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Preface

A mind body revolution is under way in the medical world. This revolution is regularly punctuated by research breakthroughs, including our most recent findings that mind body strategies can actually “switch off” or “switch on” gene activity or gene expression associated with disease.

My professional life over the past four decades has been devoted largely to furthering our understanding of the science and the exciting treatment possibilities of these mind body phenomena. For me, it all began back in the early 1970s with my identification of the relaxation response, the term that I coined to describe the physiologic reaction that is the exact opposite of the stress (fight-or-flight) response. The fight-or-flight response is a reaction that prepares the body to act upon fears and physical challenges through the secretion of such stress hormones as adrenaline and noradrenaline.

Since that foundational moment, much of my research—along with that of colleagues I have worked with at the Harvard Medical School, its affiliated hospitals, and other research centers—has focused on understanding the relaxation response phenomenon. Among other things, we have established the first effective therapy to counteract the harmful and pervasive effects of stress. We have also explored how the relaxation response relates to other mind body phenomena, such as the placebo effect, a mechanism that may produce healing through belief and expectation.

In fact, we believe that mind body science has now reached a stage

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where it should be accepted as the *third major treatment and prevention option*, standing as an equal alongside drugs and surgery in the clinical medical pantheon. Hence, it seemed quite appropriate to call this book the *Relaxation Revolution*. But like most true revolutions, this one has taken on a life of its own.

In the beginning, I never anticipated that the physiologic effects we were seeing with the relaxation response—including reduced metabolism, blood pressure, heart rate, and respiratory rate—would be accompanied by molecular changes, such as an increase in exhaled nitric oxide. I had no idea that experts in fMRI technology would find a calming and “opening” of the brain to healing possibilities. I didn’t foresee that scientific and treatment links would be established with other mind body phenomena, such as the therapeutic power of expectation and belief. Most recently, I was as surprised as many of my scientist colleagues when we found that the relaxation response can actually alter gene activity—the way that genes express themselves and thus influence the body. Although the genes themselves are not changed through this process, the genetic activity that we have discovered will almost certainly have profound implications for your personal health and our medical practice.

Furthermore, this revolution reaches beyond the treatment of disease to the *prevention* of disease. In particular, mind body medicine has significant implications in the vast, burgeoning field of stress management; according to a growing body of research, stress has a huge impact in causing or exacerbating many diseases. The potential is enormous for preventing such stress-related conditions as insomnia, lower-back pain, hot flashes, premenstrual syndrome, and various types of tension and migraine headaches.

Finally, there is the potential for a revolution in reducing the cost of medical care. Increasingly, medical studies are showing that employing mind body treatments and prevention strategies could save billions of the dollars now being spent on medications and surgeries.

The *Relaxation Revolution* is unique not only in presenting the lat-

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est scientific findings, but also in describing how this science can be applied—and, in fact, *is* being applied—to treat patients with specific medical complaints and diseases. Our treatment recommendations, which are based not on speculation or wishful thinking but on scientific fact, focus on a wide variety of conditions, including high blood pressure, many types of chronic pain, various phobias, arthritis symptoms, depression, and anxiety. Yet these conditions are just a sampling of what is possible when the *Relaxation Revolution* is employed in a clinical setting.

Chapter 7—the treatment chapter—is especially long because the list of medical conditions that can be treated by mind body strategies is long and growing longer. This section has been designed for use as a health manual. It functions as a “book within a book,” which may be consulted again and again by readers who want to put the *Relaxation Revolution* to work in treating or preventing a wide variety of health conditions.

But a word of caution is in order: In this new role as the third major treatment option, mind body treatments must always be evaluated and used with the same care that is accorded other medical treatment options. Before you try any of the treatments suggested, you should consult your personal physician and seek his or her guidance. This book is not intended to provide independent medical advice or to operate as a substitute for your personal physician.

Also, more often than not, the mind body approaches in these pages should not be used alone but should be employed *in combination* with drugs and surgery prescribed by your physician. With your doctor overseeing your entire personal health plan, including the mind body treatments you may be using, you are much more likely to be given advice that may enable you to reduce or eliminate medications or avoid surgical procedures.

The research cited in this book has been conducted at a wide variety of venues. These include the Harvard Medical School, the Mind/Body Medical Institute, the Benson-Henry Institute for Mind Body Medicine at Massachusetts General Hospital, the Beth Israel Deaconess

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Medical Center in Boston, and other leading medical centers around the world.

A further word about the Benson-Henry Institute: At the writing of this book, as the director emeritus, I am confident that the Institute (www.massgeneral.org/bhi), under the superb current leadership of Gregory Fricchione, will continue the advancement of the revolution that began with the discovery of the relaxation response in the early 1970s. The Institute is even now building upon the long history that is presented to you in these pages and, in conjunction with modern medicine, will continue to help you utilize your innate capacity to help and heal yourself as you journey through life.

Here are a few stylistic considerations to keep in mind as you read:

First, we use the term *mind body medicine* without a hyphen or slash. This choice reflects a personal preference that has developed at the Benson-Henry Institute for Mind Body Medicine. Others may prefer *mind-body* or *mind/body*, and we certainly recognize that these spellings are grammatically and stylistically acceptable.

Second, we most often use the terms *gene expression* and *gene activity* to refer with some scientific precision to the new genetic research into mind body exercises. It would not be accurate to refer to the changing of genes themselves, because such mutation does not occur with the elicitation of the relaxation response. Rather, our studies with sophisticated genetic analysis have shown that what *can* be changed is the way that genes interact or express themselves, especially in relation to a variety of medical conditions. Also, we have chosen the more familiar term *genetic* rather than *genomic*.

Third, when we use the first person singular—*I*, *me*, or *my*—the reference is to Herbert Benson. When we use the first person plural—*we*, *us*, or *our*—the reference is to the authors of this book, Herbert Benson and William Proctor, or to Herbert Benson and his research colleagues, depending on the context.

Fourth, we have consciously employed redundancy at different points, both to emphasize important concepts and to facilitate the use

Part I

***The Science of
Mind Body Healing***

The Making of a Revolution

We now have scientific proof that the mind can heal the body.

This means that *you* have the innate ability to self-heal diseases, prevent life-threatening conditions, and supplement established drug and surgical procedures with mind body techniques that can improve your physiology, biochemistry, brain functioning, and genetic activity. Furthermore, these benefits have the potential to reduce individual health costs and the broader societal expenses of health care.

How can you take advantage of these revolutionary advances in medical science? The best way to answer this question is for us to introduce you to Caroline, a 47-year-old accountant and mother of three, who started out with some skepticism about mind body medicine. After she became my patient, she soon learned the tremendous personal benefits of this burgeoning field of medical treatment.

How Caroline Conquered Her Back Pain

Caroline, an experienced squash player, considered her forehand her best shot. But as she whipped forward into the ball, she felt something

“give” in her lower back. She thought nothing of the discomfort, which subsided as she continued to play. The morning after the match, however, she awoke with lower-back pain that hardly allowed her to stand.

Caroline decided that the pains were somehow related to her habit of bending her back excessively when she was serving. Because she had experienced lower-back pains before—and thought she knew how to deal with them—she immediately reached for an over-the-counter painkiller. Sure enough, after about 20 minutes the pain began to subside. But the discomfort didn’t completely disappear, and she went to bed that night struggling to find a position that would allow her to go to sleep.

The next morning, the pain was still present. Furthermore, when she made a seemingly innocuous movement to turn on the hot water in her bathroom, an excruciating back pain immobilized her. The attack began in the same general area, in the small of her back just above her buttocks, but now seemed to spread across her entire lower back.

After suffering the next day at work and finding she couldn’t concentrate, Caroline decided to make an emergency appointment with her physician. Her doctor, an internist, immediately prescribed a strong prescription painkiller, a narcotic-like opioid. But within a couple of days of taking the medication, Caroline began to experience side effects, including constipation, nausea, and intermittent stomach pains. Although the doctor switched her prescription to another painkiller that had fewer side effects, the new drug continued to upset her digestive system with occasional cramps.

More important, the second medication didn’t help as much with the back pain, which returned in force in a day or so. The fact that Caroline was not improving provided additional stress, triggering the “fight-or-flight response.” This physiologic condition, which comes into play when a person is subjected to stress, caused her body to put out excess adrenaline and noradrenaline, secretions that actually increased her sensitivity to pain. The end result was the creation of a vicious mind body cycle of escalating pain, discomfort, and anxiety.

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Furthermore, the pain was spreading, moving down into her right leg. According to her physician-internist, this change might be a sign that she was dealing with sciatica. This tentative diagnosis, he explained, meant that the pains might involve her sciatic nerve, which runs from the lower back into the buttocks and the back of the upper leg.

Now at the end of his medical options, the internist sent Caroline to an orthopedic surgeon who specialized in diseases and health conditions related to the spine and back. The surgeon scheduled a magnetic resonance imaging examination, which required Caroline to undergo a nuclear scan of her spine in an enclosed, tubelike structure. The computerized MRI images revealed some herniation (abnormal bulging) of one of her disks and the beginnings of osteoarthritic bone buildup in her lower spine. (Osteoarthritis is a wear-and-tear form of bone and cartilage deterioration that occurs in all of us to one extent or another as we place stress on our bones and joints during the aging process.) But these findings weren't necessarily conclusive about the cause of her pain.

"A lot of people have MRIs that look like yours," the orthopedist explained. "But most aren't experiencing the kind of pains you're having. In fact, most aren't in pain at all. They may have slightly stiff lower backs, but that's about it."

He also noted that he could find no tumor or other systemic problem that might be causing the pain. So, unable to identify the source of Caroline's complaint but well aware of her distress, the orthopedist prescribed an even stronger narcotic painkiller. He also referred her to a physical therapist, who prescribed regular massages and an exercise plan. The new pain medication and the physical therapy helped enough to provide some temporary relief. But side effects from the new drug, including a tendency for Caroline to become drowsy at her desk, forced her to cut down on the dosage. As a result, by the end of the year, Caroline's back pain had returned.

Another MRI and additional diagnostic procedures suggested some deterioration in the condition of the disk in her lower spine.

and surgery. It was also an option that carried no side effects and would cost nothing, once she learned how to use it.

“I’m talking about the mind body treatment option,” I explained, introducing her to what we have come to call *mind body healing*. “But before we get into the practical techniques, let me make the science behind this quite clear.”

At this point, I briefly described the various research studies that have established beyond any doubt that mind body approaches to treatment have a direct effect on beneficial physiologic and molecular changes in the body. I particularly emphasized those studies that dealt with the application of mind body strategies in treating pain.

I also went into some detail describing the nature of the relaxation response as the biological polar opposite of the fight-or-flight response. A major reason for my explaining the scientific foundation for mind body treatments was to engage one of the most important components of this type of therapy—Caroline’s belief and expectation that the therapy could have a positive, healing effect.* Because a proper understanding of the power of belief and expectancy is so important in mind body healing, I knew that it was *essential for Caroline to be convinced* that this new concept to which I was introducing her—the use of mind body healing to control her pain—was rooted in scientific fact. Many hundreds of scientific studies have shown that an inner conviction, which the medical community has linked to the phenomenon called “the placebo effect,” can help produce healing for scores of diseases and medical complaints. The placebo effect is a mind body mechanism that may bring about healing through a person’s expectation and belief that a certain treatment will work.

To be certain that Caroline understood, I summed things up by emphasizing that effective mind body treatments must be grounded in two factors:

* See Chapters 2 through 5 for an extensive treatment of the scientific evidence, which I merely summarized for Caroline at this point.

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- Techniques designed to elicit the relaxation response, and
- a comprehensive set of inner beliefs and positive expectations.

“For you to experience relief from your back pains,” I said, “you must incorporate these two factors into your mind body healing plan.”

When it became clear that Caroline was willing to accept what I was saying about the science behind the mind body approach, I introduced her to our two-phase Benson-Henry Protocol* for mind body healing: 1) the Phase One relaxation response trigger, and 2) Phase Two visualization or mental imagery. This two-phase protocol has been summarized in the accompanying box.

The Benson-Henry Protocol

PHASE ONE: Relaxation Response Trigger

Step 1: Pick a focus word, phrase, image, or short prayer. Or focus only on your breathing during the exercise.

Step 2: Find a quiet place and sit calmly in a comfortable position.

Step 3: Close your eyes.

Step 4: Progressively relax all your muscles.

Step 5: Breathe slowly and naturally. As you exhale, repeat or picture silently your focus word or phrase, or simply focus on your breathing rhythm.

Step 6: Assume a passive attitude. When other thoughts intrude, simply think, “Oh well,” and return to your focus.

Step 7: Continue with this exercise for an average of 12 to 15 minutes.

Step 8: Practice this technique at least once daily.

* The two-phase Benson-Henry Protocol introduced here shares a common base with the Relaxation Response Resiliency Enhancement Programs that are offered by our Institute.

Option: Use an optional relaxation response exercise described in Chapter 6, page 95. If you take this option, incorporate three essential components:

- 1) *A mental focusing device to break the pattern of everyday thoughts.*
- 2) *A passive, “oh well” attitude toward distracting thoughts.*
- 3) *Sufficient time—an average of 12 to 15 consecutive minutes.*

Important: To ensure beneficial genetic effects (see Chapter 2), Phase One should be practiced daily for at least eight weeks. For the maximal genetic effect as established by our research, the exercise should be practiced for many years.

PHASE TWO: Visualization

Use mental imagery, such as picturing a peaceful scene in which you are free of your medical condition, to engage healing expectation, belief, and memory. This second phase will usually require an average of 8 to 10 minutes.

Total time for Phases One and Two will be 20 to 25 minutes per session.

Caroline Learns the Relaxation Response

I told Caroline that, in my presence during this initial session, she should engage in a “mind-opening” relaxation response exercise for about 12 to 15 minutes. “This exercise will prepare your mind to receive new positive impressions and information that can lead to healing,” I said.

I also reminded her about the molecular, metabolic, respiratory, and brain changes that would occur in her body with this phase. With these facts bolstering her conviction that this unfamiliar approach to treatment might actually work, we moved to the heart of the mind body healing procedure.

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“It’s essential for you to break the train of your everyday thoughts,” I told her. “The usual way to do this is to repeat a word, prayer, sound, phrase, or movement that’s comforting or pleasant for you. What kind of focus word do you think you’d like to choose? It can be religious or secular.”

Caroline thought a moment and replied, “*Peace*. That word should be just right for me.”

“Okay,” I said. “Now close your eyes and relax your muscles, starting with your toes and feet. Now relax your calves. Next, your thighs. Now your abdomen. Fine. Now shrug your shoulders. Roll your head and neck around.

“Now sit at ease without any movement and focus on your breathing. Breathe slowly. On each out-breath, say silently to yourself the word *peace*. Allow the word to stretch out, to extend itself to the end of your out-breath, so that the *peace* becomes *peaccss*.

“As you continue with your breathing and the repetition of your focus word, you’re going to find all sorts of thoughts coming into your head. They’re normal. They should be expected. But as you become aware of them, simply say, ‘Oh well,’ and return to the word *peace*.

“Do this for about fifteen minutes, and at the end of that time, I’ll ask you to start thinking regular thoughts. But for now, on each out-breath, *peace*. When other thoughts occur, ‘Oh well,’ and back to *peace*. Even if you are ‘oh welling’ very frequently, that’s okay.”

After about 15 minutes, I instructed Caroline to keep her eyes closed for about a minute and then open them slowly. After she opened her eyes, I asked her to describe her experience. She said she had “oh wellled it” frequently, but she had been able to return to her focus word. Also, her breathing had slowed markedly.

I responded, “Yes, and I actually counted your breathing rate. The number of your breaths decreased by three to four breaths per minute toward the end of the exercise.”

In addition, she said she experienced a sense of well-being that had been lacking when she had walked into my office. I asked her whether

at any time during that relaxation response exercise she was free of pain. Yes, she said, with some surprise, there had indeed been several very brief moments when she had felt no pain.

“Before this, I was in pain all the time,” she noted.

I explained to her that, as she practiced the relaxation response regularly, those periods of being free from pain would increase. I then instructed her to do this exercise at home every day during the next week for 12 to 15 minutes, just after she had awakened in the morning, gone to the bathroom, and showered.

“But don’t use an alarm to time yourself,” I cautioned. “That would be too jarring. Instead, place a clock or watch nearby so that you can glance at it every now and then.”

This program, I explained, would help her become comfortable with the procedures of eliciting the relaxation response and would also give her a good start in developing the habit of regularly using the technique.

“Developing the right habits is essential if you hope to benefit from a mind body treatment,” I said. “The only way to develop solid habits is to do the procedure daily for a period of three to four weeks. Day by day, and week by week, the routine will help you change the ‘wiring’ or neurological structure in your brain. Even though the process may seem a little strange at first, you’ll soon create new default responses in your mind and body. You will slip into the relaxation response more naturally, as a kind of reflex. So establishing a basic routine this next week will be essential for your improvement.”

When it was clear that she understood what was required for success, I told her to return to my office in one week. During her second visit one week later, Caroline reported that the pain was still there, but she said she did have longer periods of relief from it when she was eliciting the relaxation response. Also, once or twice on most days she experienced a glimmer of being free of pain, even when she was not consciously trying to elicit the response.

All this was quite positive and set the stage for Phase Two of the Benson-Henry Protocol: *visualization*.

These four steps also provide a broad mind body healing model, which serves as a treatment paradigm for the many health complaints described in Chapter 7 of this book. (For a summary of this model, see the box on page 18 at the end of this chapter.)

What Can Be Treated by Mind Body Healing?

Specific scientific studies show that many common diseases and health complaints can be treated directly with the mind body healing techniques described in this book—and the list is constantly expanding.

Here is an overview of the conditions that we address in Chapter 7. Scientific studies have documented that these conditions have improved through the triggering of the relaxation response and the belief and expectation that healing is possible. Throughout, we include scientific references to substantiate the power of the recommended mind body treatment.

- Angina pectoris (chest pains caused by heart disease)
- Anxiety
- Depression
- Hypertension (high blood pressure)
- Infertility
- Insomnia
- Menopausal, perimenopausal, and breast cancer hot flashes
- Nausea
- Pain—general
- Pain—variations
 - * Abdominal
 - * Back
 - * Head
 - * Joints and rheumatoid arthritis
 - * Knee

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- * Neck and shoulder
- * Postoperative
- Parkinson's disease
- Phobias
- Premature aging
- Premature ventricular contractions (extra or skipped heartbeats) and palpitations (heart pounding)
- Premenstrual syndrome (PMS)

In addition to these diseases and symptoms, clinical and research evidence mounts that mind body approaches can be effective in treating many other complaints. These include allergic skin reactions, bronchial asthma, congestive heart failure, constipation, cough, diabetes mellitus, dizziness, drowsiness, duodenal ulcers, fatigue, herpes simplex (cold sores), hostility and anger, immune problems, impotency, obesity, postoperative swelling, post-traumatic stress disorder (PTSD), and tinnitus (ringing in the ears).³

In fact, any condition that is caused or exacerbated by stress can be helped by a well-designed mind body approach. Furthermore, because all health conditions have some stress component, it is no overstatement to say that *virtually every single health problem and disease* can be improved with a mind body approach.

Why is it that all diseases have a stress component? First of all, just having a disease is stressful in itself. An important stressor in all diseases is the anxiety, depression, or anger that usually accompanies the disease. In addition, stress may, in whole or in part, be the cause of a particular disease. For example, studies on heart attacks and high blood pressure have shown that these conditions may result directly from stress.

Unfortunately, even as the list of conditions treatable by mind body healing continues to expand, many physicians and scientists persist in ignoring the research evidence that has clearly established the power of mind body medicine. They actually appear to have become *blinded* to the possibilities of such treatments.

Three factors may contribute to this blindness: the lack of profit to be made from mind body approaches, ignorance of the scientific proof, and the tendency to discount mind body techniques as “alternative medicine.” But there is another, more basic reason that the mind body approach has been rejected—a reason that is rooted in Western intellectual history and that can be traced back to an error foisted on us by one of the great thinkers of the 17th century.

Bridging the Cartesian Divide

This subheading—“Bridging the Cartesian Divide”—may sound overly philosophical or eggheaded. But, in fact, we in the Western “scientific” medical tradition are locked in the grip of a long-standing philosophical bias that has upset an important balance in the health-care professions.

Modern medical science has long accepted the erroneous assumption—attributed to the “Cartesianism” that arose from the mind body separation of 17th-century French philosopher René Descartes—that the mind *cannot* directly improve bodily health. Instead, physicians and scientists have come to regard the body as an exquisite machine that can be tuned up, repaired, and overhauled with drugs, surgery, or other physical tools.

Their views have been reinforced over the years by the spectacular advances in modern medical science, such as the discovery of penicillin and other “wonder” drugs. But leaders of the medical establishment have often discounted evidence that the mind is also essential for complete treatment and prevention of disease. Researchers, medical journals, and practicing physicians have typically ignored or rejected mind body treatments as “alternative” or “not scientific” or “all in your head.”

But now a new era has dawned, as various research teams—including those we have mobilized at Massachusetts General Hospital, the Beth Israel Deaconess Medical Center, and the Harvard Medical School—have used the scientific method to disprove these long-stand-

ing misconceptions. For example, our own current research at Harvard, published in July 2008 in the peer-reviewed online journal of the Public Library of Science, *PLoS ONE*,⁴ shows conclusively that *the mind can indeed influence the body down to the genetic level*.^{*} Your mind can actually change the way that your body functions, for good or ill. This finding effectively does away with Descartes' mind body separation.

Our recent genetics research provides an excellent springboard to launch an exciting exploration of how the science of mind body healing—the third great option for medical treatment—is resuming its rightful, equal place next to prescription drugs and surgery. In our research into the power of mind body healing, it would be difficult to find a more dramatic example that disproves the Cartesian Divide than the discovery that you can consciously “switch on” healthful genetic expression. You may not be able to change your genes per se, but you *can* use your mind to change your genetic activity. And with that altered activity, you can enhance your potential for healing and good health.

Mind and body are no longer strangers that pass in the night. Instead, mind and body have become part of a scientific and medical whole, a complete approach to healing and maximal well-being, which physicians may ignore at the peril of their patients' health. We conclude this introduction with the accompanying summary of our Mind Body Healing Model, which will be applied to the treatment of specific health conditions in Chapter 7.

The Mind Body Healing Model

Step 1: Identify your symptoms and specific medical condition. Your physician helps you interpret specific symptoms and diagnostic results.

Step 2: Evaluate standard medical treatments for your condition. You and your physician explore the usual treatment

* Details are included in the following chapter.

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options, including drugs and surgery. Learn about possible side effects and also the likelihood of improvement or cure.

Step 3: Evaluate the scientific support for mind body healing.

You and your physician evaluate medical research findings into how mind body treatments have or have not worked for your health problem.

Step 4: Apply the two-phase Benson-Henry Protocol. If you and your physician determine that a mind body approach may relieve your health condition, proceed with the two-phase mind body healing treatment (see the box on page 9):

- * ***Phase One—The Relaxation Response Trigger:*** Elicit the relaxation response, which will produce proven beneficial changes in genetic activity and stress-related physiologic responses, at least once daily for 12 to 15 minutes.
- * ***Phase Two—Visualization:*** For 8 to 10 minutes, use the visualization to engage healing belief and expectation and to take advantage of “remembered wellness.” Practice the visualization immediately after you elicit the relaxation response—or the time when your mind is most “open” and malleable to new learning.

the health-giving power of belief and expectation, and such arcane notions as “Cartesian dualism” was nonexistent.

Those in the second group of 19 in our study were considerably more expert in the subtleties of mind body medicine. They averaged 9.4 years of practice with techniques that elicited the relaxation response—such as various types of meditation, yoga, or repetitive prayer. The most experienced in this group had been employing these techniques for 20 years.

We knew from our previous scientific studies that those practicing mind body techniques tended to experience lower blood pressure, calmer brain activity, healthful emissions of nitric oxide in the body’s cells, and other physical and emotional benefits. But our objective in this study was even more ambitious than in those of the past. We wanted to determine whether regular practice of the relaxation response might be associated with any changes in a person’s “gene expression”—the activity of genes in influencing health or producing other changes in the human body. We wanted to identify which, if any, of the body’s 54,000 genes were “turned on” or “turned off” by the relaxation response.

But how might we go about examining such genetic activity? The answer to this question lay in the use of some highly sophisticated gene-analyzing technology that is changing the face of medical science.

Taking a Closer Look at Adam’s Genes

Specifically, we employed the latest “microarray analysis” technology to check the activity of *all* of the 54,000 genes in Adam and in the other participants in the experiment. This technology represents a well-established and reliable method of assessing “global gene expression differences.”² The procedure that we used unfolded this way:

Blood was drawn from all the participants, including Adam, through catheters placed in their arms. Half of these participants were in the 19-member group of highly experienced mind body practitioners, and half were in Adam’s 19-member inexperienced group. Next, the blood samples were placed in a centrifuge, a desk-sized device that spun the blood around in tubes until the red and white

blood cells were separated from the plasma. As the heavier blood cells of each participant were spun down to the bottom of the tubes, we harvested the red and also the white blood cells, which contained nuclei with genetic material—such as genes, DNA, and RNA. We then froze all the cells at minus 80 degrees F for later analysis.

Each of the white blood cell nuclei in Adam and in the other participants contained 23 pairs of chromosomes, which carried the genetic information of their bodies. These genes and their activity determine who they—and you—are physically and emotionally as an individual, and also the state of the person's health and his or her likelihood of developing various diseases. Every function of you—since you were born and until you die—is dependent upon your genes and their expression.

Later, we defrosted the genetic materials, placed them on gene chips (specially made glass wafers), and then inserted them into a larger desk-sized device, a microarray scanner and analyzer. This scanner, using sophisticated software, was able to isolate *all 54,000* of Adam's genes and also identify which genes were active or “expressed.”

Our Discovery: High-Stress Gene Activity

Through this initial study, we found some dramatic differences between the group of experienced mind body practitioners and Adam's inexperienced group. Specifically, 2,209 genes in the experienced practitioners were being expressed differently than the same genes in the inexperienced participants. The probability of this result being due to chance was less than five in 100.

The genes that acted differently have been associated with stress-related medical problems, including unhealthful regulation of immune responses; various forms of inflammation; premature aging, including thinning of the cortex of the brain; and other health conditions that may involve oxidative stress. Oxidative stress—which involves damage to physical tissues by the release of destructive oxygen molecules (“free radicals”)—may be involved in various cardiovascular problems, such as heart disease, and may also be implicated in cancers. In such cases, employing mind body healing could in effect

serve as a highly effective antioxidant treatment to lower cardiovascular and other risks. Other studies have confirmed that destructive genetic activity from stress-related genes is involved in such conditions as post-traumatic stress disorder.³

We continued our investigation by posing these questions:

“What would happen if the participants in Adam’s group—those with no experience with the relaxation response—were instructed in appropriate mind body techniques and then applied them in their daily lives for a few weeks? In that short time period, would they show any of the same positive, anti-stress gene-expression changes that the highly experienced mind body practitioners had shown?”

Lessons in Mind Body Healing

To find the answers, we set aside eight weeks to teach Adam and his group how to enter the relaxation response state. The teaching sessions with our experts at the Institute included an introductory session followed by seven once-a-week review sessions.

During the introductory session, we gave Adam and his group an educational overview of the stress response and the relaxation response and instructions on how to elicit the relaxation response. They were also led through a 20-minute guided relaxation response experience, using our Institute’s “Olivia” audio disk, a 20-minute CD.* We have employed this disk at the Institute for more than 15 years in our scientific research that has required subjects to elicit the relaxation response.⁴ Adam and the others were told to listen to the CD at home for 20 minutes each day for eight weeks.

On the CD, Adam and his cohorts were introduced to various mind body techniques that are known to trigger the anti-stress relaxation response. These included deep, regular (diaphragmatic) breathing; mental “body scans,” involving a focus on relaxing different parts of

* To order the Olivia CD, which is titled *Bring Relaxation to Your Life*, by Olivia Hoblitzelle, please visit our website, www.massgeneral.org/bhi, and click on the link to the “Online Store.”

the body; the use of repetitive focus-phrases, prayers, and mantras; and “mindfulness meditation,” which involved a gentle, meditative consideration of any thoughts that drift into the mind. Adam, like most of our other participants, didn’t try anything tricky or advanced; he just followed the simple leading of the voice on the disk for 20 minutes per day.

Becoming Immersed in Olivia’s Voice

Like the others listening to the CD, Adam immediately felt himself being drawn into a calm, relaxed inner world by the soothing woman’s voice on the disk. She first asked him to focus on regular breathing—while letting go of his inner tensions on each out-breath. She also suggested that with his in-breaths he might sense coolness around his nose, while on the out-breaths there would likely be warmth. The idea behind such suggestions was to help him to focus exclusively on the process of breathing and to avoid the interference of outside thoughts and distractions.

The voice then led Adam through a mental “scan” of his body, from feet, to calves, to abdomen, to head and face. He was asked to allow these body parts to “soften” and release any tensions. Next, Adam was told to focus on releasing any remaining tension anywhere in his body as a whole.

Toward the end of the 20-minute session, the voice asked Adam to try counting 10 breaths backward—from 10, to nine, to eight, to seven, and so on. As he counted, he was told to imagine himself on each out-breath letting go of any residual inner anxieties or worries. After this, he was instructed to murmur two soothing sounds, one on each in-breath and one on each out-breath. At this point, he was reminded that whenever his mind began to wander, he should try labeling the distracting thoughts, perhaps just by saying to himself, “Thinking, thinking,” or by applying some more specific label to the intruding thoughts. As he did this, he was told, the distracting thoughts would begin to “soften” and finally “dissolve” away.

Expert Reviews

During the weekly training sessions that were scheduled after Adam and the other participants began to practice the techniques daily at

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home, an expert from our clinic reviewed a home log (see the model form in Fig. 1) that the trainees kept to describe their daily experiences with their mind body exercises. Adam and the others were encouraged to write down descriptions such as these:

“I’m having too many outside thoughts.”

“I’m handling distractions much better by giving them labels, such as ‘noisy child,’ ‘barking dog,’ and ‘uncomfortable clothing.’”

“I felt like I was floating.”

“It took me over ten minutes to settle down today.”

“I become more relaxed when I’m counting backward than I do when I’m repeating a phrase or sound.”

Figure 1
Relaxation Response Training Diary

ID NUMBER: _____

Elicitation of the Relaxation Response		
		DESCRIPTION OF RELAXATION RESPONSE EXPERIENCE
Date:	Day 1:	
Date:	Day 2:	
Date:	Day 3:	
Date:	Day 4:	
Date:	Day 5:	
Date:	Day 6:	
Date:	Day 7:	
COMMENTS:		

one in 10 billion. It was virtually *impossible* that the similarities in gene activity of the experienced practitioners' group and Adam's group occurred by chance.

Possible Health Implications of Switching Certain Genes On or Off

Further gene analysis revealed something even more important for Adam's group (who now knew how to elicit the relaxation response) and for the group consisting of long-term mind body practitioners: *Gene signatures that were switched on or off in both groups by the relaxation response were associated through past research with clear health benefits.*

As indicated earlier, these benefits included more healthful regulation of the immune system, lower psychosocial stress levels, less destructive oxidative stress, and a reduced tendency toward premature aging. Also, the gene activity we observed is associated with healthful gene activity that is the opposite of that found in many cardiovascular diseases and other conditions.

Finally, after analyzing and comparing the gene expression in Adam's minimally trained group with that in the extensively trained group, which averaged 9.4 years of relaxation response practice, we saw it was likely that mind body practitioners could expect a significant expansion of their mind body healing powers over time. In this particular study, the more experienced group with more than nine years of practice enjoyed an even higher level of healthful, anti-stress gene activity than did Adam's group after their eight weeks of training. Clearly, the mind body training had worked well in enabling Adam's group to increase the stress-lowering power of their genes. But Adam and his colleagues could look forward to significantly more improvement if they continued to practice mind body healing in the future.

This basic genetic breakthrough is by no means the end of our research in this field. Investigations into the genetic nuances of mind body

healing continue apace; we are just at the beginning of finding ways that the relaxation response can achieve healthful, anti-stress gene expression. For example, research has recently emerged that enables us to link relaxation response treatments to the genetic characteristics of certain types of cancer (see Chapter 8, page 204).⁶ Given our progress, we are highly optimistic about the prospect of using mind body approaches to treat an ever-widening variety of medical conditions.

This groundbreaking 2008 study—which we have presented by highlighting healthful changes in Adam and the expression of his genes—represents a major milestone in the mind body research that we at the Institute and other scientists have pursued over the past 40 years. When I started work in this field in the 1960s, I found myself stepping into a medical arena with the most ancient of roots yet with little acceptance or understanding in the mainstream medical community. Gradually, study after mind body study, carried out with the most careful scientific protocols, produced incontrovertible evidence that the mind can indeed influence—and heal—the body.

The better you understand how these mind body clinical studies have improved hypertension, chronic pain, depression, angina pectoris, and many other health conditions and complaints, the more clearly you will see how these findings can be applied to treat *your* medical problems. But this body of research, along with the revolutionary implications the research findings have uncovered for your own health, is a story itself. That story begins with the fall and subsequent rise of the healing mind.

The Fall and Rise of the Healing Mind

Rachel, an athletic seven-year-old who had become deeply involved in team sports, came down with what seemed to be a severe cold. Soon, she was suffering from a fever of 102 to 103 degrees F and a persistent cough.

Her parents feared that the symptoms meant bacterial pneumonia. Rachel had developed pneumonia once before, and the symptoms had been identical.

The parents also knew the routine. Rachel's pediatrician proceeded with several diagnostic procedures, which included taking a sputum culture from coughed-up material, checking her breathing and lungs with a stethoscope, and ordering a chest X-ray. After diagnosing the bacterial pneumonia, the doctor placed Rachel on an antibiotic regimen. Within several days she showed marked improvement, and by the second week she was back to normal.

Given Rachel's history of pneumonia, it may be that she had an innate genetic propensity to develop this disease. But whatever the underlying cause, the antibiotics had cleared up the infection quickly. Furthermore, her recovery in no way depended on anything that was going on in her mind. If Rachel had lived in the early 20th century

rather than in the early 21st century, she would most likely have died from one of these bouts with pneumonia. She and millions of patients have been saved and given a long life because of the discovery of antibiotics—and other “miracles” of modern science.

But these miracles have given rise to a peculiar dichotomy: unparalleled progress in one type of healing, accompanied by a dramatic decline in another. Surgical techniques, diagnostic procedures, and powerful, effective drugs have almost totally supplanted the mind body approach to treatment. Our practicing physicians, medical researchers, medical schools, and medical publications have virtually abandoned the highly effective mind body strategies that center on utilizing belief, expectation, and powerful memories of good health. The rejected approaches of the past include meditation, prayer, the healer-patient relationship, and various rituals and traditions that promoted confidence in recovery.

How did this shift from a strong reliance on mind body healing to a near-exclusive focus on physical or mechanical means of healing occur? The answer to this question is complex, historically and scientifically.

The Roots of Mind Body Medicine

Up until the mid-19th century, folk medicines and the self-healing powers of the human body dominated the medical landscape—along with a powerful and pervasive reliance on prayer and religious faith. Some folk medicines, including herbs and other traditional remedies, actually had medicinal properties that had been discovered through trial and error over the centuries. At the same time, many of these “remedies,” such as bloodletting, either did not work or actually caused harm.

Those folk remedies that did work typically gained their power not from innate medicinal properties but from the mind: the belief of the patient and, in many cases, the belief of the healer that they would be effective. That is, patients might get well because they were convinced