Strangers in our Homes: TV and our Children's Minds

TV and Our Children's Minds
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> TV rots the senses in the head!
> It kills the imagination dead!
> It clogs and clutters up the mind!
> It makes a child so dull and blind.
> He can no longer understand a fantasy,
> A fairyland!
> His brain becomes as soft as cheese!
> His powers of thinking rust and freeze!

An excerpt from Charlie and the Chocolate Factory by Roald Dahl, 1964

As a mother and a pediatrician who completed both a three-year residency in Pediatrics and a three-year subspecialty fellowship in Behavioral and Developmental Pediatrics, I started to wonder: "What are we doing to our children's growth and learning potential by allowing them to watch television and videos as well as spend endless hours playing computer games?" I practiced seven years as the Physician Consultant at the School Health Center in San Francisco, performing comprehensive assessments on children, ages 4–12, who were having learning and behavioral difficulties in school. I saw hundreds of children who were having difficulties paying attention, focusing on their work, and performing fine and gross motor tasks. Many of these children had a poor self-image and problems relating to adults and peers.

As a pediatrician, I had always discouraged television viewing, because of the often violent nature of its content (especially cartoons) and because of all the commercials aimed at children. However, it wasn't until the birth of my own child, 6 years ago, that I came face to face with the real impact of television. It wasn't just the content, for I had carefully screened the programs my child watched. It was the change in my child's behavior (his mood, his motor movements, his play) before, during and after watching TV that truly frightened me. Before watching TV, he would be outside in nature, content to look at bugs, make things with sticks and rocks, and play in the water and sand. He seemed at peace with himself, his body, and his environment. When watching TV, he was so unresponsive to me and to what was happening around him, that he seemed glued to the television set. When I turned off the TV he became anxious, nervous, and irritable and usually cried (or screamed) for the TV to be turned back on. His play was erratic, his movements impulsive and uncoordinated. His play lacked his own imaginative input. Instead of creating his own play themes, he was simply reenacting what he had just seen on TV in a very repetitive, uncreative, and stilted way.

At age 3-1/2 years, our son went on a plane trip to visit his cousins near Boston, and on the plane was shown the movie Mission Impossible. The movie was right above our son's head making it difficult to

block out. Earphones had not been purchased, so the impact was only visual, but what an impact it had on our son. He had nightmares and fears about fires, explosions, and bloody hands for the next 6 months, and his play was profoundly changed. One of my colleagues told me I just had an overly sensitive child, and because I had not taken him to see a movie or let him watch much TV, he was not "used to it" and that was why he was so disturbed by the pictures he saw. All I could think was—thank heaven he was not "used to it."

Later that year, I assessed six different children from ages 8–11 years at the School Health Center who all had similar difficulties with reading. They couldn't make a mental picture of letters or words. If I showed them a series of letters and asked them to identify one particular letter, they could do it. If I gave them no visual input and just asked them to write a particular letter by memory, they couldn't do it. All of these children watched a lot of television and videos and played computer games. I wondered what happens to a developing child placed in front of a TV set if they are presented with visual and auditory stimuli at the same time. What is left for the mind to do? At least with reading a story or having a story read to them, the mind can create its own imaginative pictures.

A question arose and I immediately called up my colleague and asked: "Could television itself be causing attention problems and learning difficulties in children?" My colleague laughed and said just about everyone watches TV—even my child does—and she doesn't have Attention Deficit Disorder or a learning disability. I thought to myself: "Are we spending enough time with our children and looking deeply enough into their development and souls to notice the often subtle changes that occur from spending hours in front of the TV set?" Maybe some children are more vulnerable to the effects of television because of a genetic predisposition or poor nutrition or a more chaotic home environment. I wondered about the loss of potential in all our children, because they are exposed to so much television and so many videos and computers games. What are the capacities we are losing or not even developing because of this TV habit? I then started to read, attend lectures, and ask a lot more questions.

Television has been in existence for the past 80 years, though the broadcasting of entertainment shows didn't begin until the 1940s. In 1950, 10 percent of American households owned a TV set. By 1954, this percentage had increased to 50 percent, and by 1960, 80 percent of American households owned a television. Since 1970, more than 98 percent of American households own a TV and currently 66 percent of households own three or more TVs. Television is on almost 7 hours per day in an average American home. Children of all ages, from preschool through adolescence, watch an average of 4 hours of TV per day (excluding time spent watching videos or playing computer games). A child spends more time watching TV than any other activity except sleeping, and by age 18 a child has spent more time in front of a TV than at school.

There have been numerous articles looking at the content of television and how commercials influence children's (and adults') desires for certain foods or material goods (e.g., toys), and how violence seen on television (even in cartoons) leads to more aggressive behavior in children (Fischer et al. 1991, Singer 1989, Zuckerman 1985). Concerns have been raised about who is teaching our children and the developmental appropriateness of what is presented on TV to toddlers, children, and even adolescents.

Miles Everett, Ph.D., in his book, How Television Poisons Children's Minds, points out that we don't

allow our child to talk to strangers, yet through television we allow strangers into the minds and souls of our children everyday. These “strangers” (advertising agencies), whose motivations are often monetary, are creating the standards for what is “good” or developmentally appropriate for the developing brains of our children. More importantly, several investigators (Healy 1990, Pearce 1992, Buzzell 1998, Winn 1985) have drawn attention to the actual act of viewing television as even more insidious and potentially damaging to the brain of the developing child than the actual content of what’s on TV. So what are we doing to our children’s potential by allowing them to watch television?

Question: How does a child’s brain develop and how does a child learn?

Joseph Chilton Pearce in his book, Evolution’s End, sees a child’s potential as a seed that needs to be nurtured and nourished in order to grow properly. If the environment doesn’t provide the necessary nurturing (and protections from over-stimulation), then certain potentials and abilities cannot be realized. The infant is born with 10 billion nerve cells or neurons and spends the first three years of life adding billions of glial cells to support and nourish these neurons (Everett 1992). These neurons are then capable of forming thousands of interconnections with each other via spider-like projections called dendrites and longer projections called axons that extend to other regions of the brain. It is important to realize that a six-year-old’s brain is 2/3 the size of an adult’s though it has 5–7 times more connections between neurons than does the brain of an 18-month-old or an adult (Pearce 1992). The brain of a 6–7 year old child appears to have a tremendous capacity for making thousands and thousands of dendrite connections among neurons.

This potential for development ends around age 10–11 when the child loses 80 percent of this dendritic mass (Pearce 1992, Buzzell 1998). It appears that what we don’t develop or use, we lose as a capacity. An enzyme is released within the brain and literally dissolves all poorly myelinated pathways (Pearce 1992, Buzzell 1998). In the developing child, there is a progression of brain development from the most primitive core (action) brain, to the limbic (feeling) brain, and finally to the most advanced neocortex, or thought brain. There are critical periods for brain development when the stimulus must be present for the capacity to evolve (for example, language). There is also plasticity in brain development so that even adults can make new dendritic connections, but they have to work harder to establish pathways which were more easily made in childhood.

The core (action) brain is dedicated to our physical survival and manages reflexes, controls our motor movements, monitors body functions, and processes information from our senses. Along with the limbic (feeling) brain, it is involved in the “flight or fight” response that our body has to a dangerous or threatening situation. Humans react physically and emotionally before the thought brain has had time to process the information (Buzzell 1998). Our limbic (feeling) brain wraps around our core (action) brain and processes emotional information (e.g., our likes/dislikes, love/hate polarities). Our feeling brain gives meaning and value to our memories and what we learn. It influences behavior based on emotional feelings and has an intimate relationship to our immune system and capacity to heal. It is involved in the forming of our intimate relationships and emotional bonds (e.g., between mother and child) and is connected with our dreaming, subtle intuitive experiences and the daydreams and fantasies that originate from the thought brain (Healy 1990). This feeling brain connects the more highly evolved thought brain to the more primitive action brain. Our lower action brain can be made to follow the will of our thought brain or our higher thought brain can be “locked into” the service of the lower action-

feeling brain during an emergency that is real or imagined (Pearce 1992). The action and feeling brains can't distinguish real from imaginary sensory input. It is a survival advantage to react first and think later.

Finally our thought brain, the neocortex, represents our highest and newest form of intellect. It receives extensive input from the core (action) brain and limbic (feeling) brain and has the potential of separating itself and being the most objective part of the brain. It connects us to our higher self. However, the neocortex needs more time to process the images from the action and feeling brains. It is also the part of the brain that has the most potential for the future, and it is the place where our perceptions (experiences), recollections, feelings, and thinking skills all combine to shape our ideas and actions (Everett 1997). The thinking brain is "5 times larger than the other brains combined and provides intellect, creative thinking, computing and, if developed, sympathy, empathy, compassion and love" (Pearce 1992).

There is a sequential development (a progressive myelination of nerve pathways) of the child's brain from the most primitive (action) brain to the limbic (feeling) brain and finally to the most highly evolved thought brain, or neocortex. Myelination involves covering the nerve axons and dendrites with a protective fatty-protein sheath. The more a pathway is used, the more myelin is added. The thicker the myelin sheath, the faster the nerve impulse or signal travels along the pathway. For these reasons, it is imperative that the growing child receives developmentally appropriate input from his/her environment in order to nourish each part of the brain's development and promote the myelination of new nerve pathways. For example, young children who are in the process of forming their motor-sensory pathways and sense organs (the action brain) need repetitive and rhythmical experiences in movement. Children also need experiences that stimulate and integrate their senses of sight, hearing, taste, smell, and touch. Their senses need to be protected from over-stimulation, since young children are literally sponges. Children absorb all they see, hear, smell, taste and touch from their environment since they haven't developed the brain capacity to discriminate or filter out unpleasant or noxious sense experiences.

The sense of touch is especially crucial since our culture and its hospital birth practices (including the high rate of C-sections) and, until recently, its discouragement of breastfeeding, deprive infants of critical multi-sensory experiences. The stimulation and development of our sense organs is the precursor to the development of part of our lower brain, called the Reticular Activating System (RAS). The RAS is the gateway through which our sense impressions coordinate with each other and then travel to the higher thought brain. The RAS is the area of the brain that allows us to attend and focus our attention. Impairments in motor-sensory pathways lead to impairments in children's attention span and ability to concentrate (Buzzell 1998). Over-stimulation and under-stimulation of our senses and poorly developed fine and gross motor movements may lead to impairments in attention. By age 4, both the core (action) and limbic (feeling) brains are 80 percent myelinated. After age 6–7, the brain's attention is shifted to the neocortex (thought brain) with myelination beginning first on the right side or hemisphere and later joined by the left hemisphere.

The right hemisphere is the more intuitive side of the brain, and it particularly responds to visual images. It grasps wholes, shapes and patterns and focuses on the big picture rather than the details. It

directs drawing and painting and monitors melodies and harmonies of music. It is especially responsive to novelty and color and is the dominant hemisphere when watching TV (Healy, 1990, Everett 1997). The left hemisphere dominates when a child reads, writes and speaks. It specializes in analytical and sequential thinking and step-by-step logical reasoning. It analyzes the sound and meaning of language (e.g., phonic skills of matching sound to letters of the alphabet). It manages fine muscle skills and is concerned with order, routine and details. The ability to comprehend science, religion, math (especially geometry) and philosophy relies on abstract thinking characteristic of the left hemisphere.

Even though we emphasize which functions of learning are performed by which hemisphere, there is a crucial connection between the two hemispheres called the corpus callosum. It consists of a large bundle of nerve pathways that form a bridge between the left and right hemispheres. It is one of the brain's latest-maturing parts. The left and right sides of the body learn to coordinate with each other by this pathway. Gross motor activities like jumping rope, climbing, running, and circle games and fine motor activities like form drawing, knitting, pottery, origami, woodworking, embroidery, and bread-making are crucial to myelinating this pathway and lead to more flexible manipulation of ideas and a creative imagination. This pathway provides the interplay between analytic and intuitive thinking, and several neuropsychologists believe that poor development of this pathway affects the right and left hemispheres' effective communication with each other and may be a cause of attention and learning difficulties (Healy 1990).

We myelinate our pathways by using them. Movements of our bodies combine with experiences of our senses to build strong neural pathways and connections. For example, when a toddler listens to the sound of a ball bouncing on the floor, tastes and smells the ball or pushes, rolls and throws the ball, neurons are making dendritic connections with each other. When a toddler examines balls of varying sizes, shapes, weights and textures, a field of thousands (and possibly millions) of interconnecting neurons can be created around the "word" ball (Pearce 1992). Repetition, movement, and multisensory stimulation are the foundations of the language development and higher level thinking. The toddler's repetitive experiences with an object like a ball, create images or pictures in his/her brain. "The images of the core limbic brain form much of the elemental "food" for the remarkable and progressive abstracting abilities of the associative high cortex [neocortex]" (Buzzell 1998).

Question: What is so harmful to the mind about watching television?

Watching television has been characterized as multileveled sensory deprivation that may be stunting the growth of our children's brains. Brain size has been shown to decrease 20–30 percent if a child is not touched, played with or talked to (Healy 1990). In addition, when young animals were placed in an enclosed area where they could only watch other animals play, their brain growth decreased in proportion to the time spent inactively watching (Healy 1990). Television really only presents information to two senses: hearing and sight. In addition, the poor quality of reproduced sound presented to our hearing and the flashing, colored, fluorescent over-stimulating images presented to our eyes cause problems in the development and proper function of these two critical sense organs (Poplawski 1998). To begin with, a child's visual acuity and full binocular (three-dimensional) vision are not fully developed until 4 years of age, and the picture produced on the television screen is an unfocused (made up of dots of light), two-dimensional image that restricts our field of vision to the TV screen itself. Images on TV are produced by a cathode ray gun that shoots electrons at phosphors

(fluorescent substances) on the TV screen. The phosphors glow and this artificially produced pulsed light projects directly into our eyes and beyond affecting the secretions of our neuroendocrine system (Mander 1978). The actual image produced by dots of light is fuzzy and unfocused, so that our eyes, and the eyes of our children, have to strain to make the image clear.

Television, like any electrical appliance and like power lines, produces invisible waves of electromagnetism. Last June, a panel convened by the National Institute of Environmental Health Sciences decided there was enough evidence to consider these invisible waves (called electromagnetic fields or EMFs) as possible human carcinogens. In the article it was recommended that children sit at least 4 feet from TV and 18 inches from the computer screen (Gross 1999). Our visual system, "the ability to search out, scan, focus, and identify whatever comes in the visual field" (Buzzell 1998), is impaired by watching TV. These visual skills are also the ones that need to be developed for effective reading. Children watching TV do not dilate their pupils, show little to no movement of their eyes (i.e., stare at the screen), and lack the normal saccadic movements of the eyes (a jumping from one line of print to the next) that is critical for reading. The lack of eye movement when watching television is a problem because reading requires the eyes to continually move from left to right across the page. The weakening of eye muscles from lack of use can't help but negatively impact the ability and effort required to read. In addition, our ability to focus and pay attention relies on this visual system.

Pupil dilation, tracking and following are all part of the reticular activating system. The RAS is the gateway to the right and left hemispheres. It determines what we pay attention to and is related to the child's ability to concentrate and focus. The RAS is not operating well when a child watches television. A poorly integrated lower brain can't properly access the higher brain. In addition, the rapid-fire change of television images, which occurs every 5 to 6 seconds in many programs and 2 to 3 seconds in commercials (even less on MTV), does not give the higher thought brain a chance to even process the image. It reportedly takes the neocortex anywhere from 5 to 10 seconds to engage after a stimulus (Scheidler 1994). The neocortex is our higher brain, but also needs a greater processing time to become involved. All the color combinations produced on the television screen result from the activation of only three types of phosphors: red, blue and green. The wavelengths of visible light produced by the activation of these phosphors represents an extremely limited spectrum compared to the wavelengths of light we receive when viewing objects outdoors in the full spectrum of reflected rays from the sun. Another problem with color television is that the color from it is almost exclusively processed by the right hemisphere so that left hemisphere functioning is diminished and the corpus callosum (the pathway of communication between the brain's hemispheres) is poorly utilized (i.e., poorly myelinated).

Reading a book, walking in nature, or having a conversation with another human being, where one takes the time to ponder and think, are far more educational than watching TV. The television—and computer games—are replacing these invaluable experiences of human conversations, storytelling, reading books, playing "pretend" (using internal images created by the child rather than the fixed external images copied from television), and exploring nature. Viewing television represents an endless, purposeless, physically unfulfilling activity for a child. Unlike eating until one is full or sleeping until one is no longer tired, watching television has no built-in endpoint. It makes a child want more and more without ever being satisfied (Buzzell 1998).

Question: Well, what about watching Sesame Street? Isn't it educational for our children? Doesn't it teach them how to read?

Jane Healy, Ph.D., in her book, Endangered Minds wrote an entire chapter entitled "Sesame Street and the Death of Reading." In addition to the concerns already mentioned about watching television, Sesame Street and the majority of children's programming seem to put the left hemisphere and parts of the right hemisphere into slow waves of inactivity (alpha waves). Television anesthetizes our higher brain functions and disrupts the balance and interaction between the left and right hemispheres.

Brain waves can be measured by an EEG, and variations in recorded brain waves correspond to different states of activity in the brain. In general, reading produces active, fast beta waves while television watching leads to an increase in slow alpha waves in the left hemisphere and at times even in the right hemisphere (Buzzell 1998). Once again, the left hemisphere is the critical center for reading, writing and speaking. It is the place where abstract symbols (e.g., the letters of the alphabet) are connected to sounds (phonic skills). The pulsating fluorescent light source of television may have something to do with promoting slow wave activity. Our brain "wakes up" to novelty and falls asleep or habituates to repetitive, "boring" stimuli. Advertising agencies and many children's shows (including Sesame Street) have had to counter children's tendency to habituate to television by increasing the frequency of new images, using flashing colors, closeups, and startling, often loud, sounds. These distracters get our attention momentarily but keep us operating in our lower core and limbic brains. The lower brain can't discern between images that are real or created on TV, because discernment is the function of the neocortex. Therefore, when the TV presents sudden close-ups, flashing lights, etc., as stimuli, the core-limbic brain immediately goes into a "fight or flight" response with the release of hormones and chemicals throughout the body. Heart rate and blood pressure are increased and blood flow to limb muscles is increased to prepare for this apparent emergency. Because this all happens in our body without the corresponding movement of our limbs, certain TV programs actually put us in a state of chronic stress or anxiety. Studies have shown atrophy of the left hemisphere in adults who are chronically stressed and only functioning from their core-limbic brain. Even as adults, what we don't use, we lose.

Finally, when our brain is simultaneously presented with visual (images on the screen) and auditory (sound) stimuli, we preferentially attend to the visual. A dramatic example of this phenomenon was illustrated when a group of young children (6–7 years old) were shown a video show where the sound track did not match the visual action, and the children, when questioned, did not appear to notice the discrepancy. Therefore, even in Sesame Street, studies have shown that children are not absorbing the content of the show (Healy 1990). Maybe the most critical argument against watching television is that it affects the three characteristics that distinguish us as human beings. In the first 3 years of life, a child learns to walk, to talk and to think. Television keeps us sitting, leaves little room for meaningful conversations, and seriously impairs our ability to think.

Question: What's wrong with using television as just entertainment?

I enjoyed watching Disney films like Snow White. Television seems to have a profound effect on our feeling life and therefore, one could argue, on our soul. As human beings, we become detached from the real world by watching television. We sit in a comfortable chair, in a warm room, with plenty to eat and watch a show about people who are homeless, cold and hungry. Our hearts go out to them, but we

do nothing. One could argue that reading a book could promote the same sense of unreality without action. The phrases “turn off the TV” or “get your nose out of your book” and “go do something” have meaning.

Nevertheless, while reading a book (that doesn’t have a lot of pictures) the child’s mind creates its own pictures and has time to think about them. These thoughts could actually lead to ideas that inspire a child or adult to action. TV does not give time for this higher level of thinking that inspires deeds. Television projects images that go directly into our emotional brain. It is said that the words we hear go into knowledge while the images we see go into our soul. Pictures that elicit emotion are processed by the limbic system and the right hemisphere of the neocortex. If no time is given to think about these emotional pictures, then the left hemisphere is not involved. Once again, watching television often eliminates the part of our brain that can make sense of, analyze and rationalize what we are seeing. We don’t forget what we see. The limbic brain is connected to our memory, and the pictures we see on TV are remembered—either consciously, unconsciously or subconsciously.

For example, it is almost impossible to create your own pictures of Snow White from reading a story if you have seen the movie. It is also true that often one is disappointed when one sees a movie after reading the book. Our imagination is so much richer than what can be shown on a screen. The problem with television is that children get used to not using their imaginative thinking at all, and they don’t exercise that part of the brain (the neocortex) that creates the pictures. Children are not reading enough, and we aren’t reading or telling them enough stories to help their minds create pictures. Creating pictures is not just entertaining, but the foundation of our dreams and higher thoughts (intuitions, inspirations and imaginations). We dream, think and imagine possibilities of the future in pictures.

Finally, the heart is now seen as an organ of perception that can respond to a stimulus and release a hormone-like substance that influences brain activity. This phenomenon is referred to as our heart intelligence (Pearce 1992). Interacting with human beings is essential for the development of this intelligence. When we stand face to face and look into another person’s eyes, we meet soul to soul and we get a sense of who they really are (Soesman). We get a sense of whether they mean what they say—in other words, whether they are enthusiastic and passionate about their subject. We experience their non-verbal language such as how they move, the tone of their voice, and whether their gaze shifts around when they talk. This is how we learn to discern consistency between verbal and non-verbal cues and, therefore, truth.

Television can’t give us this intelligence of the heart. It can shock our emotions, and we can cry, laugh or get angry, but these emotions are just reactions. When human beings speak on TV, children are often doing homework, playing games, and talking to friends while watching TV. These activities help save their visual system from the effects of TV, but the underlying message is that you don’t need to listen when another person speaks or comfort anyone if you hear crying. If the heart, like the brain and probably the rest of our body, gives off electromagnetic waves (Pearce 1992, Tiller 1999), then there is a form of subtle energy that only can be experienced between human beings by relating to each other in the same physical space. This subtle energy can’t be experienced by watching human beings on television. Just as we must use all our senses to construct higher level thoughts or pictures of an object, empathy and love for others does not develop from seeing human beings as objects on TV, but by actively relating, face to face, with each other.

Question: What can we do to help our children's brains develop?

1. Keep the television turned off as much as possible. One author recommended avoiding television as much as possible for the first 12 years of your child's life and then encouraging your child to always read the book first before seeing the movie. It helps to cover the TV with a cloth or store it away in a closed cabinet or closet. Out of sight really helps the child keep the TV out of mind (Large 1997). Remember that what we do serves as a role model for our children. We can't really ask our children to stop watching TV if we keep doing it—that will eventually lead to power struggles. When the television is on, then try to neutralize its damage. Select the programs carefully and watch TV with your child so you can talk about what you see. Keep a light on when the TV is going since that will minimize the effects of the reduced field of vision and provide a different light source for the eyes. Try to sit at least 4 feet from the television and 18 inches from the computer screen. Plan to go outside (to the park, woods, or beach) after viewing television.

2. Read a lot of books to your children (especially ones without lots of pictures) and tell your children lots of stories. Children love to hear stories about our lives when we were little or you can make them up. Bedtime and riding in the car provide good opportunities for telling stories. Telling our children stories helps to stimulate their internal picture making capabilities.

3. Nature! Nature! Nature! Nature is the greatest teacher of patience, delayed gratification, reverence, awe and observation. The colors are spectacular and all the senses are stimulated. Many children today think being out in nature is boring, because they are so used to the fast-paced, action-packed images from TV (Poplawski 1998). We only truly learn when all our senses are involved, and when the information is presented to us in such a way that our higher brain can absorb it. Nature is reality while television is a pseudo-reality.

4. Pay close attention to your senses and those of your child. Our environment is noisy and overstimulating to the sense organs. What a child sees, hears, smells, tastes, and touches is extremely important to his or her development. We need to surround our children with what is beautiful, what is good, and what is true. How a child experiences the world has a tremendous influence on how the child perceives the world as a teenager and adult.

5. Have children use their hands, feet and whole body performing purposeful activities. All the outdoor activities of running, jumping, climbing, and playing jump rope help develop our children's gross motor skills and myelinate pathways in the higher brain. Performing household chores, cooking, baking bread, knitting, woodworking, origami, string games, finger games, circle games, painting, drawing, and coloring help develop fine motor skills and also myelinate pathways in the higher brain.

Finally, the future of our children and our society is in the protection and development of our children's minds, hearts and limbs. What we are aiming for in the thoughts of our children is best summarized in this fine verse from William Blake's "Auguries of Innocence":

> To see a World in a Grain of Sand
> And a Heaven in a Wild Flower
> Hold Infinity in the palm of your hand
> And Eternity in an hour.

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