decompression babies*

by David M. Rorvik
with O.S. Heyns, D.Sc.
foreword by Lawrence Lundgren, M.D.

A New Medical Breakthrough for:
- Easier, safer pregnancy
- Shorter, less painful labor
- Healthier, brighter children

*CAUTION: After reading this book you may never want to have another baby without benefit of decompression

$5.95

Here is a technique that has reproducible results. If the mother's blood pressure is high during pregnancy, you can consistently bring it down; if the baby isn't growing properly in the womb, you can get it to grow in almost every case; if the baby is distressed in labor and thus endangered, you can reverse the distress and dispel the danger; when you use decompression prophylactically, you don't get any distress; when you use it through pregnancy, you don't get babies with cerebral palsy. These benefits are all highly reproducible and statistically provable. Ultimately, I believe that it will be scientifically demonstrated that the intellectual quality of the baby is also consistently improved by decompression. Most important at the present time, however, is the fact that women with long histories of fetal wastage (miscarriage) give birth to live healthy babies for the first time as a direct result of abdominal decompression.

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This book is joyously dedicated to the more than ten thousand decompression babies already among us—and to the millions more still to come—in confidence that they will make our world a better place in which to live.

And to Dr. O. S. Heyns, who fathered decompression and nurtured it through its infancy.

With special thanks to Dr. Donald Lithgow and his family for doing so much to make the author's stay in South Africa both pleasant and productive.

Here is a technique that has reproducible results. If the mother's blood pressure is high during pregnancy, you can consistently bring it down; if the baby isn't growing properly in the womb, you can get it to grow in almost every case; if the baby is distressed in labor and thus endangered, you can reverse the distress and dispel the danger; when you use decompression prophylactically, you don't get any distress: when you use it through pregnancy, you don't get babies with cerebral palsy. These benefits are all highly reproducible and statistically provable. Ultimately, I believe that it will be scientifically demonstrated that the intellectual quality of the baby is also consistently improved by decompression. Most important at the present time, however, is the fact that women with long histories of fetal wastage [miscarriage] give birth to live, healthy babies for the first time as a direct result of abdominal decompression. In this domain no other treatment can even remotely compare with it. And I believe that this, more than anything else, will help put decompression in its rightful, prized place in the obstetrical armamentarium of today.

J. A. BLECHER, M.D., *Johannesburg*

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The Dawn of Decompression In the United States

A Foreword by LAWRENCE LUNDGREN, M.D.

I take pride in writing this foreword, as a small token of my appreciation to a great and gentle man, Dr. O. S. Heyns, one of the unsung heroes of modern obstetric care. Although he has not received the honor he deserves at this time, I know his work and that of others following in his footsteps will ultimately be accepted as one of the important forward steps in medicine.

Controversy has surrounded the claims of abdominal decompression, but objections to it do not have much basis in fact. Those of us who are proponents of abdominal decompression are capable, honest men, who have endeavored to give our patients the best in maternity care. We know that decompression shortens the first stage of labor in a very high percentage of cases, and that many patients have marked relief from pain. We have also been able to treat patients with toxemia of

pregnancy and bring the patient's high blood pressure back to normal levels.

To my mind, however, the most important results are those affecting the decrease in the flow of oxygen to the baby during labor. This lack of oxygen, called hypoxia, can, if severe enough, cause irreparable damage to the infant's brain, resulting in fetal mortality, brain dysfunction, learning disability, or outright spasticity or cerebral palsy. Most physicians agree that hypoxia in labor is responsible in great degree for these difficulties, and yet, when a technique is offered that may prevent hypoxia in labor, very few physicians in the United States (at least until recently) have seemed interested.

In the United States decompression stands now where the Lamaze technique of psychoprophylaxis in childbirth stood about ten years ago. Obstetricians then were adamant in their resistance to this "fad" of women assisting in their own labor and having their husbands in the labor and delivery suite. Indeed, as recently as two years ago in Houston, which purports to be a forward-looking medical center, only one suburban hospital allowed the mother to practice the technique with her husband in the labor room. This year there are at least *six* hospitals in Houston alone that provide facilities for those who have completed the Lamaze course. But, though changes are occurring, we still need to insist on better care for women in pregnancy and labor in order

to reduce the shocking fetal morbidity that the statistics still reveal in the United States today.

A great deal of the controversy surrounding abdominal decompression followed the publication of Dr. Heyns's medical monograph on abdominal decompression in 1963; subsequently, sensationalized distortions of that work appeared in several lay magazines around the world. Some of the distorted claims for decompression, I'm afraid, turned off many American obstetricians. Knowing little, if anything, about the technique, they were adverse to the point of obstinacy when patients who had read the magazine articles came in demanding this new panacea for painless childbirth with the added serendipitous benefit of greatly enhanced I.Q. for their babies.

I began working with decompression in 1963, and by 1971, felt I had developed enough expertise and had followed a sufficient number of patients to present a small scientific exhibit on decompression at the national meeting of the American Academy of General Practice in Dallas. Imagine my surprise when the exhibit was accepted with much critical success, followed by articles on my work in the local press, as well as in *Reader's Digest* and *Family Circle.* Later, after this first effort, the medical editor of *The Obstetric and Gynecological Encyclopedia* and *Davis' Gynecology and Obstetrics* asked me to submit a paper, which was subsequently published in Chapter 4A, Volume II, in 1968.

Since that time I have presented papers and scientific exhibits in Dallas, San Antonio, Austin, Houston, New York City, San Francisco, and Chicago. At each meeting, I'm happy to report, there has been increased interest in and acceptance of the technique. But decompression must have far more exposure than I alone can give it. Funding is desperately needed to complete the studies that will scientifically establish the full benefits of decompression.

It is interesting that much of our recent knowledge concerning hypoxia during the birth process has been provided by people not in the obstetric field. Dr. R. Caldeyro-Barcia is a pathophysiologist. Dr. William F. Windle, whose Lasker award-winning work on asphyxiated monkeys is already a classic, is a Ph.D. and Sc.D. and also could be classified as a physiologist.

Caldeyro-Barcia has demonstrated that uterine contractions can have marked effects on blood flow through the uterus, effects that we believe can be overcome with decompression. In one study, it was found that blood flow through the uterus and placenta was completely blocked for a brief time during a contraction. It is obvious that this type of blockage leads to oxygen deprivation in the fetus; if this should continue over even a brief span of time, fetal morbidity must result, and brain damage, including the most severe type of cerebral palsy, may occur.

Experimental evidence demonstrates that abdominal

decompression *lowers* the intra-abdominal, intra-uterine, and intervillous placental pressure. This leads to less resistance to blood flow in the organs in the low-pressure zone and also improves the maternal-fetal exchange. With decompression, we can reverse the stresses on the maternal-fetal exchange and thereby eliminate the acute fetal distress of hypoxia with its fearful end results.

Caldeyro-Barcia is noted also for work that relates hypoxia during labor to abnormalities in auditory functions in infancy. He related this work to the animal experiments of Windle, in which unborn Rhesus monkeys were asphyxiated for different periods of time and then studied for brain damage. Windle and Caldeyro-Barcia come to the conclusion that both infants and monkeys who suffer acute fetal distress (oxygen deprivation) during labor may *seem* to recover following resuscitation. But even in the cases of apparent recovery the monkey brains were found to be full of permanent lesions. Thus one can assume that some of the human infants are likely to be affected in subtle ways that are too finite for our standard neurological tests at six months, one year, two years; yet they are so affected that they will grow up to be mentally retarded.

Towbin, a Harvard psychiatrist, demonstrates conclusively, by retrospective studies of the brains of cerebral-palsied children and adults, that these brains show the same kind of damage as the monkey brains of Windle. He draws the same conclusions that Heyns drew

fifteen years ago. It is almost intolerable that Heyns was so effectively ignored; surely we can no longer tolerate the frightening situation of at least 500,000 brain-damaged infants born every year in the United States alone.

Abdominal decompression can reverse these terrible statistics. The proponents of decompression will continue their investigations until the subjective evidence is so overpowering that there can be no questions as to its worth.

There have been further difficulties in acceptance of decompression in the United States. For unknown reasons, which I can only assume were valid, the Committee on Scientific Exhibits for the American College of Obstetricians and Gynecologists refused my request to enter a scientific exhibit on decompression at the annual meeting for three years—1968, 1969, and 1970. I continued my work, nonetheless, constantly adding case histories to my study. During this time, others were discussing the work of Windle, Caldeyro-Barcia, and Towbin, and the English and Czech studies; whatever happened, my exhibit was finally accepted for the annual meeting in San Francisco in 1971, and to my great delight it won the First Prize Award. Above all else, this recognition at last legitimized abdominal decompression in the United States. Now, with money and more work we can make it available to women all over the United States.

So far in this country we have delivered more than 1000 babies using abdominal decompression. We have not had any maternal morbidity from the use of the technique and have not lost a single full-term baby. In general, we provide normal care for normal patients, only a little more of it, and special care for those with special problems. During the prenatal visits we talk about decompression, and the husband and wife see a fifteen-minute TV tape or twenty-minute movie, showing several of my patients using abdominal decompression prenatally and in labor. These are of great benefit in demonstrating the technique and in dramatizing the ease with which a woman can experience labor. The expectant mother sees several women in active labor, resting quietly in bed, lipstick fresh, hair combed, bed clothes smooth; they are in complete control of the situation, talking to their husbands, nurses, or the obstetrician. And when they are questioned about pain during labor contractions, they say, "No, I can feel the contractions, but when I push the button I don't feel any pain."

During the course of the tape or movie, I time the labor; we mention that active labor started, say, at 1:20 P.M., with 3 cm. dilatation, it is now 2:10 P.M., with 7–8 cm. dilatation, and delivery will probably be within forty-five minutes. The prenatal patient watching the film relaxes and says, "That's the only way to go."

The women practice with the decompression bubble

about ten minutes before they take it home, just to learn how to put it on and how to adjust the amount of decompression. There is no learning process. One just puts it on the abdomen and then pushes the button. They use it at home during the last three months. This is the period when the pressure of the growing fetus, increased pressure of the amniotic fluid, and the increasing contractility of the uterine muscles all lead to a relative reduction in maternal-fetal exchange of oxygen. At the same time, the fetal brain is developing at an accelerated rate. If we can increase the oxygen flow, and we can through decompression, then we are increasing our chances for a baby with the best prospects for a long and healthy life.

In conclusion, let me point out that recent published reports by reputable clinicians around the world agree that decompression *does* improve fetal oxygenation in pregnancy, *does* prevent fetal hypoxia in labor, *does* shorten labor and reduce pain in a great percentage of cases, and *does* reduce perinatal mortality and morbidity, with delivery of alert infants with very high Apgar scores (which reflect overall health).

We *cannot* be satisfied with the fetal morbidity and mortality statistics which now exist in the United States. Abdominal decompression proponents realize that many more investigators are needed; we welcome all the help we can get. We know that by the use of monitoring and abdominal decompression, fetal mortality and morbidity

can be reduced markedly. We invite our peers to give abdominal decompression a fair test. We are confident that they will become as interested, as involved, and as rewarded as we have been.

A CASE HISTORY:
The "Wonder" Baby

Caroline told Bob the news as soon as he got home from work that afternoon.

"I'm pregnant again," she said, noting that Bob's reaction was guarded. "This time we're going to make it; the doctors are going to try something new," she recalls saying.

"Bob just patted me on the back. I knew he didn't believe it; I guess I didn't either. He was thirty-seven and I was nearly forty, and we'd already tried four times. Four pregnancies and four miscarriages. The last one had nearly killed me."

Caroline's pregnancies always started out normally. Everything would appear to be going beautifully right up through the sixth month of pregnancy when, abruptly, her blood pressure would zoom upward; her hands, legs, and even her face would begin to swell with retained fluids. Headaches, very rapid weight gain, nau-

sea, and visual disturbances usually followed. Caroline was the consistent victim of severe toxemia of pregnancy, a mysterious disease process that results in many thousands of miscarriages each year and sometimes, even more tragically, in live babies who are physically deformed and mentally retarded. Occasionally, toxemia becomes so severe that the mother lapses into convulsions, coma and, ultimately, death.

Despite the fact that toxemia is not at all uncommon, it is still "a disease of theories." Some think of it as a sort of blood poisoning, though it has nothing to do with infection. What seems to happen is that the circulation between the mother and the baby in her womb becomes impaired, limiting the amounts of oxygen, blood, and other nutriments that feed the baby, and at the same time limiting and "backing up" the outflow of wastes from the baby. A substance called fibrin, a clotting compound that seals up cuts, is produced in great quantities during toxemia, and many researchers believe it is this substance that "clogs up the works."

After losing the fourth baby, Caroline remembers, "We waited four years before trying again. It seemed like our last chance and not a very good one at that. Still, I felt I'd given my body a rest and that it just might work for me this time. Anyway, I let it happen. My doctor was appalled, angry. He lectured me for half an hour, called me a 'silly girl.' After threatening to drop my case, he ordered me back to bed again for the

long wait. At the same time he said he was going to look into a treatment one of his colleagues had started using, something called 'abdominal decompression.' He said he didn't know much about it, and it was clear he wasn't holding out much hope for it—or for me either.

"When I came back two weeks later he had calmed down a bit. He seemed almost hopeful, in fact. 'I've done some checking,' he said, 'and it's possible that decompression may help us keep your toxemia from getting out of hand this time; there's a chance it could prevent it entirely.' I was stunned. Decompression. Almost a sinister-sounding word. What in the world was it? I hadn't even dared to ask on the previous visit. Now I had to know everything.

"The doctor explained that it was a series of treatments that I would begin immediately. It seemed that I was to sit in some sort of special chair with a large dome over my abdomen, a sort of small decompression chamber that would reduce the pressure over and inside my abdomen and even within my uterus. The doctor spoke of a 'negative pressure zone' in the abdominal area that would allow more blood to flow into the uterus and hopefully to the baby itself. This increased flow of blood and oxygen, he added, would keep the vessels and the placenta flushed out so that fibrin couldn't accumulate and gradually shut off the lifelines to my baby.

"Though I didn't understand everything the doctor said, I got the general outline. It all seemed so simple:

reduce the pressure *in* the abdomen by sucking out the air *over* it; then blood from zones of greater pressure (the areas not covered by the dome), would just naturally, by the basic laws of physics, flow into the lower pressure zones in the abdomen and the uterus and across the placenta to the baby. Why hadn't someone thought of this before, I demanded. My doctor gave me one of those ignorance-is-bliss looks and told me I would spend two or three hours a day in decompression—*every* day up until delivery. The very mention of the word 'delivery' thrilled me. I was more than eager to get started.

"The doctor gave me the address of a decompression clinic in the city and told me to be there the next day at a certain hour. I was met there by a smiling woman who had already talked to my doctor and knew my history. As she took down routine information we chatted. I asked her if all the other women in the waiting room suffered from toxemia, too. She said, 'No; we're getting more toxemia cases all the time, but most of the girls who use decompression have routine pregnancies.' Then why in the world did they need decompression?

"The woman laughed and said, 'Once you've had it you won't want to be without it, toxemia or no toxemia.' She explained that the treatments eased many of the everyday discomforts of pregnancy, such as backache and, more important, generally shortened the time a woman was in labor by half or more. 'There's far less pain during delivery, too,' she added. 'Most of the girls

don't take any anesthesia.' Again I was stunned. Here was a procedure that was not only going to enable me to have a baby (at this point, of course, I wasn't absolutely convinced of that) but would also make having that baby far easier than I ever dreamed possible.

"But this wasn't all I was asked to believe. The woman was talking about some of the mothers who kept coming back for the treatments with each new pregnancy, claiming that their decompression babies were healthier and brighter than their other babies at the same ages. 'The doctors often comment on this, too,' she said. 'They're always surprised at how healthy these babies are and how quickly they develop physically and mentally.' I was hopeful about having the baby but, despite what the woman said, I was skeptical about giving birth to an exceptionally bright child. I'd be satisfied with just about anything.

"After I learned how to use the decompression apparatus, I was supplied with my own lightweight decompression unit to take home. The unit consisted of a suit, a light collapsible chair, a dome, a pressure gauge, and a suction unit that looked like an ordinary vacuum cleaner. It was simple to set up and use. Sometimes I spent as much as four hours a day in decompression, though I probably could have got by, even with my history of toxemia, with as little as two and a half hours a day. Women without complications generally only do it half an hour a day. One reason I did it so much was

that it relaxed me. It was better than a tranquilizer. It relaxed all of my muscles and always got rid of any aches and pains in my back.

"As the weeks went by and there was no sign of any toxemia I began to get more and more excited. I guess that's another reason I began spending more time in decompression. It was the increasing motivation. Every time I felt the baby kick inside me it was a new thrill. And I noticed that after each decompression session the baby would become extremely active. The doctor said that was probably because it was getting more oxygen.

"By thirty weeks, I was really worked up. So was Bob. We *knew* it was going to work. We even went out and bought baby clothes—for a boy, we were that certain. As the time for delivery approached, I had to decide whether I would use decompression in labor or anesthesia. You can use both, but generally there is no need. It was no contest; I wanted decompression with no anesthesia. I wanted to experience the whole thing, and I wanted my baby to come into the world bright and sassy, without any sort of drug hangover.

"When the time finally came I knew exactly what to do. I called Bob, and he took both me and my decompression suit to the hospital. During the first stage of labor, when the baby gets ready to start its journey out of the womb, I sat in the decompression suit with Bob at my side. Every time I felt a labor contraction, I sim-

ply pushed the lever forward and decompressed until the pain vanished. What I was doing was lifting the abdominal muscles up off the uterus so that there was no restraint. It's amazing how well and how quickly this dispelled the pain. As the contractions became stronger I simply held the lever forward longer, building to higher negative pressures. Sometimes the contractions would catch me off guard and there would be a sharp pain or two before I could decompress, but I never experienced any pain that was difficult to handle. It was all so easy that Bob and I talked right along about a house-remodeling plan to accommodate our growing family!

"After only three hours in labor, the baby started out, and the doctor unzipped the suit and delivered it right there where I was sitting. It was the boy we had hoped for. We named him Robert, Jr. the second he let out his first squall. He was seven and a half pounds, pink and healthy.

"Naturally, both Bob and I began to watch little Robbie for signs that he really was a 'wonder' baby. We were delighted when he began to do things that all the books we read said he wouldn't be doing at his age. At ten days he purposefully followed objects with his eyes, and at six weeks he was already smiling at us, something most babies don't do until they're nearly three months old. At seven months he was sitting up by himself, playing with objects and mouthing his first understandable

words ('da-da' and 'ma-ma,' predictably enough). At ten months he could walk with a little help from me. At eleven months he could walk unaided and had a vocabulary of twelve words, compared with the normal five words at eighteen months. Now he's just turned five, and his I.Q. tests out at 150, which is considerably higher than either Bob's or mine. The doctors caution us against attributing too much of this to decompression, but we're happy to give it most of the credit."

Author's note: Caroline is a citizen of South Africa, where decompression was discovered and is widely used today.

I

Decompression and You: A First Look

Perhaps the best way to introduce you to decompression, in a general way, is to let you read the following material from an excellent pamphlet called *The Easier Way to Have a Healthier Baby*, prepared by the Decompression Clinic in Johannesburg, South Africa. Every woman who comes to the clinic for decompression, and there have been many thousands of them in recent years, is required to read this before beginning her treatments.

"What decompression does," the pamphlet states, "is to ease the atmospheric pressure on the external wall of the abdomen so that the wall can more easily stretch to accommodate the growing baby."

The pamphlet continues:

When decompression is applied during the actual birth of the baby, you can easily see that the relaxation of the atmospheric load on the stomach wall (which is about half a ton) makes it much easier for the baby to be propelled by

muscular contractions out of the uterus and along the birth canal. This easing of the process of birth makes it go much more quickly. Normally the first stage of labor, in which the baby is preparing to leave the uterus, is quite protracted, in a first birth on average about fourteen hours, and a very uncomfortable fourteen hours. With decompression, the time is usually halved, and it is quite common for the stage to take only two to three hours.

It is also easy to understand that the internal relaxation, which results from the relieving of the external load, enables the spasmodic movements that are necessary for the baby to be expelled to occur without the resistance normally offered by the muscles of the abdominal wall, so that the process will take place with less pain. One cannot measure pain with a foot-rule, but long experience with decompression has shown that there is considerable pain relief. In some cases, mothers have actually reported having been completely free from pain.

Decompression lowers the internal pressure by pulling the abdominal muscles outward and reducing the tension which restricts the growth of the uterus during pregnancy, particularly in the woman who is becoming a mother for the first time. This reduction in pressure results in an increase of the oxygen supply to the baby and also improves the circulation through the placenta or afterbirth. The baby profits by this increased oxygenation, and you will notice that the baby very frequently becomes more active after a treatment with decompression.

Having carried out regular decompression treatment during pregnancy you will find that preparations for labor have in fact taken place without your experiencing any unusual sensations. This means that quite a lot of the work required

during your first stage of labor has already been done for you, and labor will then proceed smoothly.

Periodic decompression treatments, which get more frequent as the baby grows and the birth time approaches, promote better blood—and therefore better oxygen—supply to the fetus.

Over the years of research and experience with decompression, a program of regular decompression has been worked out to give the best results. The program is as follows:

First treatment at eighteenth week.

Second treatment at twentieth week.

Third to seventh treatments at weekly intervals from twenty-fourth to twenty-eighth weeks.

The next six treatments between twenty-eighth and thirtieth weeks.

From the thirtieth week, decompression apparatus will be made available for you to take home for daily use. The recommended treatments at home will be one half-hour run twice daily if possible. The details of how each treatment must be conducted will be given to you as you attend the clinic. The more decompression you can do at home the better prepared you will be for the commencement of labor.

During the last ten weeks you will attend the clinic once every seven to ten days for check-up on pressures.

By this time you will be ready to go into labor and you will be required to take your plastic suit with you to the nursing home in which you are booked for your confinement. The nursing home should have the apparatus available for you to use during labor. Decompression during labor is only exerted with every contraction. This means that at the precise moment that your contraction com-

mences you will close the valve as you have been taught at the clinic, and continue decompression until that contraction has passed over. Approximately once every hour your doctor or your nurse should check up on your progress to see how everything is going. Once the first stage of labor is nearly over, you will be transferred to the labor ward for actual delivery of your baby. At this stage your doctor may, if he wishes, use another form of decompression for the delivery of the baby during the second stage. He may also assist the delivery of the afterbirth using the same apparatus.

You will now be experiencing the real joy and pleasure of having delivered your decompression baby. He or she will be in the "pink" of condition and announcing very lustily his or her arrival in the world.

NOTE: There will be short periods of time during labor, however, when decompression will not be active. For example: on your way to the nursing home; during your preparation; and in between times, when the condition of you and your baby is being checked by the doctor or nurse. It is essential at this time that you do not lose the value that you have gained from decompression thus far. In order to do this, relaxation is important, and if you remember what decompression has been doing to your abdominal muscles you will be able to imitate this during the breaks in decompression. You will have been shown how to accomplish this by the nurse at the clinic during the course of treatment.

Right from the start of decompression, it was observed that decompression babies tend to be bonny and pink. Extensive experimentation to determine the quality of the decompression babies as they get older has been carried out, and they certainly seem to be superior. In one batch tested,

there was not a single baby with a Developmental Factor below 120 (normal is 100). Above 138, babies are considered "superior," and the incidence among the population as a whole is only 2–3 percent, according to the statisticians. Of decompression babies tested, the proportion varied from 20 to 32 percent over three series; and in one series the figure was 49 percent. Of 1000 decompression babies tested, there were five with factors above 200, and the incidence in the population is statistically only one in a million.

Don't imagine, however, that decompression will ensure that your baby will be a genius. Such a claim would plainly be nonsense. A human being's quality is determined by the genes with which he is born. Decompression can do nothing to alter their composition. What it claims to be able to do, however, is to give to a human being the chance of developing to the full the potentialities which his genes make possible.

So far, it seems that decompression babies continue to maintain their superiority over nondecompression children. It does not, of course, mean that this will necessarily persist as the years go on. We do not yet know; but at least these babies have a good beginning to life and that is surely one of the greatest gifts you can give your child.

From the above you will see that major emphasis falls in three areas: safer pregnancy, by ensuring an adequate oxygen supply to the growing baby throughout pregnancy; quicker, less painful labor and delivery; and healthier, brighter babies. In the following chapters of this book each of these three areas in which decompression seems to have real significance will be explored in

detail. That decompression makes pregnancy safer and easier for the mother, as well as the baby, has already been dramatized in the case history at the very beginning of this book. This aspect of decompression will be considered again later on.

II

How Decompression Works

Like so many significant discoveries, decompression was not the product of some instantaneous insight but the result of long years of work. At first glance, some may be surprised that this discovery took place in faraway South Africa. With a little reflection, however, this will not seem so surprising. South Africa, you will remember, is the same country that produced Christiaan Barnard and the heart-transplant operation. Its medical technology is as advanced as that of any country on earth. And the man most responsible for this remarkable discovery was superbly trained in both clinical medicine and medical research in England and South Africa. Before his recent retirement, Dr. O. S. Heyns, a Fellow of the Royal College of Obstetrics and Gynecology, served as Head of the Department of Obstetrics and Gynecology at the University of the Witwatersrand, Dean of the Faculty of Medicine, and Chief Obstetrician and

Gynecologist at the major hospitals in Johannesburg, a metropolis of more than two million people.

When he made his discovery, Dr. Heyns was doing intensive research on childbirth, and specifically on the nature of the uterine contractions. He was not looking for a means of easing childbirth, but was trying to fill in the gaps in our knowledge of the mechanics of labor. At his home in Hermanus, overlooking one of the most beautiful shorelines on the Indian Ocean, he recounted for me the events that led from this basic research to the discovery of abdominal decompression.

"In order to understand what was happening to the uterine wall during contractions," he explained, "we had to contend with the action of the overlying abdominal muscles as well. Our task was to separate the action of those muscles from the action of the uterine wall; otherwise we would never get a clear picture of what was happening to the womb."

The task was not an easy one. The powerful abdominal muscles influenced the contour of the uterine wall to the point that it was almost impossible to get a separate, isolated picture of the uterine activity itself. Various exotic sensing devices were used to pick up electrical impulses from the uterus, but there was always the possibility that some of these impulses were being generated by abdominal activity.

Finally, in desperation almost, Dr. Heyns and his colleagues decided to use a curarelike drug to temporarily

paralyze the abdominal muscles of a pregnant subject whom they believed to be in "doubtful" labor, with weak and poorly established contractions that were not likely to lead to delivery soon. Theoretically, by putting the abdominal muscles temporarily out of commission, they could study the uterine contractions directly without any interference. Unfortunately, they believed from the outset that their experiment would fail (though they still felt it was worth the chance), because when a doctor gives a patient curare he must also administer a general anesthetic to overcome distress caused by the paralyzing drug. And the anesthetic used in these circumstances almost always inhibits uterine contractions. So Dr. Heyns expected to end up with an inhibition of both the abdominal muscles *and* the uterus.

"Much to my amazement and delight, however," he recalls, "the contractions, far from ceasing, actually became more powerful. At the beginning of the experiment, as I stated earlier, the subject was in doubtful labor. Soon she began to have good contractions, and within 68 minutes dilatation [opening] of the os [mouth of the womb] was over 6 centimeters. She was in unequivocal labor for not more than six hours, remarkable for a primigravida [a woman having her first child]."

"We were excited, of course," Dr. Heyns continues. "Not only had we got some of the data we had so long been looking for on uterine action, but we also made an interesting observation, one that suggested the extent

to which the abdominal muscles *might* be slowing down and generally making labor more difficult. Because even with a general anesthetic that could be counted on to inhibit uterine action, labor had gone better than ever. It seemed inescapable that this was because we had removed the restraint that is normally imposed on the uterus by those powerful abdominal muscles. Without them pressing in on the uterus, tensing up from fear and so on, the contractions were unencumbered and able to do their work with much greater speed and efficiency. That was the theory anyway. Obviously we had to do more checking. It was possible that we would never have a case like this again, that it had simply been a fluke."

It wasn't long before Dr. Heyns had the opportunity to deliver a woman whose abdominal muscles were entirely paralyzed by polio. "From an experimental standpoint," he says, "this was even better than our curarized subject, because here the paralysis of the muscles was complete. As we had suspected would happen, she had an incredibly easy labor. It was so short that you could hardly tell she was even in labor; and there was no pain whatever.

"One doesn't come across pregnant women with this condition every day, so we had to resort to curare again to continue our study. These preliminary findings, encouraging as they were, gave us more justification. In our second trial with the drug, a patient who was having

her second baby went from a condition of spurious labor, with the os dilated 3 cm. to *full* dilatation in thirty-five minutes, followed by delivery six minutes later! Needless to say, the speed of this demanded attention."

Thus Dr. Heyns and his colleagues began to focus their interest less on the nature of the uterine contractions themselves (though important observations were made in this domain) and more on a phenomenon that promised immediate, practical benefit to prospective mothers everywhere. What woman would not welcome substantial respite from the long and harrowing first stage of labor, which this technique seemed to offer?

Another dozen cases, in which curare was again used, convinced the South African team that labor could indeed be significantly speeded by halting the inhibitory action of the abdominal muscles on the uterus. "But, of course," Dr. Heyns points out, "we were not about to propose that every pregnant woman be given curare. There had to be a safer, more efficient way of halting that muscular activity that makes labor such a trial."

It turns out, of course, that there is a far better way. But before we consider that, it seems in order to ask why the human body should be constructed in such a way that the abdominal muscles interfere with childbirth in the first place and, to use Dr. Heyns' words, "make it such a trial." Did Mother Nature make some sort of mistake?

"Not really," Dr. Heyns says; "Mother Nature

planned everything quite efficiently—for four-legged animals. We fouled everything up when we decided to stand up on our hind legs and use our front ones for arms. Somewhat more difficult childbirth may be a small price to pay for this giant evolutionary step, but why put up with the inconvenience, if we don't have to?"

Four-footed creatures, it seems, bear their young with far less difficulty than the two-footed type. The reasons for this are easy to discern. In a four-footed animal, the growing fetus is suspended from a strong horizontal beam, the backbone. The abdomen in this configuration need not be supported by strong abdominal muscles and thus can easily stretch to accommodate the fetus as it grows in size. The backbone, in its horizontal position, is well suited to carry this weight and more.

"Now imagine what happens," Dr. Heyns continues, "when you tilt that horizontal beam, the backbone, upright. All of the internal organs that used to hang so neatly and efficiently from the overhead beam now fall into disarray, overlapping one another, stretching and bulging against the abdominal wall. The muscles that connect these organs to the backbone are twisted, distorted, and strained. Clearly some additional support will be needed to contain this awkward, unbalanced state of internal affairs. Nature answers this need with strong abdominal muscles to help hold everything in its new position. Now, however, when the womb begins to

expand under pressure from the growing baby the abdominal covering no longer cooperates the way it used to; where it used to stretch without complaint, it now resists.

"And here," Dr. Heyns continues, "we come to the important part. When the uterus begins to contract in true labor, the distortion of the muscles becomes such that the woman experiences real pain. Additionally, the resistance from the abdominal muscles forces the uterine muscles to work that much harder to expel the baby. This slows things down, protracting labor and causing even more pain."

So what was to be done, short of giving every pregnant woman curare to put those obstinate abdominal muscles temporarily out of commission? Dr. Heyns toyed for a time with the idea of hypnosis. Suggestion had been used, he knew, by Dr. Grantly Dick-Read, to get women to relax so that they experienced little pain during childbirth. Surely what this accomplished was that these women were forgetting their fears and consequently forgetting to tense their abdominal muscles. The same thing, he knew, must apply to the various types of natural childbirth, in which no anesthesia is used. Women schooled in these techniques voluntarily relaxed their muscles, working *with* rather than *against* their labor contractions. And when it worked, Dr. Heyns knew, it worked very well. The trouble was, most women simply were not capable of achieving this deep

relaxation under such trying circumstances. Training for this sort of relaxation would be time-consuming in any event, and Dr. Heyns felt that hypnosis, which might be quicker, was too unpredictable to be relied upon.

A method was needed that could be counted on to work in *every* case, regardless of the woman's state of mind. There had to be some way of lifting those muscles up off the uterus so that it could do its work without restraint. But "lifting" those muscles, Dr. Heyns realized, would not be as easy as it might appear. He knew that the pressure from the atmosphere (14.7 pounds per square inch at sea level) was putting a load of a *half ton* on the abdomen and the uterus. Thus, it is not only the abdominal wall itself but also this tremendous atmospheric weight that resists the action of the uterus as it tries to go from the elliptical to the spherical shape that helps push the fetus out of the womb. As Dr. Heyns and his colleagues began to think in terms of isolating the abdomen from external atmospheric pressure, the idea of putting the pregnant woman in a decompression chamber sprang into being.

"Again we were excited," Dr. Heyns recalls, "even though many of our colleagues responded to the idea with disbelief. It all seemed rather far out, perhaps a little like science fiction." Still, the logic of the idea seemed impeccable. By reducing the pressure over the abdomen to well below normal atmosphere, the intesti-

nal gases within would surely expand to some degree, pushing the abdominal wall upward.

In order to test his theory, Dr. Heyns had to obtain the help of the medical division of the South African Air Force; it had some small decompression units that were used to treat polio victims. The units, normally placed over the chest to aid breathing, were equipped with powerful pumps that would suck the air out of an enclosed space, thus reducing the atmospheric pressure on the body and making expansion of the lungs of polio victims less difficult. Dr. Heyns proposed to place the decompression units over the abdomen to see if they would work in the same way there.

He and a colleague were the first volunteers. They fitted the decompression units over their abdomens and observed the effects as they gradually reduced the pressure. Atmospheric pressure at the locale where they were conducting the experiment was 650 mm. Hg. (Hg., or mercury, is the substance used to indicate fluctuations in pressure inside a barometric gauge; the level to which the mercury drops or rises is measured in millimeters, abbreviated mm. Dr. Heyns and his associate observed the effects at 500 mm., 400 mm., and 300 mm., thus dropping the pressure around their abdomens to less than half that of the surrounding atmosphere.

"It was demonstrated conclusively that the abdominal wall projected forward on decompression." Success, at last. Not only did the wall project forward, but it

stayed forward throughout decompression; the abdominal muscles were not strong enough to hold it back. Furthermore, apart from a little soreness, the researchers experienced no ill effects from prolonged decompression sessions, even when the pressures were extremely low. Nor was there then—or later—any evidence that decompression caused disfigurement or permanent stretching of the abdominal wall, even after prolonged use. Nonetheless, because the sensations of decompression were unusual, they decided that most women would not easily tolerate pressures below 500 mm. "But," Dr. Heyns notes, "it was certain that at this two-thirds of a full atmosphere the muscle stretch would be sufficient for easier, less painful labor." As it turned out, even less decompression was more than adequate for this purpose.

The time had finally come to test decompression on a woman in labor. But first some new decompression apparatus would have to be devised to accommodate the pregnant abdomen. A great deal of experimentation followed, and what emerged was a hemispherical dome of lightweight material that was fitted over the abdomen, with a rubber seal to prevent air from getting inside. The inside of the dome was linked to a suction device by hose. A hole in the dome permitted simple regulation of the pressure, which was indicated on a nearby gauge. Negative pressure would continue to build as long as the patient held her finger over the

hole; remove the finger and pressure returned to normal immediately.

It was with this apparatus that the first patient received decompression. "The results in her case," Dr. Heyns observes, "were so spectacular that the method gave promise of something unusual." The woman, a lower-income patient at the state-run Queen Victoria Maternity Hospital in Johannesburg, was having her first baby. But in place of the long labor that might have been expected of a first-time mother, she was delivered in three hours. The second woman to receive decompression delivered her first baby in two hours and twenty minutes.

"Decompression," Dr. Heyns notes, "was not, at this time, intended for second-stage use." The second stage marks the passage of the baby down the birth canal, from the first moment that it begins to emerge from the womb. "The second stages," Dr. Heyns continues, "were, however, very short, as well, and the most notable feature at the time was the relaxation of the patients, and their freshness. We were unaccustomed to this, and it all seemed quite dramatic.

"The freedom from pain that these women seemed to enjoy was really astonishing," he adds. "In our earliest theorizing we had assumed that faster labor would actually have to be paid for in terms of greater pain." They had thought that the unrestrained contractions resulting from decompression, while expelling the baby

from the womb more quickly, would be more painful because they would be so much more potent. This fear did not deter the researchers, since anesthesia could always be used when necessary to overcome pain. As it turned out, however, decompression actually *reduced* the pain of childbirth so much that most women who use it do not require any sort of anesthesia. A more detailed discussion of decompression's pain-alleviating quality is included in the chapter on labor.

These initial results, of course, were not taken as proof positive that decompression would consistently shorten labor and reduce pain. It was only after many hundreds of women had been given decompression that these observations became established as facts. Whereas the average woman having her first baby spends fourteen hours in the first stage of labor, decompression mothers having their first babies spend only *four* hours, on average, in this first stage. Many women having first babies have labors of less than an hour, and such brief labors are actually commonplace now among women who have third and fourth babies with decompression.

Over the next few years, as more and more women began to ask for decompression, the South African team kept making improvements on the apparatus. The model that is most widely used today is far less cumbersome and uncomfortable than the early models, some of which were ill-fitting. Originally domes of differing sizes were used. Apart from the impracticality of this,

there were never enough domes of enough different sizes to provide an exact fit in each case. This major problem was solved when the researchers decided to use only one size of dome and encase it (and the patient) in a plastic suit that would ensure against air leakage. The suit, moreover, was flexible enough in its sacklike fashion that it could accommodate almost any size of woman. An airtight longitudinal zipper enables doctors and nurses to make quick examinations during decompression.

"The apparatus," Dr. Heyns explains, "now consists of a plastic suit from which the air is evacuated [usually with a slightly modified vacuum cleaner] and a spacer, which resists atmospheric pressure. [See Appendix, page 132.] The spacer is made of two sections of fiberglass: a bucket seat and an anterior cage [the dome] fitting over it into a groove. The suit is placed on a chair, and the bucket seat is placed on top of the suit. After the patient sits down, the anterior cage is placed in position over her abdomen. The suit is zipped up [over the dome] to her armpits, where it seals. A gauge placed over the front of the apparatus indicates the air pressure within it; wide-bore tubing connects the pump with a wide-bore nipple through the suit and the cage. When the patient closes the vent with her thumb, the pump sucks air directly from within the airtight suit. When she removes her thumb from the vent, the pump simply

sucks air from the outside, and the pressure returns to normal."

Actually, there are now a variety of controls for regulating the amount of suction inside the suit. Some of the models made in England and the United States employ switches or levers to control the suction, while most of the South African models use a "flute" control, which is nothing more than a few holes in the hose that sucks out the air. By covering these holes with her fingers and then uncovering one or more at a time, the patient can easily and conveniently control the amount of suction. Operating this control may sound slightly complicated, but in fact it is quickly learned after only a few minutes of experimentation.

The American decompression apparatus, popularly called "the baby bubble," differs from the British and South African machines in that it covers less of the body and features a clear bubblelike dome through which the physician can peer to immediately determine the status of labor at any time. The physician can easily lift it off with one hand in order to make a closer examination. It should be stated that *all* existing decompression suits are based on Dr. Heyns's findings. Not all of them, however, work in exactly the same way, according to Dr. Heyns. The British apparatus provides complete and satisfactory decompression, but the American "baby bubble," he says, provides only partial decompression.

"You get partial instead of total decompression," he explains, "because the back section of the spacer is missing. The loins and posterior part of the soft abdominal wall are then still subject to atmospheric pressure. . . ." Improvements have recently been made in the American apparatus, however (used by Dr. Lawrence Lundgren of Houston and others), and excellent results have been reported. Nonetheless, Dr. Heyns is convinced that only with full decompression, as achieved with the apparatus designed in South Africa, can the *full* benefits of decompression be realized.

And the "full benefits" go well beyond faster and less painful labors. "When it was noticed that the decompression babies displayed heightened vitality and that they survived otherwise lethal complications during partus [labor and delivery]," Dr. Heyns observes, "we decided it might be beneficial to start treatments earlier in pregnancy, *before* labor had begun. We believed that this might provide a better environment for the baby during critical periods of development within the womb. Several investigators had reported in the scientific literature over the years that fetal circulation and oxygenation are seldom optimal. In other words, there *was* room for improvement in most cases, and we believed that decompression could provide that improvement."

In using decompression before labor, the lifting of the abdominal wall was not as important as the theory,

soon established as fact, that decompression would increase circulation and oxygenation across the placenta to the baby. It was this that persuaded doctors to begin the treatments earlier in pregnancy. At first, women were started on decompression ten days before their babies were due, which had the further advantage of familiarizing the women with the procedure during a period of relative calm, so that they could use it more efficiently during labor. The results of the ten-day regime were so good (even easier labors and healthier-looking babies) that the doctors decided to start decompression treatments earlier yet. From the ten-day plan, they went to half-hour sessions two or three times weekly in the last three months of pregnancy.

"Now," Dr. Heyns says, "we recommend one or two sessions before the twentieth week of pregnancy, three sessions between the twenty-fourth and twenty-seventh weeks, and finally one or two sessions daily between the twenty-eighth week and delivery."

It soon developed that women who followed this schedule not only produced healthier babies with less strain in labor, but also were healthier themselves during pregnancy. Most women reported a greater sense of well-being after starting decompression, noting that the treatments often induced profound states of relaxation, easing muscle strain and particularly the low back pains that often occur during pregnancy. At the same time, most of the mothers commented on the effects of de-

compression on their unborn babies. "The baby always becomes more active during and after a treatment," was a typical comment. "He feels his oats," is the way one father put it. The doctors attributed this to the enhanced circulation and oxygenation.

More important, Dr. Heyns and his colleagues couldn't help but notice that the women who used decompression regularly during pregnancy had an extremely low incidence of toxemia and other complications that often result in miscarriage. And after birth, the decompression babies were almost uniformly free of cerebral palsy and other disorders that cause deformities and mental retardation. This, of course, could have been mere chance in the beginning, but as the sample of decompression babies became larger, it was evident that, in scientific terminology, the low incidence of these disorders was statistically significant, indicating that decompression was in fact exerting a strong protective influence.

It was further noted that decompression *during labor* not only makes delivery faster and less painful but, here too, protects the baby against the sort of oxygen deprivation that can, in a matter of minutes or even seconds, cause brain damage. This deprivation of oxygen occurs when the powerful contractions momentarily shut off the supply of blood going to the baby. Where circulation is already poor this further reduction can do real damage. Decompression, however, reduces the

risk by shortening the duration of labor and by maintaining an ample oxygen supply throughout labor.

What may posssibly prove to be the most significant benefit of decompression did not begin to be seen until the earliest decompression babies were a year or so old. It had been noticed at the outset that these babies were remarkably healthy looking, pink, and vigorous, and that they scored consistently high on the Apgar scale. (The Apgar Scoring System, developed by Dr. Virginia Apgar of the National Foundation—March of Dimes—in the United States, is now universally used to evaluate a newborn infant's health, taking into account such things as muscle tone, color, and reflexes.) It seemed logical to assume that these babies might also be mentally superior, because of optimal oxygenation during their prenatal development. Mothers began reporting, spontaneously, on the remarkable progress of their offspring, how they were able to manipulate objects earlier than their other (nondecompression) babies, how they talked and walked sooner.

A surprising percentage of the children seemed to be truly extraordinary, performing both physically and mentally in ways that would have been expected of much older children. Many were doing things at eighteen months, for example, that normal toddlers can't do until they are at least thirty months. Some of them could carry on coherent conversations (with vocabularies of 200 or more words) at eighteen months, and one

was speaking fluently in four languages at the age of three. There are no reliable I.Q. tests for very young children, but the Gesell tests, widely used in the United States and elsewhere, provided strong clues to the potentials of these children.

Extensive testing, which will be discussed in more detail in a later chapter, demonstrated the superiority of decompression babies as compared to controls, that is, babies born without decompression. Many of the earliest decompression offspring are now entering their teens, and it is hoped that a carefully controlled, scientific program of I.Q. testing will be performed on these children to establish once and for all whether decompression enables the individual to attain his full intellectual potential. Many of the decompression babies have, of course, been given I.Q. tests over the years, and these have very definitely tended to confirm the results of the earlier Gesell tests, but a much larger sample must be made in a formal research setting before any final conclusions can be drawn.

Sensationalized early reports in the lay press, claiming that decompression could turn any baby into a genius, did more than anything else to slow down decompression research. Wild claims, none of which were made by the researchers themselves, alienated sections of the scientific community. Doctors who were intrigued by decompression had to wait for the air to clear before

beginning their own sober research. Fortunately, that clearing now appears to have taken place, and an increasing number of researchers are eagerly examining the potential of decompression.

III

Decompression for Easier, Safer Pregnancy

Dr. Cecil Michelow, a personable obstetrician with a flourishing practice in Johannesburg, first turned to decompression in "a desperate, last-resort effort" to help a patient deliver a live baby. "This particular girl," he recalls, "was thirty-eight and married for the second time. In her first marriage, she'd had three miscarriages and no live babies. She came to me during the first pregnancy of her second marriage. She was already twenty-six weeks along, and the baby she was carrying was dead. A microscopic examination of the placenta showed marked fibrosis—a sign of aging. It was also small for a pregnancy of twenty-six weeks. It was apparent that the patient's placental insufficiency was responsible for the miscarriage.

"The next step was to try to prevent this insufficiency from developing again. Having been a pupil of Heyns, I was familiar with decompression. I told Mrs. K. that

when she became pregnant again she should report to me at once to begin decompression. Given the details of her medical history I saw no other chance of her ever delivering a live baby. This was way back in 1965, and not a great deal was yet known about decompression. So I suppose it was somewhat daring when we began treatment of a patient who was only a little more than seven weeks pregnant.

"The clinic people were reluctant to do much at this point and, in fact, delayed for awhile and then only gave her two decompression treatments of a half hour each per week. When she checked in with me at eleven weeks, I didn't like the way things were going, so I said, 'Look, we've got to get this placenta flushed out and keep it flushed out so that we can get more oxygen and blood into it while it's developing. We want to get a big, fat, healthy placenta early on so that it can sustain the baby all the way to term.' So then I arranged for her to take one of the decompression suits home and use it there on a daily basis—at first for a half hour a day, then twice a day, then three and four times a day.

"The patient thought this was all eyewash at first. At twenty-six weeks she was still a little dubious, even though that was as far as she had ever got, previously, without miscarrying. At twenty-eight weeks she began to get very definitely worked up over the possibility of delivering a live baby, and by thirty weeks she was so excited that she began spending five hours a day in de-

compression. The final result was a seven-pound baby with a perfect Apgar score. The child, last I heard, was still developing, both physically and mentally, at a very advanced rate."

While no one could say for certain that Mrs. K.'s pregnancy had progressed with such ease and resulted in such a fine baby *because of* decompression, the circumstantial evidence clearly indicated this was the case. Much stronger evidence was to surface with the passage of time, but in the meanwhile, Dr. Michelow was heartened to hear of the experience of Dr. W. J. Gordon, a Scottish gynecologist, who was the first doctor outside of South Africa to report on the use of decompression in the prevention of miscarriage.

Dr. Gordon's first patient was also thirty-eight. Her first pregnancy developed normally until the twenty-eighth week, when fetal movements abruptly weakened and growth appeared to stop. The patient was confined to bed and given the best available treatment; despite this, she miscarried at thirty-two weeks. Two years later she became pregnant again. "Faced with the probable occurrence of intrauterine death for a second time in a patient with no children," Dr. Gordon noted, "I was prompted to consider the use of abdominal decompression as a means of treating placental insufficiency. The placenta appeared to be failing at a relatively early stage in pregnancy, and it was hoped that by increasing the oxygen transfer to fetal blood, intrauterine life would

be prolonged until cesarean section could be employed with reasonable certainty of producing a live mature child."

At the twenty-seventh week of pregnancy, fetal activity began to diminish abruptly, just as it had in the previous pregnancy. Immediately, Dr. Gordon began giving his patient decompression three times daily. *He observed that fetal movements began to increase as soon as treatments began.* The activity of the fetus was greatest during the actual period of decompression and could be observed to diminish noticeably after each session in the suit. Even when decompression was not being used, however, activity was more vigorous than it had been before the treatments.

Six weeks before term, Dr. Gordon decided the baby was strong enough to be delivered by cesarean section. It weighed six pounds and developed normally after four days of incubation for a mild respiratory ailment. Dr. Gordon said there was little doubt in his mind "that the second pregnancy would have ended in the same disastrous way as the first if it had not been possible to increase fetal oxygenation. The fact that there was a dramatic return to strong fetal movements concomitant with the institution of abdominal decompression suggests that the increased oxygen supply to the fetus, resulting from the regular decompression, was sufficient not only to maintain the life of the fetus but also to promote normal growth.

"This progressive increase," he continues, "was obvious both to the patient and to her observers. The lack of increased abdominal girth had been observed by the patient before admission to the hospital. The small size of the placenta and the subsequent histological examination supported the contention that placental insufficiency existed, and intrauterine death would have been a likely result had it not been possible to increase fetal oxygenation."

Soon after this first success, Dr. Gordon again had occasion to use decompression "with apparent success in a patient with toxemia, along the lines suggested by Heyns. In this instance the toxemic process appeared to be arrested by repeated decompression, the pregnancy proceeding to term without any evidence of toxemia and without any other method of treatment being employed." Dr. Gordon summed up his experience as follows:

"Abdominal decompression appears to have a real place in the treatment of placental insufficiency and may well eventually also play a part in the treatment of pre-eclampsia [toxemia] and similar conditions also associated with placental insufficiency."

Dr. Michelow reached a similar conclusion: "Two patients with essential hypertension and evidence of severe placental insufficiency," he wrote in the South African journal *Medical Proceedings*, March, 1968, "were treated with prolonged daily abdominal decom-

pression throughout most of their pregnancies, with excellent results as far as both babies and placentas were concerned. The first patient pioneered the usage of up to five hours of decompression daily, given in an attempt to secure a live baby by improving the placental blood circulation and nutrition during pregnancy. She had lost at least two infants before due to recurrent gross placental insufficiency. The resulting baby and healthy placenta more than justified the very many hours of treatment. It is strongly recommended that abdominal decompression be tried out in similar cases of placental insufficiency."

As we shall see, decompression is beneficial for nearly *every* pregnant woman, regardless of whether she has a history of miscarriage or other complications. For the woman who *does* suffer from what doctors call placental insufficiency, however, decompression can mean the difference between a healthy, live baby and a deformed or dead one. It can also keep the mother herself out of the hospital and out of harm's way. By helping to prevent desperately sick unborn babies it also helps prevent critically ill prospective mothers. Before we examine more closely the ways in which decompression protects both mother and baby, let's review some of the basics of pregnancy, specifically some of the things that can go wrong in pregnancy.

Miscarriage, spontaneous abortion, placental insufficiency, toxemia of pregnancy, prematurity—all of these

terms require clarification. All too frequently there is considerable confusion about their meaning. Many doctors define *spontaneous abortion* (not to be confused with *induced abortion,* which is planned and caused by human interference) as the accidental expulsion of the fetus from the womb during the first three months of pregnancy. Spontaneous abortions usually occur because of some abnormality in the growing fetus. When fetal death occurs between the third and seventh months, doctors call it *miscarriage.* Others refer to *any* spontaneous abortion as a miscarriage. Babies delivered after the seventh month but before full term are called *premature.* Even if the baby dies, such births are not termed miscarriages.

In the United States, 15 percent of all pregnancies—*one in every six*—end in miscarriage or spontaneous abortion. More surprising yet, some medical authorities believe that *nearly half of all women who become pregnant experience at least one miscarriage.* The figure could be even higher, since many women miscarry without knowing it. In fact, many spontaneous abortions occur even before a woman knows she is pregnant. One in every 300 women who become pregnant can be classified as a "habitual aborter"—a woman who repeatedly miscarries.

Nearly 8 percent of all the babies born in the United States annually arrive prematurely. They account for 70 percent of infant deaths during the first month of life.

Thousands of those that do not die are doomed to deformity and mental retardation. Additional thousands who reach full term before birth are also born deformed and/or retarded because of such pregnancy complications as toxemia and placental insufficiency, both of which are also prime contributors to miscarriage and prematurity.

The *placenta* is the extremely important organ through which the developing fetus gets its nourishment from the mother. It begins to develop within the womb almost as soon as the fertilized egg attaches itself to the lining of the uterus. The fertilized egg soon develops into the fetus, which is connected to the placenta via the umbilical cord.

When fully developed, the placenta is a flat, rounded organ, composed of layers of tissue and membrane, about six to eight inches in diameter and slightly more than one inch thick. (The name in Latin means "flat cake.") It has two closely related parts—the maternal side and the fetal side, which are separated by a layer of cells commonly called the *placental barrier.* Contrary to popular belief, the mother's blood supply does not circulate through the body of the fetus. As the mother's blood supply flows into the maternal side of the placenta, food elements and other substances, such as oxygen, filter through the membrane into the fetal blood system. (The filtration is through thousands of tiny fingerlike projections called *villi* which, taken all to-

gether, are referred to as the *intervillous space.*) From the opposite side, the unborn baby's waste products are transmitted through the placenta to the mother's bloodstream and excreted by the mother.

The placenta is also important in the production of hormones and enzymes. The hormones estrogen, progesterone, and chorionic gonadotropin, which are produced by the placenta, help maintain the pregnancy. Recent research has demonstrated that another placental hormone, chorionic growth hormone prolactin, can have a profound effect on the growth of the fetus. Through its effects on the mother's metabolism, it seems to regulate the growth nutriments required by the fetus for continuing development.

From all of this it can be readily appreciated that if anything goes amiss in the placenta, the pregnancy will be endangered. Any number of things can prevent the placenta from working at optimal level. Smoking, alcoholism, kidney disease, high blood pressure, diabetes, even emotional upset and living at high altitudes can reduce the efficiency of the placenta, inhibiting the flow of oxygen and other nutriments to the baby, sometimes "starving" it or suffocating it.

When there are signs that the fetus has ceased to grow or is growing at an abnormally slow rate, the doctor generally suspects some form of *placental insufficiency.* The placenta, in other words, is not doing its job or at least is not doing it well enough to ensure the birth of a

healthy baby. In order to prevent miscarriage or an abnormal baby, the doctor acts quickly. He may prescribe hormones to make up for those not being produced in proper quantity by the placenta. If he has not already done so, he will certainly order his patient to stop all smoking, drinking, and vigorous activity. Very likely he will recommend extensive bed rest or even hospitalization. He will give close attention to his patient's diet, making sure she is getting all of the nutriments that she and her baby need. Then he will cross his fingers and hope for the best.

All too often, however, this traditional treatment fails; and all too often it fails tragically. It's bad enough when the end result is miscarriage or early death after premature delivery; it's far worse, however, when the end result is a child badly deformed or mentally retarded because he did not get enough oxygen during his development in the womb.

The baby, however, is not the only one at risk in cases of placental insufficiency. *Toxemia,* one particularly pernicious kind of insufficiency, can threaten—and *take* —the life of the mother, as well as the baby. Toxemia, still a mystery disease, is characterized by the entry of toxins, or poisons, into the bloodstreams of both mother and fetus. It is believed that these toxins originate in the placenta; probably their buildup is somehow related to the general aging of the placenta. Old cells die and begin to pile up. If the body cannot dispose of them

quickly enough, vessels and tissues may become clogged with wastes, greatly reducing their efficiency in delivering nutriments and eliminating other wastes. Fibrin, which accumulates in unusually great quantities in toxemia, apparently further contributes to the clogging of the tissues, vessels, and villi that are the links between mother and fetus.

Toxemia develops gradually and generally does not become noticeable until sometime around the twenty-eighth week of pregnancy, when the prospective mother may begin to complain of unusually great weight gain, headache, high blood pressure, and swelling of the ankles, hands, and face. Distorted vision and difficulty with urination may also be experienced. These early stages of toxemia are called *preeclampsia.*

As in most forms of placental insufficiency, the treatment is immediate bed rest and appropriate medication to reduce blood pressure, swelling, and urinary problems. However, toxemia frequently resists traditional treatment as long as the pregnancy continues, and in order to rescue the mother, the physician often has to terminate the pregnancy. If the fetus, which may already be dead, is not removed, resistant preeclampsia can progress to *eclampsia,* in which the mother lapses into convulsive fits, coma, and death.

Roughly 10 percent of all pregnant women contract toxemia; many others suffer from other forms of placental insufficiency that do not readily yield to the

standard treatments. Some better form of treatment is desperately needed to prevent difficult, life-threatening pregnancies, fetal death, and deformed or retarded babies. (It is well to remember that "retardation" is a relative term. Placental insufficiency may be slight in millions of cases, resulting in babies who can be categorized as normal; in fact, they have been denied the full mental and physical potential that could have been realized if their mothers' placentas had been fully functioning.)

Obviously, what is needed is something that not only overcomes placental insufficiency but prevents it from happening in the first place—so that the mother can enjoy an easier, safer pregnancy and produce a baby with the best possible start in life. The very earliest indication that abdominal decompression might provide protection for both mother and fetus came in 1963 when Dr. Heyns and his colleagues, including Drs. J. A. Blecher and P. B. Combrink, treated toxemia with decompression for the first time.

Dr. Heyns recalls that decompression was being used at that time primarily to speed labor and reduce the pain of childbirth. Already, however, the South African doctors had been impressed with the uniform quality of the decompression babies they were delivering and so had begun to apply the technique earlier in pregnancy.

"We also began to notice," Dr. Heyns remembers,

"that our decompression mothers were not developing toxemia. We began checking the records and found that in 300 cases there were only two very mild episodes of toxemia. In this particular hospital there should have been 23 such cases on average out of 300.

"So when Basil Combrink rang me up one day and mentioned in passing that one of his patients had severe toxemia I didn't hesitate to suggest that he give her decompression at once. Dora, a Bantu girl of twenty-three, having her first baby, was twenty-six weeks pregnant. Her toxemia was in an advanced stage; she was stuporose, and her kidneys had stopped functioning. This situation normally leads down a steep path to death, though the decline can sometimes be halted by cesarean section. Decompression was recommended here merely as a possible means of improving the patient's condition preparatory to the section. I hoped specifically that it would improve kidney function. As it turned out, Dora's condition improved so dramatically with the first treatment that we decided to conserve the pregnancy and kept her on decompression, three times daily, right up until we delivered a healthy baby at thirty-eight weeks."

Drs. Blecher and Combrink later published the account of this pioneering case in the British medical journal, *Lancet*. They noted that within minutes after the first decompression treatment, Dora's kidney function, which had virtually ceased, improved dramatically,

and her blood pressure immediately dropped from 160/100 to 120/80. "An apparently hopeless case of severe toxemia of pregnancy, with gross oliguria, was thus successfully taken to term, with a resultant live healthy child," they concluded. "Placental and fetal damage, which could reasonably have been expected as a result of the gross disease process at such an early stage of pregnancy, was absent.

"Although the well-tried and accepted treatment of toxemia was initially instituted," they continued, "the patient's condition deteriorated. With abdominal decompression, and later with a combination of decompression and standard therapy, there was much clinical improvement, and this was maintained without relapse at any stage of pregnancy.

"In our view, decompression of the abdomen, by producing a negative intra-abdominal and intrauterine pressure with respect to the rest of the body, promotes an increased flow of blood into the abdominal compartment. The kidneys and placenta therefore receive a better blood supply, with all the concomitant advantages of increased oxygenation and nutrition. . . . We are conducting extensive trials on all cases with raised blood pressure and toxemia of pregnancy. We are also treating cases of fetal distress in labor, and cases where placental insufficiency is suspected, on the same basis, with the object of improving the blood flow to the uterus, placenta, and kidneys."

In 1967, Drs. Heyns and Blecher published the results of their continuing investigation of decompression therapy for toxemia and other aspects of placental insufficiency. Included in their studies was a group of forty-eight patients with moderate to severe toxemia, which was treated with decompression. These patients were compared to a control group of fifty patients who had toxemias of equal severity but who were treated with standard techniques, including the latest drug therapies, bed rest, and low-sodium diets. Of the decompression group, 76 percent showed *some* benefit from treatment, while 38 percent showed *marked* benefit. Only 59 percent of the controls, none of whom received decompression, showed some benefit, and only 18 percent showed marked benefit.

Fetal mortality (death rate) in the decompression group was 15 percent compared with 22 percent among the controls. *Maternal* mortality among the decompression mothers was 9 percent, as compared to 16 percent for the controls. In a second series of patients, decompression mortality was 12 percent, as compared with 28 percent for the controls who received standard treatment. Both of these series included women who suffered not only from toxemia but also from high blood pressure and nephritis (an inflammation of the kidneys). When only the toxemia patients are considered, the mortality rate in the decompression groups was only 7 percent—

less than a third of that for the drug-treated toxemia patients, whose mortality was 24 percent.

Little wonder that Drs. Lithgow, Lundgren, and Blecher find it "almost criminal" for obstetricians to ignore decompression in cases of toxemia and placental insufficiency. "Even if a doctor doesn't want to use the technique on a routine basis, for some of the other benefits it can supply," says Dr. Donald Lithgow, a professor of medicine at the University of the Witswatersrand in Johannesburg, "he certainly ought to use it for placental insufficiency, toxemia, and in all cases where there are histories of fetal wastage. I think it's been pretty clearly demonstrated now that it can flush the fibrin and other wastes out of the placenta and restore adequate functioning. I think that it's in this area—the area in which it is possible to save the baby and the mother, too, if *her* life is threatened—that decompression is bound to come into its own. How can any responsible doctor dare overlook it?"

In addition to its usefulness in cases of placental insufficiency, decompression can also be useful in preventing miscarriage caused by prematurely ruptured membranes. The fetus is contained in the membranous *amniotic sac,* which bursts when the baby is due, releasing the amniotic fluid and enabling the baby to escape from the womb. Sometimes an abnormally weak sac bursts too early, with a resulting premature baby or miscarriage.

"We've done some study on this problem," Dr. Michelow says, "and it seems that just as some women are prone to develop toxemia, some other women are genetically prone to produce weak membranes. I had one patient whose mother and grandmother, between them, had suffered some twenty miscarriages because of weak membranes that prematurely burst between the thirtieth and thirty-second weeks. The daughter suffered from the same problem. I suggested decompression when she became pregnant again, hypothesizing that if we can strengthen the placenta with decompression perhaps we can do the same thing to the membranes. It worked. When I ruptured the membranes at thirty-eight weeks, they felt tough and hard, and she gave birth to a big, healthy baby." Like the fetus itself, these membranes apparently are strengthened by an increased blood supply.

Another possible benefit that should be mentioned involves Rh disease, in which antibodies in the mother's blood literally wage war on the fetus's red blood cells, in effect "rejecting" them as if they were some sort of foreign matter. Dr. John Sampson, one of Dr. Heyns's earliest research collaborators, found evidence that decompression could reduce maternal sensitization to the baby's blood by minimizing the placental breakdown that permits exposure to the fetal blood supply.

"We had mothers with very high antibody counts," Dr. Sampson observes. "But with decompression the

babies withstood the challenge far better than those who got no decompression. We still had to perform exchange transfusions at delivery, but the babies were in surprisingly good condition, given those high antibody counts. It's likely that some of them wouldn't have survived without decompression. This is a fertile area for further study."

As the benefits of decompression became increasingly apparent, Dr. Heyns and some of his associates began an in-depth study of its effects on the body. Dr. Blecher, a young doctor now in private practice, was particularly active in this investigation. His account of this work, along with his own evaluation of decompression as a means of safeguarding mother and baby, follows:

"Apart from everything else that decompression was doing—speeding up labor, reducing pain, relieving backache, and so on—it soon became apparent that a number of other things were happening, of possibly far greater import. For example, the women who had decompression during their pregnancies rather than just during labor were giving birth to exceptionally fine babies, all in the pink of condition. There was never any fetal distress. Out of 6000 cases of women who had decompression there were only two babies born with cerebral palsy. The normal incidence here is three per thousand, so we might have expected eighteen cases of cerebral palsy.

"This suggested," he continues, "that decompression

was providing some sort of protection to the baby inside the womb. What actually was happening? It is obvious that if you reduce the atmosphere around the abdomen there will be changes in the circulation of the subject. So I did a series of physiological experiments on hemodynamics, the circulation of blood in the patient, while using decompression. By putting radioactive isotopes, harmless to the patient, into the blood, you can monitor its movements with special equipment. Using this technique, we were able to establish without doubt that decompression *does* increase the flow of blood throughout the abdominal viscera, the uterus, and the intervillous space through which the fetus gets its nourishment. Concomitant with the increased circulation in all of these structures, of course, was a corresponding drop in pressure within them.

"In the course of these investigations, incidentally, we discovered that decompression can have a number of beneficial side effects. As blood was sucked into the low-pressure zone of the abdomen, we observed the blood draining from varicose veins in the legs and from hemorrhoids, both of which often occur in pregnancy. Additionally, we observed that pressures inside all the heart chambers and pulmonary vessels were markedly reduced by decompression. These findings were later confirmed in laboratories in London. This confirmed our early suspicion that decompression might be a very good treatment for various forms of heart disease or heart

failure. By pumping blood into the low-pressure area in the abdomen, you reduce the venous return to the heart and so prevent the sort of overload that can be problematical in some individuals. Decompression gives the diseased heart more time to cope with the load. Several cardiologists in Canada and Britain and elsewhere have tried this out with success and, in fact, our cardiologist here has been using this successfully in *all* his cases of acute left ventricular failure, mitral stenosis, pulmonary edema, and the like. He still uses medication, as well, but this has been found to be a valuable adjunct.

"Finally, however, our mission was to see once and for all whether the placenta, like all of the other visceral organs, was getting more blood. The question we were really asking was, 'Does all of this increased blood flow really help the baby or doesn't it?' We set out to see by doing acid-base studies on the unborn babies. This involves sampling the blood from the baby while it's still in the womb. During labor you can reach in and scratch the baby's scalp lightly to get the blood samples. By analyzing the acid and base components of the blood, you can tell whether the baby is getting enough oxygen, whether it is adequately getting rid of metabolic acids and carbon dioxide, waste products. We found, very definitely, in cases of fetal distress, where the baby definitely wasn't getting enough blood and oxygen, that decompression could quickly reverse the distress.

"Time after time, after having diagnosed definite fetal distress in late pregnancy, we have seen this reversal take place while the expectant mother waits in the decompression suit for the doctors to set up the operating theater for a cesarean section. Just from that hour or two in decompression, we invariably found such marked improvement in the acid-base readings that we no longer had any indication to perform the cesarean. Thus we would just leave the woman in the decompression suit until she was fully dilated and then deliver the baby in the normal fashion. In this way we avoided doing cesarean sections—which carry extra risk—in all cases of fetal distress except those caused by a knot in the umbilical cord or by bleeding behind the placenta, rare occurrences that cannot be helped by decompression.

"In addition to the acid-base tests, we also attached tiny electrodes to the fetal scalp during labor, so that we could monitor the fetal heart. The electrodes were attached to a transistorized electrocardiograph machine that records the fetal heart without any interference from the maternal heart. We found that in cases of fetal distress, irregularities and weaknesses of the fetal heart observed before decompression would, *in every case*, be regularized within minutes after starting decompression. We wondered whether this was a chemical effect, related to improving the acid-base balance, or a sort of mechanical effect involving the flushing-out of various

metabolic products from the placenta. This seemed more likely since the improvement was so rapid.

"It transpired that what happens is that the labor contractions press the uterine walls down on the baby's head, and when the pressures are strong enough the head is compressed to the point that the vagus nerve in the brain is stimulated. This nerve acts directly on the heart, causing the irregularity. Additionally, this nerve activates the bowel, causing it to empty wastes into the amniotic fluid that surrounds the baby, further aggravating the fetal distress.

"When the amniotic sac breaks, of course, the pressure on the baby and the cord becomes even greater. We know that above certain pressures, all blood and waste transport between baby and mother ceases. Nothing reaches the placenta and nothing can get out. Decompression significantly reduces these pressures, even during powerful contractions, so that blood flow is definitely improved, fresh blood is sucked in, and the waste products are flushed out.

"Some people wonder what good decompression can do when it is applied only a half hour or at most a few hours daily. But if you study placental aging you can understand the benefit quite clearly. You observe the sediment that builds up in the vessels that are behind the placenta and deprive it of part of its blood supply. If one can flush out these little clots and fibrin deposits regularly, say for half an hour each day, that's all it

takes, along with sucking more oxygen through the intervillous space. Where the placenta is failing, particularly in women with toxemia, older women, women with diabetes, high blood pressure, spasm of the blood vessels, and so on, decompression can make all the difference. The fact is, this is the *only* means we have, anywhere in the world, of increasing the blood flow into the placenta. There is no substitute. There is no drug that can specifically divert blood into the placenta.

"Here is a technique that has reproducible effects. If the mother's blood pressure is high, you can consistently bring it down. If the baby isn't growing, you can get it to grow; if the baby is distressed in labor, you can reverse the distress. When you use decompression prophylactically in pregnancy, you don't get distress. When you use it through pregnancy, you don't get cerebral palsy."

MD's and physiologists may be interested to know that Dr. Blecher has described this research, which he has outlined for me only briefly here, in his 200,000-word thesis—"Aspects of the Physiology of Abdominal Decompression and its Usage in the Toxemias of Pregnancy and in Fetal Distress in Labor."

A number of other researchers have begun to investigate the physiological effects of decompression, confirming some of Dr. Blecher's most important findings. In the January, 1970, issue of the *American Journal of Obstetrics and Gynecology*, for example, A. Dolezal

of the Clinic of Obstetrics and Gynecology of Charles University in Prague, Czechoslovakia, and V. Hlavaty of the Institute of Biophysics at Charles University reported that their radioisotope studies reavealed that blood flow through the placenta during labor contractions *was* significantly increased by decompression.

In May of 1970, in the *Proceedings of the Royal Society of Medicine,* Drs. D. J. MacRae and S. M. Mohamedally, both of the Mother's Hospital in London, reported on metabolic effects of decompression. Specifically, they examined the effects of decompression on the output of the maternal hormones estriol and pregnanediol. The levels of these hormones are particularly important to doctors because they are among the best indicators of placental and fetal health. If the placental function is good, the hormone levels will be within a certain range; if the function is poor, the levels will fall below this range. It was theorized that if decompression was really useful in overcoming placental insufficiency then it should have a direct, *boosting* effect on these hormones.

In this study, seventeen pregnant women whose hormone levels were depressed were treated with decompression. "A rise in hormone levels was obtained in fifteen of the seventeen cases treated," the researchers announced. The rise, in each case, coincided with the onset of decompression treatments. Many of the women had histories of miscarriage but were able to carry

babies to term with the decompression treatments. Only two patients did not experience a rise in hormone levels. In one of these patients, however, the researchers note, "treatment sessions were limited to two per week because of domestic difficulties." Each session lasted a half hour, making a total of only sixty minutes of decompression per week in this case, far too little, according to the South African doctors, to overcome a case of real placental insufficiency. In the other nonresponsive case, a stillborn infant was delivered at the thirty-seventh week and was found to have severe heart abnormalities, which unquestionably made treatment more difficult.

Among the seventeen cases, there was only one stillbirth, even though many of the women had histories of repeated miscarriage. One patient, for example, had "an obstetric history of a small-for-dates baby, a stillbirth, and a miscarriage at six months. . . . Abdominal decompression was given thrice weekly from the twenty-sixth week and twice daily during the thirty-ninth week of pregnancy; the baby at term weighed 3345 grams [better than seven pounds]. In another case, a primigravida showed an increase in hormone values with once-daily decompression treatments for the last seven weeks of pregnancy; the term baby weighed 3033 g. [nearly seven pounds]. Concern at the persistently low estriol levels in [another] patient with an obstetric history of three miscarriages and two dysmature [poorly developed] babies initiated a course of abdominal de-

compression therapy of seven sessions between the thirty-seventh week of pregnancy and term. A rise in hormone levels ensued. [The rise, charted on a graph, can be seen to be immediate and dramatically steep.] The baby weighed 5550 g. [twelve pounds] when delivered at term."

In the January, 1971, issue of the *Journal of Obstetrics and Gynecology of the British Commonwealth,* Dr. Alan Coxon, an obstetrician, and J. W. Haggith, a physicist, provided some additional confirmation of Dr. Blecher's work. Like the Czechoslovakians, these researchers in Newcastle, England, detected definite reproducible blood-flow increases in the placenta during decompression. When there were no contractions, decompression produced a 30 percent increase in blood flow; during contractions it still produced a 15 percent increase.

In this country, Dr. Lundgren's wide experience with decompression has also strongly supported the claims of the South Africans. "Our patients," Dr. Lundgren notes, "use decompression daily during the last twelve weeks of pregnancy. We agree with Heyns that inadequate placental oxygenation during the last trimester and parturition [birth] may lead to mental retardation or cerebral palsy." Additionally, Dr. Lundgren believes that decompression may be useful in combating toxemia and placental insufficiency. His experience with de-

compression is illustrated by the following three case histories from his practice:

Case One: Mrs. V. T. had suffered two miscarriages and a stroke before she became pregnant for a third time at age forty. After consulting Dr. Lundgren, Mrs. T. used decompression for two hours a day at home, throughout the last half of her pregnancy. The baby, delivered at full term, was a healthy girl with a perfect Apgar score of 10. "I have to believe," Dr. Lundgren concludes, "that without abdominal decompression we would have had another fetal death *in utero*. It is obvious that this patient was at high risk; she had definite cerebrovascular changes and had suffered previous mid-term miscarriages due to placental insufficiency."

Case Two: Mrs. A. R., at forty, was pregnant for the fourth time. Her first pregnancy had been successful, resulting in a healthy baby girl in 1962. Her second child, born in 1963, had cerebral palsy. The third pregnancy ended in miscarriage at eight weeks in 1968. "This woman had read of my work," Dr. Lundgren recalls, "and when she became pregnant a fourth time she felt that decompression might be a good way to ensure the best for both herself and her baby. She came to Houston from a large eastern city. She began using decompression for two hours a day in April. In mid-July she had an excellent labor of only three hours duration, using decompression. Her baby, a girl, was another Apgar 10."

Case Three: Mrs. B. T., seen by Dr. Lundgren in the first trimester of her pregnancy, weighed 220 pounds and had high blood pressure (180/120). Despite bed rest, sedatives, diuretics, and medication to reduce blood pressure, Mrs. T.'s condition continued to deteriorate. Her blood pressure went up to 220/120, and her tissues began to swell with retained fluids, a sign of toxemia. At five months, Dr. Lundgren started her on decompression—one hour each day. Almost immediately her blood pressure began to drop. Dr. Lundgren increased the decompression to two hours daily, and Mrs. T.'s blood pressure was soon down to 190/110, despite the fact that medication had first been halved and then discontinued altogether, except for the diuretics.

"When she was checked at weekly intervals," Dr. Lundgren observes, "the blood pressure kept on decreasing, so that by the seventh month the patient's pressure averaged about 140/90. Given her age of thirty-eight and her history of hypertension, we felt this was quite adequate for her. After a five-hour labor, during which her blood pressure was 130/90, she delivered a male with an Apgar score of 10. It's interesting to note that after the baby was delivered and Mrs. T. had discontinued decompression, her blood pressure went right back up. So I don't think there's any question but that decompression temporarily cured this patient of her hypertensive cardiovascular disease. And it certainly took

care of the toxemia, which was in part an outgrowth of this hypertension.

"These case histories emphasize what can be done in cases at high risk. There are many thousands of these problem cases seen each year, and decompression can be of significant benefit in almost all of them. In addition, I believe that decompression is of very real benefit in every pregnancy, labor, and delivery. We never know when a patient, in what appears to be a normal labor, may, with distressing suddenness, become a high risk, either losing her baby or giving birth to a baby with severe neurological damage caused by distress during labor."

In addition to protecting both mother and baby from serious complications during pregnancy and labor, decompression has been reported to have a number of other effects that make pregnancy easier. The possibility of using decompression for certain forms of heart disease and for at least temporary relief from varicose veins and hemorrhoids, both of which frequently plague pregnant women, has been suggested. Many women who have used decompression for a number of pregnancies claim that decompression has brought about *lasting* improvement in their varicose veins and hemorrhoids.

Insomnia and fatigue are two other frequent companions to pregnancy. Almost without exception, women using decompression say that it is better than a tranquilizer for dispelling nervous fatigue and better

than chemical sedatives for inducing drowsiness. As one woman put it, "I can be taut and irritable, really just a bundle of nerves, so tired but at the same time so high-strung that I can't begin to sleep. And after even a half hour of decompression I can feel all the tightness and tension melting away." Another says, "I always come away from a session in the decompression suit relaxed and ready to nap. Where I couldn't begin to get to sleep before, I can slip right off after decompression." Many note that they use decompression just before bed for this very purpose.

One of the most common—and devilish—problems faced by pregnant women is backache, particularly during the latter stages of pregnancy when the increased weight of the baby puts a considerable strain on the back muscles. The pregnant woman, to compensate for her unaccustomed burden, tends to walk with back arched, shortening the back muscles and at the same time tensing them. After awhile, the tension turns to outright soreness or pain. So many women commented on the fact that decompression relieved their backaches that Dr. Heyns and his colleague, Dr. Sampson, initiated a special study on decompression for the treatment of backache. Their subjects included twenty men as well as a number of pregnant women—all suffering from various types of back discomfort. Depending upon the severity of their pains, the subjects had decompression as often as four times daily.

The results, in terms of relief achieved through decompression, were as follows: excellent, 24 percent; good, 60 percent; satisfactory, 12 percent; unsatisfactory, 3 percent. Many of those who got excellent relief required no further treatments. Those who got good relief required seven to ten further treatments, while the satisfactory group got only temporarily relief and had to return for repeated treatments whenever the pain presented itself.

One of the earliest cases of backache to be treated with decompression involved a young rugby player whose back was injured in a game. Dr. Heyns, a rugby enthusiast, happened to be at the game and suggested decompression, intuitively guessing that it might provide rapid relief in this case. A stretcher was summoned, and the young man was carted off to the Queen Victoria Maternity Hospital, much to the amusement of many of the women there. The embarrassment of checking into the maternity ward proved more than worthwhile for the young man, however, because the treatment did relieve his pain, and in very short order. He was soon back on the rugby field.

Dr. Heyns is quick to concede that decompression is not effective for *all* backaches. Backaches caused by muscular spasm, rather than by structural defects, seem to yield most quickly to the treatment.

No one knows for sure how decompression works to break the muscle spasms. Dr. Heyns hypothesizes that

expansion of the rib cage pulls the muscles, thereby breaking the spasm that causes the pain. In order to exert a sufficient pull on these muscles for a sufficient length of time, the negative pressures used are much greater than those applied during pregnancy decompression. Though the sensation of these relatively high negative pressures can be initially breathtaking, the immediate relief from pain that most people experience compensates for the mild discomfort of the decompression itself.

IV

Decompression for Shorter, Less Painful Labor

Studies have shown that women worry more about severe pain during labor than about any other aspect of pregnancy. They worry, too, about the length of labor. Almost every woman has heard of labors, among friends or relatives, that lasted two or more days. They may have heard that anesthesia isn't always effective in killing the pain of labor contractions, that it often simply has an amnesiac effect, making you forget the agony once the ordeal is over. While these fears are often exaggerated, it is wrong for a doctor to give his patient the impression that labor will be a snap or that, with modern anesthetics, she "won't feel a thing."

The fact is, persistent cries of pain *are* still heard with predictable regularity in labor wards and delivery rooms. And anesthetic agents *do* tend to have amnesiac effects in many cases, dulling the memory of pains that were real enough at the time. And while labors seldom

stretch to two or more days, a woman having her first baby will, on average, spend some fourteen hours in labor—anything but a snap.

In recent years, women have begun taking a more active interest in their own biology. They have begun to insist that their doctors be more open and frank with them about such things as labor and delivery. Understandably, they have become somewhat intolerant of their doctors' "pooh-poohing" their fears about these important events in their lives. After all, most doctors are *men* who never will know what it really feels like to have a baby. Understandably, an ever-increasing number of women are turning to various types of natural childbirth and associated training, which prepare the expectant mother for everything that will happen during labor and delivery.

Let us consider the case of Emily, who had had one baby and was about to have another, an experience she was looking forward to with mixed emotions. "The first time," she recalls, "I didn't really have a worry in my head. I'd heard all the stories, of course, about women being in labor for days, suffering frightful pain and so on. But I always associated that with the bad old days. My doctor reinforced this notion. He told me not to worry, that I wouldn't feel anything. 'No worse than having a tooth out with Novocain,' is the way I think he put it. He didn't give me any options, either. I mean, at that time I didn't know anything about natural child-

birth or the pros and cons of the various anesthetics. I just wanted to be 'out'—all the way.

"Anyway, I had gas anesthesia and it worked, up to a point. I mean I did black out, and I stayed out a lot of the time. But there were periods in between, periods I still remember, when I felt the pains. I still have nightmares about that, and I wake up all of a sudden in a cold sweat. I even woke up my husband Roger one night, screaming. Apparently, when I was having the baby, I was screaming for him almost constantly. The doctor finally let him come in, and he held my arm while they gave me more gas. It was awful for him. He said later I was screaming and writhing through the whole thing.

"Well, when it was all over, I felt I'd been short-changed, that my doctor hadn't been completely honest with me. And I know now that what happened to me was what most women experience with that type of anesthesia. It gives you a creepy feeling: the doctor telling you everything is all right, that everything went fine, when in fact you were lying in there screaming with pain. And there you are too rummy to know what's really happened. I vowed, right after I saw how shaken Roger was, right after he told me what had happened and I began to remember it myself, that I would never have another baby in that drugged, half-alive state again.

"When I got pregnant a second time, I decided, after talking to a lot of friends, that I would have a local

anesthetic, something that would leave me awake during delivery. Then when I was about six weeks pregnant, I heard about something that sounded even better, something that didn't require any drugs whatever. It was also supposed to *speed up* the labor. That was for me, I thought, remembering the seventeen hours I'd spent in labor the first time. It was decompression, of course; a friend of a friend had used it during her first delivery, and the labor had only lasted two hours. I could hardly believe it. Besides that, she hadn't had *any* anesthesia and said she'd suffered almost no pain.

"I got a referral to her doctor and started decompression right away, using it half an hour each day at home. The machinery was simple to operate and I enjoyed the whole thing. Roger was skeptical at first but didn't really complain. He was willing to try anything but what we'd been through the last time. I used decompression right up through the first stage of labor. The whole labor lasted only three and a half hours, and I never felt any pain that was strong enough to make me scream or even cry out.

"Roger was with me all the time, and we were able to carry on a normal conversation all the way up until the doctor came in to deliver the baby, which practically popped out. I did take an oral pain killer, but that was all. I was awake and alert through the whole thing. When I compared the two deliveries, it was like the difference between night and day. I'd never

dream of having a baby without decompression, particularly when I reflect on the difference between the two babies. The first one, Mark, was sluggish compared to Mary Ellen. The poor thing was almost as drugged by the gas as I was. Mary Ellen came out squalling at the top of her lungs. She was pinker than Mark and generally did much better all around. She had a higher Apgar, too. The doctor told me I probably shouldn't make comparisons, and certainly I don't plan to do this in front of the children, but Mary Ellen advanced a lot more rapidly in every way. She was grabbing things, crawling, walking, talking, advancing at every stage of development much earlier than Mark had."

Before going any further, we should review some of the basic facts about labor and delivery. Contractions, or muscular activity in the walls of the uterus, actually begin long before the onset of active labor. These mini-contractions act to tone up the uterus, "ripen" the cervix and, in general, prepare the body and particularly the womb for childbirth. These contractions are generally painless and are hardly felt except, perhaps, in the form of mild discomfort in the small of the back. Gradually, the muscles of the uterine walls begin to contract with greater intensity and rhythmicity. When real labor is at hand, the contractions become fairly regular, recurring every ten to fifteen minutes. As labor advances, the intervals between contractions shorten, and the contrac-

tions tend to become longer in duration and more painful.

The first stage of labor covers the period from the onset of regular contractions to the time when the baby first begins to emerge from the uterus through the cervical opening. The second stage marks the period in which the baby pushes down through the birth canal and emerges from the vaginal opening. The third stage marks the expulsion of the placenta, which is then called the afterbirth.

When Dr. Heyns first began experimenting with decompression he was not surprised to find that it speeded up the labor process. After all, the primary effect of decompression was to lift the powerful abdominal muscles, freeing the underlying uterine walls to contract more vigorously than ever—without restraint. It was natural, then, that the baby should be expelled more rapidly.

The South African doctors feared, however, that their patients would have increased pain from the more potent contractions. On the contrary, the shorter labors seemed to be accompanied by *reduced pain*! The doctors were at a loss to explain this remarkable result for some time, particularly since so little was known about the actual origins of pain in labor. Dr. Heyns began a series of studies, attempting to determine how decompression might be diminishing the pain of contractions. On the basis of his findings and his intuitions, he con-

cluded that the pain of labor is a "reflexive" pain, meaning that it is triggered in one area but produces a discernible effect in another. Using complex equipment to monitor muscle activity throughout the body, he found definite reflexive effects in the sacrospinalis muscles of the lower back. He found that the spasms in the muscles and related pressures on various nerves could be abolished by decompression, greatly diminishing the pain. The decompression apparently stretches the muscles and breaks the spasms.

Interestingly, he found that similar reflexive pains in cases of dysmenorrhea, or painful menstruation, could also be abolished by decompression. Since that time, decompression has been used with considerable success in a number of problematical cases of dysmenorrhea, although not all instances of this disorder have yielded to the treatment.

Finally, it should be added that the South African doctors are not entirely in agreement on the reasons why decompression relieves pain during labor; most of them, including Dr. Heyns, concede that more study is needed. But they all agree that it *does* decrease pain—and very often dramatically.

They also agreed that the longer decompression was used *before* labor, the speedier and less painful labor was likely to be. (Pain relief, however, was significant even in those women who were *first* introduced to it during labor itself.) The theory is that decompression

encourages the Braxton Hicks (painless) contractions that tone up the uterus and soften the cervix long before labor ensues. Thus, decompression could be thought of as "training" the uterus for the task of labor, bringing it to optimal performance.

Dr. Heyns, reporting on his first several hundred decompression patients, reached the following conclusions about the speed and pain of labor:

1. For more than 50 percent of the women having their first babies, first-stage labor lasted less than half the average time of fourteen hours. "This," he noted, "is from the very earliest onset of labor. For 37 percent, the first stage was under five hours. The corresponding percentage figures for controls [women who did not have decompression] were 24.5 percent [having labors lasting seven hours or less] and 13.5 percent [having labors lasting less than five hours]."

2. Pain relief was a prominent feature—some 77 percent of the women felt they had gotten excellent relief from pain with decompression and without anesthesia.

A number of Dr. Heyns's associates use decompression routinely for its pain-relieving qualities. Dr. John Sampson, who delivered most of the first decompression babies in collaboration with Dr. Heyns, says, "I've seen women in absolute agony who have found great and in fact *complete* relief from pain during labor, thanks to decompression. And these women have had no anes-

thesia, mind you. Others get less relief, of course, but generally I find the relief substantial.

"In addition, I've no doubt whatever that the duration of labor in the woman who has been using decompression is much shorter than in the woman who hasn't had benefit of it. To quote one example, not really atypical, I had one patient who previously had labors lasting forty-eight and fifty-six hours; after using decompression during her third pregnancy, her labor and delivery lasted only three hours, from start to finish. Time and again the staffs in the private maternity hospitals have expressed surprise over the ease and speed with which first-time mothers who've used decompression have their babies.

"The other important point I'd like to stress is the *condition* of these decompression mothers. After labor and delivery, instead of having an exhausted, squeezed-out rag of a patient, you have a woman who is physically and emotionally alert and excited about the whole adventure. She is truly energized."

"The best way to illustrate the pain-relieving aspect," Dr. Blecher suggests, "is to ask the woman to sit through a few contractions without using decompression. She'll cry and puff and groan, and then we'll tell her to go ahead and use it. You'll see the difference right away. There'll be a big smile on her face and she'll get through the next contractions without any visible discomfort."

"I was impressed from the outset," Dr. Michelow adds, "with the extent to which patients got relief from labor pain. When they got the negative pressures of decompression up high enough, using it rhythmically during contractions, they definitely got pain relief. Generally, there was no anesthesia used and very little sedation either, for that matter. Pain relief and shortened labors were particularly evident in cases where the patients had been using decompression regularly for a few weeks or more before labor.

"Decompression, I think, ripens the cervix and shortens it, contributing to quick, efficient labors. Efficiency, of course, is also maximized by lifting the abdominal muscles off the uterus. I recommend decompression for all of my patients. I do use local anesthetics in my own practice, and I've found that by combining decompression with a paracervical block [one kind of local anesthetic] I get remarkably speeded labors. Normally it can take up to 200 minutes or more to get from 4 or 5 cm. to full dilatation of the cervix in labor. With a paracervical block applied at 5 cm., 90 percent of my patients are fully dilated within 60 to 70 minutes. By adding decompression to the block, total dilatation, again from 4 or 5 cm., can occur within 30 minutes. Now, of course, the skeptics will say that they have seen this happen in women who have had *neither* decompression nor paracervical block. The difference is that we see it *consistently*. Decompression used alone also

speeds up labor, though not so much as when used in conjunction with paracervical block.

"This, of course, is based on my own long-term experience. I realize that an extended study will have to be performed before we can claim *categorically* that decompression significantly relieves pain and speeds labor. Personally, however, I'm more than satisfied that it does —and so are most of the other doctors who have used decompression on any significant number of cases. What really impresses the obstetrician who is just becoming acquainted with decompression on a first-hand basis is its effectiveness in these areas, even with women having their first babies, when labor is normally prolonged."

Dr. Tony Roberts, another pioneering decompression researcher and one of the chief developers of the decompression suit, was the first to demonstrate the pain relief of this method outside South Africa. Dr. Roberts refers to what Dr. Heyns labeled "270 D." "As you know," Dr. Roberts explains, "pregnancy runs an average of 280 days. The idea was that if you give decompression daily during the last ten days—from the 270th day on—you will ripen the cervix and make labor that much smoother. This idea turned out to be well founded and became standard, though later on, decompression was begun even earlier in pregnancy in order to reap the additional benefits of enhanced fetal oxygenation.

"In any event, we found that during actual labor contractions you need far greater negative pressures than

are applied during pregnancy. This is why some others who tried decompression during labor failed; they simply didn't utilize great enough negative pressures. When you push the pressures up there, you get very effective pain relief—certainly enough to carry most women through labor without anesthesia.

"I remember demonstrating pain relief before a group of somewhat skeptical doctors in London. The subject on this occasion was in labor, experiencing very strong contractions and very intense pain. She had been given no anesthesia and had never seen a decompression suit before. I supose it was all rather unfair to her, but as it turned out it was a tour de force, as demonstrations go. I put her into the suit and told her to close off the hole in the control flute with her finger when she felt the next contraction coming on. This activated the decompression.

"The contraction began, and the effect was marvelous to see. The expression on her face went from a tearful, acutely apprehensive look to a beatific, totally relaxed look. A grin suddenly spread across her face, and I'll never forget, she said, 'Ohhh, doctor, it's lovely!' "

After this, other doctors began experimenting with the pain-relieving aspect of decompression. Dr. Louis J. Quinn of St. Mary's Hospital in Montreal, Quebec, and some of his associates began publishing their results as early as 1960. In their first paper, the Canadian

researchers listed their findings on a series of forty-six patients as follows:

1. Only seven of the forty-six patients (15.2 percent) took more than five hours to reach full dilatation. Five of the seven were women having their first babies.

2. Only eight out of forty-six (15.2 percent) had less than what they termed "good relief" of pain. The majority of these failures can be explained on grounds of technical inadequacy of equipment, which can be corrected. Patient's estimation of pain relief during decompression:

Excellent	75+ percent relief of pain
Good	50–75 percent relief of pain
Fair	25–50 percent relief of pain
Poor	0–25 percent relief of pain

3. Only 21 of 46 patients (45.6 percent) received any sedation, and many of these could have managed without it.

4. We have made a few tentative experiments with patients in prodromal [tentative or uncertain] labor. Our early impression is that the method seems capable in some instances of converting prodromal labor into an unequivocal type of labor. Some of the more lengthy labors fall into this category.

5. It is our impression that labor is stimulated by this technique; the contractions appear more frequently, last longer, and are apparently stronger.

6. The average time of decompression (from 4 cm. or less to full dilatation) was two hours and fifty-six minutes for primigravidas and one hour and fifty-seven minutes for multigravidas.

7. All patients aided in labor by this method of decompression were carefully examined at delivery, to exclude any possible damage to the genital tract. Only one case of cervical laceration was found. This was associated with a forceps delivery and manual removal of a trapped placenta.

The paper concluded:

The results are very encouraging and we feel that further trial is warranted, as this method of decompression may be a very important addition to our conduct of the first stage of labor.

A second paper, published in the *American Journal of Obstetrics and Gynecology*, reported on a larger series of cases. "Our latest results," the Canadians wrote, "confirm our original work and show that this method considerably relieves the pain of labor and shortens the first stage. We feel that this is brought about by the vacuum creating a sucking force on the abdomen, which causes it to bulge outward where the wall is muscular and able to stretch. This then allows the uterus, which lies in a somewhat posterior position, to rise forward into the true axis of the pelvis with each contraction, unopposed by the tense abdominal wall. This action reduces the uterine muscle fatigue, resulting in longer contractions that are presumably more efficient and less painful. The relaxed rectus muscles are themselves painless."

Results of the second Canadian study, involving 142 women (100 of them having first babies) were as follows:

Fifty percent of the first-time mothers had first-stage labors of under three hours; 33 percent had labors of three to five hours; 14 percent had labors of five to seven hours; and only 3 percent had labors lasting longer than seven hours. Among women who had already borne children, better than 90 percent had labors lasting less than three hours.

Among first-time mothers, 18 percent said they got "excellent" relief from pain, and an additional 65 percent said they got "good" pain relief from decompression. Among women who had previously given birth, 31 percent said they got "excellent" relief, and 57 percent said they got "good" relief.

"One of the very important benefits of abdominal decompression during the first stage of labor," the Canadian doctors asserted, "was the ability of so many of the patients to go through labor without any analgesia. This we feel is a very distinct help in conducting the first stage of labor, as the babies show no respiratory distress and begin to cry as soon as they are delivered. In our series of 142 patients, 86, or 60.5 percent, required no analgesia during labor. The remainder required only a small amount of analgesia."

Still other doctors in different countries have taken note of the benefits of decompression in labor. Dr. Yoshio Sakakura of the Keio University Hospital in Japan, for example, writes that "there have previously been methods of relieving pain in labor, but the method

[decompression] has proved that it reduces the length of the first stage of labor and alleviates pain; that it improves fetal oxygenation; and that it offers the best conditions for both parturient [the mother] and fetus during labor."

Dr. G. di Francesco, writing in the *Annali di Obstetricia Ginecologia,* of Italy, concludes: ". . . our experiments undoubtedly confirm that this method could have an analgesic effect and speed up labor."

And in Mexico, Dr. M. H. Gutierrez, an American-trained obstetrician who has treated many American patients at his superbly equipped clinic in Guadalajara, writes in a monograph on decompression:

In recent years, scientific research has celebrated what we might call a landmark in modern obstetrics. . . . Heyns discovered a method, known as abdominal decompression, which most wonderfully solves the problems of suffering in the first and second stage of labor. (A) It relieves the pain; (B) it significantly reduces the duration of labor, decreasing the resistance and bringing about the relaxation of the muscles of the birth canal; and (C) it ensures a greater supply of oxygen to the child *in utero* during labor.

. . . uterine contractions always represent a deficit of oxygen resulting in different degrees of hypoxia. We are sure that we can render the supply of oxygen greater during each uterine contraction than is the case in normal labor, and consequently can eliminate any injury which might cause trauma in the neurones [the cells of the brain], so safeguarding the interest of the child and providing higher indices of intelligence. . . . We are certain that the

risk of epileptic children, imbeciles, and spastics can be minimized when decompression is used.

Since February, 1964, the use of decompression in labor has been the routine method in my private obstetrical practice. Results obtained in patients from seventeen to forty-eight years of age treated by this method, as well as in patients in premature labor from the twenty-seventh to the thirty-sixth week of pregnancy, have been excellent.

Duration of labor has been significantly reduced to not more than three and a half or four hours in primiparae [women having first babies]. . . . We have observed carefully how, in all children born by this method, the respiratory condition has been normal at birth, the reflexes generally perfectly active; they have cried at the very moment of birth, while the coloration of the skin has been the best proof of oxygen saturation.

In the United States, Dr. Lundgren's results concerning labor pain and duration were very much like those reported elsewhere. Those results, involving 628 women, including 100 controls, are summarized in Tables 1 and 2.

These figures, Dr. Lundgren notes, have remained remarkably constant as more cases (now totaling more than 1000) have been treated by decompression in his practice.

Commenting on pain relief, Dr. Lundgren acknowledges that "the estimation of pain relief is colored by the patient's tolerance and the attendant's attitude and reaction. Perhaps somewhat more objective is the comment of our chief of anesthesiology on the use of the

decompression bubble: 'All I know is that when they put on the bubble, the patients stop yelling.'

TABLE 1

DURATION OF FIRST STAGE OF LABOR

528 Cases—*Using Decompression*

234 Primigravidas (women having first babies)		294 Multigravidas (women having babies who have previously given birth)	
Hours	Percent	Hours	Percent
0–2	15%	0–2	50%
2–4	61%	2–4	40%
	76%		90%
4–6	14%	4–6	6%
6+	10%	6+	4%

100 Cases—*Controls Not Using Decompression*

All 100 Primigravidas

Hours	Percent
0–2	14%
2–4	45%
	59%
4–6	19%
6+	22%

TABLE 2

PAIN RELIEF

528 Cases—*Decompression Plus Analgesic*

234 Primigravidas		294 Multigravidas	
Excellent	20%	Excellent	25%
Good	64%	Good	61%
	84%		86%
Fair	14%	Fair	12%
Poor	2%	Poor	2%

"I feel that use of abdominal decompression is an *addition* to the armamentarium available to the practitioner, not a substitute for other established techniques. Analgesics are administered in my practice to every patient using decompression. However, only a minimal dose need be given, and very rarely does it need to be repeated." Because Dr. Lundgren uses mild analgesics during early labor and saddle blocks (local anesthesia) during the second stage of labor, his patients generally require negative pressures of no more than 40 or 50 mm. Hg. for even the strongest contractions. "The vacuum cleaner can give maximum vacuum of minus 90 mm. Hg. [Recall that atmospheric pressure is measured in millimeters of mercury, or Hg. Minus readings indicate pressure *below* normal atmospheric pressure.] The higher levels of vacuum become necessary for pain relief

as the strength of contractions increases. The patient observes a gauge mounted directly on the dome and operates a release valve. This allows air to enter the dome to maintain the vacuum at the required negative pressure level. The South Africans, in the many cases where they use no analgesics and no anesthesia, escalate these negative pressures to 100 mm. or more and thus obtain quite effective relief without medication.

Dr. Lundgren makes reference to two studies that concluded that decompression was not highly effective as a pain killer in labor. In both of these studies, Dr. Lundgren observes, the researchers were testing the efficacy of decompression *alone* (without analgesic supplements).

"For that reason," he says, "I was not surprised by the results of these two studies. Decompression was never meant to be used as the only means of analgesia in labor."

Again, however, the South Africans believe that decompression can and does serve quite effectively alone, provided the negative pressures are high enough during the contractions. Many of their subjects are able to easily tolerate negative pressures well above 100 or even 150 mm. Hg. after brief training. In the two studies that failed to confirm the analgesic potency of decompression, Dr. Heyns points out, negative pressures no higher than 70 mm. were applied. Even given the lower nega-

tive pressures used here, given the lack of any analgesics and, according to Dr. Heyns, given the shortcomings of the apparatus used (not identical to his own), some 41 women out of 100 in one study, done in Venezuela, said the relief they got from decompression was at least "satisfactory."

In the other "negative" study, undertaken in the United States, there were only twenty-five subjects. Five of these—20 percent of the total sample—said they were satisfied enough with the relief obtained through decompression that they would use it again in subsequent pregnancies. This, again, despite the fact that the negative pressures used without any analgesic were far below those recommended for adequate relief by the South Africans. And their experience is much broader than that of the two American doctors who dismissed decompression out of hand, after using it on only twenty-five subjects. To date, the South Africans have delivered more than 10,000 women using decompression—and, in most cases, using decompression alone.

Let us return for a moment to Dr. Lundgren's study of 628 women. In addition to the "noteworthy" reduction in labor times for the 528 women who used decompression (as compared to the 100 controls), he also noted significant differences in the condition of the babies born to the two groups of women. These differences, expressed in Apgar scores, are outlined in Table 3.

TABLE 3

APGAR SCORES

Score	Decompression Babies	Control Babies
8–10	95%	80%
6–7	5%	10%
0–5	0	10%

Commenting on this study in the textbook entitled *Davis' Gynecology and Obstetrics,* Dr. Lundgren concludes that: "1. Abdominal decompression is entirely safe for both mother and baby. 2. When employed correctly, decompression markedly shortens the first stage of labor in the majority of patients. 3. The relief of pain is striking, and less analgesic drugs are needed with decompression. 4. Decompression babies have higher Apgar scores than those delivered by conventional methods."

The beginning of the second stage of labor is marked by the first sign of the baby emerging from the womb through the cervical opening. At this point, decompression is halted, the decompression dome or zipper is opened, and the baby is delivered. Dr. Heyns and his colleagues have observed that this second stage of labor, almost always quite short under any circumstances, is further shortened by decompression treatments throughout the latter part of pregnancy and the first stage of

labor. It is quite often so short that the woman experiences very little discomfort, even though she is no longer in decompression.

In some cases, pain does result, and that is why some doctors who use decompression also give analgesics or local anesthetics at this point. Actually, it is possible to continue using decompression during the second stage of labor if difficulty is encountered. This is a different type of decompression, however, known as second-stage decompression or "outlet" decompression. Also invented by Dr. Heyns, the outlet decompression device is a hand-held dome that fits over the pelvic area, completely enclosing the vaginal opening. It is connected to a pump, and a gauge measures the negative pressures being produced in the birth canal.

The effect of outlet decompression is to impart extra forward momentum to the fetus, thus further speeding its departure from the womb and birth canal. It does this by creating a low-pressure zone in the birth canal, below the baby. In a sense, the baby is "sucked" forward into the partial vacuum.

The idea of helping the fetus along during the second stage of labor is far from new in itself. Almost everyone has heard of the forceps, an instrument invented four hundred years ago in France. It is still used today when the fetus is having difficulty getting out of the womb or when it is essential to deliver the baby as quickly as possible. Unfortunately, the forceps, which is

applied to the fetal head, sometimes does damage. It requires a highly skilled hand and, because it must be introduced into the birth canal, also requires careful sterilization.

Outlet decompression, on the other hand, accomplishes the same thing as forceps but cannot damage the fetal head since it never comes in contact with it. And since it isn't introduced into the birth canal, sterilization can be dispensed with. It also works far more rapidly. Dr. Roberts, who carried out much of the early research with this form of decompression, summarizes some of its benefits:

"As the force generated by outlet decompression is in the order of, or greater than, that produced by maternal bearing-down efforts, progress in the second stage of labor can often be maintained or accelerated without voluntary effort on the part of the mother and in the absence of uterine contractions.

"In case of acute, unexpected fetal distress late in the second stage of labor, outlet decompression can be lifesaving. In this [experimental] series, outlet decompression extracted an acutely distressed infant (long before forceps could have been applied) within seconds in the absence of primary and secondary powers. The method is safe and simple enough to be used by midwives. It requires no preparation and can be used without anesthesia."

Dr. Heyns observes that outlet decompression can also be used to deliver the placenta within a matter of seconds, which is useful when the placenta resists natural delivery. In such cases, drugs are not necessary.

V

Decompression for Healthier, Brighter Babies

We are almost certain that we can avoid most epileptics, spastics, imbeciles, and other mental defectives by using decompression. And there is growing evidence that a significant number of decompression babies are mentally gifted and even highly gifted.

Dr. O. S. Heyns

With the use of decompression, we noticed that we were obtaining exceptionally fine babies even under conditions that would normally give rise to the gravest alarm—marvelously pink, alert babies that normally would have been gray and flaccid. As the babies grew we observed accelerated development. These things happen even without decompression, of course, but when you see so many that are so bright it becomes difficult to dismiss it as chance.

Dr. Tony Roberts

It's complete nonsense, of course, to suggest that all of these [decompression] babies are geniuses. Just such claims in the lay press did more to harm decompression research,

I think, than anything else. It's tragic that these distortions put off much of the medical fraternity, because early testing did, in fact, show pretty convincingly that the decompression babies *were* developing more rapidly than non-decompression babies used as controls. More and better testing should be done, particularly now that we have such a large pool of decompression children, many of them at an age where I.Q. testing can be performed with far greater reliability. . . . Personally, I believe that ultimately it will be scientifically demonstrated that intellectual quality of the baby is consistently improved by decompression.

Dr. J. A. Blecher

Those of us who have been closely associated with decompression and have used it in hundreds of cases believe that it will be proved, beyond doubt, that the technique is valuable in optimizing intelligence. I believe that decompression will make its mark in this domain and that it will be used *routinely,* in every case of pregnancy, for this if for no other reason.

Dr. John Sampson

As a doctor who sees—and delivers—a great many babies, I find it difficult to doubt that decompression is having some effect on mental development and baby quality in general. The impressional data, at the very least, is overwhelming. All of the mothers who use decompression report that their babies sit up earlier, smile earlier, walk earlier, and so on. This doesn't provide scientific proof but, coupled with one's own observations, it all seems highly suggestive of some real effect.

Dr. Cecil Michelow

Women who use the technique are continually making comparisons between their decompression babies and their earlier, nondecompression babies. Almost without exception they say the decompression babies are brighter, that they developed earlier, and the like. And I must say that they are usually quite specific. They'll say that baby one, two, and maybe three could do this, that, and the other thing at such and such ages, in months, whereas baby four, a decompression baby, could do these same things so much earlier, again giving specific dates. This is all anecdotal, of course, but when you take all of these consistent, specific, and often spontaneous reports together it begins to seem rather impressive. The early tests, using scientific controls and so on, confirm these things. And I know that in the casual follow-ups on some of the older children there have been a significant number of really fantastic academic records. Still, we clearly need a lot more testing, using some of the older children, with controls, double blind procedures, and so on, before all doubts can be overcome.

Dr. Donald Lithgow

The evidence presented in previous chapters strongly supports the contention that babies who have benefit of decompression are generally healthier than those who do not. Robust babies with perfect or near-perfect Apgar scores are the rule rather than the exception when decompression is used. And the statistics suggest that decompression, if it is not actually enhancing or improving intelligence, is certainly helping to protect the fetal brain from the sort of damage that can result in gross retardation. It seems logical to assume that it also helps

prevent milder forms of brain damage—that it helps ensure that each individual will come into the world with his full mental potential intact.

No one associated with decompression claims that it *increases* I.Q., in the sense that it adds something to the brain that was not there before. This would be impossible. They believe, however, that decompression overcomes or at least ameliorates conditions in the uterine environment that tend to suppress or decrease some of the mental potential that exists from the outset. Chief among the conditions that diminish potential is hypoxia —oxygen deprivation. And in this domain decompression is especially effective, since it increases the supply of oxygen to the fetus. It is persuasively theorized that the mental potential of almost every individual is diminished to some extent by the conditions that exist in the womb and birth canal during pregnancy, labor, and delivery.

As one decompression researcher put it, "You wonder how many millions of people are walking around, not in any way retarded, in the clinical sense, but people who should have been so much more intelligent and who *could* have been more intelligent if they had received more oxygen during fetal development . . . in other words, people with some brain damage or deficit that is not clinically recognizable but which exists nonetheless."

In this sense, then, decompression, used routinely in every pregnancy, might have the effect of raising, per-

haps significantly, the average I.Q. of mankind. If it should be conclusively demonstrated that decompression has this capability then it must surely come to rank as one of the most important discoveries not only in obstetrics but in all of medical science.

One could fill an entire book with the anecdotes of mothers relating the precocity of their decompression babies: babies doing at twenty-four days what most can't manage until they are three or four months old, babies who recite rhymes when they are only a year old, babies who have vocabularies of several hundred words when they are fifteen months old, babies who grasp things, sit up, crawl, walk, and run far earlier than they are supposed to, and so on. Here are some notes Dr. Heyns kept on some of the first decompression babies he delivered:

It was our astonishing beginner's luck to have Lesley Rootenberg as our third baby. Of course we only tested her eighteen months later . . . continuing through thirty months. Her mother, a nurse at the clinic, filled us in. She started talking at eight months and had a vocabulary of 200 words at seventeen months. She started saying rhymes and counting at fifteen months.

. . . then came Shaun Boardman. . . . He walked unaided at seven months and two days and was very precocious from the start. He was the first decompression infant to bring eating habits to our notice. From the age of six weeks he began to refuse milk. So he was put directly on solids, which he lapped up. At two months he was grabbing things; sat up

quite sturdily by himself at four and one-half months; crawled at five months and at the same time was able to stand up in his crib.

. . . Etienne van Onselen, who did so well on our tests, later scored an I.Q. of 167 at school. . . .

. . . it was noted that Louis Pretorious, aged seven months twenty days, "uses the language of bishops, not of clergy." Well it is true that at that time he had already said, quite clearly, a few words for us [generally babies have a vocabulary of no more than four distinct words at twelve months].

. . . Shirley Johnson sat at three months, stood at five and one-half months, and walked unaided at eight months, despite the fact that she was plagued with an ear infection and bronchitis between the sixth and seventh months.

. . . when the quality of the decompression newborn was first noticed in 1960, I kept asking my staff whether the baby shown on this or that transparency had been painted with antiseptic. They were all so pink! They were all rather like the Canadian baby born here. His mother had come from Canada to have decompression, staying for two months before delivery. The baby's birth weight was ten pounds three ounces, and he was the most beautiful baby I'd ever seen. He was robust, pink, had a big British bulldog-type face, and his hair was thick and silken and gold. . . . One estimates that only 2 or 3 percent of newborn babies can be called truly superior, but even in our first 196 decompression cases, we felt our corresponding figure reached 20 percent.

. . . it was the mothers' unsolicited reports that first drew our attention to the persistent quality of the babies. No one had suggested that these would be fine babies, because of course we had no ideas along those lines to begin with. We

were using decompression for other reasons. But the uniform enthusiasm of the mothers over the progress of their babies soon made us sit up and take notice. They would tell us how good their babies were, how they seldom cried, how there was seldom any fuss over feeding, how quickly they walked, potty trained, and advanced in general. Those mothers who had had babies before almost all reported that their decompression babies were superior. I remember one mother who had had twelve babies. Her thirteenth was her first decompression baby. She came to us excited, as if she had made a discovery, and perhaps she was in fact sharing in one: she said the decompression baby was by far her best, outstripping the performance of all her other earlier babies at every stage.

Intriguing as the anecdotal evidence is, Dr. Heyns is the first to concede that it does not provide *proof* that decompression has a positive effect on intelligence. He looks forward to the day when someone with adequate personnel and funding will conduct a large-scale I.Q. study, drawing subjects from the large pool of decompression children who are now of an age when I.Q. testing can be carried out with substantial accuracy. Many of the 10,000 decompression babies in South Africa are now approaching their teens. In the meantime, he calls attention to the developmental tests that were given to a substantial sample of decompression babies several years ago.

Dr. Tony Roberts, who was the most active investigator in these developmental studies, related to me the

details—and the controversy—surrounding that early testing. Before we began, however, I was introduced to his daughter, a decompression child of three and one-half years who looked five. "She walked unaided at eight and one-half months," Dr. Roberts says. "She didn't crawl at all, just began walking. She had a vocabulary of fourteen words at ten months. You expect only four words at twelve months. By fifteen months she had quite a large vocabulary."

Mrs. Roberts interrupted at this point to add: "Yes, she was already saying things like, 'You may go out. I won't be miserable.' She's a very comfortable child, too. Very little crying. I remember I was rather upset when the neighbor child seemed almost as advanced at the same age. But then I discovered she was decompression, too."

"These things happen even without decompression," Dr. Roberts conceded, "but when you see so many that are so bright it becomes difficult to dismiss it as chance. And I've seen quite a number since I began working with Dr. Heyns in 1955. As the observational and anecdotal data began to accumulate, supporting the idea that these babies who'd had benefit of decompression were somehow advanced or superior, we felt compelled to investigate the issue scientifically. The American pediatrician Arnold Gesell had become established as the leader in testing the performance of very young children, so we decided to base our approach on his work."

The Gesell system involves a series of monthly tests, which relate to the child's ability to respond to certain stimuli, to speak, move, adapt to surroundings, and the like. The tests are considered useful through thirty months of age.

"First," Dr. Roberts continues, "we learned Gesell's techniques. For the sake of convenience we worked up a scoring system that was rather like that used for I.Q.s, developmental age over actual age multiplied by 100. The standard, then, was 100, and in our initial pilot test of sixty *nondecompression* babies, born of women who used standard hospital facilities, we got 108 for the normative mean. We felt that was close enough to 100. This gave us confidence in the way we were applying the tests. Whenever we tested decompression babies we got a highly significant difference statistically. They were significantly superior to nondecompression babies every time.

"Our critics, of course, have attacked us on several grounds. Unconscious bias was possible, they said, with the 'unconscious' qualification sometimes sticking in their throats. It was true that we did know which babies were which, at this point of testing, so bias could have entered into it. I'm convinced, however, that it didn't. We tested all of the babies, decompression and nondecompression, exactly alike. This, after all, was just a pilot study to see what was going on, if anything. There was no sense, at this point, in setting up an expensive dou-

ble-blind study [in which the researchers do not know which of their subjects are controls and which are experimentals until the conclusion of the study].

"Nonetheless, this did leave us open to criticism. So did the fact that all of our women were volunteers. The criticism here was that more intelligent women were likely to volunteer for something like this, and these women, genetically, were likely to have more intelligent children, decompression or not. This is all true, too, but we still felt these things could not account for all of the consistent, significant difference.

"A later study made us feel even more firmly that we were on to something. In this study we used only women who were in a low economic group staying in a home for unmarried expectant mothers, so we felt we had circumvented the problem of higher-I.Q. volunteers. We didn't have funds to test the I.Q.s of all these prospective mothers, but what testing was performed tended to confirm our suspicions that these women were, if anything, below average. One of them, for example, had an I.Q. of 55, another an I.Q. of 60. As for the volunteer aspect of the criticism, we eliminated that by having *all* of the women participate.

"There were sixty-three girls in all in this group, which we called the sanctuary series, and their babies came out at a mean level of 131. Only one was below 110. That one scored just under 100 and was born to the woman with the I.Q. of 55. Here again, however, we

were open to the bias charge. And again I can only state that we did the most objective, conscientious job we could do. I'm absolutely convinced there was no bias—certainly there could have been none large enough to account for the great difference we came up with in scores, unless, of course, you choose to believe we were openly distorting them. I think, however, the fact that we were so eager to have these exciting preliminary findings tested by the appropriate government agency says something about our confidence and sincerity.

"We *did* go to the government for backing to organize a proper experiment. We met with top people, including the Secretary of Health. We presented our case and were successful in persuading them to proceed with an experiment. It was decided that we would have 300 experimental subjects, who would, of course, receive decompression, and 300 controls. All would be volunteers and each would simply be designated "control" or "experimental" on an alternate basis as they came in. The testers would not know which group was which.

"All very good to begin with. But things began to go wrong almost immediately. Dr. R. Liddicoat, a Ph.D. from the government psychometric division, was put in charge of the testing, after having made her feelings about the whole project perfectly clear. At the conclusion of that first meeting she came up to me and said, 'Oh, Dr. Roberts, surely you can't think this [decompression] will make the slightest difference?' Now talk

about bias. Dr. Heyns meanwhile, bending over backward to be objective, suggested that we must make the controls feel as important as the experimentals. He recommended that they get something extra; so they all got special physiotherapy.

"Only 30 percent of the experimentals got the full projected amount of decompression, and the projected amount was far less than I had proposed in the first place. Another 30 percent got less than half of this projected amount, and the others fell somewhere in between. It was all very sloppy. Some of the mothers simply weren't brought around for their treatments, which had to be done under supervision in order to monitor the amount they were getting. Others were started late. Some delivered early and so on. Still others got sick or had to leave town for various reasons.

"The National Institute of Personnel Research did the actual testing, once the babies were born. Here were people who were supposed to be so much more professional about this sort of thing than we were. But the testers were actually mostly young lay girls working under Dr. Liddicoat. They had little or no experience working with very young children. Watching the testing through a one-way glass panel with sound piped into the room I was in, I quickly came to the conclusion that the children were being poorly tested, by which I mean *all* of the children, controls and experimentals alike, and, of course, I didn't know which were which.

"Additionally, Dr. Liddicoat came up with a peculiar way of testing the babies. There's really only one reasonable way to use the Gesell tests. If a four-month old baby, for example, passes all twelve of the four-month tests, then one should proceed to the five-month tests and so on, until he can't pass any more. This is the way Gesell did it, and there's no limitation on how high a child can go. Dr. Liddicoat, however, just arbitrarily threw out some of the Gesell tests, on her own authority and without any data to support her, saying they were no good. Also, rather than start the babies at their own age levels she made all of them start at the bottom and do all of the tests, for one month, two months, and so on. In addition, she established an arbitrary cutoff point, not bothering to see whether the child could go beyond it or not.

"I contended that her method of making the babies do all of the younger tests, before starting at their own age levels, tired out the children, made them irritated and impatient so that they didn't perform as well as they might have. Because of this and all of the other irregularities, I went to Dr. Heyns and explained the situation. We decided we must do some testing of our own if we were to salvage anything from the study. We went to the government and asked them to let us independently test 100 of the babies, 50 of them controls and 50 experimentals. They agreed and, of course, did not tell us which babies were in which group. After we

concluded our testing we turned in our results on each baby to the government and were pleased to learn that they coincided with our earlier results. The experimentals got significantly higher scores than the controls.

"Dr. Liddicoat's results, on the other hand, results which were the product of her testers and her testing techniques, showed that the experimentals as a group had higher scores than the controls—but the difference was not statistically significant. At every age tested, however, the Liddicoat results showed the experimentals doing better than the controls, though not sufficiently better to make a cast-iron case. As far as we're concerned, however, Dr. Liddicoat had made the testing apparatus so insensitive that one wouldn't have expected it to show any difference at all.

"It's really quite surprising that the superiority of the decompression babies showed through, particularly when you remember that most of the mothers didn't have nearly enough decompression to start with. When the children were given I.Q. tests at three years of age, the same thing emerged: the decompression babies were brighter than the controls, though again statistical significance was lacking in the Liddicoat results. Because of this, Dr. Liddicoat concluded that decompression was of no value in promoting optimal intelligence.

"However, if she had chosen to examine her own data a little more closely she would have found that there *is* a direct positive correlation between I.Q. of

the baby and the number of decompression treatments the mother had. In other words, the more treatments, the higher the I.Q. of the baby. This statistically significant correlation exists even when you scientifically adjust for the fact that the more intelligent women *may* have come in for more of the prescribed treatments. This statistically significant correlation existed at every stage of testing, including the testing at three years of age.

"Now, of course, another study should be done—this one tightly controlled from the outset. Now that so many of the decompression babies are older, a larger sample could be tested, using more reliable I.Q. tests. Hopefully, if such a study is undertaken, every effort will be made to see that the experimentals get the *full* recommended amount of decompression."

What are the prospects that such a study will be done? Dr. Roberts explains that Dr. Heyns's original medical team has now been disbanded, with the various members branching out into private practice. "So this," Dr. Roberts says, "will have to be undertaken by someone else. There are researchers in various parts of the world who have expressed interest, but a proper study will take considerable time, money, and personnel and can't be launched without careful preparation. I'm confident, however, that such a study will ultimately be undertaken. I'm also confident that if it is done fairly and

properly it will establish for all time the efficacy of decompression in this domain.

"In the meantime," he concludes, echoing the sentiments of Dr. Heyns and many of the others who have devoted so much effort to the development of this technique, "I believe that decompression should be used routinely for all of the other benefits it delivers. The big point, as I see it, is that until we are able to diagnose, to say with certainty that the fetal environment is optimal, that it is as good as it can be in each individual case, then we should, as a matter of course, use decompression on *all* pregnant women.

"I believe, in fact, that it is criminal *not* to use decompression, that whether a doctor fully accepts decompression or not he should still use it on the basis of what has already been convincingly established for it. There's enough hard data to indicate that it has highly beneficial effects—effects that can be lifesaving for both mother and baby. No one has ever demonstrated that decompression can do any harm, and all of the evidence indicates that it can do a great deal of good."

Appendix:
Illustrated Decompression Instructions

The following illustrated instructions are routinely given to all women who take the portable decompression apparatus home for daily use. Note that the home decompression units utilize a "flute" control to adjust pressure while some other models come equipped with lever controls. The drawings referred to are on pages 132-3.

APPARATUS:

The apparatus, which consists of five main parts plus connections and gauge, is arranged ready for immediate use.

The five parts consist of:

1. Suction pump.
2. Chair (wooden or heavy-duty chaise longue).
3. Fiberglass seat.
4. Fiberglass dome (which engages in grooves of seat).
5. Plastic suit.

Connections:

One short length of hose with a flute control on one end and an adaptor to the suction end of the pump at the

other. The flute slips over the small pipe in the dome. The gauge plugs into the central hole in the dome.

Selection of Suit Size:

The suits are supplied in various sizes from about 26 inches to 42 inches in 2-inch increments. The sizes represent the patient's chest measurement above the breasts, at armpit level. The suit size is selected by measuring around the patient's chest (without clothing) above the breasts (see Fig. 8).

Please Note:

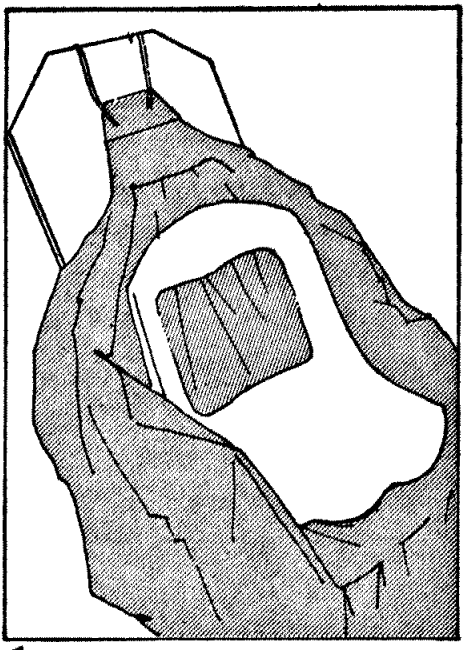
Unless the pump is kept in a well-ventilated place, a burnout of its motor can be anticipated. Noise can be reduced by putting the machine outside the room or in a well-ventilated box or cupboard and by attaching a large flexible hose to the exhaust side of the machine. Though the machine looks like an ordinary vacuum cleaner, it has been specifically calibrated for decompression and should be used for no other purpose.

INSTRUCTIONS FOR USE:

1. Unzip the suit and lay it open on the chair as centrally as possible and without folds or wrinkles.
2. The white fiberglass seat is now laid on top of the suit in as upright a position as possible. The cut-out portion of the seat will be in your lumbar region. In this position, the top hemband of the suit should extend 4 to 5 inches above the fiberglass seat (Fig. 1).
3. You need only remove your dress, shoes, and any tight abdominal clothing. However, arms and shoulders must

be free of the straps which support upper garments (Fig. 2).

4. Sit on the chair, being careful not to derange the suit. In the case of the long metal chair, you should be seated by lowering yourself backward over one of the armrests.
5. Put your feet in the bottom of the suit and draw the hemband around your chest at armpit level (Fig. 2); if the suit selected is the correct size, the two halves of the zipper should meet without exerting any pressure. If, however, you have put on weight, it may be necessary to stretch the upper hemband manually.
6. With the two halves of the zipper held together, the bib at the top rear center of the suit is arranged smoothly against the back (its purpose is to prevent air leaks between the shoulder blades). The bib top should reach to the seventh cervical vertebra (Fig. 3).
7. The cords are tied loosely around the neck (Fig. 2) to hold the back in position while the remaining operations are carried out.
8. The suit is again laid wide open and, taking care not to trap or damage the suit or any of your clothing, the front, rounded portion of the fiberglass dome is placed over the abdomen so that the edges engage in the grooves of the seat. The small pipe in the dome must be on the patient's right-hand side. (Fig. 4—suit omitted for clarity.)
9. The dome edges can be slid along the grooves of the seat and if necessary, this should be done to ensure that the top edge of the dome, when pressed firmly down, is ¾″ clear of your chest or breasts.
10. The small hole (the one farthest from the zipper) in the suit is now fitted over the pipe in the dome. In the in-



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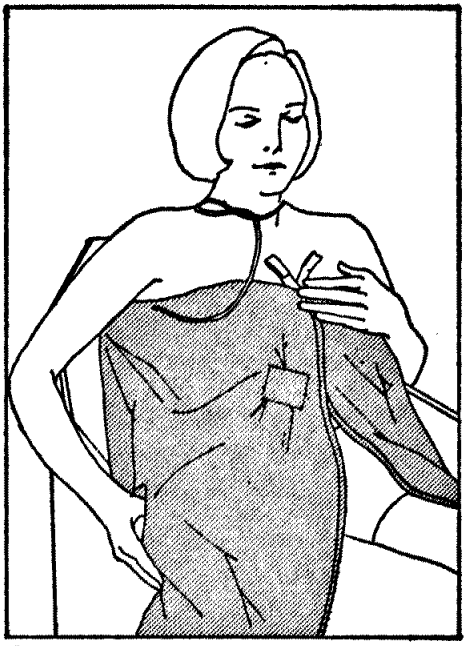

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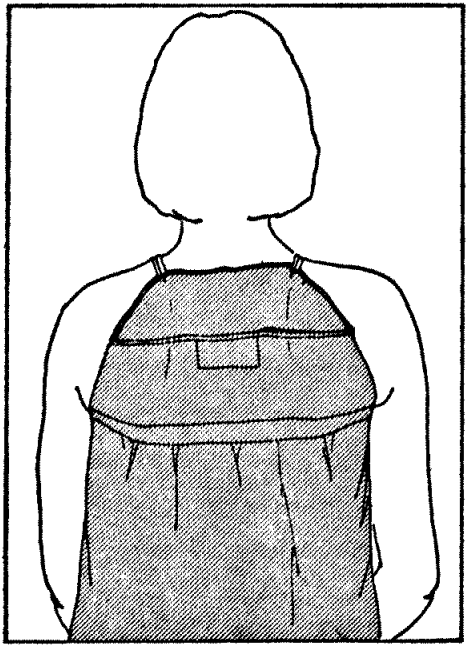

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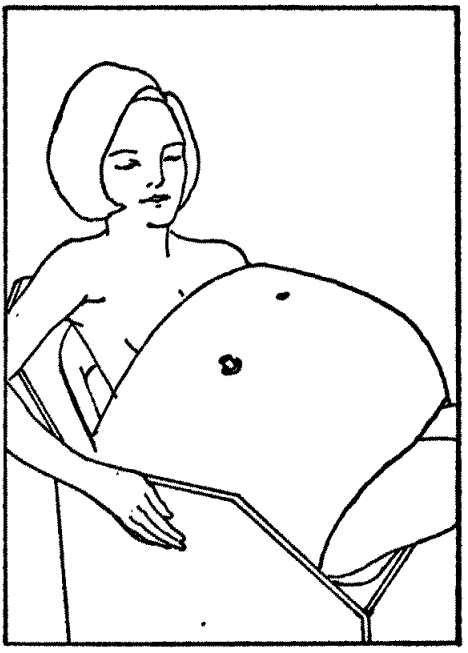

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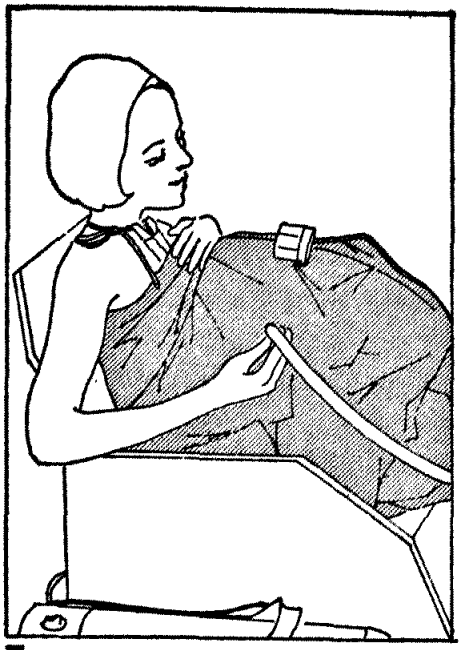

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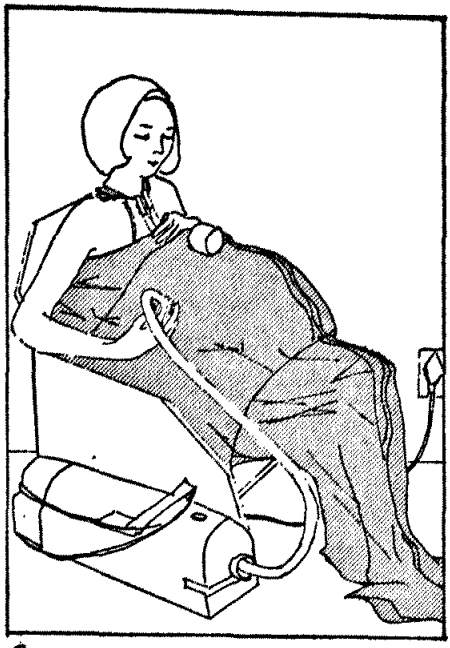

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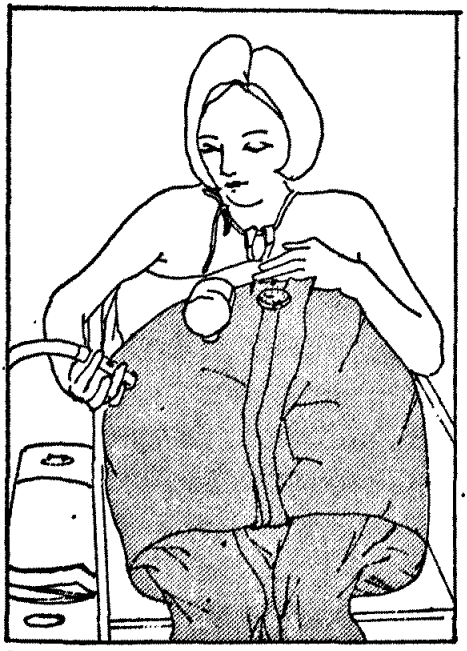

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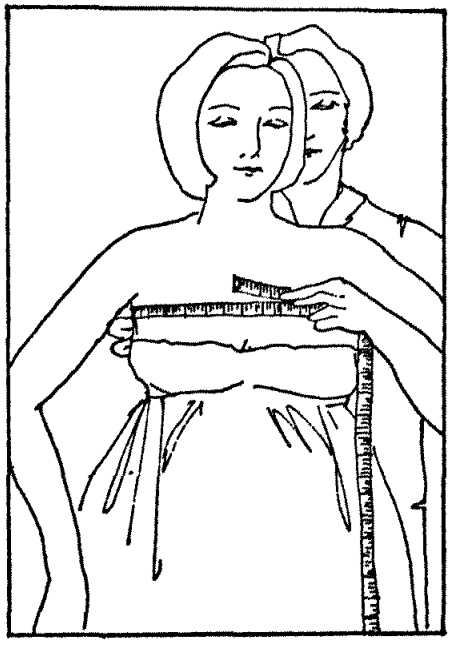

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terests of comfort, the knees should be slightly separated as decompression would draw the knees tightly together. The edge of the zipper is drawn together and fastened (Fig. 5).

11. One of the cords attached to the bib is now threaded through the loops found in the top of the zipper material, and the two cords are fastened together with a bow. This ensures that neither the front nor the back of the suit can get sucked down into the fiberglass casket and cause leaks. To protect the zipper from damage caused by high pressures, it is advisable, if not essential, to fold the suit material throughout its length in such a way that the zipper lies to the patient's left and is at the peak of this fold. Thus the suit material is sucked together and subsequently acts as a seal without the zipper itself taking any of the strain (Fig. 7).
12. The flute is now attached to the dome's pipe and the gauge inserted as described earlier. The machine is switched on, and closing the holes in the flute will cause the air within the suit to be evacuated (Figs. 6 and 7). To prevent leaks, patient presses top of suit front at zipper gently against her chest with left hand (not with fingertips). After a little practice it will be found that by lifting a finger off one of the small holes in the flute after 3 or 4 seconds, the pressure will remain at a definite level (about 50 or 60 mm. Hg.).

DECOMPRESSING YOURSELF:

When first introduced to decompression, one experiences a most unusual and peculiar sensation, the reasons for which are several. As the air is evacuated from the suit, the plastic material is pressed firmly against the patient's legs and chest

by atmospheric pressure and, as the pressure within the suit is lowered still further, this change of pressure is transferred to within the abdominal cavity. In consequence, the thoracic diaphragm is drawn and held downward, causing breathing to be slightly impaired. At the same time an apparent increase of atmospheric pressure around the chest is noted.

As a result, it is most desirable to start off by only partially closing the holes in the flute, dropping the pressure slowly, 5 mm. at a time, to approximately 30 mm. Hg. below atmospheric pressure, as indicated on the gauge. Throughout this, you should breathe regularly, not necessarily deeply. After a couple of runs from zero to 30 mm. Hg., at approximately half-minute intervals, a couple of quick runs can be attempted by the following method:

Close the flute holes completely (it is assumed that the suit is fitting properly and that there are no leaks) and run the pressure to 50 or 60 mm. on the gauge. Then immediately remove the fingers and allow atmospheric pressure to reestablish itself. Next, hold the pressure at 50 or 60 mm. for 10-second intervals. Wait 50 or 55 seconds and then repeat. Gradually push the pressures higher, to, say, 80 or 90 mm., breathing deeply as you do so.

The normal routine you will use during pregnancy calls for pressures of 50 to 60 mm. held for 10 to 15 seconds, followed by 45 seconds of "rest," with normal atmospheric pressure. Then repeat: 10–15 seconds of decompression with 45 seconds of rest each minute for half an hour at a time. If you feel comfortable with the higher negative pressures, up to, say 100 mm., by all means use them. Between suction, breathe normally, relax, and wait for the sweep-second hand on your watch to come up to twelve o'clock before be-

ginning decompression again. Always use a clock or watch with a second hand rather than guess at the time.

Normally you will begin this routine during the last three months of pregnancy. Two half-hour sessions a day are recommended as the minimum. You can do more if you wish.

Note:

Occasionally during antenatal treatment, you may experience some giddiness. This is usually caused by the initial apprehension that accompanies this new experience, or because the patient is not breathing properly. However, if it persists, it may be due to a slightly low blood pressure, in which case relief will be obtained by leaning the chair back; in severe cases the foot of the chair can be lifted onto a table to keep the head low. The small wooden chair can also be tilted backward against some suitable support and your legs supported on another chair, stool, or table.

DECOMPRESSION IN LABOR:

In labor, the method is completely different. Here we no longer use it as an exercise at regular intervals, but operate the decompression in conjunction with the uterine contractions. Some indoctrination may be necessary, unless labor is well established. The method to be used is as follows:

The pressure is dropped *rapidly* to 90–100 mm. Hg. *in anticipation* of the arrival of a contraction—only early and quick application of decompression will give complete pain relief. If the contractions are far apart, you may have a couple of ordinary runs of decompression between pains, in the manner in which you have been using the treatment in the clinic and at home. The contractions will get stronger,

and last longer, and be closer together. When this happens, use decompression only with the pain, as described above. At this level (90–100 mm. Hg.) the patient may be aware of the contraction, but ought to experience little or no pain from it. After a short while, it may be possible to change the pressure slowly to 70 mm. or even 50 mm. If the pain is then felt, the pressure should be returned to 90 mm.; when the contraction fades, the pressure can be gradually returned to zero, and the patient can await the onset of the next contraction. In practice, however, we find that many patients prefer to retain a pressure of 20 mm. or 25 mm. between contractions; this assists a more rapid drop in pressure when required by the coming contraction, and also brings a little extra comfort, especially for backache.

The above applies only to the first stage of labor. Some guidelines to follow during this first stage:

When your labor commences, telephone your doctor. Your labor can start in one of four ways: 1. *rupture of membranes;* 2. *low, persistent backache;* 3. *contractions;* 4. *show of blood.*

1. If the membranes rupture—*i.e.* the "waters break"—you may only use decompression with your doctor's permission—not otherwise.

2. If your labor begins with a low, persistent backache, use your decompression to relieve the backache in the same way that you have been using it at the clinic and at home.

3. After being in decompression for a time to relieve the backache, you may feel contractions starting. They will probably be quite far apart, short, and not too severe. Apply decompression as described above.

4. Show of blood: Use decompression as described above.

At some point, you will have to stop decompression, and

get to the nursing home or hospital. Generally the time to do this comes when your contractions are well established and about 10 to 15 minutes apart.

At the nursing home or hospital, once you have been prepared for labor, you may continue your decompression until the second stage of labor, if this has been previously arranged with your doctor. The second stage of labor begins with ruptured membranes or "pushing pains," when you must get out of decompression, and continue in the normal way until the arrival of your baby.

Remember that while using decompression at home in the early stages of labor you do not have to get out of the suit after a half hour, as you have been doing in all the prior weeks of pregnancy. You can stay in decompression indefinitely during contractions, until you leave for the hospital.

Decompression for Toxemia:

It sometimes happens that during the final weeks of pregnancy the patient experiences a rise in blood pressure. Should you be advised of this by your doctor, this is the point at which *more* decompression treatment is applied—*not less.*

The general method of treatment for toxemia is as follows: Three treatments daily, for half an hour at a time. *More* than three daily treatments is even better, with an interval of approximately three hours between treatments. Commence treatment *immediately* toxemia is diagnosed. Use decompression 15 seconds on and 15 seconds off throughout the half-hour period, at pressures of somewhere between 60 and 80 mm. Hg. on the gauge. Depending upon the nature of your case, your doctor may vary the treatment con-

siderably. If you have a history of toxemia, for example, treatments may begin as soon as pregnancy is confirmed.

DECOMPRESSION FOR BACKACHE:

For backache treat as above, but drop the pressure by as much as 120 mm. or more; in the case of some backaches it may not be possible to drop the pressure so drastically at first, because of the patient's ailment.

Generally, it is only necessary to have one treatment a day —for four or five days—to ease pain. Not all backaches yield to decompression; if pain persists after four or five days of treatment it is likely that the pain is caused by something other than muscular spasms and therefore cannot be alleviated with decompression. In cases of chronic muscular spasm, it may prove wise to acquire a home decompression unit for frequent use.

DECOMPRESSION FOR DYSMENORRHEA *(Painful Menstruation):*

For dysmenorrhea, three or four daily half-hour runs are given (starting two days before the period) as follows:

After a few preliminary runs drop the pressure by 50–100 mm. (the lower the better) approximately every half-minute. Retain this lowered pressure for 3–10 seconds, pressure and time depending on the individual.

Doctors have observed that in many cases these treatments permanently alleviate distress from dysmenorrhea. If discomfort recurs monthly, acquisition of a home unit is advised.

Bibliography

I. PAPERS AND BOOKS ON ABDOMINAL DECOMPRESSION PUBLISHED BY STAFF OF THE UNIVERSITY OF THE WITWATERSRAND.

1. *Physiology and General Usage of Abdominal Decompression*

Blecher, J. A. 1967. Cardio-pulmonary physiology of abdominal decompression. *Lancet* 2: 614.

Blecher, J. A., and Heyns, O. S. 1968. The physiological and therapeutic effects on the body produced by using the Heyns abdominal decompression suit. *Med. Proc.* 14: 66.

Heyns, O. S. 1958. The effect on the human placenta of change of uterine shape during contraction. *S. Afr. J. Med. Sci.* 23: 157–66.

———. 1959. Abdominal decompression in pregnancy and labor. *Med. Proc.* 5: 121–35.

———. 1959a. Abdominal decompression in the first stage of labor. *J. Obstet. Gynaec. Brit. Emp.* 66: 220–28.

———. 1961. A device to improve fetal oxygenation. *Trans. Coll. Physns. S. Afr.* 5: 11–26.

———. 1962. Use of abdominal decompression in pregnancy and labor to improve fetal oxygenation. *Develop. Med. Child. Neurol.* 4: 473–82.

———. 1962a. The improvement of fetal oxygenation by abdominal decompression. *Bull. Soc. Gynec. Belge* 32: 29–34.

———. 1962b. The present range of value of abdominal decompression. *Proc. R. Soc. Med.* 55: 459–61.

———. 1963. How does abdominal decompression help the fetal C.N.S.? *Leech* 33: 98–100.

———. 1963a. Theory and application of abdominal decompression. Chapter 9 in Kellar, R. J., *Modern trends in obstetrics.* London: Butterworths.

———. 1963b. *Abdominal decompression,* a monograph. Johannesburg: Witwatersrand Univ. Press.

Heyns, O. S., Samson, J. M., and Graham, J. A. C. 1962. Influence of abdominal decompression on intra-amniotic pressure and fetal oxygenation. *Lancet* 1: 289–92.

Heyns, O. S., Samson, J. M., and Roberts, W. A. B. 1962. An analysis of infants whose mothers had decompression during pregnancy. *Med. Proc.* 8: 307–11.

Roberts, W. A. B. 1968. Abdominal decompression and infant mental development. *Med. Proc.* 14: 163.

Roberts, W. A. B., and Heyns, O. S. 1968. Testing the neonate. *Med. Proc.* 14: 168.

2. *Toxemia of Pregnancy*

Blecher, J. A. 1965. Toxemia of pregnancy treated by abdominal decompression. *S. Afr. Med. J.* 39: 960.

Blecher, J. A., and Heyns, O. S. 1967. Abdominal decompression in the treatment of the toxemias of pregnancy. *Lancet* 2: 621.

Combrink, P. B., and Blecher, J. A. 1964. Severe early toxemia of pregnancy, a new treatment. *Lancet* 1: 1250.

3. *The Decompression Placenta*

Heyns, O. S. 1968. Abdominal decompression. *Organorama* 5/5: 8–11.

4. *Third-Stage Decompression*

Heyns, O. S., Roberts, W. A. B., and Smulian, H. G. 1960. Decompression a new aid in the second and third stages of labor. *J. Int. Coll. Surg.* 34: 333–43.

Roberts, W. A. B. 1964. Facilitation of vaginal delivery by pelvic outlet decompression. *S. Afr. J. Obstet. Gynaec.* 2: 29–34.

Editorial. 1964. Obstetric forceps, ventouse traction, pelvic outlet suction. *S. Afr. Med. J.*

5. *Use of Decompression in Backache*

Samson, J. M., and Heyns, O. S. 1962. Relief of backache by abdominal decompression. *Med. Proc.* 8: 92–95.

6. *Thesis*

Blecher, J. A. 1967. Aspects of the physiology of abdominal decompression and its usage in the toxemias of pregnancy and in fetal distress in labor. M.D. thesis, University of the Witwatersrand.

II. PUBLICATIONS BY DOCTORS NOT ON THE STAFF OF THE UNIVERSITY OF THE WITWATERSRAND.

1. *Effect on Labor*

Castellanos, R. et al. 1966. *Amer. J. Obstet. Gynec.* 100: 924.

Di Francesco, G. 1963. *Ann. Obstet. Ginecol., Fasc.* 11.

Dolezal, A. et al. 1967. *C. S. Gynekologie* 32: 723.

Lundgren, L. E. 1968. *Davis' gynecology and obstetrics.* Vol. 11: Chapter 4A.

Murdoch, B. D. 1968. *S. Afr. Med. J.* October: 1067.

Quinn, L. J., Dorr, P., and Bruyere, R. 1964. Experiences with abdominal decompression during labor. *J. Obstet. Gynaec. Brit. Cwlth.* 71: 934.

Quinn, L. J., and McKeown, R. A. 1962. Abdominal decompression during the first stage of labor. *Amer. J. Obstet. Gynec.* 83: 458.

Quinn, L. J., McKeown, R. A., Moore, T., and Dorr, H. P. 1960. Abdominal decompression during the first stage of labor; a preliminary report. *Canad. Med. Ass. J.* 83: 1192.

Shulman, H. et al. 1966. *Amer. J. Obstet. Gynec.* 95: 421.
Zimmerman, K. C. 1967. *Zentr. f. Gynakol* 50: 1840.

2. *Books on Decompression*

Fisher, L. J. 1968. *Give your baby a chance.* Hong Kong: Compass.
Gutierrez, M. H. 1966. *Decompression abdominal en la trabajo de parto.* Guadalajara, Mexico.

3. *Placental Insufficiency*

Coxon, A. et al. 1971. The effects of abdominal decompression on vascular hemodynamics in pregnancy and labor. *J. Obstet. Gynaec. Brit. Cwlth.* January: 49–54.
Dolezal, A. et al. 1970. Increase in uterine blood flow in the first stage of labor during abdominal decompression as measured with ^{131}I-HSA. *Amer. J. Obstet. Gynec.* January: 15.
Gordon, W. J. 1968. Placental insufficiency—its successful treatment by abdominal decompression. *Med. Proc.* 14: 119.
MacRae, D. J. et al. 1970. Effect of abdominal decompression on the metabolism of the fetoplacental unit. *Pro. Roy. Soc. Med.* 63: 502–5.
Michelow, M. C. 1968. Placental insufficiency improved by abdominal decompression. *Med. Proc.* 14: 122.

4. *Heart Disease*

Potanin, C. 1967. Body decompression in heart failure. *Lancet* 2: 241.

5. *Acid-Base Balance*

Matthews, D. D., and Loeffler, F. E. 1968. The effect of abdominal decompression on fetal oxygenation during pregnancy and early labor. *J. Obstet. Gynaec. Brit. Cwlth.* 75: 268.

6. *Testing the Infant*

Liddicoat, R. 1968. The effects of maternal antenatal decompression treatment on infant mental development. *S. Afr. Med. J.* 42: 203.

7. *Popular Articles*

Yuncker, B. 1969. The baby bubble. *Ladies' Home Journal* Sept.: 106–7.

Kennedy, E. 1971. The baby bubble: sequel. *Ladies' Home Journal* Oct.: 56.

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DODD, MEAD & COMPANY

On decompression

Women who use the technique are continually making comparisons between their decompression babies and their earlier, nondecompression babies. . . . This is all anecdotal, of course, but when you take all of these consistent, specific, and often spontaneous reports together it begins to seem rather impressive. The early tests, using scientific controls and so on, confirm these things. And I know that in the casual follow-ups on some of the older children there have been a significant number of really fantastic academic records.

Dr. Donald Lithgow

As a doctor who sees—and delivers—a great many babies, I find it difficult to doubt that decompression is having some effect on mental development and baby quality in general. The impressional data, at the very least, is overwhelming. All of the mothers who use decompression report that their babies sit up earlier, smile earlier, walk earlier, and so on. This doesn't provide scientific proof but, coupled with one's own observations, it all seems highly suggestive of some real effect.

Dr. Cecil Michelow

With the use of decompression, we noticed that we were obtaining exceptionally fine babies even under conditions that would normally give rise to the gravest alarm—marvelously pink, alert babies that normally would have been gray and flaccid. As the babies grew we observed accelerated development. These things happen even without decompression, of course, but when you see so many that are so bright it becomes difficult to dismiss it as chance.

Dr. Tony Roberts

Those of us who have been closely associated with decompression and have used it in hundreds of cases believe that it will be proved, beyond doubt, that the technique is valuable in optimizing intelligence. I believe that decompression will make its mark in this domain and that it will be used *routinely*, in every case of pregnancy, for this if for no other reason.

Dr. John Sampson