

Microbes and Man

Despite their small size, microbes are certainly of immense importance to man; they cause disease, provide us with various foods and medicines, and dispose of our wastes.

Mankind has made use of microorganisms, or their biochemical activities, since long before we even knew of their existence. We know that in 6000 BC the ancient Babylonians and Sumerians were brewing beer as we do today and that the Egyptians were baking leaven bread 2000 years later. Despite the antiquity of these microbiological practices, the first documentations of the structure of microorganisms did not occur until the advent of the first microscopes in the seventeenth century. We live in a time when microbiology has come of age. Industrial microbiologists produce microbial products on a huge scale. We use microbes to make beer, wine, cheese, yoghurt, sauerkraut, soya sauce, antibiotics, pesticides, gels and many other products. Microbiological reactions are used to process sewage, transform the chemical structures of drugs, clean clothes and even to extract precious metals such as copper and uranium from their mineral ores. Within the last decades, new technologies

have been developed, such as gene cloning, which will use microbes as factory cells for the synthesis of valuable pharmaceutical products, such as human insulin, hormones, antiviral drugs and vaccines.

Despite the dramatic advances in medical microbiology since the time of Robert Koch, microorganisms will continue to be a major problem in medicine and in diseases of plants. There is still no cure for the common cold or any of the most serious viral diseases of man.

It would be grossly misleading to create the impression that microorganisms such as bacteria are by their very nature pathogenic. A normal healthy human body harbours on its surface and within its alimentary canal ten times as many microbial cells than it has cells of its own kind. Many of these are of positive benefit to the digestive process and the rest are mostly harmless passengers which we never notice.

Our relationship with the microbes is and will continue to be dichotomous – they are our deadliest adversaries but also our closest allies.

(From: J.F. Wilkinson, *Introduction to Microbiology*, Blackwell Scientific Publications)

1 What do these personal adjectives and pronouns underlined in *Microbes and Man* refer to?

- | | |
|---------------------------------|---------------------------------|
| a. <u>we</u> refers to | e. <u>its</u> refers to |
| b. <u>their</u> refers to | f. <u>these</u> refers to |
| c. <u>their</u> refers to | g. <u>they</u> refers to |
| d. <u>their</u> refers to | |

2 Find in *Microbes and Man*:

- two foods made by using microorganisms:
- two beverages made by using microorganisms:
- two pharmaceuticals made by using microorganisms:

3 Decide whether these statements are true or false and correct the false ones.

- | | T | F |
|--|--------------------------|--------------------------|
| a. All microorganisms are pathogens. | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Man has always known about the existence of microorganisms. | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Microorganisms have been used for making food and alcoholic beverages for many thousands years. | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Microbes are used for making pharmaceuticals. | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Microbial products can now be produced in large quantities. | <input type="checkbox"/> | <input type="checkbox"/> |

4 Choose the correct option among the words in italics in the sentences below.

- The brewing of beer dates back *a) 4000 b) 6000 c) 8000* years.
- The Egyptians could make leaven bread in *a) 6000 BC b) 4000 BC c) 2000 AD*.
- The first microscope was invented in *a) 1600 b) 1700 c) 1800*.
- Microorganisms *a) have never been b) are no longer c) are still* a problem in medicine.
- a) No b) Some c) All* viral diseases can be successfully treated.

5 Use the nouns below to complete the passage What is microbiology?

acid, alkali, biosphere, compound, ecosystem, microorganisms, oceans, plants and animals, plastics, pressures, salts, sight, specializations, springs, temperatures, waste

Microbiology is the study of (1), that is organisms which are of microscopic dimensions. The striking diversity of microorganisms lies in their ecological and physiological (2) There are microbes which are adapted for life in the coldest (3) and in hot water (4) where (5) approach boiling point. Others are capable of growing in saturated (6), at high (7), in (8) at pH 0.2 or (9) at pH 12.5. The terrestrial (10) depends on the activities of bacteria and fungi to dispose of the organic (11) that would otherwise accumulate and consume the land. To this end, there are microbes that are capable of degrading every natural organic (12) and all but a few man-made organic materials, such as certain (13), dioxins, etc. Microorganisms also form a range of associations with other microbes and with higher (14) They can be pathogens, parasites, symbionts, commensals and saprophytes. The microbiological world may be hidden from (15) but it is a microcosm whose activities are of central importance to the structure of the (16)