The Ear and it's Function

Introduction

Ears are the most important tools you have when trying to get a job in the music industry. This is because if they're aren't looked after properly and are damaged then your sonic judgment may not be very accurate.

The Anatomy of the Ear

There are 3 sections of the ear. The outer, middle, and inner ear. The outer consists of the Pinna, the Ear Canal, and the tympanic membrane. The middle ear consists of the ossicles bones, and the Eustachian tube. The inner ear consists of the Cochlea, the semicircular canals, and the vestibular nerve. We will go on to talk about what they are, how they work, and what they are used for.

The Outer Ear

The pinna is the part of the ear that sticks out of the side of your head. It is shaped in such a way that it collects sound and directs it towards the ear canal. Every fold of the ear has a name and all of them help direct sound in the correct direction. Sound will also go through a filtering process which adds directional information, so you know where sound is coming from. Here is a list of each fold of the pinna:

Helix, triangular fossa, antihelix, concha, tragus, external auditory meatus, antitragus, and the lobule.

The ear canal is where the sound is directed to from the pinna. It acts as a funnel of sorts to get sound from the pinna to the tympanic membrane, also known more commonly as the eardrum. It is roughly 26mm in length and 7mm in diameter. Cerumen, also known as Earwax, is a waxy substance secreted in the ear canal. It plays an important role as it assists in cleaning and lubrication.

The tympanic membrane is a thin membrane that separates the outer ear from the middle ear. It transmits sound from the air to the ossicles bones inside the middle ear. When sound waves reach the tympanic membrane they cause it to vibrate. These vibrations are then transmitted to the ossicles bones in the middle ear.

The Middle Ear

The ossicles bones are the first part of the Middle ear. They are a transducer. A transducer is something that converts one type of energy into another E.G. Waves from the air into mechanical vibrations. This is what the ossicles bones do. They are a system of levers which are linked together and are driven by the tympanic membrane. The three bones are the Malleus, Incus, and Stapes. These bones amplify the force of sound vibrations. There are muscles in the middle ear that modify the performance of the bones as an amplifying unit. They act as safety devices to protect the ear from excessively large vibrations from loud sounds. As the noise level rises one set of muscles contracts to restrict the movement of the malleus therefore weakening the vibrations. At the same time the Stapes muscles contract to pull the stapes away from the oval window so less vibrations are passed to the cochlea. Also in the Middle Ear is the