria depicts him, and admires him, as a fighter: "This book is about a person who fought with the tenacity of the damned to recover the use of his shattered brain"; "Though in many respects he remained as helpless as before, in the long run he won his fight."

This book would not have been possible without the writings of Zazetsky himself, who, with his profound amnesia and aphasia (so that he could neither read nor remember what he had written), could only jot down

memories and thoughts as they occurred to him, at random, and with the most excruciating difficulty and slowness. He was often unable to remember or write at all, and even at best he was only able to write a few sentences a day. But he nonetheless, by incredible perseverance and tenacity, managed to write *three thousand pages* over a period of twenty years, and then—and this is the crux—to arrange them and order them, and thus recover and reconstruct his lost life, making a meaningful whole from the fragments. The odds, as Luria says, were overwhelmingly against him; the odds were (and for such a patient *are*) that he would be “shattered,” “lost,” forever. This was certainly the case with some of his cerebral functions (“in many respects he remained as helpless as before”), but it was not the case with regard to his “life”—to the way in which, through constructing his own narrative, he managed to recapture, and reappropriate, the sense of a life-world, a lived life, the sense (in every sense) of *his own* life. This is what Luria means, I think, when he says, “there is a sense in which he may be said to have triumphed.”

And perhaps there is a universal here which applies to us all, even if we learn it anew from Zazetsky—the lesson also taught by Socrates, Freud, Proust—that a life, a human life, is not a life until it is examined; that it is not a life until it is truly remembered and appropriated; and that such a remembrance is not something passive, but active, the active and creative construction of one’s life, the finding and telling of the true story of one’s life. It is a profound irony, in these

two wonderful and complementary books, that it is the memory man, the Mnemonist, who has in this sense lost his life, and the amnesiac, the shattered man, who gains and regains his life.

Concerning the Book and Its Author

This book describes the damage done to a man's life by a bullet that penetrated his brain. Although he made every conceivable effort to recover his past, and thereby have some chance of a future, the odds were overwhelmingly against him. Yet I think there is a sense in which he may be said to have triumphed. It is not false modesty on my part to wish no credit for this book. The real author is its hero.

Before me is a pile of notebooks: some of them faded, makeshift affairs dating from the war years; others, thick, oilcloth-covered books covering the recent past. There are almost three thousand pages in these. They represent twenty-five years of work this man devoted to describing the effects of a terrible brain injury.

His only material consisted of fragmentary recollections that came to mind at random. On these he had to impose some order and sense of continuity, though every word he recalled, every thought he expressed, required the most excruciating effort. When his writing went well, he managed to write a page a day, two at the most, and felt completely drained by this. Writing was his one link with life, his only hope

of not succumbing to illness but recovering at least a part of what had been lost. This journal recounts a desperate fight for life with a skill psychologists cannot help envying.

In trying to put the scattered pages of this man's recollections together, I have included observations that I made during the twenty-five years I saw him as a hospital and clinic patient. As I came to know him, I realized what a brilliant mind that bullet had destroyed, and I wished to share some of my impressions and thoughts with others. The result is this small book.

Although this man refers to his account as a "story," there is not a trace of fiction in it. Each assertion has been verified by hundreds of records and observations.

In short, this is a book about a person who fought with the tenacity of the damned to recover the use of his damaged brain. Though in many respects he remained as helpless as before, in the long run he won his fight.

A. L.

Moscow

1972

From the Author

Perhaps someone with expert knowledge of the human brain will understand my illness, discover what a brain injury does to a man's mind, memory, and body, appreciate my effort, and help me avoid some of the problems I have in life. I know there is a good deal of talk now about the cosmos and outer space, and that our earth is just a minute particle of this infinite universe. But, actually, people rarely think about this; the most they can imagine are flights to the nearest planets revolving around the sun. As for the flight of a bullet, or a shell or bomb fragment, that rips open a man's skull, splitting and burning the tissues of his brain, crippling his memory, sight, hearing, awareness—these days people don't find anything extraordinary in that. But if it's not extraordinary, why am I ill? Why doesn't my memory function, my sight return? Why does my head continually ache and buzz? It's depressing, having to start all over and make sense out of a world you've lost because of injury and illness, to get these bits and pieces to add up to a coherent whole.

The title I decided on for my writing was "I'll Fight On!" I wanted to describe how this disaster

came about, and how it has continued to plague me ever since I was wounded. I haven't given up hope. I'm trying to improve my situation by developing my ability to remember and speak, to think and understand. I'm fighting to recover a life I lost when I was wounded and became ill.

L. Z.

The Man with a
SHATTERED
WORLD

The Past

In the beginning it was all so simple. His past was much like other people's: life had its problems, but was simple enough, and the future seemed promising.

Even now he loves to recall this, the pages of his diary reverting again and again to that lost life:

In 1941, right before the war began, I finished my third year of courses at a polytechnic institute and hoped soon to get some practical experience in a specialized plant. I pictured the kind of work I would do at that plant, which had some of the best projects under way. Some independent work for a better future—it seemed an ideal way to finish my degree and research at the institute.

For some reason, even as a child I was fascinated by science, by knowledge in general, and greedily devoured any information I could pick up—at school, study groups, or simply in my daily life. I longed to become a really versatile person and be able to contribute to my country in a number of ways through science and technology.

Before I was two years old my father died sud-

denly in a coal mine where he worked as an engineer. After his death my mother had a rough time of it with four young children, since she was illiterate and didn't know how to go about getting a pension for her children. But she was a hard worker who wasn't afraid to face up to the hardships of this new life, but contrived somehow to feed and clothe us, keep a roof over our heads, and even send us to school when the time came. I too was sent, did very well in elementary school, and six years later graduated with honors from the middle school.

"Soon," I thought, "I'll be graduating from the institute. Two years left to go? That's nothing! What can possibly stand in my way now? And as soon as I get my degree, I'll start giving my mother a hand, it's about time she had a chance to rest! . . ."

At times he remembered his childhood: dimly at first, though later on his recollections were amazingly clear:

It turns out I do remember my childhood, even my first and second year in elementary school. I remember the teacher I had there—Marya Gavrilovna Lapshina, and the names of my best friends—Sanka Mironov, Volodka Salomatin, Tanya Rasina, Adya Protopopova, Marusya Luchnikova.

I can even remember the games we played and the tunes we sang, how, in second grade, I'd write nasty verses about the kids I didn't like. I was also sent to a Young Pioneers' meeting in Moscow that somehow

never managed to come off, but I remember what their camp was like and the rally we held. I also remember Epifan'—my home town—particular parts of it and the town as a whole. Also . . . my best friends and teacher in elementary school. . . . I recall what people meant by words like *earth, sun, moon, stars*, and *universe* (as only a schoolboy, a child, can remember or think of these).

Further on in his journal we find other recollections of life in that peaceful town where he spent his childhood and youth:

Epifan' was once an old trading center. In the middle of town there's a big cathedral with various frescoes of the Virgin and the Infant Jesus, and a gold cross, on its spire. From the cathedral the streets extend like rays, the nearest lined with two and three-story houses, those further off with wooden, one-story merchants' homes. At the edge of town there are three or four other churches, and a kilometer further, a stream running north to south. To get there you have to turn left down a steep block or follow a sharp, winding path near Uspenskaya Church. . . . My family lived on a small block called Parkova—on the second floor. Three houses beyond ours, there's a small park, where it's always so quiet and peaceful. . . .

War

Then suddenly it was all over.

Early one morning I was heading for the institute, thinking about my future, when suddenly I heard, actually shuddered at, the terrible news: there was a war on with Germany! Arrangements for our on-the-job training had been called off. The institute had to cancel vacations and shorten the curriculum so that we could proceed with the last year of courses. My courses (now considered the "fourth-year program") had also been included in the curriculum. But the Nazis had already invaded and we had to defend our country. The Komsomol mobilization had sent to the front fourth-year students who, for the time being, had to forgo their work at the institute until the war was over.

. . . And now I can remember fighting somewhere on the western front . . . and being wounded in the temple. But a month later I was back at the front. Our troops had stopped retreating long ago and were strictly on the offensive, moving further and further ahead. This was 1943 . . . the western sector of the

front . . . the battle of Smolensk. Somewhere near Vyazma a platoon of flame-throwers positioned on the Vorya River had been ordered to link up with a rifle company for an attack against the Germans. The combined forces of the flame-throwers and the rifle company were supposed to penetrate the Germans' defense on the opposite bank of the Vorya. Both companies were waiting for the order to attack, had been for the past forty-eight hours. It was the beginning of March, warm and sunny—but damp. Our felt boots were soaked through, and all of us were eager to get on with the attack. If only the order would come, if only it would . . .

I made the rounds again, talked with each of my men (just then I happened to be in command of the platoon of flame-throwers). . . . I looked to the west, to the opposite bank of the Vorya where the Germans were situated. That bank of the river was rocky and steep, but we had to get through somehow. And we'd make it, I thought, if only that order would come.

And then it did. Everyone started to move, and for a minute—maybe two or three—you could hear the clank of our armor. Then all was still. Suddenly, everyone stepped up his pace and moved on across the icy river. The sun had set but was still shining brightly. The Germans waited silently, two or three of them darting quickly out of sight into the depths of the region. Not a shot, not a sound from them. Then all at once there was a burst of fire from their

side, machine guns whirring in every direction. Bullets whistled over my head, I dropped down for cover. But I just couldn't lie there waiting, not while our eagles were starting to climb the bank. Under fire, I jumped up from the ice, pushed on . . . toward the west . . . there . . . and . . .

After Being Wounded

Somewhere not far from our furthest position on the front lines, in a tent blazing with light, I finally came to again. . . .

For some reason, I couldn't remember anything, couldn't say anything. My head seemed completely empty, flat, hadn't the suggestion of a thought or memory, just a dull ache and buzz, a dizzy feeling.

But as I lay on the operating table, every once in a while I'd catch the faint outlines of a man with a broad, thick-set face, whose angry eyes peered at me through glasses, as he told the doctors and aides what they were to do with me.

People in bright white coats, caps on their heads and gauze masks drawn up to their eyes, were bending over me. I vaguely remember lying on the operat-

ing table while several people held me by the hands, feet, and head so tightly I couldn't move a muscle.

All I can remember is that the doctors and aides were holding me down . . . remember that I was screaming, gasping for breath . . . that warm sticky blood was running down my ears and neck, that my mouth and lips had a salty taste. . . .

I remember that my skull was bursting, and I had a sharp, rending pain in my head. . . . But I had no strength left, couldn't scream any more, just gasped. My breathing stopped—any minute now and I was going to die. . . .

Recalling the days right after his operation, he wrote:

My head was a complete blank then. I just slept, woke, but simply couldn't think, concentrate, or remember a thing. My memory—like my life—hardly seemed to exist.

At first I couldn't even recognize myself, or what had happened to me, and for a long time (days on end) didn't even know where I'd been hit. My head wound seemed to have transformed me into some terrible baby.

I'd hear a doctor talking to someone. But since I couldn't see him, I'd pay no attention to him. Suddenly he'd approach me, reach out and touch me, and ask: "How goes it, Comrade Zasetsky?" I wouldn't answer, just begin to wonder why he was asking me

that. After he'd repeated my name several times, I'd finally remember that "Zasetsky" was my name. Only then would it occur to me to say: "Okay."

Right after I was wounded, I seemed to be some newborn creature that just looked, listened, observed, repeated, but still had no mind of its own. That's what I was like in the beginning. Afterwards, when I'd had a chance to hear words that people use again and again in conversation or thinking, various clusters of "memory fragments" developed, and from these I began to make some sense out of the life around me and remember what words meant.

By the end of the second month I recalled who Lenin was, understood words like *sun, moon, cloud, rain*, and remembered my first and last name and patronymic. At times I even remembered that somewhere I had a mother and two sisters, a brother too before the war, who'd been missing since the first year of fighting (he was stationed with the troops in Lithuania).

Later on, the fellow in the next bed took an interest in me and even promised to write home for me if I could remember my address. But how was I to remember it? It was awfully hard. Was I likely to remember that when I couldn't even think of my mother's and sisters' names? . . .

Because of my injury I'd forgotten everything I ever learned or knew . . . everything . . . and had to start from scratch to develop again—at least up to a certain point. After that, my development suddenly

stopped, and I've been that way ever since. Mostly, it's because of my memory that I have so much trouble understanding things. You see, I'd forgotten absolutely everything and had to start all over trying to identify, recall, and understand things with the kind of memory a child has.

Because of that head wound I'd become an abnormal person—except that I wasn't insane. Not at all. I was abnormal because I had a huge amount of amnesia and for a long time didn't even have any trace of memories.

My mind was a complete muddle and confusion all the time, my brain seemed so limited and feeble. Before, I used to operate so differently.

[Translator's note: Many of the entries quoted from this point on were written in the present tense, appropriate enough considering that the man's problems persisted, despite the passage of time. Professor Luria has scrupulously preserved the repetitions and inconsistencies which are symptoms of the patient's condition.]

I'm in a kind of fog all the time, like a heavy half-sleep. My memory's a blank. I can't think of a single word. All that flashes through my mind are some images, hazy visions that suddenly appear and just as suddenly disappear, giving way to fresh images. But I simply can't understand or remember what these mean.

Whatever I do remember is scattered, broken

down into disconnected bits and pieces. That's why I react so abnormally to every word and idea, every attempt to understand the meaning of words.

He was not alone in realizing this. Moreover, he not only felt but was convinced that other people noticed this, that everyone was aware he had become a totally different person, fit for nothing, the mere semblance of a man who for all practical purposes had died. In short, a man who had been killed in the war.

Now people finally realize the damage a brain injury can do. They know what I was like before the war, before I was wounded, and can see how different I am now—good for nothing, incapable of any kind of work, anything at all.

Again and again I tell people I've become a totally different person since my injury, that I was killed March 2, 1943, but because of some vital power of my organism, I miraculously remained alive. Still, even though I seem to be alive, the burden of this head wound gives me no peace. I always feel as if I'm living out a dream—a hideous, fiendish nightmare—that I'm not a man but a shadow, some creature that's fit for nothing. . . .

He had been "killed" March 2 and was living a senseless existence, a kind of half-sleep that made it difficult for him to believe he really was alive:

It's hard to believe this is really life, but if it is a dream (and is it?) I can't just wait until I wake up.

Also, my new therapist tells me we've already been at war for three years and that I've become ill and illiterate because of a serious brain injury.

So that means I haven't been dreaming all this time—of course not. A dream can't last this long or be so monotonous. That means I've actually been experiencing this all these years. How horrible this illness is! I still can't get a grip on myself, can't figure out what I was like before, what's happened to me. . . .

But once in a while, when I consider what my mind is like now, I wonder: Is this really me? Am I dreaming or is this for real? It's lasted too long now to be a dream, that sort of thing doesn't happen, particularly when you know time is passing so quickly. But if this is life, and not a dream, why am I still sick? Why hasn't my head stopped aching and buzzing, why do I always feel so dizzy?

I have just as much hope as ever of doing something with my life, and so I don't want people to think I'm a hopeless case. I'm doing everything I can to accomplish this, and little by little use what possibilities I have.

Time passes, but not the agony of this man whose awareness had been so devastated by injury. By this time the front lines were far behind him, they had been followed by a whole chain of hospitals—first in Moscow (then a front-line city), later in small provincial towns. In one of these he was actually quar-

tered in a building where he had once gone to school. He remembered those large, clean rooms that formerly had been classrooms, and the many people who came up to ask how he felt. Following this, there were numerous other trips, then a long train trip where at each station new patients were taken aboard the hospital train. Finally he reached the rehabilitation hospital in the Urals.

The Rehabilitation Hospital

He ended up in a lovely, quiet place, a refuge amid the storms of war, a hospital where hundreds of soldiers with similar injuries had been sent. He remembered this place well and described it with enviable clarity.

There's a magnificent view everywhere; on one side, an enormous lake surrounded by evergreens; then an even bigger lake, and a third. Wherever you look the trees are gigantic, and the sky overhead seems bluer, even though the sun is very bright, simply blazing with light.

He also had a vivid recollection of the last moments of his trip before he arrived:

The jolting of the station wagon irritates me, I can feel it in my head where I was wounded. For some reason the station wagon seems to have been circling around in one place for some time now. . . . But here's another lake, and over there a big, three-story building close to some others—all of them set right here in the woods. The engine's stopping—we're here.

By the time he reached the rehabilitation hospital the bandages had been removed from his head. On the surface his wound appeared to have healed.

I still have to read syllable by syllable like a child; I am just as plagued by amnesia and can't remember words or meanings; I am still overcome by "mental aphasia" and can't recover my memory, any of the skills or knowledge I once had.

Two ideas keep running through my head: I keep telling myself my life is over, that I'm of no use to anyone but will stay this way until I die, which probably won't be long now. On the other hand, something keeps insisting I have to live, that time can heal everything, that maybe all I need is the right medicine and enough time to recover.

At a later date he recalled his ambivalence and wrote:

Often, when I considered what my life was like, I'd think: Who needs it? Besides, those eternal doubts of mine made things even worse. I still wasn't willing to believe I'd suffered such a cruel head wound and kept

insisting it must be a dream. Time was racing by so quickly, so peculiarly.

I felt as though I were bewitched, lost in some nightmare world, a vicious circle from which there was no way out, no possibility of waking. Nothing I saw made any sense to me. When I thought about that injury, the dreadful effects it had, I'd become terrified: Can all this really have happened? Will it go on this way until my miserable life is over?

Although he was still sensitive to nature, everything he perceived seemed changed and inaccessible.

Ever since I was wounded I've had a hard time understanding and identifying things in my environment. What's more, when I see or imagine things in my mind (physical objects, phenomena, plants, animals, birds, people), I still can't think of the words for these right away. And vice versa—when I hear a sound or a word I can't remember right off what it means.

What do these difficulties signify? Why had his world collapsed so that everything appeared changed and difficult to grasp?

Our First Meeting

I first met this man toward the end of May 1943, almost three months after he had been wounded. In order to follow the course of his illness, I saw him fairly regularly over a period of twenty-six years (weekly or, at times, at longer intervals). As our friendship developed, I had a chance to witness his long, relentless fight to recover the use of his damaged brain—to live, not merely exist.

The first time he entered my office in the rehabilitation hospital, I was struck by how young he looked. He seemed scarcely more than a boy, who looked at me with a puzzled smile and tilted his head awkwardly to one side. (Later I learned that the vision on his right side was gone, and in order to see, he had to shift sideways.)

I asked how he was getting on, and after some hesitation he replied shyly, "Okay." The question of when he had been wounded, however, threw him for a loss.

"Well, you see . . . it's, it's . . . a long time already . . . must be two, three . . . what's the word? . . ."

What town was he from?

"At home . . . there's . . . I want to write . . . but just can't."

Did he have any relatives?

"There's . . . my mother . . . and also—what do you call them?"

Obviously he did not understand my questions at first, and even after he did, had difficulty replying. Each attempt to do so led to a frantic struggle for words.

"Try reading this page," I suggested to him.

"What's this? . . . No, I don't know . . . don't understand . . . what *is* this?"

He tried to examine the page more closely, holding it in front of his left eye, then moving it further to the side and scrutinizing each of the letters in amazement. "No, I can't!" was all he could reply.

"All right, then, just try to write your first name and home town for me." This, too, led to a desperate struggle. Awkwardly he picked up the pencil (by the wrong end at first), then groped for the paper. But again he could not form a single letter. He was beside himself, he simply could not write and realized he had suddenly become illiterate.

I suggested he try to do something simple with numbers, like add six and seven.

"Seven . . . six . . . what's it? No, I can't . . . just don't know."

"Well, then, take a look at this picture and tell me what you see. It's called 'Hunters at a Resting Place.' "

"Over here there's . . . he's . . . he's sitting. . . . And this one here is . . . is . . . And there's this . . . I don't know! Certainly is *something* there, but . . . but what's it called?"

I then asked him to raise his right hand.

"Right? Right? . . . Left? . . . No, I don't know. . . . Where's my left hand? . . . What does right mean? . . . Or left? . . . No, I can't do it."

He made a desperate effort to answer my questions and acutely sensed each failure.

"Well, then," I suggested, "tell me what you remember about the front."

"By then . . . we were . . . were in a bad way. Had to retreat . . . would lose everything. So I decided that, that . . . if that's the way things were . . . I was told to . . . how many? Five. . . . But then I was out of the hospital and, and . . . then . . . the attack. I clearly remember it . . . for then, then . . . then I was wounded. . . . That's all."

It was painful for him to try to describe what was still fresh in his memory; he simply could not find the words with which to begin. I asked him if he knew what month it was.

"Now? What's the word? . . . It's, it's . . . May!"

And he smiled. Finally he had come up with the right word. When I asked him to list the months of the year, he managed to do this with relative ease and again felt reassured. But when I asked him to list them in reverse order, he had endless difficulties.

"What month comes before September?" I asked him.

"... before September? What's the word? . . . September? October? . . . No, that's not right. . . . It just doesn't come. . . ."

"What season is there before winter?"

"Before winter? After winter? . . . Summer? . . . Or *something!* No, I can't get it."

"Before spring?"

"It's spring now . . . and . . . and before . . . I've already forgotten, just can't remember."

What did these desperate, futile attempts to remember mean?

His response to nature was as keen as ever. He enjoyed the quiet and calm of his surroundings, listened intently to the sounds of birds, and noted how smooth the lake's surface became on a still day. He wanted very much to respond, to accomplish whatever was asked of him. Each failure only renewed his sense of loss.

He had no trouble listing the months of the year. Why, then, couldn't he tell me what month precedes September, or indicate his left and right hands? Why was he unable to add two simple numbers, recognize letters, write, remember common words, or describe a picture? In short, what type of brain injury had damaged these faculties, yet spared not only his immediate grasp of the world but his will, desire, and sensitivity to experience, allowing him to evaluate each and every failure?

Excerpt from Case History No. 3712

Sublieutenant Zasetsky, aged twenty-three, suffered a head injury 2 March 1943 that penetrated the left parieto-occipital area of the cranium. The injury was followed by a prolonged coma and, despite prompt treatment in a field hospital, was further complicated by inflammation that resulted in adhesions of the brain to the meninges and marked changes in the adjacent tissues. The formation of scar tissue altered the configurations of the lateral ventricles by pulling the left lateral ventricle upward and producing an incipient atrophy of the medulla of this area.

Some alarming conclusions follow from these data. The bullet had lodged in the posterior parieto-occipital regions of the brain and destroyed the tissue in this area, an injury further complicated by inflammation. Though a local rather than an extensive wound, limited only to areas of the brain adjacent to the site of injury, it had done irreversible damage to the parieto-occipital regions of the left hemisphere, and the formation of scar tissue inevitably produced a partial

atrophy of the medulla which in time was bound to become more extensive.

A dreadful fate awaits someone who is suffering from progressive, irreversible atrophy of this part of the brain. In this case, what symptoms had it produced and still threatened to create? How does the particular kind of injury this man suffered account for the entire syndrome we have just described?

A Brief Summary of Brain Anatomy *The First Digression*

Let us assume a brain has been removed from its cranium and placed on a small glass table before us. What we see is a gray mass ridged throughout with deep furrows and raised convolutions. This mass is divided into two hemispheres, left and right, connected by a thick, callous ligament. Superficially this matter—the cortex of the large hemispheres—is of an even gray color; though less than four to five millimeters thick, it consists of an enormous number of nerve cells that form the material basis for all complex psychological processes.

The cortex of the outer sections of the hemispheres is of more recent origin than that of the interior parts.

Just below the thin layer of the cortex is the white matter, which is composed of multitudes of closely connected fibers that join separate parts of the cortex, conduct to it stimuli originating at the periphery, and redirect to the periphery reactions that develop in the cortex. On a still deeper level additional sections of gray matter are to be found; these form the subcortical nuclei of the brain, the oldest and most recessed mechanisms of the brain—stations at which stimuli from the periphery terminate and undergo their initial processing.

The brain appears to be uniform and monotonous, but it is the highest product of evolution. It receives, processes, and retains information, sets up programs of behavior, and regulates their execution.

Until quite recently we knew very little about its structure and functional organization. Precise knowledge was rarely to be found in the textbooks, which were filled with vague suppositions and fantastic conjectures that made maps of the brain scarcely more reliable than medieval geographers' maps of the world.

Owing to the work of such eminent scholars as I. M. Sechenov, I. P. Pavlov, Monakov, Goldstein, and others we now know far more about the human brain. And though our conceptions amount to no more than the most elementary stage of a real science, we have come a long way from the vague surmises and unverified assumptions that characterized the knowledge of previous generations. Precisely because

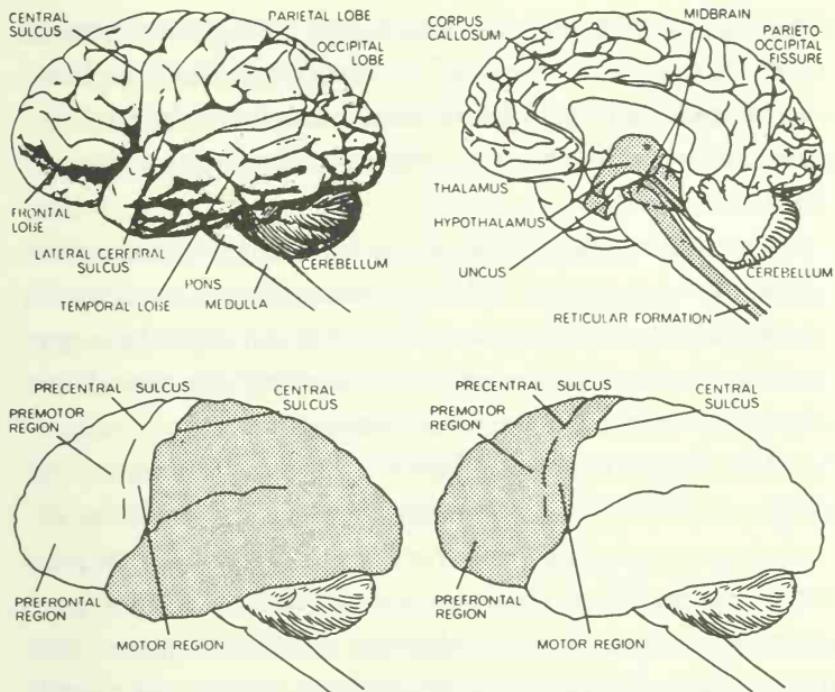
of this information we can analyze more closely the symptoms this patient's injury produced.

Obviously the superficial impression one has of the brain as a uniform, undifferentiated gray mass is diametrically opposed to the inconceivable complexity and differentiation this organ actually possesses. The gray matter consists of an extraordinary number of nerve cells, neurons, the fundamental units of brain activity. Some scientists estimate there are 14 billion of these; others assume the total is even higher. More importantly, these neurons have a strict pattern of organization: individual areas or "blocks" differ radically in function.

Given the complexity of the problems under consideration, we can simplify the case somewhat by singling out for attention the most important components of the human brain, the three fundamental "blocks" of this amazing apparatus.

The first of these formations might be called the "energizing" or "tonus-regulating" block. It is located at the base of the brain within the upper sections of the brain stem, and in the reticular formation that constitutes the starting point for the brain's vital activity.

Part of this block, located within the depths of these masses of gray matter, is what the ancients termed the "visual bump" (optic thalamus) though it actually has only a remote connection with visual processes. It is a preliminary station for processing impulses stemming from both metabolic functions in

*Figure 1*

The regions of the brain. The gross anatomy of the human brain is depicted at upper left. The other drawings identify three major blocks of the brain involved in the organization of behavior. The first block (upper right) includes the brain stem and the old cortex. It regulates wakefulness and the response to stimuli. The second block (lower left) plays a key role in the analysis, coding, and storage of information. The third block (lower right) is involved in the formation of intentions and programs.

the organism and excitation of the sensory organs. When these impulses, in turn, are conducted to the cerebral cortex, they impart to it its normal state of tonicity and vigor. If the influx of these impulses ceases, the cortex loses its tonicity, the person lapses into a semisomnolent state, and then into sleep. This

mechanism "feeds" the brain just as a power source provides for the "feeding" of electronic devices. Insofar as this "energy" block had been left intact in this patient, he was able to remain alert and generally active.

The second major block of the brain, located in the posterior sections of the large hemispheres, performs a most important function. Since it was precisely a part of this block that the man's injury had destroyed, we should consider it in greater detail.

The function of this block is not to guarantee the vigor of the cortex, but rather to act as a block for receiving, processing, and retaining information a person derives from the external world. A person perceives thousands of objects, both familiar and unfamiliar. He picks up an endless number of signals from his environment. The reflection these stimuli produce in the retina of the eye is transmitted by very fine nerve fibers to the occipital regions of the cerebral cortex—the visual area of the cortex. At this point a visual image is broken down into millions of component features, for the nerve cells in the cortex of the occipital regions have highly specialized functions. Some distinguish between the finest gradations of color; others respond only to smooth, round, or angular lines; still others to movement from a peripheral point to a center, or a center to a periphery. This section of the cortex, the "primary visual cortex" (located in the hindmost part of the occipital region), is indeed a remarkable laboratory that breaks down images of the external world into millions of

constituent parts. It, too, had been left undamaged by this patient's injury.

Adjacent to this area is another section of the occipital region that specialists term the "secondary visual cortex." The entire mass of this cortex consists of tiny nerve cells with short offshoots resembling stars (hence termed "stellate cells"). Distributed throughout the upper layers of the cerebral cortex, they combine stimuli transmitted to them from the "primary visual cortex" into complete and intricate complexes—"dynamic patterns." They convert the individual features of objects perceived into complete, manifold structures.

If one applies an electric shock to the "primary visual cortex" (this can be done during a brain operation and is absolutely painless), glowing points, circles, and fiery tips appear before the person's eyes. If, however, one applies the shock to any part of the "secondary visual cortex," a person sees complex patterns or, at times, complete objects—trees swaying, a squirrel leaping, a friend approaching and waving. It has been shown that stimulation of these "secondary" areas of the visual cortex has the power to provoke graphic recollections of the past, such as images of objects. This part of the brain operates as a device for processing and retaining information, and we are indebted to scientists from various countries (Förster of Germany, Pötzl of Austria, Penfield of Canada) for this new and fascinating discovery about the brain's activity.

Given the complexity of these functions, one can

well imagine the serious consequences that follow from an injury to these sections of the cortex. An injury that destroys the "primary visual cortex" of one hemisphere, or the clusters of nerve fibers conducting visual stimuli to it (the latter form a delicate fan within the brain matter and are appropriately termed the "optic radiation"), obliterates part of the field of vision. Destruction of the "primary visual cortex" or the fibers of the left hemisphere results in a loss of the right half of the visual field, whereas damage to this same part of the cortex in the right hemisphere affects the left half of the visual field. Physicians use a cumbersome, awkward term to describe this ("hemianopsia"—loss of half the field of vision). Such a symptom is a reliable indication of precisely which part of the cortex has been destroyed.

An injury to the "secondary visual cortex" produces an even more peculiar syndrome. If a shell or bomb fragment strikes the anterior sections of the occipital area (these are part of the "secondary visual cortex"), a person continues to see objects as clearly as before. However, the small, "stellate cells" no longer function; and it is these that synthesize individual characteristics of objects perceived into complete wholes. Hence, a person's vision undergoes a bewildering change: he still distinguishes individual parts of objects but no longer can synthesize them into complete images; and, like a scholar trying to decipher some Assyrian cuneiform, can only surmise the total from these separate parts.

Let us assume such a person is asked to look at a picture of a pair of eyeglasses. What is it he sees? One circle, then another, then a cross bar, and finally, two cane-like attachments. His guess is—it must be a bicycle. Such a patient cannot perceive objects, even though he can distinguish their individual features. He suffers from a complex disorder for which physicians use a combined Latin-Greek term—"optical agnosia" (inability to recognize the meaning of visual stimuli).

Cognition, however, is affected by other factors than those described above. After all, we do not simply perceive isolated objects but entire situations; we also note the complex relationships and correspondences between objects, their location in space (the notebook is on the right side of the table, the inkwell on the left; to get to one's room he first has to turn left in the corridor, then right, etc.). Since objects are arranged within an entire system of spatial coordinates, we can immediately sense where they are located.

The ability to grasp situations, or gauge spatial relationships, involves something far more complex than the perception of figures or objects. Not only our eyes but our motor experience plays a part in this (one can pick up a notebook with his right hand, reach for an inkwell with his left, etc.). Our ability to locate objects in space is further assisted by a special organ in the interior part of the ears—a "vestibular" mechanism which maintains the sense of balance

that is so essential for gauging three-dimensional space. Eye movements, too, are closely related to this function, for they can help to gauge the distance from one object to another at a glance and to determine their interrelationship. The organized, combined operation of these various systems is necessary to insure that distinct, consecutive impressions will be recodified into a complete, instantaneous framework.

Naturally, other, more complex sectors of the cerebral cortex affect our simultaneous grasp of spatial relationships. These sectors are adjacent to the occipital, parietal, and temporal areas and constitute one of the mechanisms of the "tertiary" cognitive part of the cortex (at this point it could be termed the "gnostic" part). The function of the latter is to combine the visual (occipital), tactile-motor (parietal), and auditory-vestibular (temporal) sections of the brain. These sections are the most complex formations in the second block of the human brain. In the process of evolution they were the last part of the brain to develop, and only in man did they acquire any vigor. They are not even fully developed in the human infant but mature gradually and become effective by ages four to seven. They are extremely vulnerable and even a slight impairment disrupts their function. Since they consist entirely of highly complex "associative" cells, many specialists term them "zones of convergence" for the visual, tactile-motor, and auditory-vestibular parts of the brain.

It was precisely these "tertiary" sectors of the cor-

tex that the bullet fragment had destroyed in this patient's brain. Hence, we must consider what symptoms damage to parts of this sector of the cortex (either by shell or bullet fragments or by hemorrhaging and inflammation) can produce.

The person's visual capacity may remain relatively unimpaired. But if the bullet passes through the fibers of the "optic radiation" and destroys part of these, blind spots occur and an entire part (sometimes one-half) of the visual field disintegrates. A person will also continue to perceive discrete objects (since the "secondary" sectors of the visual cortex have remained intact), to have tactile and auditory sensations, and to discern speech sounds. Nonetheless, a very important function has been seriously impaired: he cannot immediately combine his impressions into a coherent whole; his world becomes fragmented.

He is aware of his own body and senses both his arms and legs, though he cannot tell his right arm from his left. It is impossible for him to figure this out immediately. To do so, he has to locate his arms in terms of an entire system of spatial coordinates, to distinguish left from right. Let us say he begins to make his bed: is he to arrange the cover lengthwise or crosswise? If he tries to put on a robe, how is he to tell the right sleeve from the left? Or, how is he to understand what time the hands of the clock indicate? The numbers "3" and "9" are exactly parallel, except that one is on the right and the other on the left side of the clock. But how does such a person determine

"right" and "left"? In short, every move he makes becomes terribly complicated.

Furthermore, the above does not exhaust the range of problems he faces in a "fragmented" world. The "tertiary" regions of the parieto-occipito-temporal cortex of the left hemisphere are intricately linked to one of the most important psychological functions—namely, language.

Over a century ago the French anatomist Paul Broca discovered that an injury to the posterior sectors of the inferior frontal convolution of the left hemisphere results in a disintegration of the "motor images of words," thereby impairing a person's capacity to speak. Several years later the German psychiatrist C. Wernicke disclosed that (in right-handed people) an injury to the posterior sectors of the superior temporal region of the same hemisphere damages one's ability to distinguish and understand speech sounds.

A person works with his right hand, it plays a dominant role in his life. Yet it is the opposite, the left, hemisphere that controls this hand and the faculty for speech, one of the most complex human activities. Language is not simply a means of communication but a crucial part of the entire process of cognition. We use words to designate objects and their location in space (*right, left, behind, in front of* etc.). Through grammatical constructions we express relationships and ideas. Regardless of how private or abbreviated language may be, it is pivotal to cogni-

tion: by means of it we designate numbers, perform mathematical calculations, analyze our perceptions, distinguish the essential from the inessential, and form categories of distinct impressions.

Apart from being a means of communication, language is fundamental to perception and memory, thinking and behavior. It organizes our inner life.

Is it any wonder, then, that destruction of the "tertiary" sectors of the cortex of the left hemisphere produces even more serious consequences than those we have just described? A person with such an injury finds his inner world fragmented; he cannot think of a particular word he needs to express an idea; he finds complex grammatical relationships unbelievably difficult; he forgets how to add or use any of the skills he learned in school. Whatever knowledge he once had is broken down into discrete, unrelated bits of information. On the surface his life may appear no different but it has changed radically; owing to an injury to a small part of his brain, his world has become an endless series of mazes.

One would think that were even a part of this important block destroyed, a man's life would be devastated entirely. He would be deprived of what is uniquely human, transformed into a helpless invalid, left without a present, or any possibility of a future. Yet there is a third major block of the brain we have not discussed which, in this patient, had remained undamaged.

This block is located in the anterior sectors of the

brain, and includes the frontal lobes. It does not affect the tonicity of the cortex; neither does it receive, process, or retain information from the physical world. It is linked to the world solely by means of mechanisms in the second block, and it can function effectively only if the first block has kept the cortex sufficiently nourished and vigorous. The function of the third block is decisively important; it is a powerful apparatus that allows one to form and sustain intentions, plan actions, and carry them through.

Since I have dealt at length with this block elsewhere, there is only one point I need make here: namely, that an injury to the anterior sectors of the brain (including the frontal lobes) produces an entirely different syndrome than the one we have described. Such an injury does not damage a person's capacity to learn, perceive, or remember. His world remains intact, though his life is indeed pathetic: he is completely unable to form any lasting intentions, plan for the future, or determine the course of his own behavior. He can only respond to signals he picks up from without, but is powerless to convert these into a set of symbols to control his behavior. And since he has no possibility of evaluating his shortcomings, he cannot correct them. He cannot even conceive of what he will do the next minute, much less the next hour or day. Hence, though his past remains intact, he is robbed of any possibility of a future and loses precisely what it is that makes a person human.

In our patient the mechanisms of the third block, the frontal cortex, had been spared, and with them his

capacity to recognize his defects and wish to overcome them. He was acutely aware of what it means to be human, and to the extent his strength permitted, worked feverishly to overcome his problems. He suffered intensely, and though his world had been devastated, in the deepest sense he remained a man, struggling to regain what he had lost, reconstitute his life, and use the powers he had once had:

It was depressing, unbearable to realize how miserable and pathetic my situation was. You see, I'd become illiterate, sick, had no memory. So once again I'd try to revive some hope of recovering from this terrible disease. I began to fantasize that I'd get over the headaches and dizzy spells, recover my vision and hearing, remember all I'd ever learned.

Of course people didn't realize what my situation was really like, they weren't aware what an enormous effort it had taken just for me to get this far. Still, I want to think I can prove to people I'm not a goner, not a hopeless case, that all I need is to learn to remember and speak again, be able to use the kind of mind I had before I was wounded (a halfway decent one). Once in a while this awful amnesia gets me down but I still hope I can put some sort of life together again, so I don't want people to think I'm hopeless. I'm trying to realize part of these dreams and gradually do whatever I still can.

I haven't lost hope I'll be fit for some kind of work and can be of some service to my country. I believe that. . . .

First Steps in a Shattered World

Let us run through his recollections of the first days and weeks after he was wounded, the opening section of his journal. What do they tell us? How did his world disintegrate so thoroughly that he was never able to assemble the bits and pieces that remained?

He found himself in a hospital, and saw a group of people bending over him. Shortly thereafter, he remembered seeing different people approach him and ask how he was feeling. And with these first contacts, his life suddenly became terribly difficult. Let us examine some sections of his journal which describe the particular kinds of problems he encountered.

His Vision

Something had happened unlike anything he had ever experienced before. At first he could not perceive a thing; his world had collapsed into fragments, and

these did not form complete objects or images. The right side of whatever he happened to be looking at was nonexistent; all he could make out was an even gray vacuum. Since objects had ceased to resemble complete entities, he had to try to assemble the fragments and guess what they meant:

Ever since I was wounded I haven't been able to see a single object as a whole—not one thing. Even now I have to fill in a lot about objects, phenomena, or any living thing from imagination. That is, I have to picture them in my mind and try to remember them as full and complete—after I have a chance to look them over, touch them, or get some image of them. I can't even see a small inkwell as one complete object. True, there are some things I can think of as I remembered them before, but I've forgotten what most objects, phenomena, or living things are like, and I see, or picture them to myself, quite differently than I did before I was wounded.

Even now I still don't see entire objects, things, or people as I did before—only part of them. When I look at a spoon, at the left tip, I'm amazed. I can't figure out why I only see the tip and not the whole spoon. When this first happened it looked to me like a peculiar bit of space, and sometimes I'd actually get frightened when the spoon got lost in my soup.

At this point in his journal, he drew a sketch showing how his vision had changed—what it was like before and after his injury. (See Figure 2.)

Moreover, the objects he saw no longer appeared stable. They would glimmer fitfully and become displaced, making everything appear as if it were in a state of flux.

Through and beyond the objects I see there are endless numbers—a myriad really—of tiny, shifting swarms of midges that make it hard for me to look at the objects themselves. Because of this swarm, I can't see the first letter of a word clearly. It doesn't come through clearly but looks like it's been plucked, gnawed around the edges, and what's left are scattered points, quills, or threads that flicker like a swarm. I can see this now with my own eyes—when I look out the window I have a very small span of vision, but in and around that span I see this swarm racing back and forth.

At times this problem was compounded by hallucinations, for the scar tissue that had developed in the damaged area of his brain stimulated the nerve cells that retain visual memories. This created an additional cause for suffering—the anguish of a man who finds not only his world disintegrated but his vision deranged.

I remember there were two days and nights I didn't dare close my eyes. I seemed to be having hallucinations. I'd no sooner close my eyes than I'd see some ugly thing, something weird—a human face but with enormous ears, it seemed, and eyes that were

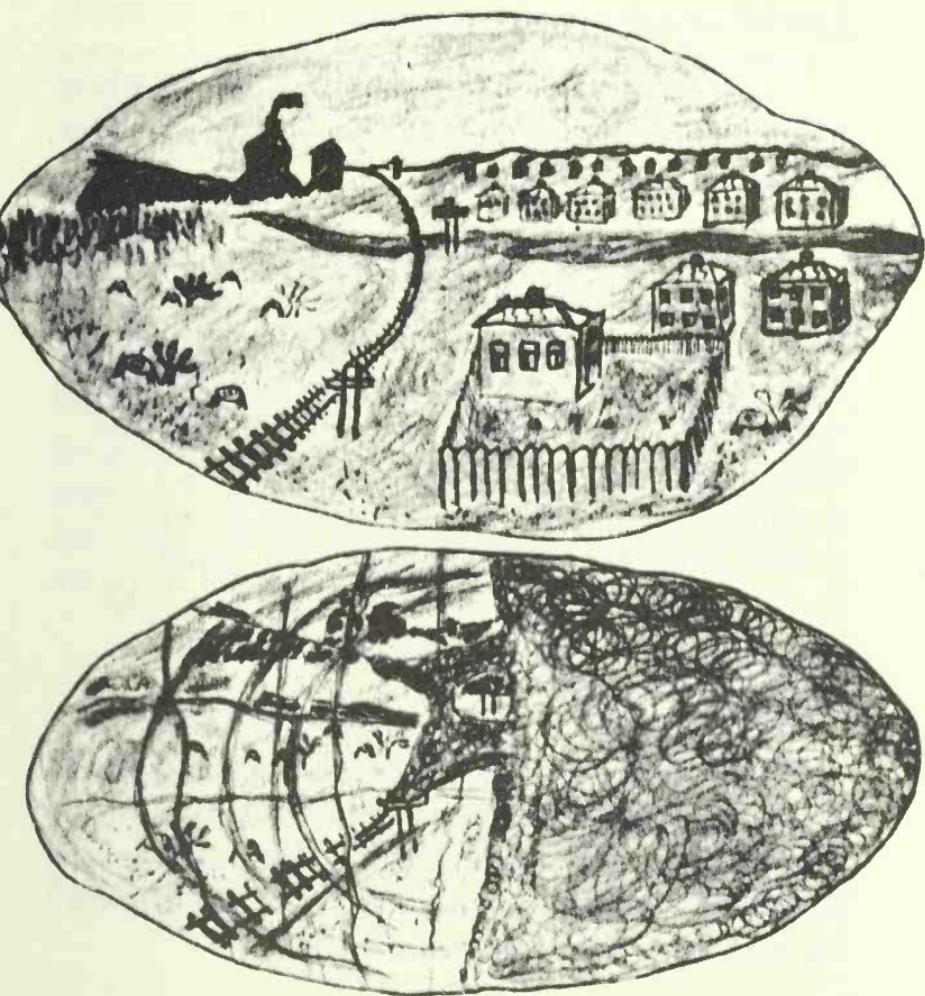


Figure 2

(Top) Vision before the injury. (Bottom) Vision after the injury.

just as peculiar. Or else I'd see faces, objects, and rooms of different sorts. So I'd open my eyes as fast as I could.

It was difficult for him to live in a world where half the things seemed to have disappeared, so that he had to reorient himself entirely.

Once when I left my room and was walking in the corridor, I'd no sooner taken a few steps than I suddenly banged my right shoulder and the right side of my forehead against the wall and got a huge bump on my forehead. I was furious; I simply couldn't understand why I'd suddenly bumped into the wall. I should have seen it. Just then I happened to look down—at the floor and at my feet—and I shuddered. I couldn't see the right side of my body. My hands and feet had disappeared. What could have happened to them?

(Even months and years later these defects had not improved; his vision remained just as fragmented.)

He tried to understand what had happened to him and began to describe each of his defects, experimenting with his badly distorted vision:

Since I was wounded I haven't been able to see anything out of the right side of either eye. But since my eyes look just as normal as other people's, no one can tell, simply by looking at me, whether or not I can see. But it means that if I focus on a point with ei-

ther eye, everything on a vertical line to the right of that point is blocked out. I can see what's to the left of that but many things are not visible, that is, there are some blank spaces in my vision. When I begin to read a word, even a word like *dizziness* [Russian: "golovokruzheniye"], and look at the letter "k," the upper right point, I only see the letters on the left ("v-o"). I can't see anything on the right of the letter "k" or around it. To the left of it I can see the two letters "v" and "o" but nothing further to the left. If someone were to trace the letters further to the left with a pencil, I'd see where the movement of the pencil began, but not the letters. This means I not only can't see anything with the right part of either eye, I also can't see some parts of the objects around me on the left side.

His Body

However severely impaired, a fractured vision was only a small part of the problems he faced. Had only his vision been affected, things would not have been too bad, but his sense of his own body had changed and, with it, his reactions:

Often I fall into a kind of stupor and don't understand what's going on around me; I have no sense of objects. One minute I stand there thinking about something, the next I lapse into forgetfulness. But suddenly I'll come to, look to the right of me, and be horrified to discover half of my body is gone. I'm terrified; I try to figure out what's become of my right arm and leg, the entire right side of my body. I move the fingers of my left hand, feel them, but can't see the fingers of my right hand and somehow I'm not even aware they're there. And I get terribly upset. I know there's something I should keep in mind—that I suddenly "lose" the right side of my body because I'm always forgetting I can't see on my right side. But I can't get used to that idea, so often I'm terrified when part of my body disappears.

Not only would he "lose" the right side of his body (an injury to the parietal area of the left hemisphere inevitably produces this symptom); sometimes he thought parts of his body had changed—that his head had become inordinately large, his torso extremely small, and his legs displaced. It seemed to him that in addition to the disintegration of objects he perceived, parts of his body had undergone some form of fragmentation:

Sometimes when I'm sitting down I suddenly feel as though my head is the size of a table—every bit as big—while my hands, feet, and torso become

very small. When I remember this, I myself think it's comical, but also very weird. These are the kinds of things I call "bodily peculiarities." When I close my eyes, I'm not even sure where my right leg is; for some reason I used to think (even sensed) it was somewhere above my shoulder, even above my head. And I could never recognize or understand that leg (the part from my foot to my knee).

Another annoying thing that happens (it's a minor problem, and I have some control over it) is that sometimes, when I'm sitting on a chair, I suddenly become very tall, but my torso becomes terribly short and my head very, very tiny—no bigger than a chicken's head. You can't imagine what that's like even if you tried—it's just got to "happen" to you.

Frequently he could not locate parts of his own body. They had collapsed into bits and pieces, and he could not immediately figure out where his hand, foot, and the nape of his neck were but had to hunt long and hard for these. In his previous life, when the parts of his body had been intact, it would have been unthinkable to have to "hunt" for them.

Often, I even forget where my forearm or buttocks are and have to think of what these two words refer to. I know what the word *shoulder* means and that the word forearm is closely related to it [Russian: "*plecho*" and "*predpleche*"]. But I always forget where my *forearm* is located. Is it near my neck or my hands? The same thing happens with the

word *buttocks*. I forget where this is, too, and get confused. Is it in my leg muscles above my knees? My pelvic muscles? The same sort of thing happens with many other parts of my body. What's more, I still can't remember the words for them.

Say a doctor asks me to show him where my back is. It's strange, but I can't do it. By now I know the word *back* refers to my body, but because of my head wound I can't recall, have simply forgotten, where this part is. I've also forgotten a good number of other words for parts of my body.

The same thing happens when the doctor asks me to point to my eyes. It takes me a long time to remember what the word "eye" means. Finally I do, but then I have the same problem with the word *nose*. After the doctor has gone over this with me many times, he asks me to point these out quickly, one after the other. But this only confuses me and I no longer can remember the words *nose*, *ear*, and *eye*, even though he's been training me to use them over and over again. Even a word I've gotten to know doesn't come to mind quickly.

When the doctor says: "Hands on your hips!" I stand there wondering what this means. Or if he says: "Hands at your sides . . . your sides . . . hands at your sides. . . ." What does that mean?

Sometimes this confusion had rather peculiar consequences: not only would he lose a sense of his own body, he would also forget how parts of his body

functioned. The following, an early recollection, dates back to the weeks right after he was wounded when he was confined to a hospital near Moscow. It is a fairly atypical symptom.

During the night I suddenly woke up and felt a kind of pressure in my stomach. Something was stirring in my stomach, but it wasn't that I had to urinate—it was something else. But what? I just couldn't figure it out. Meanwhile, the pressure in my stomach was getting stronger every minute. Suddenly I realized I had to go to the john but couldn't figure out how. I knew what organ got rid of urine, but this pressure was on a different orifice, except that I'd forgotten what it was for.

This was not the only peculiar experience he had. Very soon he discovered he had to relearn what had once been so commonplace—to beckon to someone or wave good-by.

I was lying in bed and needed the nurse. How was I to get her to come over? All of a sudden I remembered you can beckon to someone and so I tried to beckon to the nurse—that is, move my left hand lightly back and forth. But she walked right on by and paid no attention to my gesturing. I realized then that I'd completely forgotten how to beckon to someone. It appeared I'd even forgotten how to gesture with my hands so that someone could understand what I meant.

Space

He quickly adjusted to these "bodily peculiarities" and was only troubled by them later when he began to suffer from attacks. But other disturbances ("spatial peculiarities," as he called them) persisted. For example, when a doctor wanted to shake hands with him, he did not know which hand to extend; if he tried to seat himself in a chair, it often turned out to be further to the left than he expected. He had no better luck with silverware—was unable to pick up meat with his fork or hold a spoon properly, but tipped it to one side, spilling his soup. These problems began quite early, while he was still in the hospital, and continued for years on end.

When the doctor learned what my first name was, he'd always address me that way and try to shake hands when he came over. But I couldn't manage to clasp his hand. He'd try it a second time, but as luck would have it, I'd forget I had a right hand since I couldn't see it. Suddenly I'd remember and try to shake hands again but would only manage to touch his fingers. He'd let go of my hand and try once

more. But I still wasn't able to do it, so he'd take my hand and show me how.

Ever since I was wounded I've had trouble sometimes sitting down in a chair or on a couch. I first look to see where the chair is, but when I try to sit down I suddenly make a grab for the chair since I'm afraid I'll land on the floor. Sometimes that happens because the chair turns out to be further to one side than I thought.

These "spatial peculiarities" were particularly distressing when he was sitting at a table. He'd try to write and be unable to control a pencil, not knowing how to hold it. He encountered similar problems in the hospital workshops where he went for occupational therapy, hoping he'd be given some work to do and thus convince himself he could be useful, fit for some kind of job. There, too, he was up against precisely the same difficulties:

The instructor gave me a needle, spool of thread, some material with a pattern on it, and asked me to try to stitch the pattern. Then he went off to attend to other patients—people who'd had their arms or legs amputated after being wounded, or half their bodies paralyzed. Meanwhile, I just sat there with the needle, thread, and material in my hands wondering why I'd been given these; I sat for a long time and did nothing. Suddenly the instructor came over and asked: "Why are you just sitting there? Go ahead and thread the needle!" I took the thread in one hand, the

needle in the other, but couldn't understand what to do with them. How was I to thread the needle? I twisted it back and forth but hadn't the slightest idea what to do with any of these things.

When I first looked at those objects, but hadn't yet picked them up, they seemed perfectly familiar—there was no reason to think about them. But as soon as I had them in my hands, I was at a loss to figure out what they were for. I'd lapse into a kind of stupor and wouldn't be able to associate these two objects in my mind—it was as though I'd forgotten why they existed. I twisted the needle and thread in my hands but couldn't understand how to connect the two—how to fit the thread in the needle.

And then another annoying thing happened. By then I'd already learned what a needle, thread, thimble, and material were for and had some vague notion of how to use them. But I couldn't for the life of me think of the names for these or other objects people had pointed out to me. I'd sit there stitching the material with the needle, completely unable to remember what the very things I was using were called.

The first time I entered the shop and saw people working there, I noticed various things—a work-bench, a slab of wood, a plane—and I thought I recognized these objects and knew what they were called. But when I was actually given a plane and a slab of wood, I fiddled with them for quite a while before some of the other patients showed me how to use these and other tools. I started to sand some wood

but never learned to do it right, never did get it sanded. Each time I'd try, the surface would come out lopsided and crooked or had pits and bumps in it. And what's more, I got tired very quickly. While I was sanding the wood or looking at some of the other tools in the carpentry shop (a block of wood or a workbench) it was the same old story—I couldn't remember what any of these was used for.

When I went to a workshop to learn shoemaking, the instructor explained everything to me in great detail, since he was convinced I was very muddled and thickheaded and didn't know the first thing about making shoes. He showed me how to hold a hammer, drive nails in and pull them out, but all I learned to do was drive wooden nails into a board and pull them out again. And even that was hard, because I couldn't see where the nails were supposed to go but kept missing the spot and banging my fingers until they bled. And I was very, very slow at it. So the only thing they let me do was bang nails into a board.

These problems persisted, even when he returned home and wanted to help his mother by doing some simple job around the house. If she asked him to chop wood, mend the fence, or bring some milk up from the storeroom, he found he did not know how to proceed. Each time he was at an impasse, and this gave him further cause for grief.

I'd set a stump of wood in place, pick up an ax, swing, and miss, so that the ax hit the floor. Ever

since I was wounded I tend to hit the floor when I swing an ax, or else it gets caught in the wood and the block bounces up, rolls off, and hits me in the hand or foot, leaving me black and blue. I seldom manage to hit the center of the block but usually land somewhat to the right or left of it, as though some mysterious power were twisting my swing to one side. That's why I have so much trouble chopping wood.

Once my sister asked me to fasten the barn door which was hanging on one nail. I wanted to do it but spent a long time rummaging around the barn trying to figure out what I needed, where I was to get the tools to fix the door. I couldn't remember, even though they were right there in the barn. Since I was wounded I've been afraid to reach out and touch things—anything around me. That was the feeling I had when I was in the barn, but it also comes over me when I'm in my room. I don't know or understand where things are. Somehow I can't really examine things and figure out what they're for. When my sisters realized I couldn't find what I needed in the barn, they brought me the nails and hammer. I picked them up but just stood there wondering how I was going to fix the door. After thinking about it for a while, I finally picked up the hammer. But I wasn't holding it straight—I twisted it so that the nail bent as I hammered it in, and I hurt my finger. The nail was already crooked and bent. I tried to figure out how to fix it but couldn't find a way of straightening it. At that point my mother got angry with me, took the hammer, and fixed the door herself.

When I tried to fetch some water, I filled up the bucket and started back, but suddenly fell flat on my back on perfectly level ground. I was lucky I didn't hit my head—I landed on my back and only dented the pail.

Often I ram the right edge of the pails into a fence or a wall, or trip if the ground is uneven. When I start back with the pails of water I feel perfectly all right but I soon get exhausted and very nervous. My hands and feet tremble and I get irritable and annoyed even though I never have to carry water more than 100 meters, since I live right near a well.

The problems of coping with a world that seemed to have disintegrated and a body that refused to function properly plagued him not only when he tried to work but affected everything in his daily life, even something as simple as exercising or playing a game. Confronted with obstacles at every turn, the simplest, most commonplace matters became painfully difficult.

I'd stand in the middle of my room and try to exercise. Before I was wounded I knew four different kinds of exercise I'd learned to do to music when I was a child in the Young Pioneers' Camp. But for some reason I can't remember these now; I have forgotten all four. So I just try various kinds of movements like raising and lowering my arms, sitting down, standing up. But I don't enjoy doing these. I get tired quickly and lose all interest in exercising.

When I try to bowl, I never manage to hit the

pins—for that matter I've forgotten how to play any kind of game. I can't see very well or think quickly. If I try to throw a stick, I miss, my aim is usually far off. The same thing happens with other games I finally figure out how to play.

What was at the root of the problems he describes here? Why couldn't he control his aim when he chopped wood, hold a spoon properly, or find things in his room instead of having to wander around helplessly, mentally probing each object as though he were a blindfolded man groping his way through space? What was causing those "spatial peculiarities" he referred to so often?

The problem was not that he failed to see an object. He would recognize it, know what it was for, and how to use it. But it was altogether different when he tried to orient himself in space, distinguish right from left, or gauge the distance and relationship between two objects.

These "spatial peculiarities" became apparent to him when he was still in the hospital. If he left his room he would be unable to find his way back, not knowing whether to turn left or right in that long hospital corridor. And what did "right" or "left" mean to him? At one time the distinction would have been obvious, but from the moment he was wounded all such distinctions had collapsed. He had to wrack his brain for a solution to simple matters as though they were complex algebraic problems for which one needs tried and tested methods. Since these methods had not yet be-

come clear to him, he wrote about his problems repeatedly in his journal. The following excerpts deal with the periods he was in hospitals and sanatoriums.

When I came out of the bathroom, I forgot which way I had to turn to get back to my room. So I just started walking, dragging myself along. Suddenly I banged my right side against the door—something I had never done before. I was amazed that this had happened. Probably it was because I'd forgotten the way back and was confused. I tried to figure out where my room was, looked around everywhere, but couldn't get the layout of things and decide which way to go.

I turned in the other direction and fell, because I got confused again and didn't know which way to walk. Suddenly the words *right, left, back, forward, up*, and *down* occurred to me, but they weren't any help since I didn't really understand what they meant. A minute later I also remembered the words *south, north, east*, and *west*. But when I tried to figure out what the relationship was between any two of these words, I was lost. I didn't understand whether *north* and *south* meant areas that were side by side or just the reverse. I even forgot what direction north or south indicated. But right then someone called me. At first I wasn't aware I was being called, but when the fellow repeated my name a few times I looked around to see who it was. Finally, I saw a patient approaching and beckoning to me.

When I went for a walk the same thing happened.

I forgot where our building was, what direction I should walk to go back. I looked at the sun but couldn't remember where it was supposed to be at that time of day—whether to the left or the right of me. I had already forgotten how I'd gotten to this place and what direction to take to get back, even though I had only gone a short distance from the building. The hospital was hemmed in by enormous evergreens, a little ways off there was a lake, and after that—nothing but dense forest. What was I going to do? How was I going to manage?

The same thing happened when he went to have his eyes examined by an oculist:

The doctor pointed to the figure of a semicircle and asked me in which direction it was turned. I looked at her but didn't answer, since I didn't understand the question. She began to get annoyed: "Why don't you answer? Which direction is the semicircle pointing—to the right or the left?" When I finally understood what she was asking, I looked at the semicircle but couldn't judge since I didn't know what "left" or "right" meant. It seems that ever since I was wounded I can't understand such expressions.

I could see that ring (the circle with one side missing). It was so clear you couldn't miss it. But I didn't understand the doctor's question. She was getting impatient with me and repeated the question again. I just sat and stared at that figure but wasn't able to answer her since I didn't know what the words meant.

Once again I had to tell her I didn't know. But she couldn't believe me, she thought I was pretending. Then she picked up the pointer and indicated a much larger figure. But again I didn't know what to say. It's strange, but I just can't grasp simple things like that.

These problems also occurred in his reactions to sounds. When someone called him in the hospital corridor he was unable to tell which direction the sound was coming from, for he was as disoriented aurally as visually. Obviously, his problems stemmed from something deeper and more pervasive than a mere visual defect.

Although he had already experienced problems with spatial orientation in the hospital, it was incomparably more difficult for him after he was discharged and sent home. Some of the pages of his journal describe his trip home from the hospital. A nurse accompanied him to the railroad station where he was to catch a train to Tula. When she left he wondered how he was going to manage, whom he would turn to for help.

As soon as the nurse left me at the station, I became very uneasy and looked around to get my bearings, decide what side of the station I should be on to catch my train. I was sitting in the Kursk Railway Station in a special room for wounded soldiers. No one had been assigned to accompany me home, and I don't know whether anyone should have since I was able to walk and could at least make myself understood. I even

thought I'd have no trouble getting home alone since I'd traveled by train many times before I was wounded. But when I noticed passengers were arriving and others leaving the station, while I was still sitting there, I suddenly got up and began nervously pacing back and forth holding my small suitcase.

I was utterly confused, didn't know where to go, how to get to my train. I was so upset I became completely incoherent. A strange sense of uneasiness about my personal welfare suddenly took hold of me. Nothing in my surroundings made any sense at that moment, I felt absolutely helpless. Finally I had enough sense to go over to a woman wearing a uniform with the railroad insignia on the sleeve. I tried to tell her I had to catch a train to Tula, but stuttered so badly and couldn't remember the few words I needed, and I bit my lips in despair. When she saw how incoherent I was, she asked if I'd been wounded. "In . . . in . . . the . . . head," was all I could get out. Once she understood, she didn't ask me any more questions but led me over to another woman who showed me where I was to get the train to Tula.

Finally he was approaching his home town, the place where he had attended school and over the years had come to know each block so well. Yet here, too, he found himself in a completely strange and unfamiliar world:

I got off the train in Tula and had to transfer to another station to catch a trolley to the other side of

town. For some reason no trolleys were coming, so I decided to walk—it wasn't far, less than two or three kilometers from the station. But a strange thing happened. Somehow I just didn't recognize Tula, none of the streets, avenues, trolley stops, or routes. Yet only a short while back, just before the war, I'd spent three years there in a polytechnic institute. And all of a sudden it looked like an entirely different place. How was I going to find my way to the other station? It seemed ridiculous even to me, but it was also terribly depressing.

Was it possible I couldn't recognize the town any more because of that injury? Strange, but damn it, it was true. I tried to remember just a few of the streets in Tula I knew so well but none of them came to mind. For some reason I had forgotten the entire place. I walked along trying to remember where Ryazhsky Station was. Finally, someone showed me how to get there. It seemed peculiar that I had forgotten the way since Tula, after all, isn't that big a town.

Yet I had already forgotten the name of the station I wanted to get to. It was a good thing the nurse had thought to give me a slip of paper listing my address and the route to our section of town. I spent an endless amount of time waiting in the Tula Railroad Station. Then someone advised me to catch the train that was leaving from the railroad junction. But it turned out I still had to transfer twice after that. I kept asking people for instructions because I was afraid I'd miss my stop.

When he finally got off the train, his house was only a short distance away. And although he had walked those few blocks thousands of times, they seemed totally unfamiliar to him. He simply did not recognize the place, didn't know which way to go:

I tried to figure out what directions north, south, east, and west were by the sun, but just couldn't. I even had trouble understanding where the sun should have been then—whether to the right or the left. I confused east with west and couldn't remember what those words meant. When someone passed by, I asked him how to get to Kazanovka. But he just smirked and walked on, since the settlement was right there—you could see it through the hedges. I still couldn't believe it and asked another person. "Look for yourself," he said, "it's right here!" And sure enough, when I looked around, I recognized the houses in Kazanovka. It's so weird—I simply can't orient myself to a place, just have no sense of space.

Finally he returned to Kazanovka (since renamed Kimovsk), the small settlement where he was born, grew up, and had come to know everyone. Yet again he was plagued by those "spatial peculiarities"—everything seemed alien, unfamiliar. How was he to orient himself to his home town when he no longer recognized it?

For days and months after I returned, I couldn't get used to my own neighborhood. When I went any

distance from home, I couldn't recognize my own house. All the houses looked alike to me and I was afraid I'd get lost.

Years passed but these "spatial peculiarities" persisted. He still could not orient himself to that little settlement.

I've been living at home now for almost two years, but when I go for a walk I still can't seem to remember the streets, even the nearest ones. Although the town is so small you can walk from one end to the other in an hour, it's awkwardly built, the architectural layout doesn't make sense to me. That's why I stick to those two or three blocks and always walk along the ones near Parkova Street. What's more, I get tired very quickly and forget everything. I'm also afraid those fits may suddenly come on, particularly the severe attacks that make me so sick I'm bedridden for days afterwards. So I generally don't go far from home, but still have trouble remembering the names of nearby streets and lanes I walk each day. As for some of the other blocks and sections in Kimovsk that are also very nice, there's no point in my trying to remember them, since my injury has blotted out so much, I couldn't possibly recall them.

His problems increased a few years later when his family moved to a two-story house, a very convenient location not far from a lovely wooded area.

During the first few days and weeks after we moved to the new place, I couldn't get used to it, couldn't get my bearings. So I just didn't leave the house during that time. To get to the Miners' Club—which is only three houses from ours—all I have to do is cross one small block (Octyabrskaya). But if I do go there, I can't remember how to get home. I not only forget where our apartment is, but even the name of my block. That's how bad my memory's become since I was wounded. I always have to carry a little notebook with me listing my address and apartment number, just in case I get lost.

Since his damaged brain had shattered his world, he found it difficult to do what had once been so simple—read a map or analyze a mechanical drawing. As the commander of a platoon, he had had plenty of experience reading maps, and mechanical drawings had been routine matters at the polytechnic institute. Now, however, even the simplest tasks left him helpless:

Recently my family bought a small kerosene cooking stove with an oven. It came with a book of instructions including diagrams that showed how each part operated. I spent several weeks trying to figure out this stove but couldn't understand many of the parts or which ones were illustrated in the diagrams. It took me a long time to decide how to insert the wick and light it. I was convinced that the stove didn't function right, that it was defective.

Whenever I try to analyze anything and have to concentrate for a long time, the strain of coping with things that are not clear makes me anxious and upset. Since this can easily touch off an attack, I've quit trying to read books or burden my mind with too many ideas.

In summary, the bullet fragment that entered his brain had so devastated his world that he no longer had any sense of space, could not judge relationships between things, and perceived the world as broken into thousands of separate parts. As he put it, space "made no sense"; he feared it, for it lacked stability.

After I was wounded, I just couldn't understand space, I was afraid of it. Even now, when I'm sitting next to a table with certain objects on it, I'm afraid to reach out and touch them.

Reading

The world no longer seemed "stable" to him, it had disintegrated. But his problems did not end here. As the excerpts from his journals indicate, although he had been a fourth-year student at a polytechnic institute, he was now illiterate. This sudden revelation oc-

curred just as he became ambulatory and could leave his room.

I went into the hall to look for a bathroom I'd been told was next door. I went up to the room and looked at the sign on the door. But no matter how long I stared at it and examined the letters, I couldn't read a thing. Some peculiar, foreign letters were printed there—what bothered me most was that they weren't Russian. When a patient passed by, I pointed to the sign and asked him what it was. "It's the men's room," he replied. "What's the matter with you, can't you read?"

I stood there as though rooted to the spot simply unable to understand why I couldn't read that sign. After all, I could see, I wasn't blind. But why was it written in a foreign alphabet? Wasn't someone playing a joke on me—a sick man?

I tried to figure it out again . . . and . . . the same thing happened! I went up to another door and looked at the sign there. Something was written there but it wasn't in Russian either. I looked at the sign and thought: It must be the ladies' room, it's got to be. But then I went up to the sign on the first door again, and it seemed just as foreign and incomprehensible to me. For a long while I stared at the two signs, which obviously designated the men's and ladies' rooms I'd been told were there. But how was I to tell which was which?

The shock of this revelation was reinforced when he went to an oculist to have his eyes examined.

The eye doctor had me take a seat, turned on a small light, and asked me to look at a chart containing letters of various sizes. With a pointer she indicated a letter midway down the chart. I saw some letter there but didn't know what it was, and so I just didn't answer. I said nothing, because I didn't know what letter it was. The doctor was impatient: "Why don't you say anything?" she asked. Finally it dawned on me to tell her I didn't know the letter. Irritated but, it seemed, astonished she said: "Can someone your age still be illiterate?"

When I just look at a letter, it seems unfamiliar and foreign to me. But if I strain my memory and recite the alphabet out loud, I definitely can remember what the letter is.

He was read a newspaper and enjoyed listening, for it put him into touch with life again. But when he picked up the paper to have a look at it, he was in for a shock:

What on earth was this? The letters looked foreign to me and I figured it probably wasn't a Russian newspaper. But when I looked at the name of the newspaper on the first page, the type was very large and seemed familiar to me. So I couldn't understand why it wasn't printed in Russian. I thought it might be a newspaper from one of the Soviet republics. Still, the company commander was reading it to us in Russian. I interrupted him and asked: "This paper . . . what's the name of it? Is it . . . is it Russian?" He was on the verge of laughing, but when he noticed the ban-

dages on my head, he replied: "Naturally, it's *Pravda*. You can see, can't you, that it's printed in Russian?"

I looked at the first page again but couldn't read the name of the paper, even though I could see the print was enormous and resembled the word *Pravda*. But why couldn't I read it? To console myself I thought I must still be asleep and dreaming all this. Certainly, I couldn't be so badly off that I wasn't able to read any longer. Impossible!

Suddenly I got up, looked at the newspaper, and immediately saw a photograph of Lenin and was overjoyed to recognize that familiar face. Still, I couldn't read any of the print, not even the largest type in the word *Pravda*—I just couldn't recognize this. Something's very peculiar, I thought. At that time the idea that my head injury had made me ignorant and illiterate just wouldn't register. Was it possible I couldn't read Russian any more—not even worlds like Lenin and *Pravda*? Something was wrong. It was ridiculous.

He was perplexed, and for a long time he refused to believe he no longer could read.

How awful it is not to be able to read. Only by reading does a person learn and understand things, begin to have some ideas about the world he lives in, and see things he was never aware of before. Learning to read means having some magic power, and suddenly I'd lost this. I was miserable, terribly upset by it.

But he refused to remain incapacitated. He would simply have to begin from the beginning and learn to read. It seemed peculiar to have to study to become literate again, but this is precisely what he did.

A Student Again

He was assigned a teacher and given a reader specifically designed to help brain-damaged patients like himself recover their ability to speak and read. He was baffled by it all, but determined to learn.

The next day I was seated humbly beside a teacher. She pointed to the Russian alphabet while I sat there looking on with that idiotic smile on my face. I would look at a letter and not recognize it. What was I to make of all this? I'd learned all that long ago—not only Russian, but German and English. And suddenly I couldn't read a single Russian letter, to say nothing of foreign alphabets. Impossible, I thought, it must be a dream. It's got to be. And that stupid smile of disbelief reappeared, an expression that lasted for many years. For I was torn by contradictory feelings. Suddenly I'd think I wasn't dreaming. But if all this was actually happening, I'd have to move fast and

learn to speak, read, and write again if I was to become the person I was before the war, before my injury.

His lessons were difficult, because he had to start from scratch.

My therapist, O. P., would point to a letter and ask me what it was. For a moment that silly smirk almost vanished from my face, for I had to concentrate and come up with some answer. By the third lesson I could remember the letters "m" and "a," even though I couldn't recall the letter "m" immediately. When I tried to remember anything my mind seemed empty, a complete blank.

He progressed very slowly. Each step required additional effort, for he constantly had to discover new ways to make sense of letters and so be able to recall them.

I associated the letter "z" with my last name—Zasetsky; the letters "zh" and "sh" [Russian: ж and ш] with my sister's and brother's names—Zhenya and Shura. Naturally my teacher approved of this way of associating letters with names since she realized I progressed more rapidly. But there were some letters I just couldn't remember, since I couldn't find suitable words to associate them with. I'd think up a word, but for the life of me couldn't remember it a minute later. There were three letters in particular I had trouble remembering—"s," "k," and "m." But

later I remembered the word *krov* [“blood”] which came to mind so often I couldn’t possibly forget it. I concentrated on this word and soon began to associate the letter “k” with it and would remember it each time. Then I did the same thing with the letter “s”—associated it with the word *son* [“sleep”].

Since I think of that word every night when I go to bed, I quickly remembered the letter “s.” Before that I could never recall it. When I tried to think up a good word with which to remember the letter “t” I suddenly recalled my sister’s name—Tamara.

So I began to make some progress by finding words that would work as memory props. But sometimes I could only remember these for a minute or two before they’d slip my mind completely. Even so, this work has helped me remember more and more letters of the alphabet. Pretty soon I began to associate the letter “l” with Lenin, “ts” with *tsar*, “zh” with Zhenya, and “sh” with Shura. My teacher suggested I try associating the letter “k” with *koshka* [“cat”], “s” with *stol* [“table”], and “t” with *tom* [“volume”].

Soon he made another discovery that proved to be a great comfort to him. It appeared he could also remember letters by reciting the alphabet out loud as he did as a child, using a long-established oral-motor skill instead of trying to visualize each letter. This method was possible because it required a faculty that had not been damaged by his injury (only the part of the cortex responsible for gauging visual-

spatial relationships had been affected, not the verbal-motor functions). So he started to apply this method of learning.

By this time I could remember a great many letters by associating them with different words, but when I tried to visualize a particular letter—"k," for example—or hunt up a word for it, I needed quite a bit of time in order to recognize it and point it out to my teacher. Suddenly I'd remember the letter, run through the letters of the alphabet, and practically shout when I got to the letter "k."

After a few months I could remember the entire alphabet. However, I still couldn't identify any of the letters immediately. When the teacher asked me to point to the letter "k," I'd have to think for a while and recite the alphabet until I got to "k"! For some reason, I still knew how to recite the alphabet and could run through it without a hitch.

He soon began to read, though his visual span was so limited he could not see an entire word at a glance but had to read letter by letter, straining his memory to recognize each one and not let it slip his mind when he went on to the next.

When I try to read a book, the most I can take in are three letters at a time (in the beginning I could only see one). I also have to focus a little to the right and above a letter in order to see it. That's the way I manage to see a letter, though I can't immediately re-

member how to say it. My memory seems blocked, as though it has some kind of a brake on it.

I read printed matter letter by letter. When I first started to read again, I often couldn't recognize a letter at first and had to run through the alphabet until I found it. But later I did this less and less and tried to remember it myself—just waited until it came. Often after I've figured out the letters in a word, I forget the word itself and have to read every letter over again in order to understand it. Sometimes I read a text and don't make any sense out of it—I just read through it. If I want to understand a word, I have to wait until the meaning comes to me. Only after I read a word and understand it can I go on to the next word, and then the third. By the time I get to the third word I often forget what the first or sometimes even the second word meant. No matter how hard I try, I just can't remember.

I have to read words one at a time until I get the meaning—I read a word, understand it, then go on to the next, then to the third. I also have to stop at the fourth letter of every word, because even though I can see it and know how it's pronounced, I've already forgotten the first three letters. While I'm looking at the fourth letter, I can still see the second and third, but not the first letter of the word, which is completely blurred.

And so he started to read letter by letter, word by word, all the while fearing a letter he had just

recognized would escape him or a word be immediately forgotten.

I started to read a chapter of a book someone had pointed out taking it in letter by letter, syllable by syllable, word by word. But I read so slowly I got irritated. What's more, one eye (particularly the right one) seemed to hinder the other—my eyes would focus to one side carrying off a letter I'd been looking at. I'd try to find the letter or word I'd just lost track of in the text and hurry, knowing I was losing time. But I'd forget where I had stopped reading—at which particular word or letter.

In the last few months it's become even harder for me to read a newspaper or book. Why have I run into more problems? Say I'm reading a chapter—I can't even get through half of it. It would have been simpler if I'd just spent some time trying to remember particular words—like *eclipse* or *sun* or *moon*. . . .

As the years passed, he continued to read, trying to recognize letters, link one letter to the next, and not forget them. But the problem grew no simpler with time, for further obstacles appeared.

During the last few years I've had considerable blocks in reading and my pace has become even slower. What's more, letters seem to escape my span of vision more and more often. Once (May 2, 1967) while I was reading and looking at a letter (with my left eye first and then my right), I noticed I couldn't see

out of my right eye. The letter looked so small (two or three times smaller than it did to my left eye which had almost normal vision). I couldn't figure out what letter it was. It was so blurred and tiny it was painful to look at.

It took an incredible effort for him to learn to read. Was he any more fortunate in his attempt to write?

Writing, the Turning Point

At first writing was just as difficult as reading and perhaps more so. He had forgotten how to hold a pencil or to form letters. He was completely helpless.

I'd forgotten how to use a pencil. I'd twist it back and forth but I just couldn't begin to write. I was shown how to hold it and asked to write something. But when I picked up the pencil all I could do was draw some crooked lines across the paper. I looked at the pencil and at the paper and finally moved the pencil across the paper. But looking at the mark I'd made it was impossible to tell where I'd started. It looked something like the scribbling of a child who

still hasn't learned the alphabet. It seemed funny but also weird that I'd done that. Why had I? At one time I knew how to read and write well—and quickly. I began to think I must be dreaming again, that's all there was to it. And I looked at my teacher again with that idiotic smile.

But a discovery he made one day proved to be the turning point: writing could be very simple. At first he had proceeded just as little children do when they first learn to write—he had tried to visualize each letter in order to form it. Yet he had been writing for almost twenty years and as such did not need to employ the same methods as a child, to think about each letter and consider what strokes to use. For adults, writing is an automatic skill, a series of built-in movements which I call "kinetic melodies." Hence, why shouldn't he try to use what skills he still had? His injury, after all, had damaged his capacity to see and orient himself spatially, but had not affected his kinetic-motor functions.

He remembered this day well and mentioned it frequently in his journal. Though it was such a simple discovery, it had changed his life entirely:

At first I had just as much trouble with writing—that is, even after I thought I knew the letters, I couldn't remember how they were formed. Each time I wanted to think of a particular letter I'd have to run through the alphabet until I found it. But one day a

doctor I'd come to know well, since he was always very informal with me and the other patients, asked me to try to write automatically—without lifting my hand from the paper. I was bewildered and questioned him a few times before I could even begin. But I finally picked up the pencil and after repeating the word *krov* ["blood"] a few times, I quickly wrote it. I hardly knew what I'd written since I still had trouble reading—even my own writing.

In this way he started to write. He no longer had to agonize over each letter, trying to remember how it was formed. He could write spontaneously, without thinking.

It turned out I could only write certain words automatically—short ones, but not words like *rasporyadok* ["arrangement"] and *krokodil* ["crocodile"], etc. But still, after the doctor showed me how to write quickly, automatically, and not letter by letter, I was able to get one word down after the other without having to think about it. When I come to a word like *rasporyadok* or others that are even longer, I have to break them down into syllables. But even this is an enormous achievement for me, a great help in developing my memory. I was very grateful to the doctor and to my therapist O. P. for this. Three months after I arrived at K. I could already write this way, even though I still couldn't read my own writing.

As the years passed his discovery bore fruit. Despite the difficulties, the mistakes, and the problems he had deciphering his own handwriting, he could write and that meant a great deal.

After intensive training I learned to read and write in six months. Writing came far more quickly (I write about as well as I did before I was wounded), but I haven't done as well with reading. I still have to break down words into syllables and letters—my reading ability hasn't gone beyond that.

But I have learned to write automatically, and once I remember a word I can write it—quickly and easily. True, I often have to stop and think about the first letter, but when it comes to me I have no trouble writing it. However, I often notice that I swallow or lose letters, or confuse those that are similar in sound —like "k" and "kh," "z" and "s," etc. Or else I'll substitute a letter I've already used in a word and write *zozoto* instead of *zoloto*. Frequently I forget to use punctuation marks, since I no longer remember the rules for these. I do remember to use a period after a sentence but I mostly write very short sentences consisting of several words joined by the conjunctions "and" and "but." But I still have trouble reading and understanding my own writing.

The problem of reading did not ease. He read slowly, breaking words down into letters and syllables, confronting new obstacles at every turn because the part of the cortex which controls visual

functioning had been badly damaged by his injury. Nonetheless, he could write automatically, even though he had to wrack his brain for words and ideas with which to express himself.

When I look at a word like *golovokruzheniye* [“dizziness”], I just can’t understand it. All the letters—even parts of the word—are as meaningless to me as they would be to a child who’d never seen a primer or an alphabet. But soon something begins to stir in my mind. I look at the first letter (“g”) and wait until I remember how to pronounce it. Then I go on to the letter “o” and pronounce the whole syllable. Then I try to join it to the next syllable (“go-lo”). I take a quick look at the next letter (“v”), wait a little, then quickly look at the letter “o.” While I’m looking at that letter the two letters to the left of it escape my vision—that is, I see only the letter “o” and two of the letters on the left. But the first two or three letters in the word (“go-l”) are no longer visible. To put it more exactly, at that point I see only a gray mist in which spots, threads, and little bodies seem to shift and flicker back and forth.

He decided to write a journal describing the terrible abyss into which his injury had hurled him and the struggle it took for him to recover what he had lost.

“The Story of a Terrible Brain Injury”

He worked on this journal day after day for twenty-five years, searching for words with which to express himself, sometimes putting in an entire day to write just half a page. He called his journal “The Story of a Terrible Brain Injury” but later changed it to “I’ll Fight On.” This work caused him no end of despair, but the hope that had impelled him to write carried him along.

Although he learned to write quickly and automatically, this was a far cry from being able to express his ideas in writing. To do so he needed words and these did not come easily: he had to rack his brain in order to put together a sentence that would convey his idea. In the beginning, he did not know how to start or how to link one sentence with another. He would struggle for weeks on end, ask for advice, or try to turn up the right words himself:

I spent weeks thinking about what I wanted to write and how I would do it, but my sick brain

couldn't remember the right expressions. I tried to figure out how you write a letter—mainly how to begin. I asked people about this, and I tried to find out about it in books. But somehow I couldn't begin, and after worrying about it for days I got a splitting headache.

To show you how confused I was, I sent my family a letter saying: "Greetings from Kazanovka" even though I was still in the hospital. They must have had quite a shock reading that, figuring my brain had really taken a beating, and wondering what was up with me.

I wrote very few letters because I really didn't know how. As usual, I tried to write automatically, without thinking, but sometimes I couldn't read or understand what I'd written and confused the verbs I used to link parts of the sentences together. Even a short letter took me an enormous amount of time to think through. Some mysterious power prevented me from writing even a simple letter to my mother. Why, I just don't know. But I finally got to the point where I could write a letter even though it would sometimes take a day or even more than a week for my sick head to "think it through." I'd wrack my brain trying to remember how you write to someone. And I got so exhausted from this, my mind worked more slowly.

Suppose, rather than write a letter, he tried to retell a story he'd been read—a short fable like those

one reads to second-grade pupils. Naturally this was simpler: the ideas were already expressed so that he had no need to hunt up words or think about how to begin. Yet even this proved difficult. Though the meaning was clear, the ideas familiar, how was he to write a sentence when he had hardly any vocabulary at his command? Sentences can be fairly complicated; they require a knowledge of punctuation and grammatical construction that would be difficult, if not impossible, for him. Disjointed phrases and clauses were all that occurred to him; from these he had to select the right words and try to compose sentences.

Suppose he tried not to retell a story but to describe what had happened to him. What if he wrote his own story about a terrible brain injury, described his handicaps and his past and present life, to formulate and render coherent the problems a man faces when his world suddenly disintegrates. Naturally this would be incomparably more difficult; he would have to collect those fragmentary recollections, provide some sense of continuity, and—what was most difficult—write sentences that added up to a logical account of things. This seemed almost impossible, yet he must have thought there was some chance of succeeding when he undertook this exhausting, colossal job.

I set to work writing. I decided to devote parts of the journal to the periods I spent in different hospitals. At first these were the only facts I had. I tried to

remember whatever I could with that battered memory of mine and write it as a true story, just as a writer would. But when I started, I realized I'd never be able to do that since I didn't have enough of a vocabulary or mind left to write well. I'd get a faint idea of how to describe the beginning of the attack I was in but couldn't remember the words I needed to do it. I'd try to dig these up from my mind but I'd spend ages hunting for the right words. I had to remember and turn up words that were at least fairly similar or close enough to what I wanted to say. But after I'd put together these second choices, I still wasn't able to start writing until I figured out how to compose a sentence. I'd go over each sentence again and again in my mind until it seemed like a sentence I'd heard or read in an ordinary book.

But it was so hard to write. I'd get an idea of how to describe the moment I was wounded and the period right afterwards, when my illness began. At last I'd turned up a good idea. So I began to hunt for words to describe it and finally I thought up two. But by the time I got to the third word, I was stuck. I'd rack my brain trying to remember. Hold on, I'd think, I've got it. But before I could manage to write it down, it was gone, along with the other two words I'd had such a hard time remembering. I'd try to dig up another idea and find suitable words for it, and I'd write these down on various scraps of paper before including them in my writing—I'd try to clamp the words to the idea as much as I could. But what a tor-

ture it was. I'd always forget what I wanted to write, what I had just been thinking of the minute before. Minutes would pass and I wouldn't be able to remember how far I'd gotten.

So, before I could go on and write my story, I had to jot down various words for the names of objects, things, phenomena, ideas. I'd write these down whenever they came to me. Then I'd take the words, sentences, and ideas I'd collected in this way and begin to write my story in a notebook, regrouping the words and sentences, comparing them with others I'd seen in books. Finally I managed to write a sentence expressing an idea I had for this story of my illness.

When I was almost sure a sentence made sense, I'd write it on a piece of paper (a newspaper or pad). And if I was convinced it was more or less fit to be read or heard, I'd write it in my notebook. Then I'd go on to the next sentence, each time rereading what I'd written, even though this was hard for me to do. (I could only read letter by letter what I'd just written automatically.) But this is the way I managed to get a few sentences written. I couldn't continue until I'd read over two or three of the preceding sentences. I had to do this in order to know what I was going to say next. Otherwise I simply couldn't write—that's how bad my memory has become.

I've repeated the same points over and over again in my story and may do it again, because I'm always forgetting what I've written and what I still want to say. So often I forget something important, I just overlook it.

I can only write and keep a small amount in mind at a time. I try to strengthen and fasten these ideas so that they'll finally "stick" in my mind.

I work on this story about my illness from morning until five in the evening while my mother and sisters are out working. When they return, I have to quit since we live in a very small apartment and noise or conversation prevents me from writing. I have to be alone to do this.

Sometimes I'll sit over a page for a week or two. I have to think about it for a long time, slowly considering what I want to say and then comparing various kinds of writing so that I can figure out how to express myself.

I wanted terribly to write this story but I worked so hard at it, I finally felt sick—both from my head wound and the endless job of writing about it. It's been an enormous strain (still is). I work at it like someone with an obsession.

Years of exhausting work began, during which the effort to express himself became no simpler. But he reconciled himself to this and would sit at his desk all day stubbornly hunting for words, frantically trying to grasp them and put them into a sentence before the idea escaped him. And he did all this just to write ten lines a day, occasionally a page.

By the third year I added some things to my story and decided to rewrite the whole thing. Except that I noticed my mind worked even more slowly during this time so that sometimes I couldn't even write half

a page in a day. Or I'd spend the whole day thinking and not come up with any of the ideas I wanted to write next. Sometimes I'd spend several days thinking about them and still not write anything. I just didn't seem to have the strength, memory, thoughts, ideas —they'd slipped my mind, they were buried in amnesia.

For some reason the last part of my writing dragged on for months, and there didn't seem to be any way to finish it. I tried to finish this story three years after I began. But somehow it gets harder for me to write each year and remember all that happened. My head gets duller all the time and I forget all the details of my illness—details of my past and present life.

But I don't want to give up. I want to finish what I've begun. So I sit at my desk all day sweating over each word. I can't think of any other way out of my situation—that is, any way to remember and express what I want to say. Sometimes, when I get up from the desk, I have to grab for a chair since I suddenly feel very dizzy. It's as though I've been turned upside down a few times along with the desk, chair, the whole building—whirled round and round. Of course, I don't sit and work on this story every day. If I do spend a whole day at it, the next day (or two or three) my head aches so badly, I often have to stay in bed (the pain is easier to take lying down). And sometimes I have work to do around the house.

The years dragged on. Stacks of notebooks piled up on his desk—at first, thin books he put together himself out of yellow paper, then thick gray notebooks he used after he sent the first batch off. He later changed to even larger notebooks in oilskin covers. By this time he had written a thousand pages, and when he had finished another thousand, he started over again, trying to express himself better and more fully. He started this story before the war ended and continued work on it for *twenty-five years*. One would be hard put to say whether any other man has ever spent years of such agonizing work putting together a 3,000 page document which he could not read. Why, did he do it? What was the point?

Why Did He Write?

He asked himself this question many times. Why bother with this difficult, exhausting work? Was it necessary? In the end he decided it was, for he was not fit for anything else (he could not help around the house, got lost when he went for walks, and often failed to understand what he read or heard on the radio). All such things were beyond him. Yet he could try gradually to assemble the bits and pieces of

his past, compare and arrange them into episodes, create a coherent view of what his experience and desires were. This was still possible. Hence, writing his journal, the story of his life, gave him some reason to live. It was essential in that it was his only link with life, his one hope of recovering and becoming the man he had been. Perhaps if he developed his ability to think, he could still be useful, make something of his life. Reviving the past was thus a way of trying to ensure a future. That is why he undertook this exhausting labor, spending hours, days, years searching for lost memories.

He also thought it might be useful to others, that by understanding the damage a bullet fragment does to a man (fracturing his memory, obliterating all possibility of a present, past, future), people would appreciate how much they had been given. So, regardless of how difficult it was for him to write, he had every justification to continue.

The point of my writing is to show how I have been, and still am, struggling to recover my memory. It's an extremely difficult fight. I had no choice but to try and put together a vocabulary by listening to the radio, reading books, talking to people, collecting words, phrases, sentences, and finally writing an account of what I'd tried to say back in 1944. After that strange, awful head wound I couldn't do anything else—even read a grammar or look at a book on physics.

So I started to write. I got so carried away with this morbid writing I wouldn't budge out of the house to go for a walk or see a movie. I'd just sit trying to write this story, to dig up memories of my past that had vanished, to recall words and ideas that are as hard for me as ever. For months on end, I'd spend day after day putting together a vocabulary from my scattered memory, collecting my thoughts and writing them down. That's the only way I've managed to write, and I'm still forced to do this.

This work became the most important thing in life to him—his reason for living: to write his story and possibly overcome his illness, pick up his life again, become a man like other men:

By working on that one story of mine every day—even small amounts at a time—I hoped I'd be able to tell people about this illness and overcome it.

I've already worked on the story of my illness for three years. Writing about and studying myself is my way of thinking, keeping busy, working at something. It reassures me, so I keep at it. By doing it again and again (I don't know how many times I've rewritten this over the years), my speaking ability has improved. I really do speak better now and can remember words that were scattered into bits and pieces by my head wound. By training myself (through thinking and writing) I've gotten to the point where I can carry on a conversation—at least about simple, everyday matters.

This writing is my only way of thinking. If I shut these notebooks, give it up, I'll be right back in the desert, in that "know-nothing" world of emptiness and amnesia.

Perhaps, I thought, if I describe my illness in more detail and give them a record of what's happened, the doctors will understand me. And once they understand me and my illness, they'll certainly be able to cure it. After all, when I was in the hospital I wasn't really able to remember and tell them what bothered me, so perhaps they still don't realize I'm suffering, since I can't give them any of the details.

Another reason for this story was that I wanted to develop and expand my memory, to break through this aphasia. And writing this "Story About My Illness" really has done more than anything to help me develop my memory and use of language, of words and meanings. That's a fact. I know that my writing may also be a great help to scientists who are studying how the brain and memory work (psychologists, neurologists, and other doctors).

In describing his fate, he left us not just a tragic document but some priceless information. Indeed, who is better able to describe an event than someone who has himself been an eyewitness, participant, and victim? Having been victimized by his illness, he proceeded to investigate it. His description is exceptionally clear and detailed; if we follow him step by step, we may unravel some of the mysteries of the human brain.

“My World Has No Memories”

It was the “peculiarities” of his memory, its disruption and disintegration which most disturbed Zaset-sky. They seemed nothing short of catastrophic.

In the early periods after his injury, before he discovered he was illiterate, his memory failed him entirely: he had difficulty understanding people's remarks and could not remember a single word himself. If he tried to think of his first and last names or ask for a bedpan, his memory refused to function. Though he was physically able to speak and could easily repeat words, he could not remember these at will. He encountered this problem every time he was asked a simple question. He was confronted with a void and had to hunt for words. He had lost what is distinctly human—the ability to use language. What could possibly be more devastating than this loss of “speech-memory” as he called it? He was aware of it from the beginning, when he was still in the field hospital:

After dinner, when the other patients were going to sleep, I suddenly had to relieve myself. To put it plainly, I needed the bedpan. But what a complicated

thing it was for me to remember that word and call the nurse. For the life of me I couldn't think of the word *bedpan*, even though I'd heard it many times and would sometimes repeat it to myself (after I was wounded I realized what that word meant). But when I had to think of it that night, I couldn't. There's always something blocking my memory of words and this time the word *bedpan* just wouldn't come through.

I saw the nurse passing by again and wanted to ask her to bring me the bedpan. I tried to get her attention by saying: "It's . . . what do you call it? . . . I need it. . . ." But while I was trying to remember the word she had already left.

Then I saw her coming back again and bringing someone a bedpan. As soon as I laid eyes on that object I needed so badly, I yelled to the nurse, calling her *sister*, a word that suddenly entered my mind: "Sister . . . I also . . . need the . . . what's it!" I couldn't remember the word but luckily the nurse understood me and brought it a minute later. When she had removed the bedpan I suddenly remembered the word and pronounced it. I breathed a sigh of relief once I had found it. But a few minutes later when I deliberately tried to recall the word, I couldn't. Now that's a strange thing. I simply don't understand why I have that kind of problem.

I had tried to think of the word before the need for it came. I had run through words that came to mind —*doctor?* . . . no, I knew that wasn't right . . . *sis-*

ter? (I couldn't think of the word *nurse* either and used *sister* instead) . . . *bird* . . . no, it's—*bedpan!* Suddenly I remembered about that *bird* or *duck*, the word we used for bedpan.

Somehow I also couldn't remember the name of my own region or village, even the province I was from. They seemed to be on the tip of my tongue, but an hour or two or a whole day would go by and I still couldn't come up with them. The fellow in the bed next to mine offered to help me recall them by naming various provinces, regions, villages. Also, different first names and patronymics. After he'd named a few, I recognized the word *Tula*—Tula Province, the district my family lives in. And I felt very relieved to be able to say it. My friend was delighted to hear I was from Tula; that's where he lived too.

And when this same indefatigable fellow began to list various women's names I remembered my older sister's name—Evgenya. Then he addressed an envelope to my sister so that I could write home.

I used to spend all my time lying on my right side or sitting up for a little while trying to recall some of my past. I couldn't remember anything at will, whereas when I wasn't thinking about anything in particular, some words would occur to me along with the tunes of different songs I'd hum to myself.

This was the beginning of his struggle to recollect what had been blotted out, to learn words and remember them so that he could communicate with

people again. At first this was difficult, almost impossible. Later, words did occur to him and then simple phrases. However, these did not occur spontaneously: it took considerable effort for him to recall them and not let them slip his mind. But after a month the worst was over. He could talk to people again:

For the time being I put together a vocabulary mostly out of visual images and tried to remember words better and make my memory more flexible. I had to start from scratch and learn to recognize objects and try to associate them with words. I myself wasn't aware of how these words happened to come back to me, but little by little some things about my environment managed to register in my memory—the sort of memory and understanding I have now.

Toward the end of the first month or early in the second after I was injured, more and more often I'd remember things about my mother, brother, and my two sisters. I didn't recall all these things immediately, but only bit by bit. Some memory of my mother, brother, or one of my sisters would come to mind at different times. These details would occur to me suddenly, not when I myself wanted to remember them—they'd just come to me. Toward the end of the second month one of the fellows in the hospital took an interest in me and started to jot down my family's address—bit by bit, as it came to me. I'd suddenly remember the name of the region I was from; the next day or perhaps a day later, the name of the set-

tlement I lived in; then I'd suddenly think of my sister's name. And each time he'd write these down. Finally, my friend took it upon himself to write my family a letter, though he didn't have the exact address, since I couldn't remember my apartment or building number on the street I lived on. Naturally, I still couldn't think of my mother's and younger sister's last name (that of my mother's second husband).

Sometimes I'd remember the name of a city, but in a minute or even less, I'd forget it. At times I'd recall the address of the region I lived in, but I'd quickly forget that too and couldn't remember it for a long time.

I heard everything people around me were saying, and little by little my head was crammed with songs, stories, and bits of conversations I'd picked up. As I began to remember words and use them in thinking, my vocabulary became more flexible.

At first I couldn't remember any of the words I wanted to use in a letter. But I finally decided to write home and quickly got off a letter—a short one, just a note. I was completely unable to read what I'd written and somehow didn't want to show it to any of the patients. In order not to think about it and risk getting upset, I quickly sealed the envelope with my family's address on it and sent it off to be mailed.

Had he understood his dilemma from the start, life would have been unbearable. On the contrary, he hoped to do whatever he could to "develop" his

memory, win back every part of his past, analyze and understand what had happened to him. He wrote with the precision of a man doing psychological research—someone who really knows his field. He painstakingly searched for the right expressions with which to describe his problems and give shape to his ideas. In doing so, he left us a classic analysis of his disability. Moreover, he did it alone, without appealing to anyone for advice. He simply sat alone in his small room in the workers' settlement of Kimovsk.

Before I was wounded my memory was quick, and I could think clearly about almost any subject that interested me. After my injury my memory seemed to be shattered into bits and pieces. There was a real time gap between my ability to remember a word and understand what it meant. My mind no longer functioned clearly; it was just as confused as my memory of words and meanings. Most of my memory was gone for good. Some ideas would "come" to me only after considerable effort, but others not at all. Of all the words I once knew, all I had at my command were some few that didn't seem to have any meaning.

Some vague, peculiar, incomprehensible thought would flash through my mind all of a sudden. I'd rack my brain trying to figure out what it meant, but just couldn't. I'd try to say something, but it was beyond me. All my ideas and vocabulary had escaped me completely. Some images of objects—material things—would flash through my mind, quickly

turn up and be gone a minute later, replaced by other images that also vanished. Every time I tried to talk or remember anything it was an endless struggle for words. I still can't think of particular words when I want to talk or think something through.

Because of my constant failure to remember words and ideas or understand things, it's impossible for me to study and recall what I'd once learned and had no trouble grasping.

These symptoms plagued him incessantly—whether at home, during walks, when he attempted to converse with people, or simply remained alone.

When I take a walk in the village and look at things—objects, phenomena—I always have to strain my memory to think of the words for them. I don't get too annoyed about it. When I sit on a bench outside talking to someone from my building (the usual, everyday talk), I try a little harder to remember and make sense of the person's remarks. And when I talk to my mother or sisters, I have to strain my nerves and memory even more to understand what they're saying to me so that I know what I'm to do or say. Here, too, I sometimes can't remember or understand words. Or I remember just a little of what I want to say; most of it's locked somewhere in my mind and I can't get hold of it. My family tries to help me converse by asking me questions, but after a while, when they don't get anywhere, they give up on me. It's as if they said to themselves: "There's no

point to it, he'll never remember what he wanted to say."

I'm afraid to talk at meetings because I quickly forget what's been said. And I don't know what I'd have to contribute anyway, since my mind either seems empty or else has some disconnected ideas scattered through it, so that I can't collect my thoughts. That's why I don't bother to talk at meetings.

I'm always forgetting! Sometimes I'll go to the barn to get a pail of coal or kindling. But when I get there and see the barn locked, I realize I've forgotten the key and have to go back to the house. By the time I get to our apartment I forget what I've come for—that I need to get the key and open the barn door.

Somehow I have as much trouble as I did earlier figuring out which day of the week it is. Sometimes I can't remember what I've eaten for breakfast or dinner that day. My main trouble, the worst symptom, is amnesia and forgetfulness, and that's why I can't remember words. A good deal of my environment has been blotted out by this. Even now, whether I'm looking at objects, people, or animals, I can't immediately remember and pronounce the words for them (or say them to myself). Sometimes can't even remember them after a whole day has gone by. And though I have very simple conversations with people and use only common, everyday expressions, I can't even recall the words for things in my room—things like *closet*, *cupboard*, *blinds*, *curtains*, *window sill*, *frame*, etc. It's even harder for me to re-

member parts of objects. And when I go for a long time without being able to remember and *train* myself to use these words in speaking, I forget what things I see are called; I pay no attention to them. I forget what they're for. That's even true about parts of my own body.

Why had he no control over his memory? Had all of it been obliterated or only specific parts? He felt this was a matter he had to examine more closely, and he undertook a laborious job—something like an archeological study of his memory—to distinguish what remained and what was irretrievably lost.

“My Memories Came Back from the Wrong End”

When he began to think about this, he was amazed to discover that the damage to his memory was not of a uniform nature. At first he couldn't remember anything: who or where he was, the name of his home town, etc. But gradually recollections of the past came back, mostly those having to do with the distant past: his schooldays, friends, teachers, the years he'd spent in the institute. However, he could not recall

the recent past. As he put it, his memories recurred "from the wrong end."

During the weeks right after I was wounded I couldn't remember my first or last name, patronymic, or even the names of my close relatives. Only later was I gradually able to remember a few things, mostly about my childhood and elementary school years. My memories came back from the wrong end—that is, it's become easier for me to remember things that go far back—the buildings where I went to kindergarten and elementary school, the games I played, the faces of children and teachers I used to know. But I've either forgotten or have a great deal of trouble remembering anything about the recent past—even what life was like on the front.

Now that's a weird thing. Instead of being able to remember what happened just before I was wounded—which should be the richest, most vivid memories—my recollections mostly have to do with my childhood and elementary school days. These are much easier for me to recall, so they're basically the memories I live with now.

If I happen to be sitting, or just doing nothing, I'll suddenly see images, visions, or pictures of my childhood: the shore of the Don where I liked to swim when I was a child, the cathedral in Epifan' (the town in Tula Province where I lived), the talk some friends and I gave at a club meeting.

These visions have helped me become aware of my past again, though only small fragments of it. But

since they've recurred so frequently, I think they've helped my memory in general. When I look at these visions and images, it's as though I were seeing photographs of the recent past.

Only later were other recollections linked to these. For example, he remembered the center where he received basic training, what life at the front was like, what he himself was doing when the attack began that last tragic day. Following that, his mind again was a complete blank. But at a later date he remembered the hospital and the faces of the doctors and nurses who came over to inquire about him. Still later, he recalled images of other hospitals he had been in; lastly, Kisegach, the rehabilitation center in the Urals where therapists first began to work with him and his life was enriched by so many new experiences. He described this place vividly and, later, his recollections of Kimovsk. Finally, images of other hospitals and sanatoria also came to mind.

Images of his past emerged clearly and in great detail, which is why he managed to write this journal. But he could not summon them at will, a problem that was particularly difficult in the early stages. If someone named an object, he could not immediately get an image of it; when he finally managed to, it was sketchy and lacked the intricate associations memories generally have.

My therapist would mention the word *cat* or *dog* and say: "Try to picture to yourself what a dog looks like, what kind of eyes and ears it has. Can you see

it?" But I couldn't visualize a cat, dog, or any other creature after I'd been wounded. I've seen dogs, I know what they look like, but ever since my injury I haven't been able to visualize one when I'm asked to. I can't imagine or draw a fly or a cat, can't visualize the cat's paws and ears—I simply can't picture them.

If I try to get an image of a thing (with my eyes opened or closed), I can't do it, I can't visualize a person, animal, or plant. Except that sometimes I have a sense of something that resembles them, though it fades very quickly. What I really see are some specks or tiny bodies.

I tried to remember my mother's and sisters' faces but couldn't form any image of them. But when I was finally sent home and saw my family, I immediately recognized my mother and sisters. They were overjoyed that I was home, threw their arms around me, and kissed me. But I wasn't able to kiss them—I had forgotten how. My mother wept as she embraced me, cried both from happiness and grief—that one son at least had come back, but with his brain damaged, while the other had been missing since 1941, right after the war began. They began asking me all sorts of questions—how, when, where had I returned? I tried to tell them but just couldn't get a thing out; I kept mumbling something incoherent. One or two words of a sentence was all I remembered. The rest just wouldn't come. . . .

I can't understand how wood is manufactured,

what it is made of. Everything—no matter what I touch—has become mysterious and unknown. I can't put anything together myself, figure anything out, or make anything new. I've become a completely different person, precisely the reverse of what I was before this terrible injury.

Later on his situation eased somewhat. He seemed to recover some of his memory, and his recollections of the past became richer and more vivid. Nonetheless, the world about him remained just as alien, colorless, and fragmented as before. Whatever might have given substance to each thought or impression was still buried in oblivion.

All these problems continued even though years have passed. Nothing altered the tragic state of his memory.

Gradually I began reading some short children's books. Once in a while I'd pick up a grammar or textbook on physics but I'd quickly toss it aside, it just didn't appeal to me. It was such a strain reading, my head ached and felt like it was splitting. So the only thing left for me to do was to try to use that battered memory of mine to recall whatever I could from the past and develop my memory for language and meaning.

But wherever I turn, I'm in a jam trying to remember words. That shows just how badly damaged, punctured, and scorched my brain got from that bullet and the various operations I've had. That's why,

even now, no matter what circumstances I'm in (with my friends, family, different groups of people, working, or just taking a walk), I'm always aware of these defects in my memory and in my ability to speak or think. I sense just how abnormal I am when I talk to people; I'm aware of that idiotic smile on my face, that silly, nervous laugh I have and my constant habit of saying "yes, yes" while someone is talking to me. And when I begin to talk, I start to laugh in some stupid, peculiar way for no reason at all.

I can't remember a blessed thing of all I studied and learned. It's just gone! When I'm alone, it's as though some lock has been clamped on my memory, but when people talk to me, or I listen to conversation, that lock seems to open a bit. Listening to them stimulates my thinking a little.

I've become a very peculiar sort of person since I was wounded—sickly, but on the other hand a kind of newborn creature. Everything I learned or experienced in life has just dropped out of my mind and memory, vanished for good since that awful head wound. I have to try to identify everything I see all over again, even things in my daily life. When I leave the hospital for a while to get some air, to get a little closer to nature—flowers, trees, lakes—I'm not only aware of something new and unclear that's hard to understand, but also something that makes me feel terribly helpless, that doesn't really let me grasp and understand what I see.

What did this symptom signify? What was causing

both his amnesia and those "memory peculiarities" he spoke of—his ability to revive some images of the past but none of the knowledge he had acquired?

The Peculiar Features of His "Speech-Memory"

He referred to his major disability as a loss of "speech-memory." And he had good reason to do so. Before he was wounded, words had distinct meanings which readily occurred to him. Each word was part of a vital world to which it was linked by thousands of associations; each aroused a flood of vivid and graphic recollections. To be in command of a word meant he was able to evoke almost any impression of the past, to understand relationships between things, conceive ideas, and be in control of his life. And now all this had been obliterated.

In part, words have lost meaning for me or have a meaning that's incomplete and unformed. This is true mostly of the objective characteristics of things like *table, sun, wind, sky*, etc. I've lost track of both these words and their meaning. Mostly, I can't think of or

imagine a lot of the words that have to do with things I studied.

Because of the trauma that my skull and brain suffered, my visual and auditory memories have become detached. I'll see a letter or number but won't be able to think of the word for it right away, or hear a letter or a number mentioned and not be able to visualize what either one looks like. I've often thought that's why my speaking and memory have gotten so bad—sometimes it takes me an entire day to think of a word for something I've seen and be able to say it. And vice versa: I'll hear a word (or say a particular number) but not be able to visualize it right away or form any image of it. It may even take a long while for me to remember what it means.

During the months right after he was wounded this "failure to remember words" was particularly distressing. He had forgotten even the most common words and had to search for them, sifting and groping through his memory like a man trapped in a dark and unfamiliar room. Moreover, words not only refused to come to mind but had taken on a strange ring, so that often he had to make an effort to remember what they meant. And the time spent convulsively searching his memory was long indeed.

For the first few years after I was wounded it took a long time for me to think of the word for an object, even though the very thing I was searching for was right there in front of me. If someone mentioned a

particular object, I couldn't visualize it on the spot. When the doctor would say: "Lyova, can you point to your eye?" I wouldn't understand what he was talking about. That's happened to me again and again ever since I was wounded, because I can't grasp the meaning right away or concentrate on a particular word. When the doctor would repeat his question, I'd rack my brain trying to remember what the word *eye* meant. Suddenly I'd look around and remember that the word *eye* referred to a part of my body. Finally, when I realized this, I was able to say the word and point to my eye. Then he would ask me to point to my nose. Once again I'd wonder what that word meant and I would keep on repeating it for a few minutes until I finally remembered. Next, he'd ask me if I could remember the word *ear*. It would take a few minutes too for that word to come to me. When the doctor tried to test me and see what I recalled, I'd have to hunt for those words again. It's a miserable problem to deal with.

When different words would come to mind, I'd whisper them to myself. Often these were words I myself had used in talking to people that day, but I'd quickly forget them unless they just popped into my mind. Later that day when the doctor tested me, I remembered the words I had been searching for.

Another time the doctor would point to his own eyes, ears, or nose and ask me what they were. I'd try to think of the words and finally, after a long struggle, I would remember. Hurrah, at last I'd gotten

them right. Still, there seems to be an endless barrier blocking off my memory of words most of the time. When I used to hear the words *back* or *neck*, I had even more trouble. I simply had forgotten what they meant, although I knew they were familiar and had something to do with a person's body. But what, I just didn't know. Generally, I have some peculiar kind of forgetfulness or amnesia with almost any word, or else I'm very slow. I can't remember a word immediately or if I can, I don't know what it means. When my therapist would point to a lamp and ask me what it was, I'd try to remember, but it was a struggle. A certain amount of time had to pass before I could think of the name of an object. I'd have to look at the lamp and various other objects in my room. I'd keep hoping some of the objects would become memory props and I'd try to remember them, comparing different objects in the room so they could help me recall words and talk more easily.

Months after he left the hospital he was still burdened by this problem. For example, when he was living at home with his mother and sisters in Kirovsk, he'd be asked to run some small errand—to fetch something from the basement storeroom or buy some bread or cereal at the store. What could have been simpler? Yet these proved terribly difficult, for he had forgotten the most commonplace expressions, words he had used daily since he was a child. These did not occur to him at once but seemed to be hidden

in some remote corner of his mind. Hence he had to strain his memory to get any clear notion of them. When he finally did manage to figure out what they meant, he forgot them a minute later. He was beside himself, absolutely unable to deal with these and other problems.

If commonplace expressions were difficult, they were as nothing compared to the problems he had understanding concepts he had learned and used in his daily life at home or in the institute. In a world where words seemed so strange and ideas were buried in amnesia, it required the most painful effort for him to recover his capacity to speak, his "speech-memory," as he put it.

Every word I hear seems vaguely familiar (after all, I'd once learned enough to get through three years at a polytechnic institute). As far as my memory's concerned, I know a particular word exists, except that it has lost meaning. I don't understand it as I did before I was wounded. This means that if I hear the word "table" I can't figure out what it is right away, what it is related to. I just have a feeling that the word is somewhat familiar, but that's all.

So I have to limit myself to words that "feel" familiar to me, that have some definite meaning for me. These are the only ones I bother with when I try to think or talk to people. For some time (after my injury) I began to fight to recover my memory and speaking ability, to understand the meaning of words.

I'm still doing this, since my memory is so limited and there always seems to be a gap between a word and its meaning. These two are always disconnected and I have to yoke them together somehow. But I can't keep them yoked together for any length of time; they come loose and just vanish into thin air.

Sometimes when I take a walk in the field or the woods, I test myself to see what I can remember. It turns out I've completely forgotten the names of the trees there. True, I can remember the words *oak*, *pine*, *aspen*, *maple*, *birch*, and others sometimes (when they happen to come to mind). But when I look at a particular tree, I don't know whether it's an aspen or some other kind, even though the tree looks familiar to me. If someone points out some mushrooms, I can't remember what they're called or how they're used, though I remember the names of different kinds of mushrooms—orange cap, white or brown "edible" type. But I can't tell whether a particular mushroom is a brown edible type or some other variety, despite the fact that I must have been able to identify them before I was wounded.

I've even forgotten what a dandelion is, a flower I knew when I was a child. When it becomes faded, I remember what it is, but until then I just can't imagine, I have absolutely no idea what flower it is.

Out of habit I tend to see things in my environment in much the same way I did earlier. But when I'm face to face with objects, I don't really recognize or remember them. I don't understand how plants

grow, what nourishes them, or how you grow a new plant by cutting off a leaf and putting it in water. I don't understand the essential things about the plants and animals I see, because I can't remember the names for them or what they mean.

He had not merely forgotten the meaning of words. We have already pointed out that he could not recall a word immediately but had to search actively for it, often finding that other words occurred to him instead—some of them close enough in meaning to what he wanted, but others extremely far removed. How, then, was he to select the right word when his memory was cluttered with words, all of which seemed familiar and correct? Often enough the word he wanted was inaccessible.

My biggest problem was not being able to remember the right words when I wanted to talk. From the time I was wounded, as soon as I could recognize myself again, I'd repeat a word a doctor, nurse, or patient had used but a minute later I had already forgotten it. At that time I couldn't think of a particular word when I wanted to express something; I just couldn't remember anything at will.

When I'm sitting or walking in my room and look at things there, they seem familiar and make sense to me. But somehow I can't name them right away, none of them. I'll pick up a pencil or point to a table and say: "What's this called? It's a . . . it's a . . .

what do you call it? It's not a lamp . . . not an ink-well . . . it's a table!"

I can go on struggling like this for several days, writing words down, asking myself questions. But on the whole I still have to sweat over every word. For example, I'll look at an object and begin questioning myself: "Is it a stove? No. And it's not smoke . . . or a chimney . . . or a fire . . . torch . . . candle . . . house . . . flame . . . light." Damn it, I just can't remember. So I start reciting other words: cat . . . spoon . . . etc., and finally it comes to me. It's cast iron!

My damaged brain has to "stumble" over a word to find it, and if I don't want it to slip my mind, I have to detour around the gaps in my memory. But this distracts my attention so that I lose track of other words I've just managed to recall. I've had any number of embarrassing experiences because I couldn't think of the words I was looking for. I'm still tormented by this and find it just as agonizing. But I have no intention of giving in. No matter how hard it's been, I have begun to speak better over the years. That's enough to encourage me to continue fighting and try to recover enough of my memory so that I can speak better.

On Recollecting Words

The Second Digression

Memory was once regarded as a very simple function. It was assumed that the names used to designate objects adhered to them like labels—as solidly as those a good housewife uses to designate the items on her pantry shelf. Hence (to continue the analogy), one merely had to check that shelf for whatever he needed. Though this typified a much earlier approach to memory, many people still assume the mind operates this way.

But this is hardly the case. Even as early a writer as Swift satirized these simplistic notions in *Gulliver's Travels*. The Laputans had actually decided to dispense with labels entirely, since words were unnecessary and they could make themselves understood by objects. Hence they carried sacks on their backs and took out whatever object they wished to indicate.

If one were to assume the mind functioned this way, he would be hard put to explain why we have so much trouble sometimes finding a particular word, why it sometimes becomes as difficult as recovering a lost memory.

A material object has many attributes, it is not a simple essence. Consider a billiard table, for example. It resembles an ordinary table, though its felt covering looks a bit like moss and its under part, a slate board. It has pockets on the sides and in each corner, and the balls roll across the surface, while the table itself is always placed in the middle of a room. Given these characteristics, how does one turn up the word *billiard table*? *Table*, *cloth*, *field*, *pockets*, *balls* designate some of its attributes but not the thing itself. Furthermore, the balls are stacked in a pyramid. How is one to remember that the term is *pyramid*, rather than *pile*, *nest*, *threesome*? In short, how does the memory single out precisely the essential characteristic from among the many and inhibit the endless flow of associations the object itself brings to mind?

In recollecting words, we always have to select from a variety of possible alternatives. In some cases the right association is far more likely to turn up, and the chance of others emerging is almost nil. Assume, for instance, that you had to complete the following sentence: "When winter came, the streets were covered with _____. " It is doubtful whether anyone would fail to come up with a word other than "snow." The choice is simple: here there are only two or three possibilities. But often the situation is far more complex. Take the following sentence: "I went out to buy a _____. " What? Bread? A newspaper? A hat? Only by knowing the context could you complete this sentence, for there are thousands of alternatives. In this case, the probability of finding the

right word is indeterminate; you simply need more information about the particular circumstances in order to select the right word from the storehouse of memory.

But how does one operate if he has no context, nothing whatever to go on, and simply has to turn up a word? The process is far less simple than it appears. Let us assume you enter a laboratory, see a familiar instrument, but can't remember what it is called. You know it is used to cut preparations coated with paraffin into extremely thin sections like the cutters used in food shops to slice ham, only thousands of times finer. But what is the instrument called? Even though the object is familiar, you have to rack your brain to think of the word. You know it has something to do with "micro . . .". But is it a microscope? a microcutter? No, but you're close, and finally the word "microtome" comes to mind.

Or let us say you go to a museum and suddenly find you can't remember the name of a painter (assume it is the name of a Georgian painter, one of the founders of primitivism). Is it Passanieur? you ask yourself. Pirestone? Prangishvili? No, none of these is right. There's something about the name that suggests "fire." You try again. Is it Pyrotechnik? No. You also know it has something to do with Turks. Osman? No, but you move right on to Piresman, then to the name itself—Pirosmanishvili. Once you've remembered the name, your memory automatically discards all the associations that turned up along the way.

Rarely do we have to hunt like this for a word. We

do so only if there is little to reinforce our memory of a particular word or we momentarily forget a name —like the character in Chekov's story who, when he tried to remember the name "Oates," turned up any number of names having to do with "horses": "*Konyashin*" (from *kon*—"steed"); "*Oglovyev*" (*oglovlya*—"shaft"); "*Yamshchikov*" (*yamshchik*—"driver"). As a rule, this does not happen when we recall the names of common objects; the name is firmly impressed on our memory, and often the characteristic quality of the object is clear from the name itself. For example, in a word like *stol* (table), the root "stl" is the same as in the words *nastilat'* ("to lay"); *postilat'* ("to spread or lay"); *nastil* ("flooring"). Hence we have no trouble distinguishing the predominant linguistic feature. In words like *chasy* ("clock" or "watch")—the root word being *chas*, "hour"), *parokhod* ("steam-boat"—a compound word consisting of roots *par* and *khod*, "steam," and "motion"), and *parovoz* ("locomotive"—a compound word consisting of roots *par* and *vos*—"steam" and "cart"), the predominant feature is so obvious that the name strikes us as entirely logical. We feel no need to consider other alternatives, for the name itself is so suggestive of the object it designates as to guarantee it is the right choice.

But what if damage to the brain has affected precisely those areas that enable one to analyze and synthesize visual impressions of objects, by isolating the essential features and inhibiting the emergence of secondary associations?

I. P. Pavlov, an expert on cortical functions, noted that under normal circumstances, the cortex is subject to the "law of strength." Powerful, substantial stimuli produce strong reactions and leave solid traces that more readily come to mind. Only during states of exhaustion or sleep is this balance disrupted: strong and weak stimuli register with the same intensity, arouse equally strong responses, and leave just as permanent traces. Hence there is equal likelihood that one or the other will come to mind.

Think of the strange associations that unexpectedly occur when you are falling asleep; your thoughts are confused and you can readily become disturbed by things that appear trifling during the day. A cortical condition such as this, but pathologically induced, is what Pavlov termed a "damped" or "phased" condition. In this state the cortex functions far less precisely and is barely able to distinguish the essential from the inessential; the dominant characteristics of objects (which it normally would discern) cease to predominate, but are "leveled off" with secondary, less essential attributes. It then becomes terribly difficult to select the right attribute (hence, also, the right word) from the entire range of alternatives that now seem equally probable.

The bullet that penetrated this patient's brain disrupted the functions of precisely those parts of the cortex that control the analysis, synthesis, and organization of complex associations into a coherent framework (by isolating the essential features of objects perceived and retaining traces of language habits).

Some of his nerve cells had been destroyed; others were in a pathological "damped" condition. Is it any wonder he found it so difficult, impossible at times, to distinguish the essential feature of an object and come up with the right word?

He had to hunt for a word and sort through dozens of others he turned up along the way, just as people do when they are searching for a name they've forgotten. He would try to find the class to which a word belonged and substitute too broad a category ("It's . . . an object . . . a thing . . . an animal . . ."). He tried to find some sort of context that might help him think of a word ("But you see . . . they smell so good . . . these red, beautiful, fragrant . . . roses!"). He tried automatically to evoke what he could not remember at will, but only succeeded at times, though he resorted to every conceivable device in that world of deranged probability.

This process of recollecting words and names was far removed from the graphic images that usually come to mind and eliminate the need for choosing between a range of equally probable alternatives. His impaired "speech-memory" was equally dissimilar to the normal, complete recollection of events.

And so it went for years on end: a struggle for every word his damaged brain, with its limited capacity for words and verbal associations, could not recall. These systematic associations are precisely what enable one to build a vocabulary and readily think up a word. This explains the kinds of problems he experi-

enced. He would no sooner think of the right word than his mind would race on to find the next one; being so distracted, he quickly lost track of the first word and had to hunt for it again. His was not just a constricted, impoverished memory but a wasted one. And it did not improve with time.

Restricted to Undeciphered Images, Disembodied Ideas

The use of individual words is, of course, the most elementary stage of speaking; from these one has to compose sentences and paragraphs in order to render and convey a complex idea. But how is one to express an idea if he cannot readily grasp the meaning of words, if the very idea he has escapes him along with the words he has just managed to understand?

When this man listened to people talk, heard a radio broadcast, or tried to understand a story, he was trapped with disjointed, fragmentary images that needed to be deciphered:

Even when my mother makes a few simple remarks, I don't get the point of what she's saying. I latch onto the first or last word she's said, and while I'm

trying to figure these out, I forget the rest.

I was sitting in an auditorium once, listening to some stories and a performance by some visiting artists. While the narrator was talking, the whole audience began to laugh. Seeing everyone else laugh, I did too, though I didn't understand a thing the man had said and only had some real reason for laughing when an actor imitating a drunk began to stagger and fall.

When people talk to me, or I listen to the radio, I usually can't understand more than half of what's said. I have plenty of gaps, "blank spaces" in listening too. Mostly I just listen to the words without understanding. This means I only manage to grasp a little of what is said. As soon as I recognize the meaning of a few words, the rest are drowned in the flow of speech I hear.

For example, when I heard the word "catastrophe" once, I asked the person who mentioned it what he was referring to and tried to figure out what he meant. Suddenly I remember the meaning of the word and what he was talking about—a train derailment. But it took quite a while before I could remember that. This is typical of the way my damaged memory operates.

When I listen to the radio I think I understand what I hear, except that while I'm listening I forget what the announcer is saying. If I really concentrate on a particular word he's using, I find I really can't understand it for quite a while, or have forgotten it completely. (If I haven't, I soon do.) Of course it's

easier, more relaxing listening to the radio than tiring my eyes trying to read a book letter by letter. On the other hand, when I listen to the radio I don't have a chance to stop and think about what I've heard. Ever since I was wounded, I haven't been able to remember a thing I've heard on the radio, whereas when I read a newspaper or book, I can stop and reread some of the words or sentences, think through the ideas. Even so, I quickly forget what I've read, though for a little while I can retain more of the main points than by listening to the radio. On the other hand, reading has become more and more difficult over the years.

As a test of comprehension, he was read the following paragraph in which the relationship between objects was complicated by numerous details:

"On both sides of the house were large trees of a rare variety that had big berries resembling fir cones on the under side of the leaves. In the pond, across which four white swans were gliding, one could see the reflections of the Chinese lanterns, made out of brightly colored paper, that were hung everywhere and depicted grotesque, grinning faces."

What was he able to comprehend after the first, second, and third readings? A very limited number of words and images, disjointed fragments of sentences having to do with "trees," "swans," and "mirror reflections." The paragraph was read to him again and again, but these disjointed bits and fragments did not

add up to a meaningful context. He struggled with this as though it were a hieroglyphic in which, after considerable thought, one can establish the meaning of particular elements but not the entire text, which remains unclear and needs even further time to decipher:

No . . . I can't make anything out of it . . .
They're talking about . . . about . . . it's hard to say
. . . about lantern lights, and about swans in a pond
. . . and something like woods on both sides . . .
swans . . . and lantern lights.

There are these trees . . . on both sides . . . and berries . . . and some more lantern lights . . . and swans floating. There's a house . . . and alongside it . . . fruit trees . . . They look like fir trees. Then there are also lanterns . . . and a pond . . . swans floating . . . near them . . . horns. And so . . . lantern lights . . . colored paper . . . No, I just don't understand it!

His comprehension definitely reflected a mind restricted to undeciphered images. He tried to attend some study groups and educate himself but here, too, the problems were overwhelming:

When I listen to the teacher, the words she uses seem to make sense—rather, they seem familiar. But when I focus on each word and spend any time considering it, I can't remember what it means or form any image of it. Meanwhile, as she continues talking,

the words fly by and vanish from my memory the minute I try to understand them. And for the life of me I can't recall them again. When my therapist O.P. asked me once to tell her what we did at the last lesson, it took me some time to answer, even though I'd spent several days on that chapter, had taken a few notes, and read through them the night before. But when she questioned me, I had to look over my notes again. It's awfully hard for me to read my own writing, my own notes (someone else's handwriting is completely impossible). So naturally I couldn't look through the notes quickly, particularly since she had asked me a question and I was under pressure to reply. Finally I remembered a bit of what I'd read the evening before and tried to make some general comments limited to a few words. But I just couldn't express what I wanted to say.

Naturally his problems were not limited to comprehension. He found it difficult—actually impossible—not only to interpret the steady flow of words a speaker used and grasp the logic behind them, but to formulate and express his own ideas coherently. Fragments of words swarmed through his mind, colliding with and blocking each other, so that in the process of trying to formulate an idea he forgot what he wanted to say. Hence, when he had a request to make at a government office, or wished to speak or ask a simple question in his study group, he could not make himself understood:

When I had a request to make at one of the district offices, I spent a whole day thinking about what I was going to say. But when the time came and I finally entered the building, it took a long time for me to get up enough nerve to go into the office because I was afraid I wouldn't remember the few words I needed to carry on a conversation. They'd escape me the minute I tried to express myself. Then I'd have to wait until other words occurred to me. (And they can turn up one minute and disappear the next.)

While I was standing in the corridor, and later—after I finally entered the manager's office—at the moment I was considering what to say, the words escaped me. The office manager looked at me and asked: "What do you want?" But the few words I needed to use seemed deliberately to have slipped my mind—all of them. Something felt very wrong in my head, I just couldn't remember a thing.

Once I went to the club to hear a lecture. When the speaker finished, he asked if there were any questions. I decided to ask one. I felt quite normal then—that is, my head wasn't aching or buzzing too much. The speaker asked me to go ahead with my question. I heard him, but for some reason couldn't talk, couldn't say a single word, even get one letter out. It was as though a lock had suddenly slammed shut on my mind. The whole audience was looking at me and waiting for me to speak. Meanwhile, I was not only unable to speak but couldn't utter a sound, even though I was quite relaxed then, not at all ner-

vous. Seeing that I'd either forgotten what I wanted to say or was a bit drunk, the people sitting next to me said: "Sit down if you have nothing to say." So I did. But since no one in the audience had any questions, the speaker turned to me again and said: "What was it you wanted to ask?"

The same thing occurred when he was alone and wanted to make a note of something that had come to mind. In one sense this was easier than conversing, since he had a chance to read over what he had written; on the other hand, it was sometimes even more difficult in that a thought escaped him the moment he tried to put it down.

An idea for something occurred to me, an image of what I wanted to say, and I began to try to remember the right words to express this. No sooner had I got two words down when the very idea that had just taken shape in my mind suddenly disappeared. I forgot what I wanted to write. I looked at the two words I'd written but couldn't remember what I intended to say. So my idea was gone—I couldn't remember it, no matter how hard I tried.

When a good idea came to me I'd no sooner pick up a pencil than it would be gone. That same idea wouldn't occur to me again the whole day, maybe not even the next, and if I happened to think of it again, I wouldn't recognize it. By then it would make no sense to me, since I'd already gone on and written something else.

These handicaps, made it a colossal effort to write and describe what had happened to him; his mind had nothing to work with except undeciphered images and unrelated ideas.

Grammatical Constructions

The Third Digression

We have seen that it was difficult for him to follow conversation or understand the meaning of a story or report. And his problems were compounded when he tried to analyze the ideas in a written or oral text. Since he had no ready grasp of language, the meaning of one word escaped him as soon as he proceeded to the next.

However, this was only one of many problems that made comprehension such an agonizing process for him. We have already observed that one of his main difficulties in following any detailed exposition was his inability to grasp the meaning of words; for this reason he had no sense of the unity or arrangement of a speaker's ideas and could not single out the main point. Yet this is precisely what one does in order to grasp the content of a story or talk.

Comprehension does not come quickly to a beginner, as those of us who were college students know only too well from the problems we experienced trying to master complex material. After a person has learned to read, comprehension gradually requires less effort and time; one develops skills to increase his pace and finally reaches a point where he grasps the ideas in a report or text immediately, with no apparent effort.

Nonetheless, some material is more difficult to understand than other. A speech of any length or detail may not appear to present any problems yet require an intricate process of reasoning to understand. For example, it is easy enough to follow a story that reads smoothly, consists of simple sentences, and unfolds gradually, point by point. (*It was a warm day. He went down to the lake, got in his boat, and began to row. How pleasant it was to sail over to the other shore.*) But in listening to a fairly intricate account, consisting of compound sentences in which the main idea is qualified by numerous subordinate clauses, one has to keep both the main idea in mind and the qualifying remarks that have been made.

Linguists are well aware of the problems language poses and have mapped out ways by which to deal with complex syntactical patterns. They distinguish between "extended" sentence structures (in which the main idea is interrupted by digressions) and "direct" ones (which read smoothly and have no digressions). Take the following sentence, for example: "The hill

on which the old house with the red, tile roof was situated was steep and covered with gray moss." Who or what was covered with moss? The hill? roof? What relation has "gray moss" to "red tile"? In this "extended" syntactical arrangement, where twelve words of the subordinate clause separate the subject "hill" from the predicate "was steep," the meaning is less easy to grasp.

More difficult, still, are the peculiar figures of speech known as "inversions." Are sentences like the following, with two negatives, all that simple to understand? "There is no reason not to believe this information." Does this mean one can or cannot accept the information? And consider the following: "Had I not been late for the train, I wouldn't have met you." Has the person speaking been late for the train or not? Did he or did he not meet someone? Or take another example: "I am not in the habit of challenging the rules!" * What sort of person is speaking—a refractory rebel or a compliant student? If you isolate the expressions "not in the habit of" and "challenge the rules" they sound shrill and provocative. Yet after a moment's thought you realize that precisely the reverse is intended. This is an indication of how one can be fooled by grammatical inversions.

Consider, too, instances in which the word order does not coincide with the order of events described. In the following sentence the meaning is obvious: "I

* In the Russian sentence a double negative is used. (Translator's note.)

read the newspaper; then I had breakfast." But this may also be expressed differently: "I had breakfast after reading the newspaper." Doesn't the lack of coincidence between word order and action complicate one's understanding somewhat? The phrase "after reading the newspaper" reverses the order of the action. Grammatical inversions, a means of varying syntactical structure, must have struck this patient like a sick joke.

Consider the use of case endings to create strong, strictly defined relationships between the parts of a sentence, subordinating one to the other and thereby forming the framework of a logical system of thought. We have long since become accustomed to using case endings and readily grasp their meaning. But are grammatical inflections really that simple? Take the following sentence, for example: "There is a bird's nest on the branch of the tree." The items are not merely enumerated but arranged in a strict order so that the words create a single image with each of the parts clearly interrelated.*

But there are also other, more complex case endings that express abstract relationships: "a piece of bread," or "the father's brother," etc. In the latter sentence, the reference is to neither of the terms mentioned, but a third—"uncle." And constructions like "my brother's father" can throw us all momentarily. You

* The sentence in Russian consists of only five words, four of which are nouns. Hence much of the meaning is implied in the case endings. (Translator's note.)

have to stop and think a moment before you realize that your "brother's father" is also your father. To understand such a complex syntactical relationship, in which the word in the genitive case refers not to an object but a quality or attribute, a fairly complicated thought process is required; one has to make the mental leap from the graphic sense of the word "brother" to the meaning implied by the phrase. Only if one understands this can he make sense of that enigmatic "attributive genitive." *

Those of us who are familiar with the logical patterns implicit in grammar find a construction like the one I have cited very simple to grasp. The difficulties seem not to exist. Even in the fifteenth and sixteenth centuries the expression "the children of the boyars" was replaced by a far simpler phrase "the boyars' children." But when it came to an expression like "Prokopiya's land," people were obliged to use a more wordy and awkward form: "of this Prokopiya —his land," inserting words that imparted certain formal references and thus circumvented the need for a complex grammatical construction. Instead of writing "those who feared the might of the horde of the Akheitsy," however, they simply wrote: "Those who feared the Akheisian might and horde."

Intricate turns of speech that are so routine to us

* In Russian "my father's brother" can be expressed either by using the noun in the possessive, as in English, or by a possessive adjective derived from the genitive plural of the noun "father." (Translator's note.)

that we fail to notice their complexity are, in fact, codes that have taken centuries to develop. We readily employ them, because we have mastered linguistic patterns—our most basic means of communication.

We also express relationships through certain parts of speech (prepositions, conjunctions, adverbs, etc.). We are so accustomed to using these, we do so automatically. Phrases such as the following thus are perfectly obvious to us: "the basket under the table," "the cross above the circle," "the book to the right of the inkwell." Yet two hundred years ago the relationships between these objects were designated by far more concrete terms. If someone wished to say something was "under" the stove, he used a more graphic word like "bottom." And the expressions "on the right," "on the left," "in front of," "behind," "instead of," etc., were spelled out in greater detail, so that their basic meanings—"right" "left," "front," "back," and "place"—were perfectly transparent.*

We also have no difficulty understanding the comparative forms of adjectives and the cases they require—"Is a fly bigger than an elephant?" † or

* In modern Russian the expressions he mentions are single words—prepositions or adverbs—that include the prepositions in these phrases as prefixes. (Translator's note.)

† Here and in the pages following Luria is referring to one of two ways to express a comparison in Russian: by placing the object compared in the genitive case and dispensing with the word "than." Since Russian does not have either definite or indefinite articles, the sentences he refers to consist of only three words, the two nouns and the comparative adjective. (Translator's note.)

"Is an elephant bigger than a fly?" Similarly with the questions: "Does spring precede summer?" or "Does summer precede spring?" But consider the following sentences: "The sun is illuminated by the earth"; "The earth is illuminated by the sun." In Russian the logical and grammatical subject of a sentence generally coincide. But in these sentences the rule is reversed; the passive construction requires an inverted word order.

The language we use with such ease is in fact a highly intricate system of signals that requires training to master. Such proficiency is necessary to understand complex forms of expression, for case endings and parts of speech function as precise, reliable tools of thought.

What does it take for a person to master them? One faculty in particular: an ability to remember these grammatical elements and perceive, quickly and simultaneously, the relationship of individual words and the images they evoke. The man who wrote this journal no longer had the capacity for such an instantaneous grasp of intricate patterns (whether of spatial or linguistic relationships). The damage to his cerebral cortex had affected precisely those parts of the brain that enable one to evaluate what he has seen (as neurologists would say, to "simultaneously synthesize separate parts into a complete whole").

This explains why the disruption of the cortical functions we described earlier affected not only his ability to orient himself spatially, but created insuper-

able problems when he tried to operate with language. Complex syntactical patterns are unfathomable to a patient who cannot immediately grasp the interrelationships of words and mentally size up what they imply.

Confronted with the two phrases mentioned above ("the father's brother," "the brother's father"), this patient at first assumed they were perfectly clear; in both cases he could interpret the words "brother" and "father." But what did he make of these phrases? Did he understand the relationship of the two nouns or what each of the grammatical constructions designated? It was impossible for him; they seemed identical, yet different. He could not go beyond the surface impression of the words to the meaning implicit in their arrangement. And he experienced much the same sense of peculiarity with the following phrases: "the circle under the square," "the square under the circle." Since identical words occur in both, they seemed to add up to the same thing even though he had a distinct sense that there was some difference between them.

Sentences expressing comparisons were simply beyond him—even one as simple as: "Is a fly bigger than an elephant?" or "Is an elephant bigger than a fly?" Over the years we conducted thousands of experiments with this patient, using a variety of grammatical constructions to try to judge precisely which language signals his damaged brain could grasp. Linguistic analysis thus became an important tool of psy-

chological research. Our patient, however, turned out to be an equally important instrument by which to evaluate the problems inherent in specific grammatical structures.

Again and again we were forced to a conclusion that, in the end, had become self-evident: of the two types of syntax we have described, this man was able to understand only that in which the word order coincided with the sequence of actions. Such sentences do not employ complex signals by which to organize the ideas. Thus, the following sequence of sentences was clear to him: "Winter came. It grew cold. Snow fell. The pond froze. The children went ice-skating." He could also grasp a somewhat more complex sentence like the following: "Mother and father went to the theater, while the old nurse and the children remained at home." Here the word order corresponds to that of the ideas and adds up to a simple, logical progression of images.

But another sentence, consisting of the same number of words, was difficult for him to understand: "At Dunya's school one of the women workers from the factory gave a report." * What did this mean to him? Who gave the report—Dunya or the factory worker? And where was Dunya studying? Who came from the factory? Where did she speak? If one

* In Russian the two sentences consist of twelve words each, but the latter is a compound sentence which literally reads: "In the school where Dunya studied a worker from the factory came to give a report." (Translator's note.)

understands the grammatical constructions used in this sentence the answers to these questions are obvious. But this man's injured brain was unable to combine and synthesize the separate elements of the sentence, to perceive the relationship between them and see it as one coherent idea. Though he tried desperately to understand the sentence, it was beyond him.

He had similar problems with a sentence we referred to earlier: "There is a bird's nest on the branch of the tree." This sentence from a child's primer struck him as quite simple at first, yet he ran into precisely the problem we have noted before: the words *branch*, *tree*, *bird*, and *nest* seemed to have no interrelationship. How, then, was he to combine them into a coherent framework?

After our experiments began, new entries appeared in his journal, dating from the months right after I met him when he entered the rehabilitation center and began to work with therapists. He recorded his experiences with language throughout the twenty-five years he kept this journal. His problems with language became a focal point for all the helpless attempts his injured brain was forced to make:

The doctor showed me a picture and asked me what it was. I saw two figures there, but it took me a little time to answer. Then I said: "This is a woman . . . and this is a little girl." He explained that these were a mother and daughter. Now it's strange, but I

don't really understand words like that any more. I must have looked bewildered, because the doctor asked me if I knew what *mother's daughter* meant, whether it referred to one person or two.

I didn't understand that picture. I knew what the words *mother* and *daughter* meant but not the expression *mother's daughter*. The doctor asked me to give him any answer I could, so I held up two fingers to show I thought the words meant two people—a mother and a daughter. But then he asked me what *daughter's mother* meant. I thought for a long while but couldn't figure it out, just pointed to the two figures in the picture. The expressions *mother's daughter* and *daughter's mother* sounded just the same to me, so I often told him they were.

That's as far as I got the next day with another picture he showed me. He pointed to the figures in the picture and asked me if I knew what the words *owner's dog* meant. Again I had to think for a while, but I finally said it was like the expression *mother's daughter*—that it meant two things, an owner and a dog. And I held up two fingers again. Then he asked me to show him *the dog of the owner*. I thought and thought and finally said that *owner's dog* and *dog of the owner* were the same thing.* I didn't understand these expressions very well; I just sensed that the two words in them were closely related, but didn't know how.

* In Russian both phrases consist of only the two nouns with different inflections. (Translator's note.)

I also had trouble with expressions like: "Is an elephant bigger than a fly?" and "Is a fly bigger than an elephant?" All I could figure out was that a fly is small and an elephant is big, but I didn't understand the words *bigger* and *smaller*. The main problem was I couldn't understand which word they referred to.

Naturally I know what an elephant and a fly are, which is large and which is small. But I just didn't understand the words *smaller* or *bigger* in those expressions. My eyes and mind would shift back and forth over those words trying to figure out the right answer. I'm still not certain, and sometimes I'm helpless when I try to make sense out of those words *bigger* and *smaller*.

Somehow I always think the expression, "A fly is smaller than an elephant," means they're talking about a very small elephant and a big fly. But when I used to ask the other patients about it, they told me it meant just the reverse. I tried to remember this, but the doctor would express the idea many different ways: "Is a fly smaller than an elephant or bigger?" "Is a fly bigger than an elephant or smaller?" "Is an elephant smaller than a fly or bigger?" "Is an elephant bigger than a fly or smaller?" "Which is bigger—an elephant or a fly?"

I'd think and think about these but get all confused. My mind seemed to be galloping back and forth so fast my head ached even more. So one way or another I'd make mistakes, and I still don't understand these things.

Often A.R. or O.P. would say: "Draw a circle over a cross. Which figure will be on top and which one at the bottom?" I'd get all mixed up and couldn't answer right away. I'd have to think and consider it a while, but couldn't understand how to draw it. Either I just couldn't answer or I'd say whatever came into my head. Ever since my injury I haven't been able to figure out things like this—where the circle should be (above or below). What's more, you can shift the words around to say: "a cross over a circle." Both these expressions sound the same to me, but O.P. says that "a circle over a cross" and "a cross over a circle" mean different things. She keeps explaining to me that the word *over* means *above* and *under* means *below*. But I just can't figure out what *over* refers to in that expression "circle over a cross." No matter how long I think about it, nothing comes. Somehow I can't understand such things.

I already knew and remembered what the words *above* and *below* meant (the lamp is above the bed; the bed is below the lamp). Still, I was all muddled and confused when I tried to answer O. P.'s question. I recognized the meaning of the words *over* and *under* but couldn't connect them with the two things—*circle* and *cross*. I still can't do that. There are many ideas like this that I can't understand or remember right away; I just can't grasp them when I try to talk or remember.

At first I couldn't make any sense out of the word, *lend* or *borrow*. It was easier for me to understand a

sentence like: "Sonya gave Varya 100 rubles," or "Varya gave Sonya 100 rubles." But I couldn't figure out what "Ivan borrowed 30 rubles from Sergei" meant. Who received the money?

The doctor showed me an album with pictures of different colored cats and asked me whether the black cat was smaller than the white cat but bigger than the red one. It was very hard for me to figure out these words. Besides, there were so many of them. Since I was wounded I've only been able to compare one word with another—one idea. And here there were so many different ideas that I got awfully confused. I could see a big black cat in the picture, then a white cat that was a little smaller, and then a red cat—the tiniest one. I could figure out by looking at them how tall each one was. But I just couldn't compare them and get the ideas *smaller* and *larger*. I didn't know which cat these words referred to.

After I was injured I finally remembered the letters of the alphabet again, though it took a lot of work. But I just can't remember connecting words like *smaller* or *larger*. It takes me a long time to think up an answer even to questions I ask myself. When the words in these questions are shifted around, the meaning changes completely. That's why I can never be sure of the answer to such simple questions, even though I know what an elephant and a fly are. You can arrange those few words in a thousand different ways, and my memory just isn't up to this. And if I have trouble figuring out something as easy as this,

I'm really up against it when I try to understand a question like: "Is the circle above or below the triangle?" And there are thousands of ideas far more complicated than this. Ever since I was wounded I haven't been able to figure out what sentences like this mean —particularly when I try to do it quickly, immediately. It takes me a long time to understand just one sentence like this. I'll go back and forth from one part of the sentence to the other, trying to figure out the right answer.

Sometimes I'll try to make sense out of those simple questions about the elephant and the fly, decide which is right or wrong. I know that when you rearrange the words, the meaning changes. At first I didn't think it did, it didn't seem to make any difference whether or not you rearranged the words. But after I thought about it a while I noticed that the sense of the four words (*elephant, fly, smaller, larger*) did change when the words were in a different order. But my brain, my memory, can't figure out right away what the word *smaller* (or *larger*) refers to. So I always have to think about them for a while. Naturally I figured out long ago that the expression, "A fly is smaller than an elephant," is right. But it still takes me a long time to think about different arrangements of these words. This has nothing to do with the letters in the words. I learned the alphabet again and can now recognize all the letters (though not immediately). It's just that the words in these sentences have an entirely different meaning when you shift them

around. So sometimes ridiculous expressions like "a fly is bigger than an elephant" seem right to me, and I have to think about it a while longer. And there are endless numbers of expressions like this people use. So I'm in a muddle all the time and have even more trouble understanding when I get those fits. The attacks make it even harder.

It was soon apparent that this man's inability to understand the logic implicit in grammatical constructions was his chief disability, one of the surest indications of which brain functions had been impaired. He himself recognized this, and after picking up the term "intellectual aphasia" from the doctors, used it to describe his illness. With the precision of an experienced researcher, he gave us a detailed, coherent analysis of his problems:

When a person has had a serious head wound, or is suffering from a brain disease, he no longer understands or recognizes the meaning of words right away and cannot think of many words when he tries to speak or think. And vice versa: he cannot form an image of a thing or an object when he hears it mentioned, even though he already knows the word.

Because of his illness he also cannot orient himself in space, or figure out immediately where a sound is coming from. He's always hesitating, shifts back and forth before he can aim straight (for example, he'll swing and miss many times before he can drive a nail into a fence or a barn). Because of his injury and ill-

ness his memory is shot, he can't recall anything. These are the consequences of a serious head injury.

All this is what I call "intellectual aphasia." I use that expression to mean everything that keeps me from remembering and being able to pronounce words, visualize objects when I hear them mentioned, and understand endless numbers of words in Russian that connect and make sense out of ideas. When I think back on my past—the different hospitals the doctors sent me to—that is how I understand my misfortune.

He was aware how catastrophic his symptoms were but was determined, at all cost, to recover what he had lost. This was the beginning of a struggle to restore his ability to think, to understand what was incomprehensible. He was guided by a number of experienced psychologists and therapists; together with him they worked out dozens of methods—supportive techniques, an algorithm of behavior.

They tried to help him analyze and reason through difficult verbal constructions, explaining that with a phrase like "my father's brother," he had to ask himself: "Whose brother?" "Brother of whom?" Similarly with the expression: "a circle over a cross." By turning the illustration upside down, they showed him what relationships "under" and "over" designated. With comparatives, they tried to explain each element as concretely as possible: "An elephant is bigger than a fly" means that an elephant is big. Bigger than what? The fly—this little, tiny fly.

It would appear they had replaced brief, succinct operations with supportive techniques, crutches to understanding, that involved lengthy, detailed considerations. Yet only through these did he begin to understand the meaning of complex grammatical constructions. His fight, however, was never completely successful. Despite the hope he brought to it, there were moments of agonizing despair, for whatever success he made came slowly. After years had passed he still had no immediate grasp of grammatical constructions.

After twenty-five years of exhausting effort, phrases like those discussed above were still complete enigmas to him. And unless he went through a lengthy analysis of each term in a comparative expression, a change in the word order would not immediately register with him; as earlier, the expressions always seemed ambiguous—identical, yet somehow different. Even after analyzing these expressions, he was still not sure of their meaning.

“All My Knowledge Is Gone”

The difficult, really impossible problems he had trying to understand the relationships expressed in grammatical constructions gave rise to a more pro-

found problem: the impossibility of recovering any of the knowledge he had acquired through years of study.

What one learns in school and in his specialized field fits into an entire framework of ideas, the whole body of knowledge that education represents. One cannot simply "recall" mathematics any more than he can "recall" Marx's *Capital*. To learn and understand means to absorb ideas which the memory retains in a succinct form as a kind of survey or digest. At a later date, this knowledge can be revived and expanded upon. One can of course temporarily forget certain principles of mathematics or heredity, but this "forgotten" information readily recurs when one refreshes his memory. Knowledge is not stored in the memory like goods in a warehouse or books in a library, but is preserved through a succinct system of codification that creates a framework of ideas. Hence, whatever the memory has retained in this concise way can be revived and developed.

This is precisely the faculty that was missing in this patient whose injury had destroyed the very sectors of the cortex which digest and convert successive pieces of information into succinct patterns one can grasp simultaneously. As soon as he tried to recover the knowledge he had once had, this became apparent. And it was a loss that struck him as catastrophic:

I remember nothing, absolutely nothing! Just separate bits of information that I sense have to do with

one field or another. But that's all! I have no real knowledge of any subject. My past has just been wiped out!

Before my injury I understood everything people said and had no trouble learning any of the sciences. Afterwards I forgot everything I learned about science. All my education was gone.

I know that I went to elementary school, graduated with honors from the middle school, completed three years of courses at the Tula Polytechnic Institute, did advanced work in chemistry, and, before the war, finished all these requirements ahead of time. I remember that I was on the western front, was wounded in the head in 1943 when we tried to break through the Germans' defense in Smolensk, and that I've never been able to put my life together again. But I can't remember what I did or studied, the sciences I learned, subjects I took. I've forgotten everything. Although I studied German for six years, I can't remember a word of it, can't even recognize a single letter. I also remember that I studied English for three straight years at the institute. But I don't know a word of that either now. I've forgotten these languages so completely I might just as well never have learned them. Words like *trigonometry*, *solid geometry*, *chemistry*, *algebra*, etc., come to mind, but I have no idea what they mean.

All I remember from my years in the secondary school are some words (like signboards, names of subjects): *physics*, *chemistry*, *astronomy*, *trigonometry*, *German*, *English*, *agriculture*, *music*, etc., which

don't mean anything to me now. I just sense that somehow they're familiar.

When I hear words like *verb*, *pronoun*, *adverb*, they also seem familiar, though I can't understand them. Naturally, I knew these words before I was wounded, even though I can't understand them now. For example, I'll hear a word like *stop!* I know this word has to do with grammar—that it's a verb. But that's all I know. A minute later, I'm likely even to forget the word *verb*—it just disappears. I still can't remember or understand grammar or geometry because my memory's gone, part of my brain removed.

Sometimes I'll pick up a textbook on geometry, physics, or grammar but get disgusted and toss it aside, since I can't make any sense out of textbooks, even those from the middle school. What's more, my head aches so badly from trying to understand them, that one look is enough to make me nervous and irritable. An unbearable kind of fatigue and loathing for it all comes over me.

Therapists tried to teach him. He struggled to recover a small part of the knowledge he'd lost and would sit for hours over a problem or theorem he formerly would have grasped immediately. And it was all in vain:

M.B., a young man who recently got his degree in philosophy, tried to teach me geometry. At first he used a text from the middle school to explain some concepts in geometry like "point," "line," "plane,"

and "surface." Then he began to discuss theorems. Now the strange thing was that I remembered I once knew these theorems, even though I couldn't understand any of them. I'd even forgotten what "plane," "line," and "surface" meant, and though M. B. explained them several times, I still couldn't remember or understand them. And I felt awkward, knowing how senseless and muddleheaded I must have seemed. So while he talked I just kept saying "yes, yes" as though I understood everything, though I couldn't follow any of his explanations. I couldn't catch the words he was using or understand them. I had to rely mostly on pictures—drawings and sketches of figures. Without them, none of the verbal explanations "got through" to me. I always had to compare the writing above the sketches—"This is a line, a point, a plane"—with the actual drawing. But I still can't explain or define any of these concepts no matter how many times I go over the explanations. All this seems strange, even to me. My head always aches and seems to be in a fog, as though I were drunk all the time. Somehow I can't understand words like "surface," "circumference," or any kind of line—even plane lines and figures. All I can make out is what I get from the sketches or drawings in the book, not from written or oral explanations. I can't figure out what "degrees in an angle" or a "curve" mean. They don't get through to me. I have no trouble understanding plane, graphic figures, but I can't understand a free-standing figure with volume, in which you have to

visualize, rearrange, and get an idea of one thing in relation to everything else. I know (though it's hard for me) how to figure the area of a rectangle from the number of centimeters on two sides. And I know that the length squared gives you the area of a square. But I just can't figure out what the "degrees in an angle" or a curve mean and connect them to anything specific like the area of the earth.

M. B. even tried to teach me the following theorem: "The exterior angle of a triangle that is not adjacent to an interior angle is greater than each of the interior angles." At first I couldn't understand any of these terms and their definitions (adjacent, angle, interior, exterior), but they made some sense after I looked at sketches of lines. The problem is that the theorems follow one after the other, and you have to be able to remember them. And this is impossible for me. I have to compare and try to remember what words like *smaller* and *larger* mean—what they refer to in a theorem like this. I know what *smaller* and *larger* mean in terms of amounts. But when a sentence has several words in between these terms, I have trouble understanding what they mean (I don't know if they refer to what precedes or what follows them). I have to rely on something definite, as in that simple question about the elephant and the fly. Then I can understand what the word *bigger* refers to. After a long struggle I finally can understand a theorem but I forget it as soon as I go on to the next one.

I always have to wrestle with the definitions of words and ideas I come across. I might have remem-

bered the words in that theorem M. B. gave me after a month or two of daily practice, but he introduced new theorems and definitions. And since I couldn't remember either the theorems, the words in the definition, or the concepts, I got absolutely nothing out of the lessons. That's the way it goes with me. If I want to remember something—even one theorem—I have to spend a month or two on it. With my "aphasic" memory, I wouldn't have any more luck with theorems or concepts than I do with words. And unless I had a chance to recall a particular theorem once in a while, I'd forget it completely, just as I've forgotten all the other theorems I tried to learn.

So it turns out that because my memory is so bad I'll never understand anything about geometry, grammar, physics, or any other science. What's happened to my life is simply terrible. This strange illness I have is like living without a brain. What I remember one minute is gone the next, so that I can't understand theorems or even simple things in my surroundings.

He had difficulty not only with complex systems of ideas like geometry, physics, and grammar, but with the simple arithmetic processes taught in the first years of elementary school. His experience with these showed that simple numerical systems were no less difficult for him than complex scientific concepts:

Because of my injury I forgot how to reckon numbers. At first I didn't know a single number (I'd forgotten them just as I'd forgotten the letters of the al-

phabet). And so once again I was seated beside a teacher, hoping I'd soon wake up from this strange and terrible dream.

I'd look at a number for a while, but if I couldn't remember it, I'd just have to wait until it came to me. Finally I recalled the first number—1—and began to recite the "numerical alphabet" to myself, going up to 7, and almost shouting to my teacher as I pointed to the 7 in the chart. But sometimes I just couldn't tell whether 6×6 equaled 36, 46, or 40. Sometimes (I myself noticed this) I wasn't even sure how much 2×2 were. Some sort of blight seemed to make my damaged mind go blank. Until recently I was still confused about multiplication tables.

In this respect I was like a five-year-old child. I didn't know a single number at first. Once I started studying, I progressed much faster than I had with letters, because the numbers are so much alike. All you have to do is remember the first ten. After that they're repeated, except for some slight changes or additions to them.

My teacher also wanted me to recite the numbers in reverse order, but this was dreadfully hard. But then I made some progress. When I'd counted up to 10, my teacher would ask me to remove the last number and go back down the list. I still couldn't say the word "nine" right away but had to count from 1 to 8 to do that.

At first I had a lot of trouble adding (after all, I was just learning how to count again). I always had to re-

cite the "numerical alphabet"; I couldn't remember any number on the spot. For example, O. P. would ask: "If you add 10 and 15, how much will you have?" First I had to count up to 10 and pronounce it before I understood what number it designated. Then I counted from 10 to 15, so that I'd know what number that was. From there I had to count on my fingers up to 25.

Subtraction was much harder. O. P. would ask: "If you take 10 from 20, what will you have left?" I'd start to reckon it. First I'd recite the numbers up to 20, then run through the first ten again in order to be able to say the number 10. I realized that 10 and 10 were 20 so that if I struck one of the 10's out, I'd have 10 left. I solved the problem but very, very slowly. Then I figured out how to reckon by tens instead of ones (I didn't do it out loud, but whispered to myself). I went a little faster this way, but it was still very hard going.

At first O. P. asked me to memorize the multiplication tables. I tried to do it but was always confusing them. True, I remembered some of them right away (1×1 , 2×2 , 3×3 , etc). After that I remembered the 5's table and could recite it up to 10×5 . But even with this I frequently had trouble forgetting.

And when O. P. started talking about the "minuend," "subtrahend," "remainder," and "sum," "multiplicand," and "dividend," I just looked at her—I listened to those words which seemed familiar, but I couldn't remember what they meant.

It was easier for me to figure numbers if I wrote them down, but it was very hard to do this in my head, and I always had to use long roundabout methods. If O. P. asked me to subtract 17 from 32 in my head, I'd have to set to work very slowly counting and recounting. I'd also have to ask her to repeat the numbers a couple of times. Then I'd start counting: "Take 2 from 32. That leaves 30. Add 3 to 17 and you get 20. Take 20 from 30. That leaves 10. 7 from 10 leaves 3. Add 10 to 3, you get 13. There was 2 left from 30, so add that to 13, and you'll get 15. If I hadn't used this roundabout method, and gone back and forth like this, I couldn't have done it. When I can write numbers down, it's easier for me, much quicker.

I already knew the meaning of simple terms like "addition" and "subtraction" (put together and take away), "multiplication" and "division," but sometimes I'd forget them just when I wanted to use them. I just couldn't remember ideas like "difference" and "quotient."

I was always confusing numbers and couldn't get the answers when I tried to add or subtract in my head. At first I had a hard time understanding square roots. I'd quickly forget how to get the square root of 49, 0.49, 4, and 0.4—I didn't pick up things like this immediately.

At first my teacher showed me how to figure numbers (add and subtract them) and a little later began to teach me the multiplication tables. After a few

months I remembered most of them, but I often confused numbers from different tables and sometimes wasn't sure how much a simple thing like five 6's were.

Recently my teacher tried to give me some simple arithmetic problems. By then I had already learned to add, subtract, multiply, and divide like children do in elementary school. But when she started talking about the "subtrahend," "difference," and "quotient," I couldn't remember these ideas, I just sensed they were familiar. Naturally, after a short time I understood them. But I couldn't recall words like "item" and "difference," and I couldn't apply them when I tried to work on a problem. I tried to figure out whether "quotient" had to do with subtraction, addition, or division. My teacher would prompt me, but by that time I'd forgotten what the word "difference" meant.

This was a terrible hindrance in his daily life. He couldn't even figure out how much to spend at the store or how to count his change.

Often I'm not sure whether five 5's are 25, 35, or 45, and I've completely forgotten some of the less obvious examples, like 6×7 . I have to run through the multiplication table to find the answer. Naturally, I have no trouble figuring out whether an answer is right when I'm at home and can write the numbers down. But if I try to figure them in my head while

I'm taking a walk or buying something at the store, I always make mistakes.

So I don't try to figure money myself when I buy food at the store. I just tell the cashier I have to get a half kilo or a kilo of something, I put the money down, and I get a stamped receipt and change from her. Then I go to the clerk who weighs out what I want to buy. But I hardly ever try to add up how much I have to spend at the store.

These problems were not limited to computing numbers. He could not play chess, checkers, or even dominoes, games he had played so well formerly he almost invariably won.

Before I was wounded I was pretty good at almost any game, but afterwards I forgot how to play them. It was years after my injury before I even tried to play checkers, chess, and dominoes, and I never really learned them again.

Before the war I was a good chess player. But from the time I was wounded I forgot how to play the game or what the pieces were named. I forgot them just as I'd forgotten numbers and the letters of the alphabet.

I tried to play chess with some beginners, but it took me a long time to figure out how to move. I still can't remember the names of the pieces while I'm actually playing. Sometimes I remember the knight (the horse) and the king (the tsar), but the rest have slipped my mind and I haven't been able to recall them during these past twenty years.

In the hospital I used different names for the pieces—I called the queen *tsarevna* (when I could remember that word) and the king *tsar*. When it came to the knight, I'd think of Budenny's horse. For the rook and the bishop I substituted the words *officer* and *crown*. As long as I could remember these words, it was easier, but I'd often forget them while I was playing. And I had the same problems I do with reading. My eyes could only see two or three figures on the board. Since I could see only a small part of the board, I'd always forget about the other figures there and lose track of them. And I couldn't even plan one move in advance.

Still and all, I did start to play again. To be more exact, I began to learn the game. Pretty soon I knew how to move the pieces and remember their names, even though I'd often confuse them. It was particularly hard to keep them in mind while I was actually playing. I still have trouble remembering and try to play now without naming the pieces, because I can't think of the words right away. First I played with beginners who didn't know the game at all, and later with patients who weren't exactly beginners but didn't play too well because they'd also had head wounds. It takes an awfully long time to decide how to move. Often I confuse pieces and lose track of others on the board.

I can't plan or foresee moves, since I have so much trouble remembering. But I can plan one move in advance, even though I can't remember the previous move that's been made. I play badly because of my

bad memory and eyesight. I can't really see the pieces on the board and always have to keep looking back and forth to get the layout. But it's so hard! I get a terrible headache and pressure in my body from playing and feel even dizzier. My head's in a fog, I see everything as though I were in a half-sleep—and this is reflected in the way I play chess.

Practically the same thing happened with checkers. Though I must admit I was a good player before my injury, afterwards I forgot this game too. When I saw people playing checkers in the hospital, the game looked familiar. But when I actually tried to play with one of the patients, I forgot how many squares to move or in which direction. On the whole, I couldn't remember much about the game. So instead of playing with me, the fellow started teaching me. This was amusing, but a hard thing for me to swallow. Soon I learned how the checkers and "kings" moved and could usually remember the words for them during the game. This was far simpler than remembering the names of chess pieces. Still, I had some problems even with checkers. I often had to think a while about each move, got confused, forgot what moves had been made, and could only think one move ahead. I had no more idea of what my opponent was doing in checkers than I did in chess.

The same was true of dominoes. While I was playing it seemed easy enough to count the dots on the pieces (twelve is the maximum on any one of them), but it was hard for me to keep details in mind. I'd

forget what a player had put down and couldn't add the dots on the pieces quickly. I'd become so nervous and anxious from playing that it seemed better to give it up. It took me so long to think about the pieces, the people I played with got angry with me. And I'd always lose, no matter who I had for a partner, since I'd forget which piece a player had used the minute he put it down. There may be only twenty-eight pieces in dominoes but there are forty-nine combinations of figures. Could I possibly remember that many? Why do I have so much trouble playing that I can never win? Before I was wounded, I could beat anyone at dominoes, so the game bored me and I hardly ever played. Now that I've been injured, I can't get the point of such a simple game. And so I go on playing it because my memory (which has to reason even in a game like this) and my eyesight took such a beating from that wound.

These problems affected not only his skill at chess, checkers, and dominoes. Almost any social situation—conversation, movies, concerts—became impossibly difficult. Simple scenes of everyday life were all he could understand in movies. Anything more complicated hardly made sense to him:

I go to the movies quite often. I like watching films, it makes life less boring. The only problem is that since I was wounded I can't read print on the screen, my reading is too slow for that. By the time I've figured out a few words, new material appears on

the screen. And I can't see the entire screen, just a part to the left of center. If I want to see the whole picture I have to keep glancing back and forth at different parts of the screen. That's why I tire so quickly and get a splitting pain in my eyes and head. Since I can't read any of the print, I don't understand silent movies. When there is a sound track, and I don't have to read anything, I still have trouble understanding. Before I've had a chance to figure out what the actors are saying, a new scene begins.

On the whole, I only understand very simple things that are familiar to me from childhood. If something in a movie makes the audience laugh, I sit there wondering what's so funny. The only thing I can understand is when two people start to argue, fight, and knock each other down. I can figure that out without words. But after I've seen a film, I can't remember a thing about it, even though it seemed to me I did understand some of it.

The same thing is true about concerts. I see and hear the performers but can't understand the words in the songs; I don't have enough time to grasp them. They're just words to me, I can't keep them in mind —they disappear in a minute.

He liked music as much as before and easily remembered the melodies of songs, if not the words. This meant that songs also seemed fragmented, consisting of a melodic part he could understand and a content that made no sense at all.

It's like what happened to my memory and speaking ability. I have the same problem with the words of a song as I do with conversation. But I can grasp the melody automatically, just as I was able to recite the alphabet automatically before I learned to recognize letters.

This was another instance of the split that had formed because some brain functions had remained intact while others had been destroyed completely. Hence, though he was unable to grasp the point of a simple conversation, or of many grammatical constructions, he left us an amazingly precise description of his life. It required superhuman effort for him to write one page of this journal, yet he wrote thousands. Despite his inability to cope with elementary problems, he was able to present a vivid account of his past. Furthermore, he still had a powerful imagination, a marked capacity for fantasy and empathy. Let us run through some of the pages of his diary in which he tried to imagine lives totally unlike his own:

Say I'm a doctor examining a patient who is seriously ill. I'm terribly worried about him, grieve for him with all my heart. (After all, he's human too, and helpless. I might become ill and also need help. But right now it's him I'm worried about—I'm the sort of person who can't help caring.)

But say I'm another kind of doctor entirely—someone who is bored to death with patients and

their complaints. I don't know why I took up medicine in the first place, because I don't really want to work and help anyone. I'll do it if there's something in it for me, but what do I care if a patient dies? It's not the first time people have died, and it won't be the last.

I can imagine what it would be like to be a famous surgeon who has saved many lives. People are grateful to me, they call me a "savior." I'm happy I can do this since I value human life. On the other hand, I can imagine being a different type of surgeon. I haven't got a big reputation because I often slip up, though it seems to me no fault of mine, the patient's, or my attitude. Anyway, I prefer the theater, dances, parties, and an easy life to medicine. My own comfort is what matters, though naturally I don't admit this to people.

But I can picture an entirely different life, that of someone who works as a cleaning woman. Life is hard, but what can I do? I'm not intelligent enough for any other kind of work and can hardly read or write. And now I'm old.

If I were a great engineer, running a factory would be no problem since I'd have connections with lots of other factories and managers. Naturally life would be much easier for me than for a cleaning woman or a longshoreman.

But what if I were a woman with a disease that made my head swell up so badly I was practically out of my mind with pain, and I screamed at everyone in the hospital night and day. I still wouldn't want to

die. I'm upset about my son whose skull was fractured so badly in back he's brain-damaged, can hardly see, feels dizzy all the time, and has become illiterate. I'm also worried because I don't know what's become of my other son. The last I heard he was with the troops in Lithuania in 1941. All this grief torments me night and day.

His vivid imagination had not been damaged by his injury. (Some neurologists believe this faculty is controlled by the right hemisphere of the brain.) It afforded him some momentary relief from the effort of coping with a world that had become so incomprehensible.

A Story That Has No Ending

Although we have come to the end of this story it has, in fact, no real end. This man still lives with his family in Kimovsk which, over the years, has grown into a much larger settlement full of three and four-story buildings. As in years past, he sits at his desk each morning working on his story, trying to express himself better, to describe the hope and despair that are part of his continuing struggle.

His wound healed twenty-five years ago, but the formation of scar tissue has resulted in attacks. The damaged areas of the cerebral cortex could not be restored. Hence, when he tried to think, his mind had to detour around these scorched areas and employ other faculties with which to learn and try to recover some lost skills.

He desperately wanted to wake from this terrible dream, to break through the hopelessness of mental stagnation, to find the world clear and comprehensible instead of having to grope for every word he uttered. But it was impossible.

Time is flying. Over two decades have slipped by and I'm still caught in a vicious circle. I can't break out of it and become a healthy person with a clear memory and mind.

The average person will never understand the extent of my illness, never know what it's like unless he experienced it himself.

And so he reverted to the past, for he could not understand why the world had become so peculiar, why war was necessary, or find any justification for what had happened to him. Twenty-five years before he had been a gifted young man with a promising future. Why did he have to lose his memory, forget all the knowledge he had acquired, become a hopeless invalid condemned to struggle for the rest of his life? This was simply beyond him:

I can't understand why oppression and slavery exist in other countries. The earth is rich enough to feed and clothe us all, to provide more than the bare necessities, to brighten the lives of generations to come. What need is there for war, violence, slavery, oppression, murder, executions, poverty, hunger, back-breaking work, or unemployment in countries that have so much wealth?

He continues to try to recover what was irretrievable, to make something comprehensible out of all the bits and pieces that remain of his life. He has returned to his story and is still working on it. It has no end.

“Were It Not for War . . .”

In Place of an Epilogue

How many tragedies has war created? How many people have died, been crippled, robbed of any chance of a productive life? Who knows how many of those whom war has crippled and destroyed might have been great people—the Lomonosovs, Pushkins, Mendeleyevs, Tolstoys, Doestoyevskys, Tchaikovskys, Pavlovs, and Gorkys of our time? Among

them some may have been great scientists who would have made life even brighter, more promising.

Were it not for war, the world would have become a great place to live long ago. In this age we have an opportunity to build and create a fine and beautiful world, to feed, clothe, and shelter all of mankind, not only the present generation but those for centuries to come.

The water and earth of this world have an endless supply of energy and raw material, there is no need to fear any shortage of them. Soon there will be flights to outer space—first to the moon and the nearest planets. This will give us an even greater chance to enrich life with rare elements and substances that may be more plentiful on planets other than the earth. We could do this, were it not for war. . . .

Index

- agnosia, optical, 29
amnesia, Zasetsky's, *see* "speech-memory"
aphasia: intellectual, 137, 138; Zasetsky's,
86, 137, 138
arithmetic, Zasetsky's loss of knowledge
of, 145-149
- body, Zasetsky's sense of, 41-45
brain, v, viii, xiii, 22-35; auditory-vestibular (temporal) section of, 30; blocks of the, 24-26, 30, 33-35; cortex of, *see* cortex; and equipotentiality principle, xiii; hemispheres of, 22, 26, 32, 33; injury to, 28, 31, 33, 34, 112, 113, 131; and localization-of-function principle, xii; maps of, xii, 23; subcortical nuclei of, 23; tactile-motor (parietal) section of, 30; tumor of, ix; visual (occipital) section of, 30
brain stem, 24
Broca, Paul, 32
- case endings, in grammatical constructions, 125-126
checkers, played by Zasetsky, 152
chess, played by Zasetsky, 150-152
cognition: factors affecting, 29, 30; and language, 32-33

- comprehension, 123
cortex, x, xii, 22, 23, 25, 30, 140; in
“damped” condition, 113, 114; injury
to, 28, 31, 33, 113, 128; and “law of
strength,” 113; primary visual, 26, 27,
28; secondary visual, 27, 28, 31; stellate
cells of, 27, 28; tertiary sectors of, 30–
31, 32, 33
- “damped” cortical condition (Pavlov),
113, 114
disembodied idea, Zasetsky’s, 115–122
passim
dominoes, played by Zasetsky, 152–153
- electric shock, 27
empathy, Zasetsky’s capacity for, 155
energizing block of brain, 24–26
extended sentence structure, 123, 124
- fantasy, Zasetsky’s capacity for, 155
- games, played by Zasetsky, 150–153
geometry, Zasetsky’s loss of knowledge
of, 142–144
Goldstein, K., 23
grammatical constructions, 122–139 *pas-*
sim; see also language; linguistic anal-
ysis; words
gray matter, 23, 24
Gulliver’s Travels (Swift), 109
- hemianopsia, 28

- ideas, disembodied: Zasetsky's, 115-122
passim
"I'll Fight On" (Zasetsky), 76
images, undeciphered: Zasetsky's, 115-
122 *passim*
imagination, Zasetsky's capacity for, 155
inversion, grammatical, 124, 125
- Kimovsk, Zasetsky in, 58-59, 92, 97, 104,
157
"kinetic melodies," 72
Kisegach, Zasetsky in, 97
- language, 123; and cognition, 32-33; *see also* grammatical constructions; lin-
guistic analysis; words
- Laputa (Swift), 109
- linguistic analysis, 123, 129-130; *see also*
grammatical constructions; language;
words
- memory, 109-112, 140; *see also* "speech-
memory"
movies, Zasetsky at, 153-154
music, and Zasetsky, 154-155
- neurons, 24; number of, in brain, 24
neuropsychology, ix, xiii; defined, viii
- occupational therapy, 47
optic radiation, 28, 31
optic thalamus, 24
- parts of speech, relationships expressed
through, 127

- Pavlov, I. P., 23, 113
Penfield, W., 27
Pötzl, O., 27
- radiation, optic, 28, 31
radio, and Zasetsky, 116, 117
reading, and Zasetsky, 61-71, 74, 117
- Sechenov, I. M., 23
sentence structure, 123-139 *passim*; direct, 123; extended, 123, 124
shock, electric, 27
“spatial peculiarities,” Zasetsky’s, 46-61
speech comprehension, xiii-xv
“speech-memory”: peculiar features of Zasetsky’s, 101-108; Zasetsky’s loss of, 87-95, 141-142; Zasetsky’s recovery of, 95-101; *see also* memory
stellate cells of cortex, 27, 28
“Story of a Terrible Brain Injury” (Zasetsky), 76
stroke, ix
Swift, Dean, 109
syntax, *see* sentence structure
- thalamus, optic, 24
tonus-regulating block of brain, 24-26
Traumatic Aphasia (Luria), vi, xi
Tula, 89; Zasetsky in, 56-57
Tula Polytechnic Institute, 141
- undeciphered images, Zasetsky’s, 115-122 *passim*
- vision, Zasetsky’s, 36-41

war, Zasetsky's condemnation of, 159–160
Wernicke, C., 32
white matter, 23
words, recollection of, 110–112, 114; *see also* grammatical constructions; language; linguistic analysis
writing: as automatic skill, 72; by Zasetsky, 71–75, 76–86

Zasetsky, L., 8–14, 35–36; capacity for empathy, 155; capacity for fantasy, 155; capacity for imagination, 155; childhood of, 3–5; description of brain injury, 21–22; disembodied ideas of, 115–122 *passim*; exercise by, 51; games played by, 150–153; in Kimovsk, 58–59, 92, 97, 104, 157; in Kisegach, 97; knowledge lost by, 139–157 *passim*; and Luria, first meeting with, 17–20; at movies, 153–154; and music, 154–155; occupational therapy for, 47; and radio, listening to, 116, 117; and reading, 61–71, 74, 117; in rehabilitation hospital, 14–16; restricted to undeciphered images and disembodied ideas, 115–122 *passim*; sense of body, 41–45; and “spatial peculiarities,” 46–61; and “speech-memory,” *see* “speech-memory”; test of comprehension by, 117; in Tula, 56–57; undeciphered images of, 115–122 *passim*; vision of, 36–41; war condemned by, 159–160; writing by, 71–75, 76–86

BOSTON PUBLIC LIBRARY



3 9999 00339 617 1

WITHDRAWN

No longer the property of the
Boston Public Library.
Sale of this material benefits the Library.

manwithshattered00luri

manwithshattered00luri



manwithshattered00luri

Boston Public Library

**COPLEY SQ
GENERAL L**

RD594
Z38L87 13
1987

87044546-01

The Date Due Card in the pocket indicates the date on or before which this book should be returned to the Library. Please do not remove cards from this pocket.

Russian psychologist A. R. Luria presents a compelling portrait of a man's heroic struggle to regain his mental faculties. A soldier named Zasetsky, wounded in the head at the battle of Smolensk in 1943, suddenly found himself in a frightening world: he could recall his childhood but not his recent past; half his field of vision had been destroyed; he had great difficulty speaking, reading, and writing. Woven throughout his first-person account are interpolations by Luria himself, which serve as excellent brief introductions to the topic of brain structure and function.

"Zasetsky . . . in eloquent excerpts from a diary, comments on his struggle to recover the use of his brain . . . He could not even have written his journal — 3,000 pages that he cannot read himself, composed with appalling effort over a quarter of a century — had he not learned to write automatically, without thinking of the process. It is a remarkable document, affecting in its simplicity, its pain, its inexorable determination."

— *Newsweek*

"The book is equally as remarkable a document as Luria's *The Mind of a Mnemonist* . . . Writing is Zasetsky's laborious way of thinking. His achievement is that he has managed, after untold agonies and frustrations, to describe his unending confusions with terrible clarity. It would take a lobotomized Samuel Beckett to match it."

— *Time*

"This is an important and remarkable book — the product of the relationship between two remarkable men, one a world authority on the brain, the other his unfortunate brain-damaged patient . . . Luria has created a fascinating and valuable review of the strange but precise working of the brain for both the general reader and the scientist. This little book will become a classic."

— *Library Journal*

The late A. R. Luria was Professor of Psychology, University of Moscow.