SET 10

CELLS OF YOUR BODY

We have all heard the phrase, "Cells are the building blocks of living things." The human body is not like a house which can be made of a single kind of building block. Your body is made up of many different kinds of cells because they must do many different things to keep you alive. There are nerve cells which carry messages to and from your brain, cells which destroy harmful bacteria, and others which make your muscles move.

In addition to these, there are many other kinds of cells, each of which has its special job to do. Each special kind of cell is suited to its work by its shape, size and internal structure. When all the cells of the body cooperate by doing their jobs, the body is in good health.

In each of these slides, you will see how the structure of the cell helps it to perform its work.

The magnification given, for example, Slide 1—Cheek Cells (900x) means that the microscope was set at that power when the photograph was taken.

1 CHEEK CELLS (900x)

These cells were gently scraped from the inner surface of a person's cheek and placed on a glass slide to be studied under the microscope.

The cheek lining cells are thin and flat. They fit together like tiles on a floor, except that they overlap slightly.

There are several layers of these cells in the lining of the cheek.

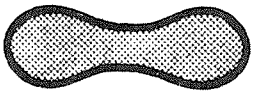
Because they are thin and flat and several layers thick, these cells make the lining of the cheek smooth, flexible and strong.

When we chew food, the top layers of cheek cells are worn away. Those beneath them are pushed up to take their place.

The large dark spot in the center of each cell is a nucleus.

2 BLOOD CELLS (500x)

The cells that are most numerous and that look like doughnuts are red blood cells. They are flat disks, thinner in the middle than at the edge. Because of this, the red blood cells look light in the middle and darker at the edge. A red blood cell has no nucleus and never reproduces.



Red blood cells contain a special chemical called hemoglobin. This chemical makes it possible for the red blood cells to do their most important job—to carry oxygen from the lungs to other parts of the body.

The white blood cells (A and B) are larger than the red cells and have nuclei. All white blood cells keep our blood clean by eating bacteria and other foreign particles.

In a drop of blood there are approximately 5,000,000 red blood cells and 7,500 white blood cells.

3 LYMPH GLAND CELLS (1200x)

These are cells in a lymph gland. Lymph glands are located in many parts of the body, for example, in your tonsils and underarms.

The arrow points to a lymph cell. Notice how similar it is to the white blood cell (B) in the previous slide. (It appears larger, only because the microscope was set at a higher magnification). Lymph gland cells and white blood cells are similar because they do similar jobs. Lymph cells destroy bacteria in the lymph glands, just as white blood cells destroy bacteria in the blood.

4 BONE CELLS (300x)

This is a very thin slice of bone, a living tissue. The two dark spots marked A are bone cells. The bone cells manufacture a chemical that leaves the cell and hardens in the space between the cells. This chemical, which makes our bones strong, contains calcium and phosphorus. Since milk is rich in calcium and phosphorus, it is an important food for growing children.

Can you see many fine dark lines connecting each of the bone cells? Scientists believe that these are canals that help the chemicals go from cell to cell and into the spaces between them.

The dark area (B) is a cross section of a tube. Blood vessels and nerves running through this tube bring food and oxygen to the bone cells.

5 VOLUNTARY MUSCLE CELLS (900x)

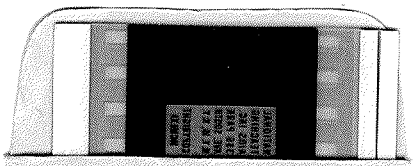
The long, spotted, ribbon-like shapes in this slide are voluntary muscle cells of the kind found in your arms and legs. The cells are so long that we can not see the ends within the field of the slide.

Muscle cells contain many long fibers which can shorten and pull with great force. Many movements of your body, such as walking and jumping, are caused by the contraction (shortening) of these cells. These cells are called voluntary muscle cells because they act when we wish them to.

At arrow A you can observe the cell nucleus.

Because of their striped appearance, scientists call voluntary muscle cells striated.

About 40% of the average person's weight consists of voluntary muscle.



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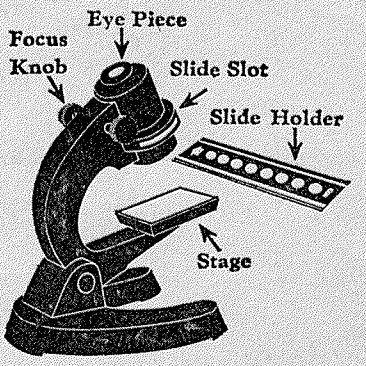
MICRO-SLIDE-VIEWER



Face the Micro-Slide-Viewer so that as much light as possible falls on the white Stage.

Insert the numbered end of the Slide Holder into the Slide Slot of your Viewer, moving it from your right to left.

View with your eye close to the Eye Piece.

With Slide No. 1 in place, focus by turning the Focus Knob.

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6 INVOLUNTARY MUSCLE CELLS (900x)

This slide was made from a piece of stomach wall.

At arrow A you can see a single involuntary muscle cell clearly. Notice how much shorter these involuntary muscle cells are than the voluntary muscle cells in slide number 5. The dark blue oval inside the pink cell is the nucleus.

Involuntary muscle cells are located in many parts of our body. For example, the walls of the swallowing tube, the stomach and the intestines have layers of these muscles which help us swallow and digest the food we eat. We call these cells involuntary because their contractions are automatic and they work without our having to think about them. Because they are not striated, scientists sometimes call them "smooth" muscles.

7 NERVE CELLS (60x)

This is tissue taken from the spinal cord.

Arrow A points to the main part of a nerve cell called the cell body. You can not see the entire cell because it has many long extensions which go far beyond the field of this slide. Only the beginnings of these branches can be seen close to the cell body.

The ends of each branch make contact with other cells. Nerve cells are shaped like long wires so they can carry messages from one end of your body to the other.

Some of the nerve cells in the brain can keep their information and send out messages for a long time. This is how we have learning and memory.

The light oval area with the dot in the middle of cell A is its nucleus.

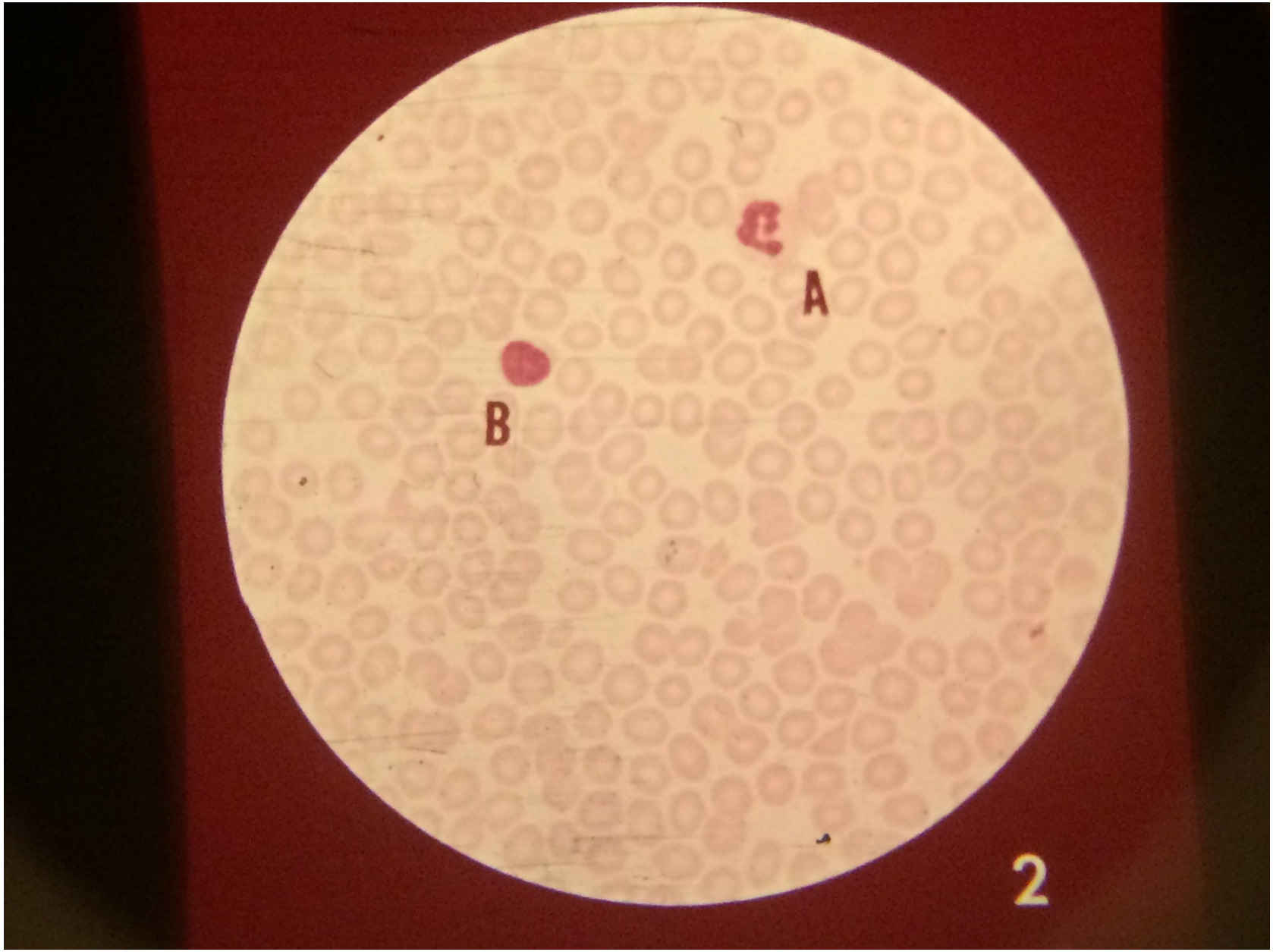
B is a small blood vessel that brings food and oxygen to the nerve cells.

8 GLAND CELLS (360x)

This slide was made from a section of the wall of the large intestine. The large intestine is a tube through which food passes.

At A you can see a gland with its duct opening into the inside of the intestine. Around the duct are many gland cells. At arrow B is the nucleus of one of these cells. These cells produce a substance which bursts from the cells and enters the duct. This substance flows into the intestines where it mixes with food to help our digestion.


1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B
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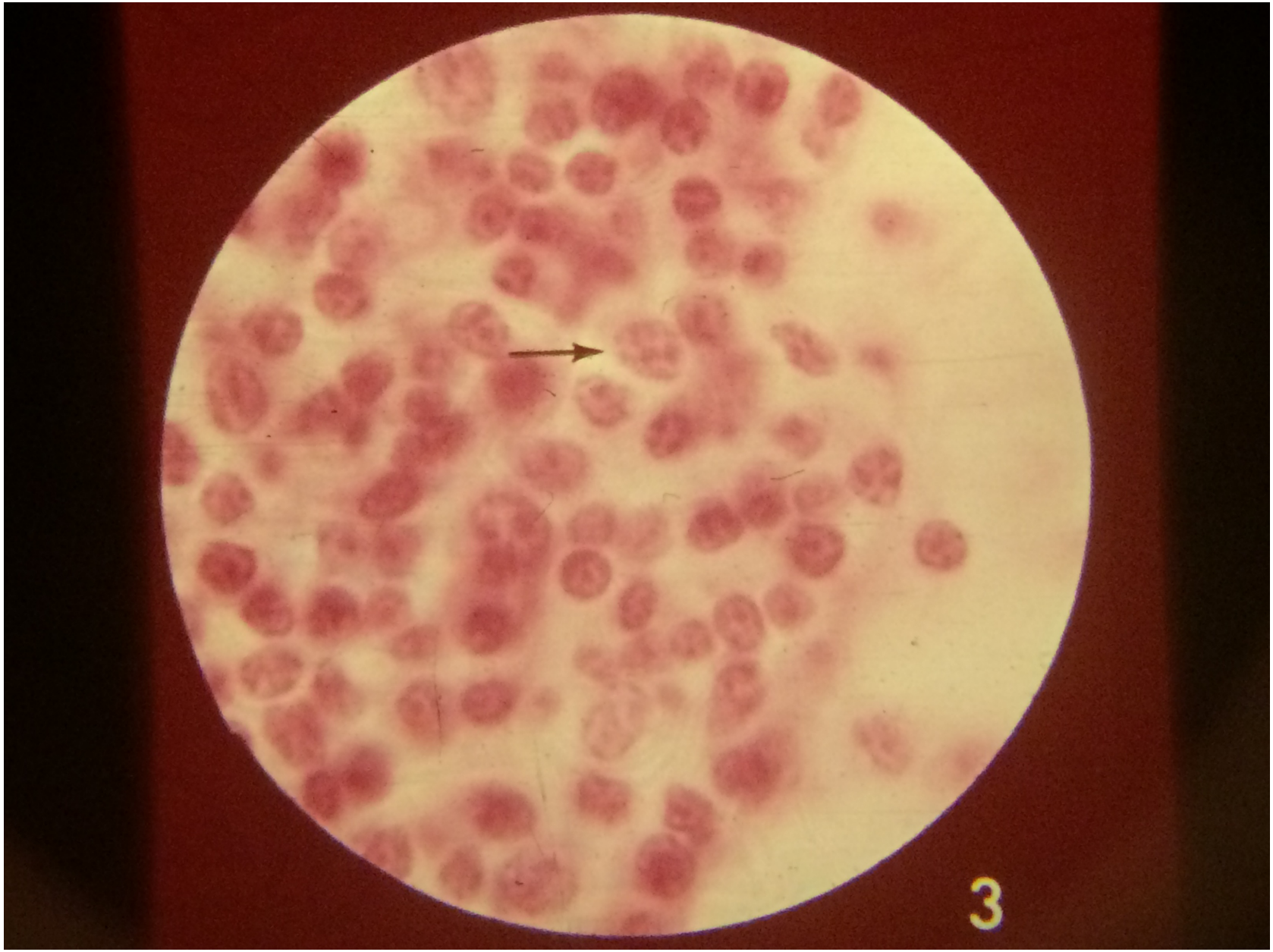
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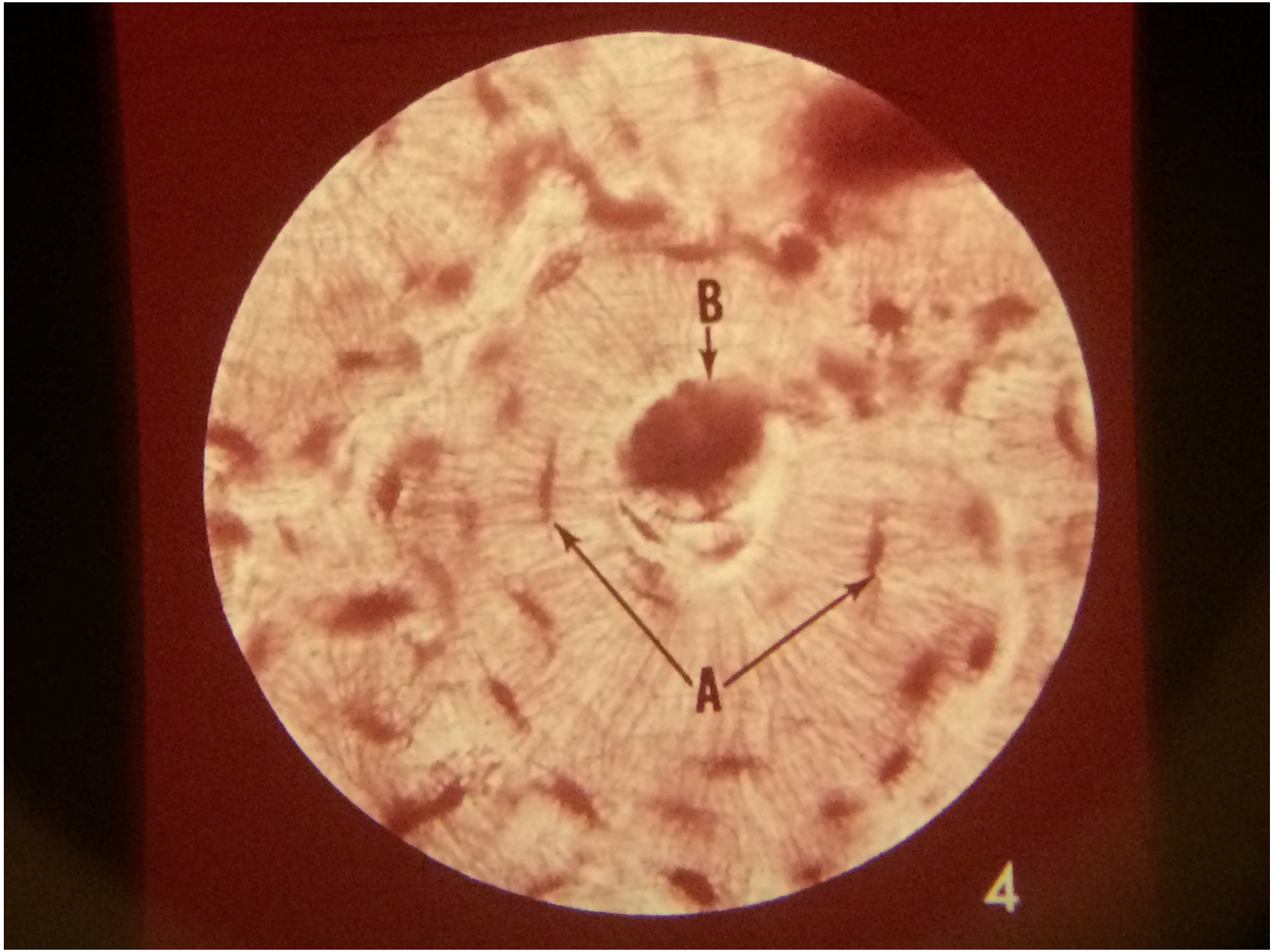
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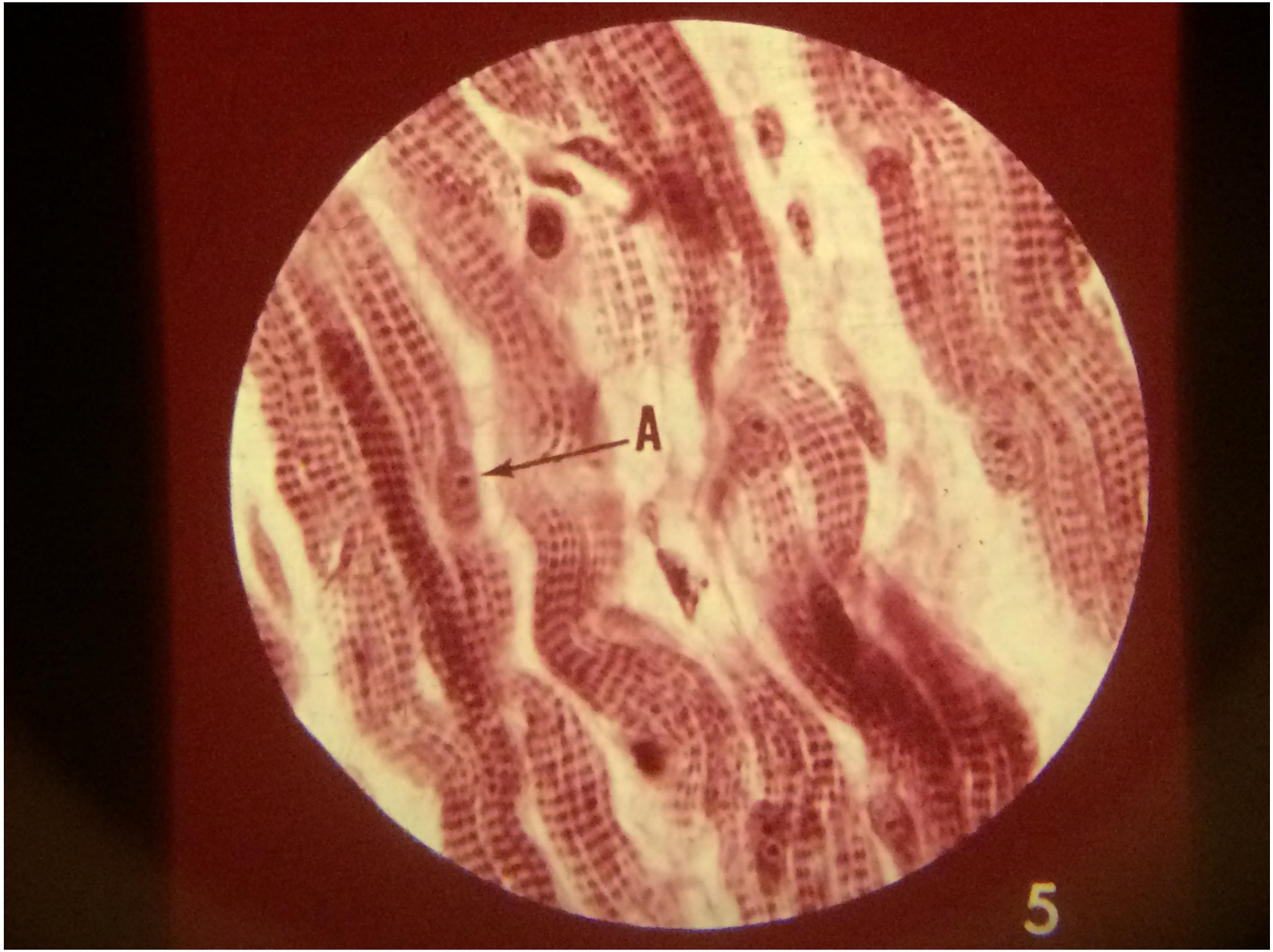
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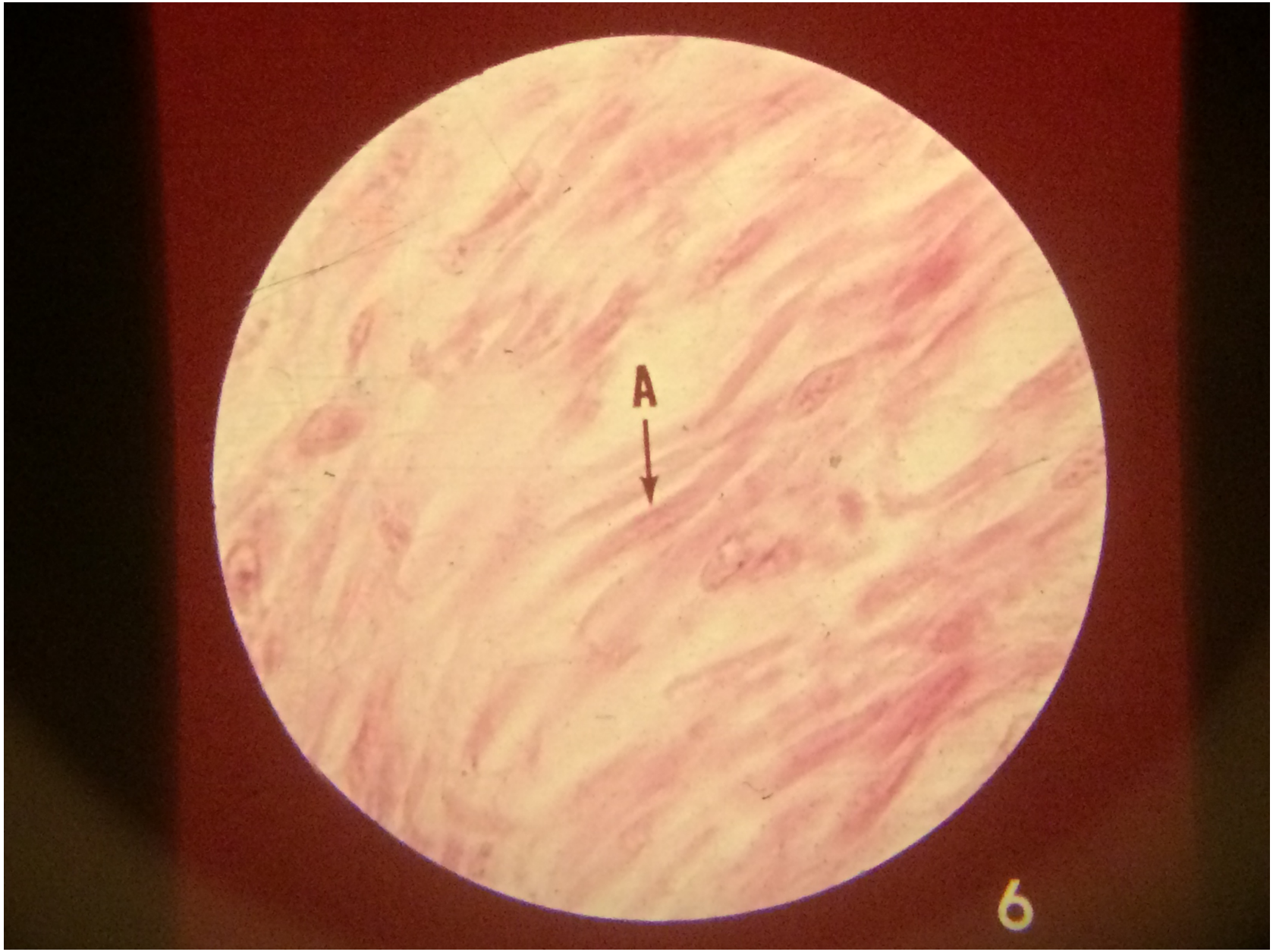
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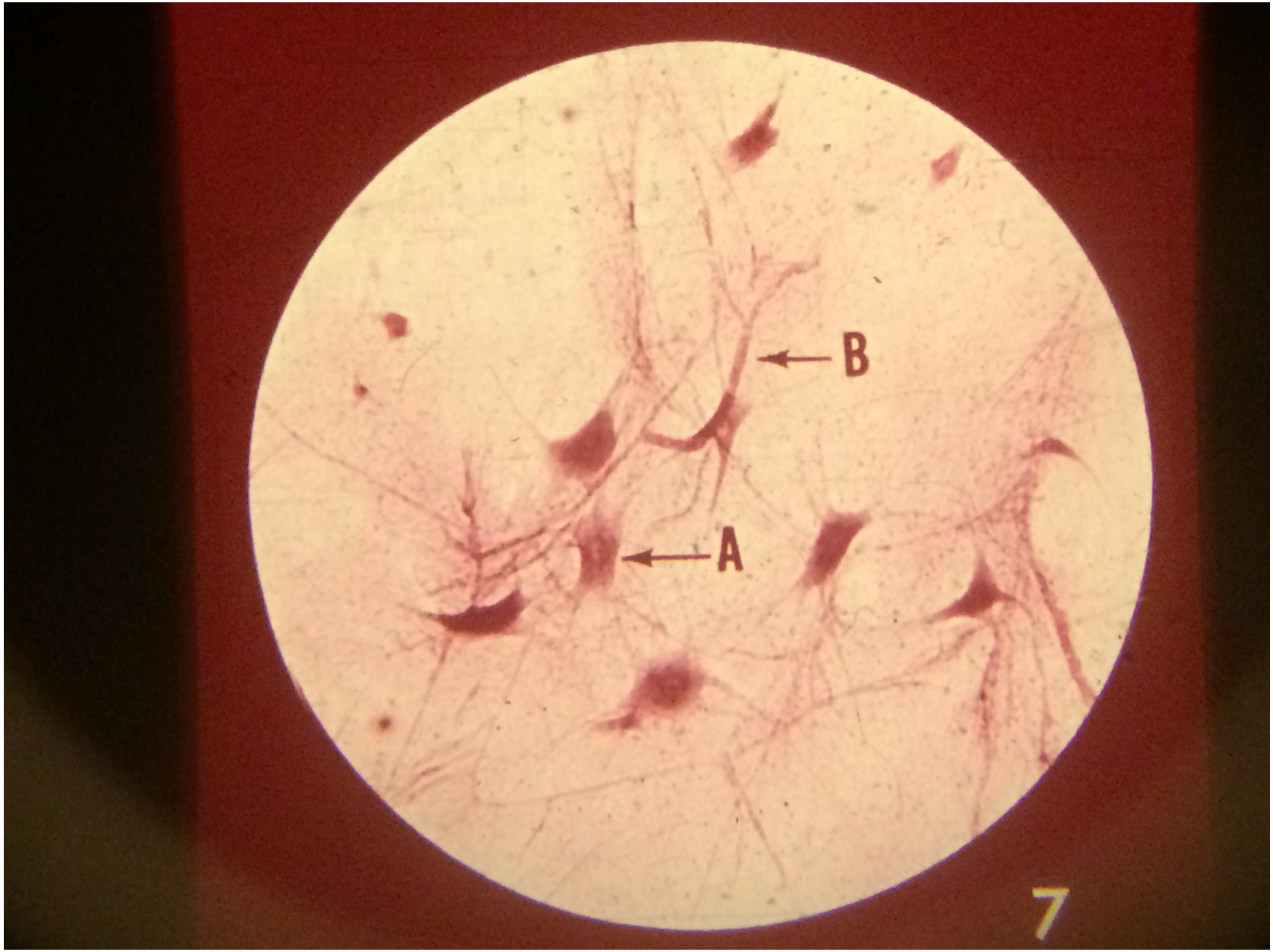
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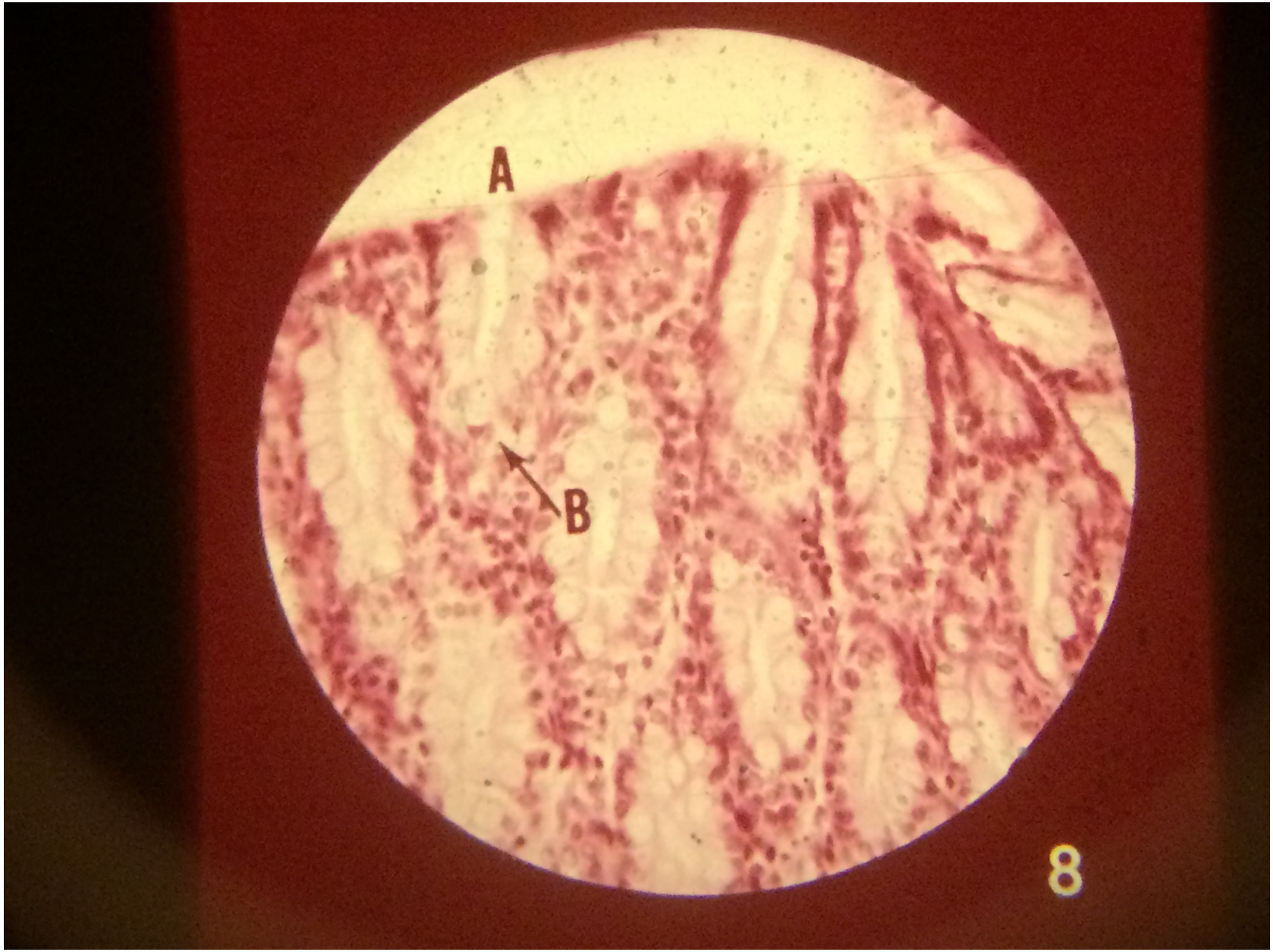
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B
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