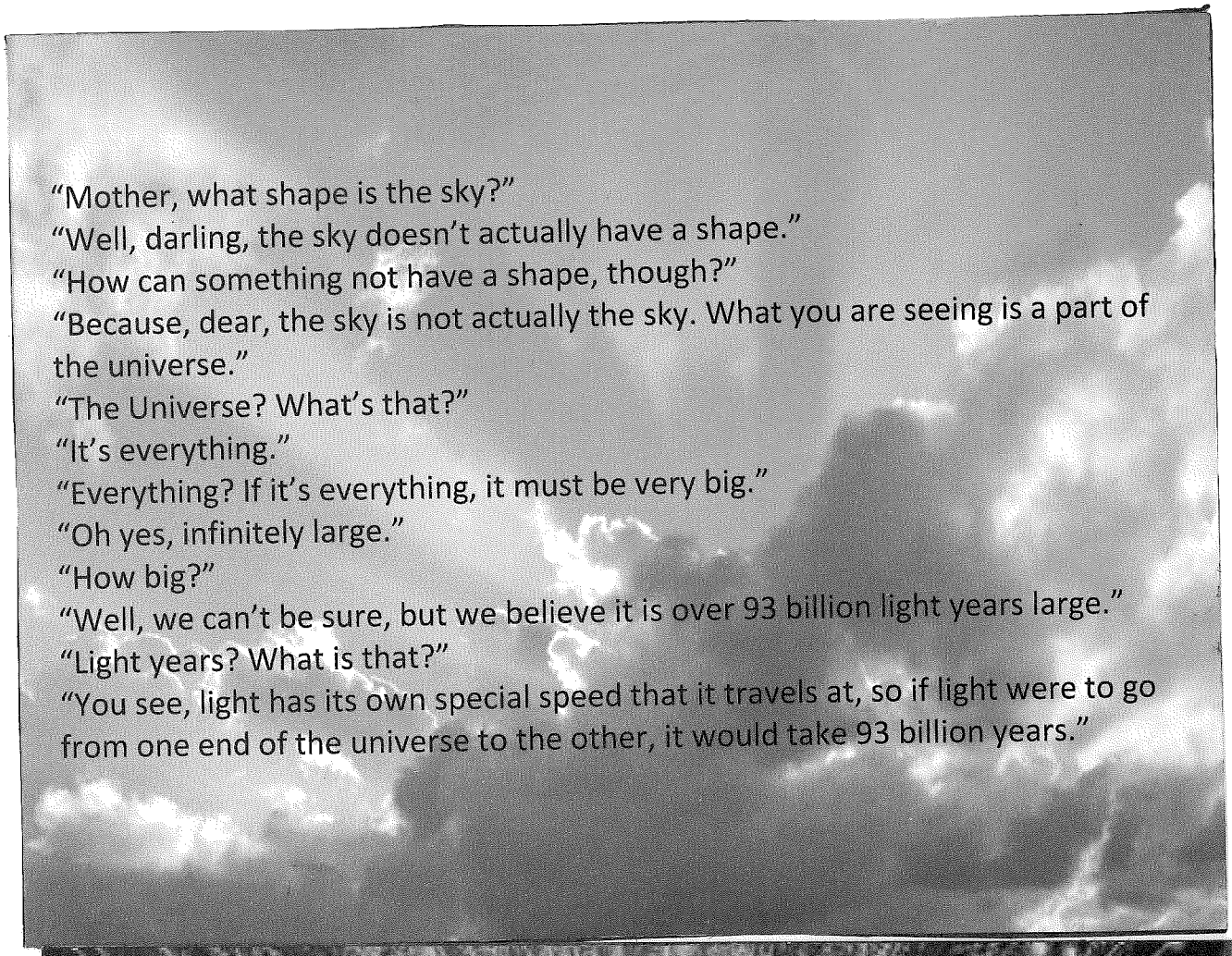
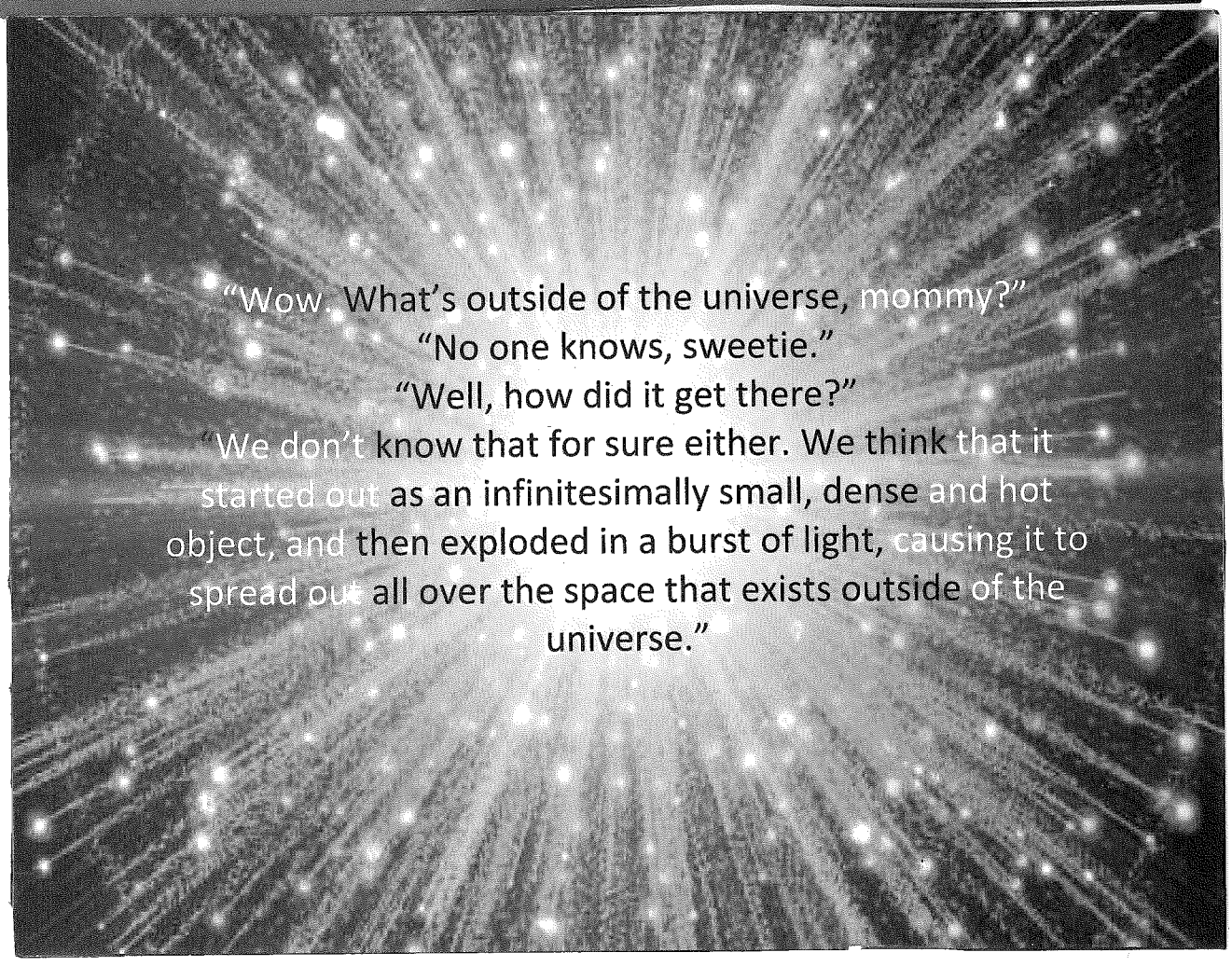
The day had faded into a lovely shade of indigo as a young mother, with a beautiful 6 year old son, was tucking him into his bed for the night. As the mother laid him down, the boy looked up at her with his imploringly large eyes and asked a rather curious question.

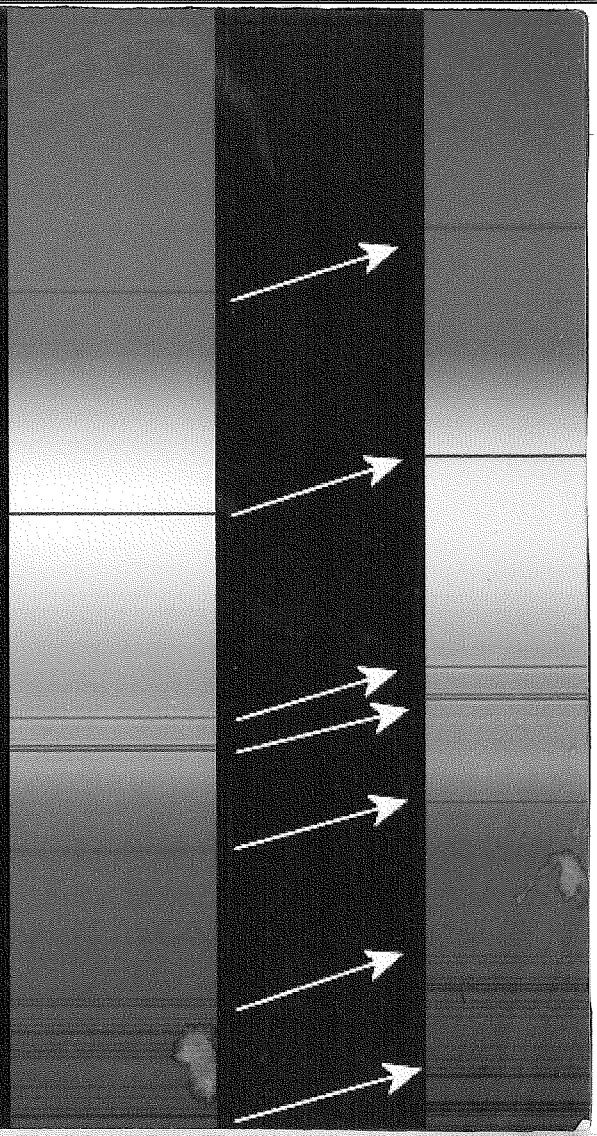


"Mother, what shape is the sky?"
"Well, darling, the sky doesn't actually have a shape."
"How can something not have a shape, though?"
"Because, dear, the sky is not actually the sky. What you are seeing is a part of the universe."
"The Universe? What's that?"
"It's everything."
"Everything? If it's everything, it must be very big."
"Oh yes, infinitely large."
"How big?"
"Well, we can't be sure, but we believe it is over 93 billion light years large."
"Light years? What is that?"
"You see, light has its own special speed that it travels at, so if light were to go from one end of the universe to the other, it would take 93 billion years."

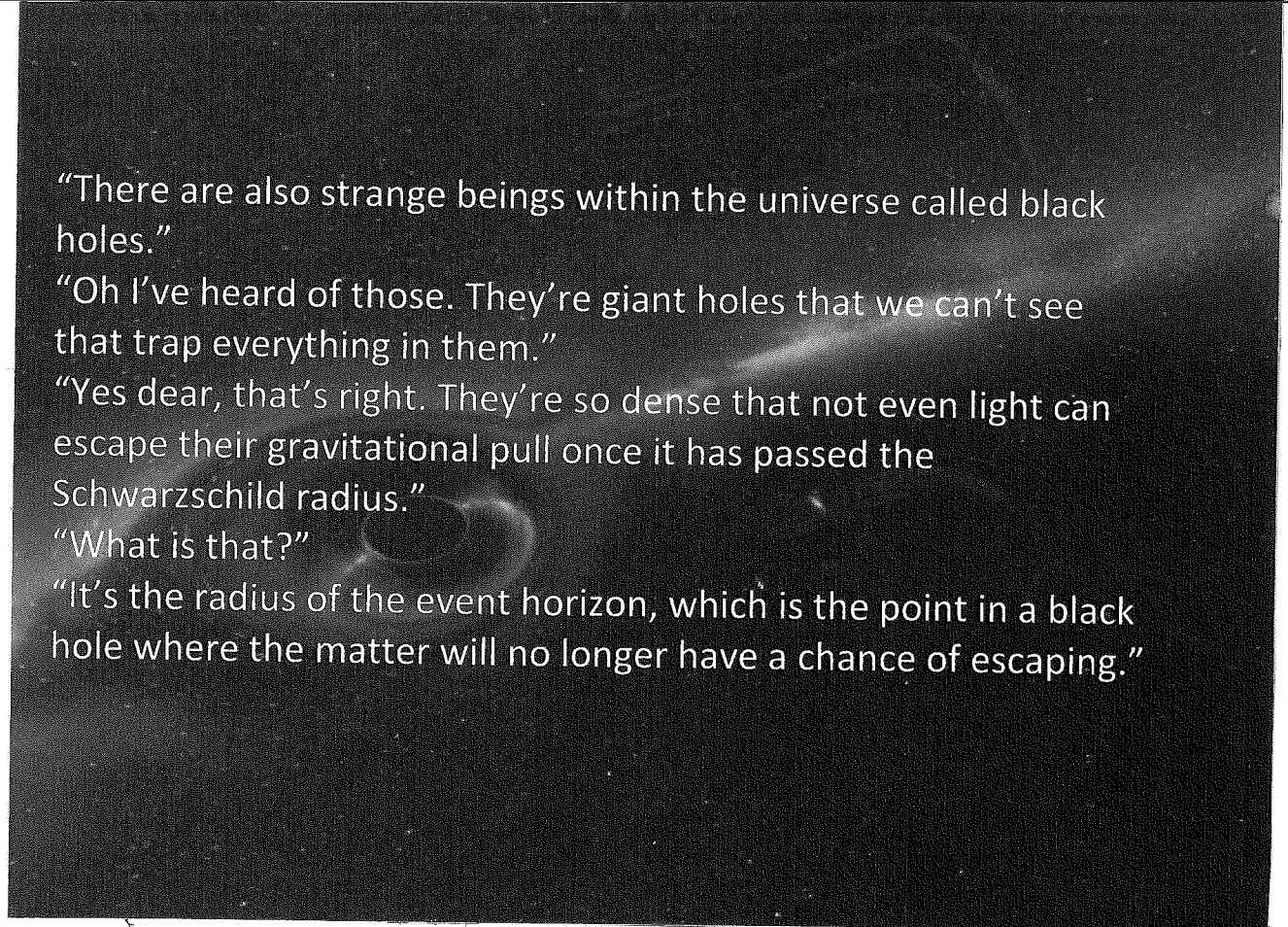


"Wow. What's outside of the universe, mommy?"
"No one knows, sweetie."
"Well, how did it get there?"
"We don't know that for sure either. We think that it started out as an infinitesimally small, dense and hot object, and then exploded in a burst of light, causing it to spread out all over the space that exists outside of the universe."

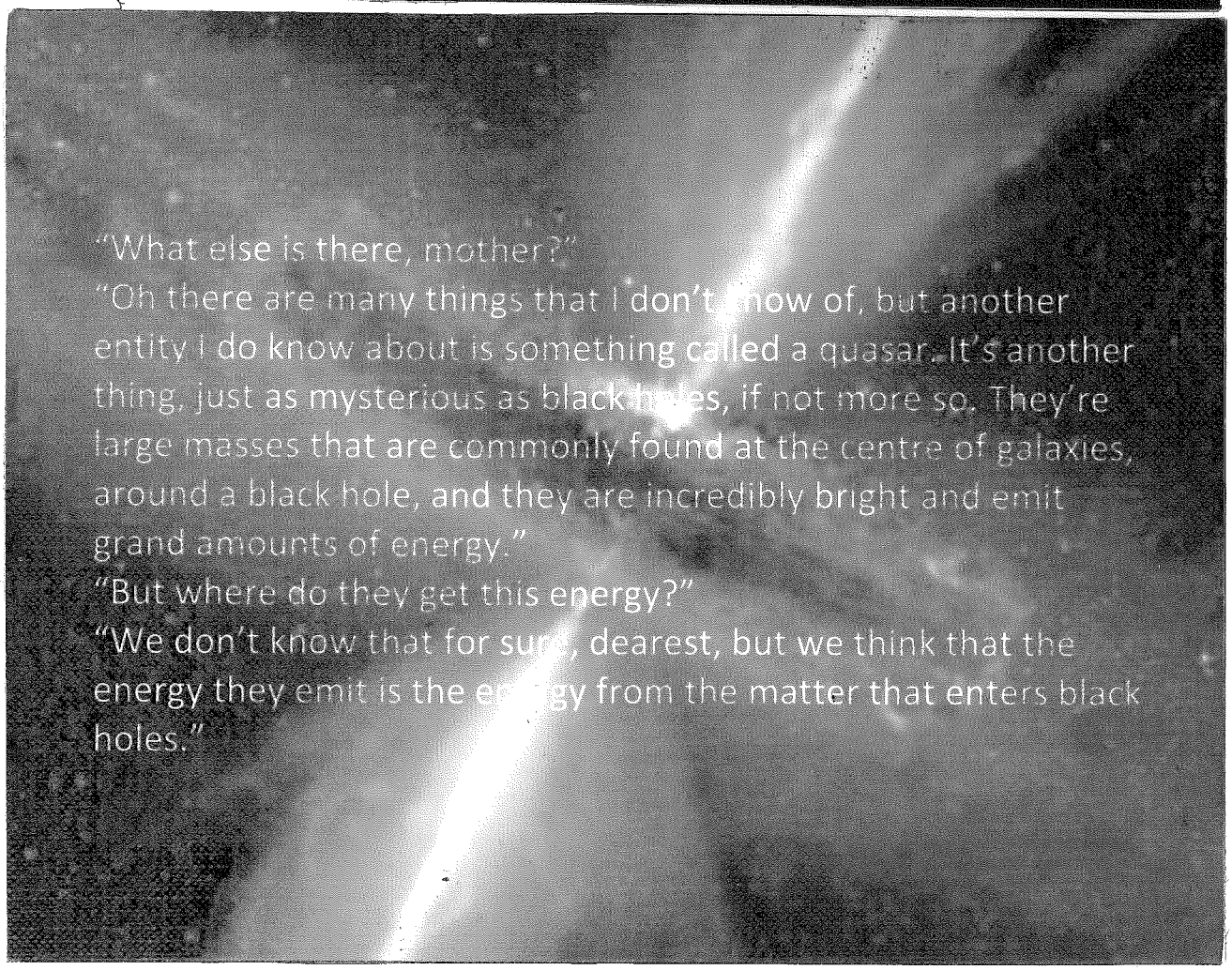
“But why do they think that?”
“Because of the research scientists have done on something called the Doppler Effect.”
“What’s that?”
“It’s all to do with electromagnetic radiation and the red shift.”
“What are those?”
“Well, according to science, the electromagnetic waves that light give off allow us to measure the movement of stars and galaxies. And because of research we’ve done on this, it tells us that everything in the universe is moving away from us.”
“But what does that have to do with where the universe came from?”
“Because the universe is still expanding, it leads scientists to believe that it was once all in one tiny spot.”



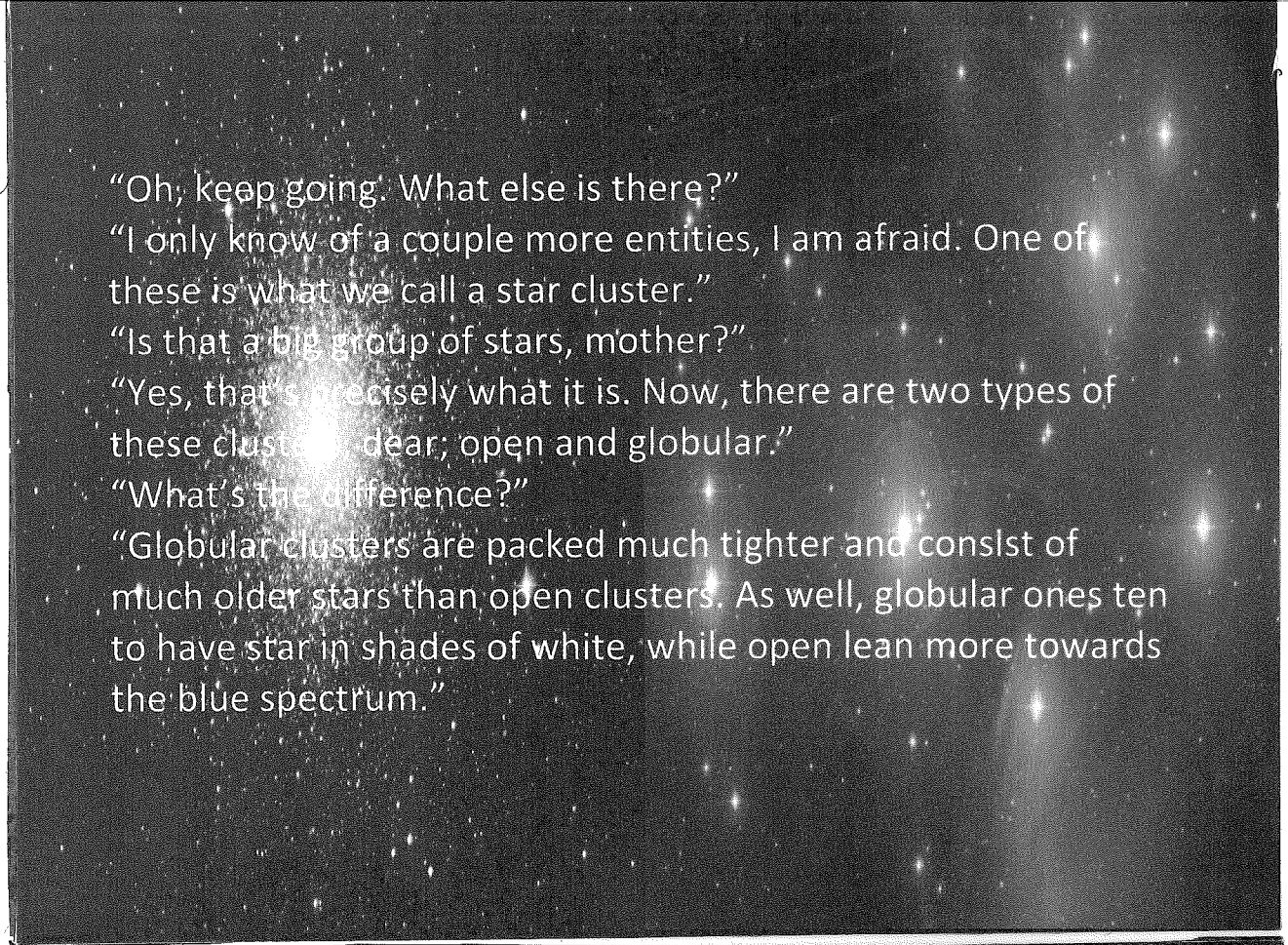
How long ago did it start expanding, though?”
“When it was first born, dear.”
“When was that?”
“We think that it was born around 14 billion years ago, but we can never been completely sure of these things.”
“That’s a long time ago. Is earth the only thing in the solar system?”
“Oh no, there are thousands of other galaxies and billions of other stars.”
“What are galaxies?”
“They’re a group of stars that share the same gravity and have huge amounts of space separating them.”
“Is that the only thing, mother? Just galaxies?”
“Oh no, there are hundreds of other planets located far off, in places we have yet to dream about.”



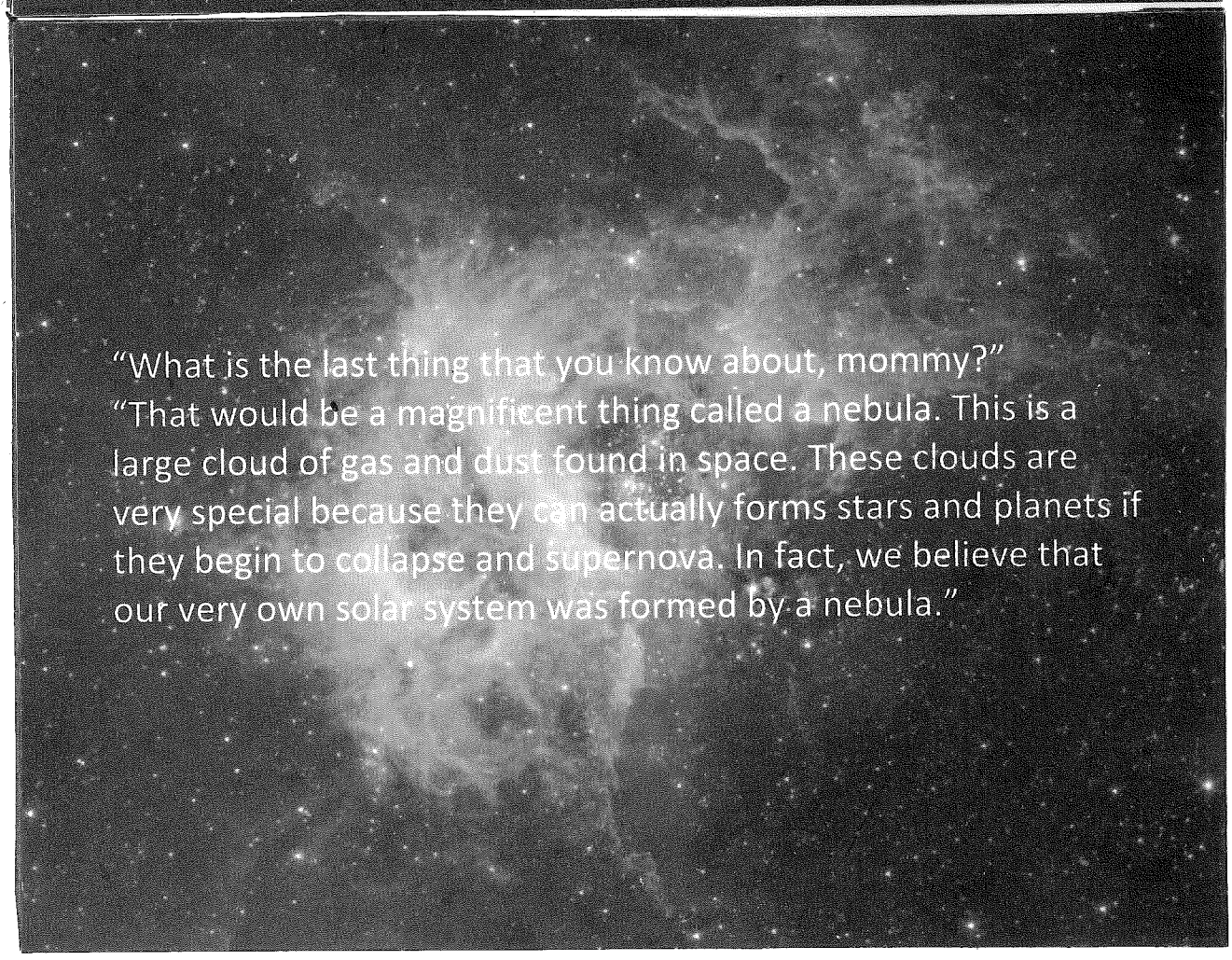
"There are also strange beings within the universe called black holes."
"Oh I've heard of those. They're giant holes that we can't see that trap everything in them."
"Yes dear, that's right. They're so dense that not even light can escape their gravitational pull once it has passed the Schwarzschild radius."
"What is that?"
"It's the radius of the event horizon, which is the point in a black hole where the matter will no longer have a chance of escaping."



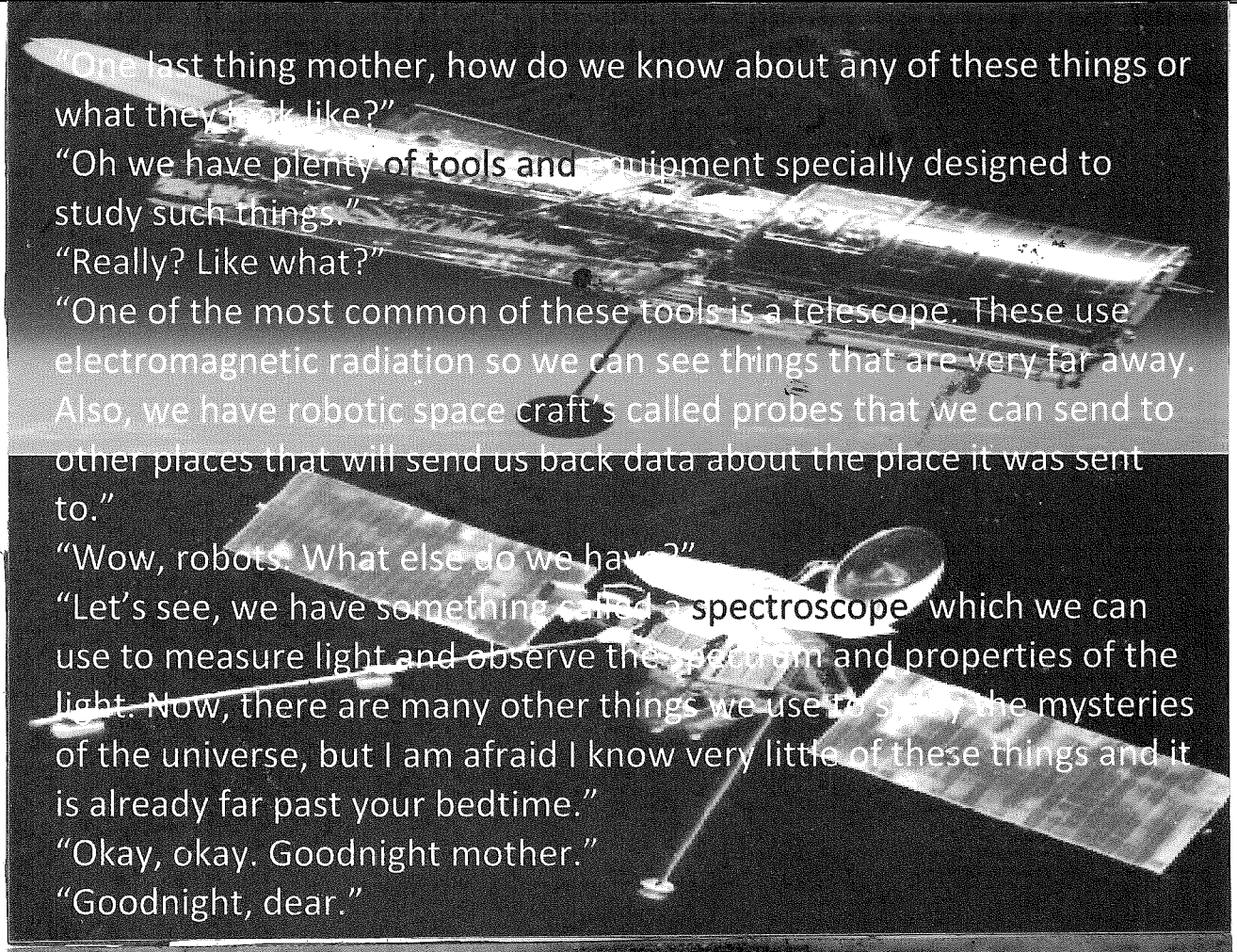
"What else is there, mother?"
"Oh there are many things that I don't know of, but another entity I do know about is something called a quasar. It's another thing, just as mysterious as black holes, if not more so. They're large masses that are commonly found at the centre of galaxies, around a black hole, and they are incredibly bright and emit grand amounts of energy."
"But where do they get this energy?"
"We don't know that for sure, dearest, but we think that the energy they emit is the energy from the matter that enters black holes."



"Oh, keep going. What else is there?"
"I only know of a couple more entities, I am afraid. One of these *is* what we call a star cluster."
"Is that a big group of stars, mother?"
"Yes, that's precisely what it is. Now, there are two types of these clusters, dear; open and globular."
"What's the difference?"
"Globular clusters are packed much tighter and consist of much older stars than open clusters. As well, globular ones ten to have star in shades of white, while open lean more towards the blue spectrum."



"What is the last thing that you know about, mommy?"
"That would be a magnificent thing called a nebula. This is a large cloud of gas and dust found in space. These clouds are very special because they can actually forms stars and planets if they begin to collapse and supernova. In fact, we believe that our very own solar system was formed by a nebula."



"One last thing mother, how do we know about any of these things or what they look like?"
"Oh we have plenty of tools and equipment specially designed to study such things."
"Really? Like what?"
"One of the most common of these tools is a telescope. These use electromagnetic radiation so we can see things that are very far away. Also, we have robotic space craft's called probes that we can send to other places that will send us back data about the place it was sent to."
"Wow, robots. What else do we have?"
"Let's see, we have something called a spectroscope which we can use to measure light and observe the spectrum and properties of the light. Now, there are many other things we use to study the mysteries of the universe, but I am afraid I know very little of these things and it is already far past your bedtime."
"Okay, okay. Goodnight mother."
"Goodnight, dear."

So, the little boy lay in bed as his mother kissed his forehead and left him for the night. He gazed at the beautiful sky outside and fell into a peaceful sleep, dreaming of someday unlocking all the secrets of the universe that had yet to be uncovered.