

A SNIPPET ON MIRRORS

Before the vain queen in *Snow White* consulted her mirror to see if she was the fairest of them all, there was Narcissus; a man so beautiful that when he saw his reflection in the water, he fell in love with, and died pining after, himself. If poor Narcissus had only been around after the invention of mirrors, he could have gazed at his beloved at will.

A mirror is a piece of glass that has been grinded twice, polished, figured, and then finally aluminized. Rough grinding is what creates the shape of the mirror. Fine grinding then smooths the surface and allows “good contact,” smooth matching spherical surfaces on the mirror blank and tool. Polishing leads to the optically smooth surface of the mirror. After the piece of glass is optically smooth, it is then deformed slightly during the figuring process in order to focus the light to a single point. Once the surface has the right figure, it also needs to be reflective. Aluminizing, or sticking a piece of aluminum to the back of the mirror, is what allows people to see their reflection.

The first mirrors were hand mirrors, while the full body mirrors didn't come into being until about 1st century CE. As with many glass items, mirrors were a luxury and only the rich could afford them. As years passed, the mirror making process became a lot easier, and soon everyone was able to have

a mirror of some sort in their home, allowing everyone to see what they really look like.

Of course, it isn't just the history or manufacturing process that makes mirrors so interesting. It's all the myths and stories and even movies that give mirrors a mystical feeling. Most notable is in *Snow White*



where the Queen has her trusty mirror to tell her that she isn't quite the most beautiful of all. In *Beauty and the Beast*, at least the Disney version, Beauty is given the magic mirror that shows whoever the user asks for. In Japanese folklore, a mirror is the soul of the woman who handles it, and depending on how bright it glows is how healthy the woman is. In Greece there is the story of Perseus who kills Medusa with a mirror. Her gaze can turn anyone to stone, and when she sees her own reflection, she becomes a



Glassblowing has become one of the most popular hobbies in the U.S.

victim of her own powers. Even in modern times, mirrors have continued to fascinate humans. Lewis Carroll's *Through the Looking Glass* has Alice step into the world of the mirror, where everything looks the same as the real world, except reversed. Perhaps the most famous of all is in Bram Stoker's *Dracula* where the Dracula has no reflection, making him even more supernatural and evil. Even movies utilize mirrors. *The Candyman* uses a mirror and a chant to summon the

candy man. In *Into the Mirror*, a Korean horror film, a ghost takes over a person's reflection and starts killing people.

There is no doubt that even today mirrors remain a mystery. They are conduits to our soul, powerful items that can tell the future, summon creatures, or even bring us to a different world. And although mirrors are designed to reflect the surroundings accurately, in truth, the figuring distorts the world just a little bit.



Now Beta Testing: Invisibility

Recently a joint effort between the US and Britain has yielded an invisibility cloak. How does this work? Tiny needles are fitted into a hairbrush cone that force light to pass around the cloak. The perception of sight is when light reflects off an object and back into our eyes. Glass (you see the connection) is an object that does not reflect light and therefore is see-through. Scientists realized that if the same technology of glass could be applied to a cloak or ship, it should render it invisible. Currently, scientists are applying invisibility more on the radar scale as it is a bit easier than on the optical scale.

There are also other studies that require the use of more items such as a computer, projector, camera, combiner (a special

silver mirror), and a reflective garment. The garment is made of a retro-reflective material made from many beads that serve to bend the light away from the garment, much like a prism. The rest of the equipment is used to process the surrounding area and then project it onto the garment. The most important object for this invisibility is the combiner: The mirror both reflects the projected image toward the cloak and allows light rays to bounce off the cloak return to the user's eye. If properly positioned in front of the user's eye, the combiner allows the user to perceive both the image enhanced by the computer and light from the surrounding world. Currently practical uses are not available, though we use this to ___ for stealth jets.