YOUR TWO BRAINS

by

Patricia Stafford

YOUR TWO BRAINS

by

Patricia Stafford

ILLUSTRATED

BY LINDA TUNNEY

Atheneum
New York
1986

Special thanks to Fran Grace,
my balloonist friend,
for her help.

Library of Congress Cataloging-in-Publication Data

Stafford, Patricia. Your two brains.

Bibliography: p. 69.
Includes index.
SUMMARY: A simple explanation of the separate function of each half of the brain describing what each half does, how they work together, and how one can achieve whole brain thinking.
1. Cerebral dominance—Juvenile literature.
2. Brain—Localization of functions—Juvenile literature.
3. Intellect—Juvenile literature. [1. Brain—Localization of functions. 2. Intellect] I. Tunney, Linda, ill. II. Title. III. Title: Your 2 brains.
QP385.5.S73 1986 612'.825 85-28575
ISBN 0-689-31142-7

Published simultaneously in Canada by
Collier Macmillan Canada, Inc.
Type set by Heritage Printers, Charlotte, North Carolina
Printed and bound by Fairfield Graphics, Fairfield, Pennsylvania
Designed by Mary Ahern
First Edition

With love to my children,

Michael, Teresa, Marie, and Stephen;

and my grandchildren,

Christine, Jennifer, Kerry, Antony, and Philip.

And to my friend and advisor,

Ross Olney.

ACKNOWLEDGMENTS

This book could never have been a reality without the encouragement of loving family and friends.

My thanks to:
Pat, Alice, Winny and Anita; Joe, Marion and Frank, Judy and Ed, Gloria, Florence, and JB.

Cathy and Keith Case for their creative suggestions.

Linda Martinez for her expert assistance.

Betty Edwards, Madeline and Rob Hunter, Barbara Coloroso, Roger Taylor, Phyllis Wood, and Billie Telles for the inspiration I received from their lectures.

Lyn Perino, Dr. James Cowan, and Steve Kingsford for their moral support.

My editor, Marcia Marshall, for her interest and cooperation.

CONTENTS

Your Two Brains

I

Your Brain

"QUIET!"

"Shush!" whispered voices in the dark. Suddenly the door opened and a young figure entered the dark room.

"Surprise! Surprise!" shouted many excited voices. On went the lights to reveal colorful balloons and bright crepe paper streamers decorating the room. A group of children moved forward. Each one carried a brightly wrapped gift.

"Happy birthday to you! Happy birthday to you! Happy birthday, dear Kerry! Happy birthday to you!" sang the young voices.

Not one of this group of children was enjoying the surprise party one bit. Not one of them could really walk, talk, smile, or sing. Not without help. They were just a group of puppets on a stage. There wasn't a brain in a single head. All the puppets' actions were controlled by real children. These children *did* have brains. Their brains made it possible for them to move the strings and make the sounds so that the puppets could perform.

Without a brain you, too, would be like a puppet. You wouldn't be able to laugh, cry, talk, or move. In fact, you wouldn't have any feelings at all. You would have no idea what was going on in the world around you.

Our brains are perhaps the most wonderful, magical exciting objects in the world. They are so complex that even the best scientists have barely begun to understand all there is to know about how they work.

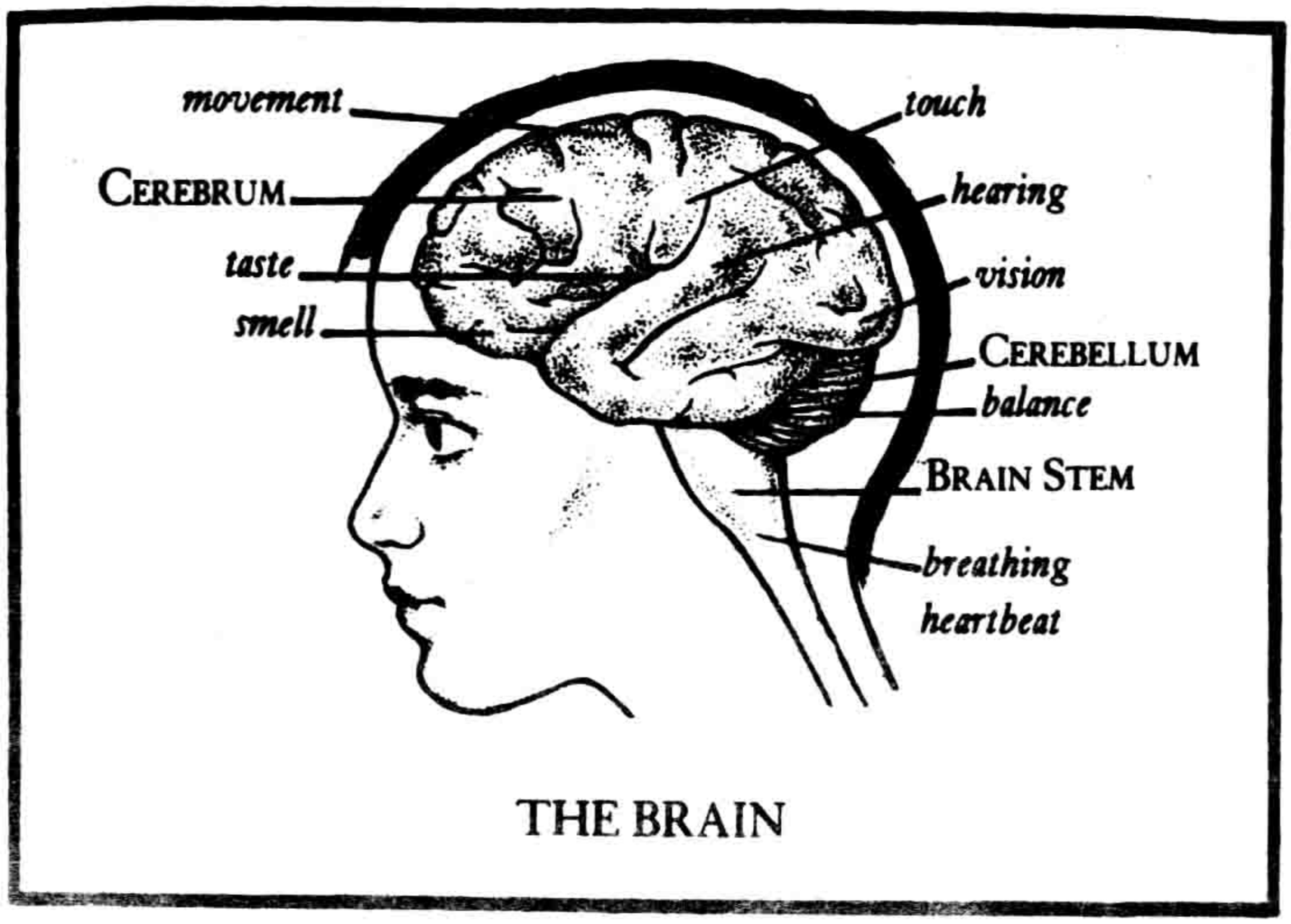
A long time ago people believed that all real thoughts and feelings came from the heart. Today we know that the brain is the center of our being. It is what makes you the person that you are. You think with your brain. With it you can decide what is beautiful or ugly and what is good or bad.

Your feelings of pain and sadness, joy and laughter come from your brain. Your brain makes it possible for you to speak and understand words. It allows you to laugh at a funny story, solve problems, and remember events that happened to you a long time ago. Sometimes it makes you daydream and imagine wonderful adventures.

Your brain controls all your actions, thoughts, and feelings. It is made up of ten billion nerve cells and is a part of your central nervous system. There are three main parts: the CEREBRUM, the CEREBELLUM, and the BRAIN STEM. And each part has its own special job to do.

Cerebrum

The cerebrum is about the same size as a softball, but it is much heavier. It weighs about three pounds and is about seventy percent of our total brain. It is made up of many wrinkled folds. In fact, it looks something like the kernel of a walnut. However, instead of being hard and brown, it is soft, jellylike, and pinkish gray. Push your fingers against your forehead. The cerebrum is located right behind your skull bone and fills the whole upper part of your head inside your skull.



THE BRAIN

Your thoughts and being aware of what goes on around you come from your cerebrum. It controls what you learn and remember by processing and storing information. Some of your movements and all your senses (touch, smell, hearing, taste, and sight) are controlled by the cerebrum.

The cerebrum has two halves connected together by nerves. This connection is called the corpus callosum. Each side of the cerebrum controls the opposite side of your body by the nerves that cross from one side to the other. If you stamp your left foot, the right side of your cerebrum sends the message for your foot to do this. And, if you raise your right arm, that action will be controlled by the left side of your brain.

The surface of the cerebrum is called the cerebral cortex. It is a thin layer of nerve cells that protect the cerebrum as bark protects a tree. If you look up the meaning of the word "cortex" in a dictionary, you will see that it means

"bark." The cortex is the wrinkled part of the cerebrum. If it were stretched, it would cover more area than a pillow case. The rest of the cerebrum consists of soft tissue nerve fibers called white matter.

The cerebrum acts as a storehouse for our intelligence and skills. The functions and actions of this part of our brain are what make it possible for human beings to do so much more than animals can. You will learn more about the cerebrum functions in Chapter Two.

Cerebellum

The cerebellum is about ten percent of our brain. It is about the size of an apple and is located behind and below the cerebrum. It, too, is made up of white matter with an outer layer of gray matter. It is even more wrinkled than the cerebrum.

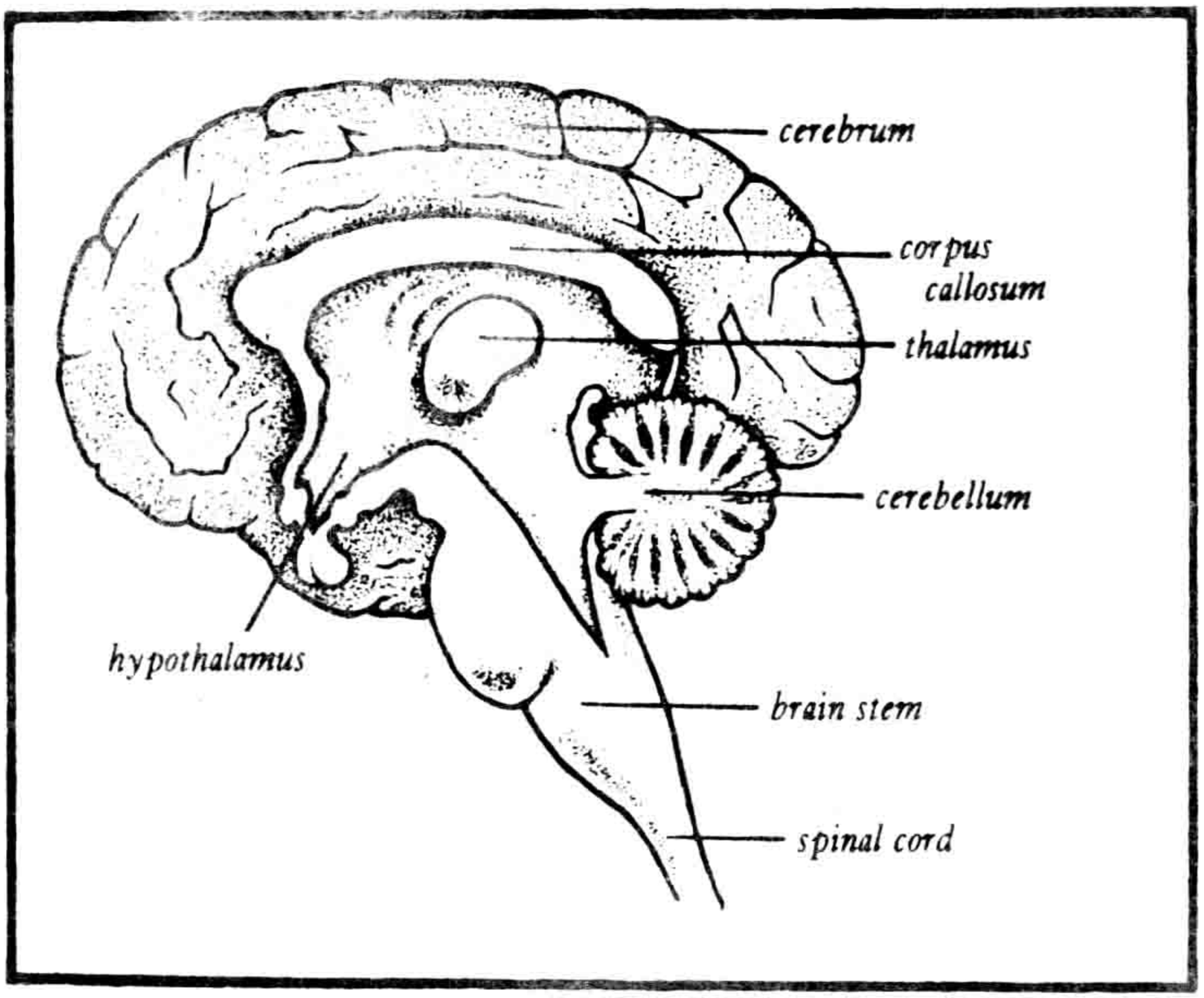
Do you like to swim, play baseball, skate, or play arcade games? These are some of the many activities that the cerebellum helps you do. It controls your balance and coordination. It does this by means of a complicated, but very precise, network of nerve cells (or neurons). These neurons send strong signals to different parts of your body.

To control your muscle movement the cerebellum receives information from many areas of your body: from the eyes and ears; from receptors (a group of cells that receive messages) in your muscles and joints; and from the cerebral cortex. The cerebellum puts all the information together to make your body move in just the right way. It helps make it possible for you to play games and do other activities that take physical skill. If the right signals weren't sent to your body from the cerebellum, you would not be able to run, dance, or play a musical instrument. In fact, it

would not be possible for you to walk across the room without stumbling or to talk without mumbling.

Brain Stem

Your brain stem is the widened top of your spinal cord. It is at the base of your skull just below the cerebellum and is about eight centimeters long. That is a little longer than a pencil before it has been sharpened. The lower and most important part of the brain stem is the medulla. Your heart would not beat and you could not breathe properly without the medulla. It regulates these functions and many other things you do every day without thinking about them. You



could not swallow, digest food, cough, sneeze, or blink your eyes without the help of the medulla.

Another important function of the brain stem is the control of consciousness. It switches the activity of the brain off and on again as we sleep and wake. That doesn't mean that our brains stop working when we are asleep. It just means that different activities are going on.

Growing out of the brain stem are several small parts of the brain. One, called the thalamus, receives signals from your senses. It can feel pressure, pain, hot, and cold. For example, suppose you were to step on a sharp tack. The thalamus will send a message to the cortex which will let you know where you hurt and why. The thalamus also controls your sleep and your good and bad feelings.

Another small brain part is called the hypothalamus. It has the important job of controlling your emotions. The hypothalamus is the center for your feelings such as fear, hunger, tiredness, and worry.

All information comes into your brain along the nervous system and is constantly being checked and monitored by the brain stem. Like a computer, it sorts out all this information. It then sends messages back into the nervous system, which controls the entire body and all its actions.

Spinal Cord

Although the spinal cord is not actually a part of the brain, it is very important for brain functions. Your spinal cord extends about two-thirds of the way down your back.

Run your fingers up and down the middle of your back. You will feel knobby bones, which are called vertebrae. This is your spinal column, which forms a protective covering for your spinal cord. The spinal cord is a bundle of

nerves that run down the inside of the spinal column. A network of nerves then branches from the spinal cord to all parts of your body. Your body makes use of this network when it carries the messages to and from various parts of the brain.

All the parts of this amazing brain of yours work something like a combination of a gigantic telephone switchboard, television network, and a complex computer. However, no switchboard, television, or computer exists that has the billions of connections found in the human brain. There is just nothing on earth that can compare with the performance of your fantastic brain.

2

The Two-Sided Brain

A WORLD WAR II soldier named W.J. threw himself on the floor. His body twisted and turned. His head, arms, and legs jerked in every direction. His eyes rolled in his head. His mouth was foaming. "What can we do for him?" the nurse asked. "The poor man must be in agony."

"Yes, his is the worst case of epilepsy we've ever had. These fits come on several times a day," replied the doctor.

"Do you know anything about his history?"

"W.J.'s story is a sad one," the doctor answered. "During the war he parachuted from a plane and landed behind enemy lines. He was taken prisoner and sent to a prisoner of war (POW) camp. One day in the camp, when he was slow to obey an order, the butt of a rifle was smashed into his head with brutal force. The brain injury he received at that time has caused him to have these epileptic seizures. Normal life is impossible for him. We've tried every way we know to help him, but nothing has worked. I'm afraid we'll have to take some drastic action."

Not long after this, special brain surgeons decided to perform a new kind of operation on W.J. This was the only way they could think of to try to help him. In the operat-