CHAPTER SIXTEEN

MUSHROOMS AND TRUFFLES

עַל דָּבָר שֶׁאֵין גִּדּוּלוֹ מִן הָאָרֶץ–אוֹמֵר שֶׁהַכֹּל.

On something that does not grow from the ground, say: "[Blessed are You, Hashem, our G-d, King of the Universe] for everything [comes into being through His word.]"

Berachos 6:3

תָּנוּ רַבָּנָן: עַל דָּבָר שֶׁאֵין גִּדּוּלוֹ מִן הָאָרֶץ, כְּגוֹן...כְּמֵהִין וּפִטְרִיּוֹת אוֹמֵר שֶׁהַכֹּל.

The Rabbis taught: Over something that does not grow from the ground, such as...truffles and mushrooms, one says, *Shehakol*.

Gemara, *Berachos* 40b

MUSHROOMS APPEAR TO GROW FROM THE GROUND, SO WHAT DO THE RABBIS MEAN?

Scientists divide living **organisms** into several major categories called **kingdoms**. The most familiar of these are plants and animals. Mushrooms and truffles, however, are neither plants nor animals. They belong to an entirely different kingdom called **fungi**. There are estimated to be millions of **species** of fungi—even more than the number of plant species!

Let's follow the life cycle of a fungus (the singular of fungi) to help us to understand the Gemara quoted above. Every fungus starts out as a spore (see Figure 16.1). The spore of a fungus is like the seed of a plant and the egg of an animal. When it starts to grow or sprout, a tiny hair-like structure called a hypha emerges from the spore (see Figure 16.2). As the fungus grows, the initial hypha branches into multiple strands called hyphae (the plural of hypha) (see Figure 16.3). You need a microscope to see an individual hypha, though once the fungus has grown into many hyphae, if they are close together, it can be seen with the naked eye. The network of hyphae is called a mycelium. You may be surprised to learn that the "main part" of a fungus is its mycelium—not the mushroom! You have probably seen a mycelium on moldy bread or fruit (see Figure 16.4).

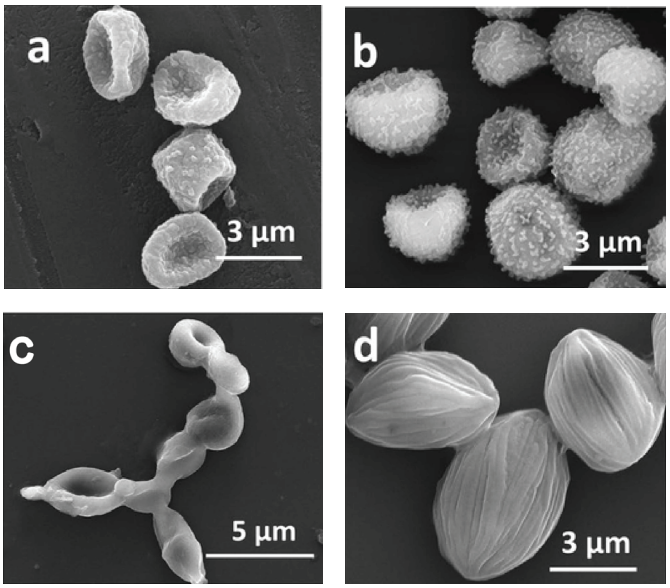

FIGURE 16.1. Fungal spores from four of the millions of species of fungus magnified under a microscope. The actual sizes of what you are looking at are indicated on the bottom right of each picture ("µm" is shorthand for **micron**, a thousandth of a millimeter). So, for example, if a spore is 5 µm across, it means 200 could fit lined up end-to-end in one millimeter. The fungi that grow from these spores are as follows: a. Aspergillus fumigatus—causes allergies, b. Aspergillus flavus—attacks wheat, corn, and many other crops, c. Cladosporium—a common bread mold, d. Aspergillus rhizopus—attacks many fruits and vegetables.

FIGURE 16.2. A drawing illustrating different stages of hyphal growth from a **germinating** spore on the left (germinating means that it is just beginning to sprout) to a mycelium on the right

Fungi live and grow by eating organic material, such as plants, animals, and their waste. In this sense, they are more like animals than plants. **Chemicals** on the outside of the hyphae **dissolve** food that is then absorbed back into the hyphae.

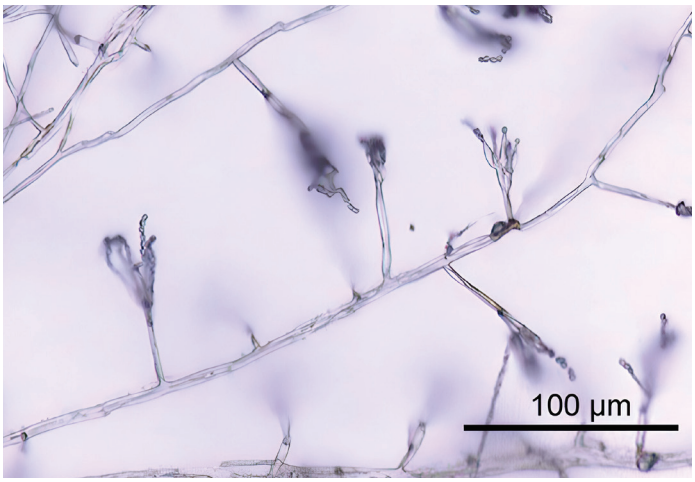

FIGURE 16.3. Hyphae branching of a Penicillium fungus

FIGURE 16.4. A bread mold mycelium. You can see the fungus's many hyphae grouped together.

In order to reproduce, fungi produce fruiting bodies such as mushrooms, which emerge from their mycelium (see Figure 16.5). The fruiting body of a fungus contains its spores, much like the fruit of a tree contains its seeds. The spores from a mushroom are spread by the wind or water (see Figure 16.6) and the process starts all over again. The quantity of individual spores released is astounding. A single mushroom can release 30,000 every second, adding up to a total of more than a billion in a day!

There are a huge variety of fungi, from tiny single-celled **yeasts**, like the ones we learned about in chapter 14, "Wine," and chapter 17, "Vinegar," to the large portobello mushrooms many people eat. In fact, there are some truly humongous fungus among us: the largest organism on dry land is a single gigantic specimen of honey mushroom