

Open Forum 3

Web Site Transcript

Chapter 4

A = Librarian (Paul)

B = Dr. Cooper

C = Library patron

A: Good evening, ladies and gentlemen and thanks for coming out to the library. This is the third in our series of lectures on the history of medical technology. It looks like more than half the people in this room are wearing tonight's topic, and so am I. I am of course talking about hairpieces. Only joking. That's next month. Our lecture this evening is on the development of eyeglasses and our guest is an ophthalmologist, that's an eye doctor for the rest of us, at the University Hospital. Doctor Cooper, over to you.

B: Thank you, Paul, for inviting me to talk to you about my favorite subject. These days, we take eyeglasses for granted. You go to the optician's or department store, you pick a pair of expensive frames off the shelf, and a few days later, you can see better. But the technology that goes into each pair of eyeglasses has been evolving since ancient times.

C: You mean the ancient Greeks and Romans wore glasses?

B: No, not exactly. The earliest record of any experimentation with lenses goes back to ancient Rome. The Emperor Nero, to be exact. The story goes that Nero couldn't see the gladiator contests clearly. That was when two soldiers—more often two slaves or prisoners—fought each other to death. Being the Roman Emperor, Nero had the best seat in the house, but according to a contemporary writer, he watched the games through beryl. That's b-e-r-y-l. Beryl is a transparent green stone—that means you can hold it up to your eye and see through it. It's similar to emerald, but it seems to work like a very simple lens. Interestingly, the word for eyeglasses in German, Brille, is derived from the word beryl. Nice piece of trivia, eh?

C: I'm sorry, doctor, if this is an obvious question, but what exactly is the medical definition of a lens?

B: No, that's a good question. A lens refracts light—refracts means it changes the direction. Your eye has a natural lens which directs light on to the back of the eye where the image is formed. If the lens isn't shaped right, or if the eye isn't exactly the right shape, then the light doesn't focus properly. A correcting lens—that's what doctors call eyeglasses

and contact lenses—a correcting lens helps refract the light so that it forms a clearer image. The right piece of beryl could work, although the world would look a little green, but modern lenses are more effective. They're about as expensive as precious gems, though! Does that answer your question?

C: Thank you, yes.

B: After the Romans, the history books are quiet on the subject of correcting lenses until about 1280, when historians believe the first eyeglasses were made in Venice, Italy. It's not surprising that eyeglasses were invented in Venice because the city has always been famous for its glasses, and the first lenses were made from glass. Of course, now, glass is considered too dangerous and most lenses are made from a plastic. Anyway, back to Venice. The first eyeglasses probably looked remarkably similar to modern spectacles¹. They consisted of two convex lenses attached to a frame.

C: Sorry to interrupt, doctor, but what does convex mean?

B: Convex is the shape of the lens. If you take your glasses and put them flat on the table, you'll probably see that the lens curves upwards—that's convex. The opposite, concave, looks like a bowl. But that's a physics lecture that I don't want to get into.

C: Were eyeglasses quickly accepted when they appeared?

B: Yes and no. There are two really fun documents from the early 14th century. Both of them are sermons—speeches given in churches. The first dates from 1305 in Pisa, another city in Italy. Brother Giordano da Rivotto loves his eyeglasses and says that they are one of the most useful inventions in history. However, over in England, a vicar called Cross disagreed. Cross means angry in British English, by the way! Reverend Cross called eyeglasses "immoral" because you see things quote: "in a false and unnatural light." He seems to be afraid that eyeglasses actually give you a different view of the world. Well, Brother Giordano won that fight and eyeglasses spread around the world. In fact, the technology hasn't changed all that much. We've gotten better at designing lenses to correct each individual patient's problem, and you can now buy

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lenses that turn into sunglasses when it's bright outside. The biggest development in eyeglasses, though, is probably the bifocal. Bifocal lenses have two parts: the top part helps you see distances; the bottom part is for reading.

C: Didn't Benjamin Franklin invent the bifocal lens?

B: Yes, he did. Franklin not only helped write the U.S. Declaration of Independence and discovered electricity, but he also created the first bifocal glasses. He wore two pairs of glasses—one for distances and one for reading. He cut the lenses in half and attached one half of the distance lens above the bottom half of the reading lens. Today, we can make bifocals that change more smoothly between the two zones, but the idea is the same. The problem with bifocals is that you only have really clear sight in a fairly small area of your total vision, so you have to move your head a lot when reading, for example. So, we keep trying to improve the technology and make eye glasses a little better. Thanks for your attention this evening.

¹spectacles: eyeglasses