mately from −73 to −49 dB, in terms of the sound pressure level at the entrance of the subject's external ear canal.

The physiological response to the 2.5 Hz acoustic stimulation can be avoided by wearing earplugs. FIG. **10** is a plot of the 100–70 counting time versus acoustic pulse frequency, with and without earplugs. The sound pressure level at the entrance of the subject's external ear canal was −6 dB for both runs. Without earplugs the counting time has the peak **59**, but no significant peak is seen in graph **60** for the run in which the subject used earplugs. Two conclusions can be reached from these results. First, in the experiments the 2.5 Hz resonance is essentially excited acoustically rather than through the magnetic field induced by the voice coil currents in the loudspeaker. Second, it follows that the exciting sound essentially propagates via the external ear canal, instead of through the skin and bones in the area of the ears, or via cutaneous mechanoreceptors in the skin at large.

To answer the question whether the acoustic excitation of the 2.5 Hz sensory resonance occurs perhaps through the cochlear nerve, one needs to consider the human auditory threshold curve such as shown, for instance, by Thomson (1967). The curve has a minimum near 1.8 KHz where the threshold sound pressure level is 0 dB, by definition. At 10 Hz the threshold is 105 dB. Hence, the pronounced acoustic excitation of the sensory resonance shown in FIG. **9** for a sound pressure level of −61 dB is 166 dB below the auditory threshold at 10 Hz. The excitation occurs near 2.5 Hz, and at that frequency, the auditory threshold is even higher than at 10 Hz. Although the curve in Thomson's book does not go below 10 Hz, linear extrapolation suggests the estimate of 135 dB for the threshold at 2.5 Hz, bringing the sound pressure level that is effective for acoustic excitation of the sensory resonance to 196 dB below the estimated threshold at the frequency near 2.5 Hz used. This result all but rules out excitation via the cochlear nerve.

Chemical modulation may be the cause for the small frequency difference for peaks **57** and **59** in FIGS. **9** and **10**, for the sound pressure level of −61 dB; these peaks occur respectively at 2.516 and 2.553 Hz.

The physiological response to the excitation of the sensory resonances at a fixed stimulus frequency is not immediate but builds over time. An example is shown in FIG. **11**, where the graph **61** depicts the measured 100–70 time plotted versus elapsed time, upon application of acoustic pulses of 2.558 Hz frequency and a sound pressure level of −61 dB. The graph shows that the response is initially delayed over about 5 minutes; thereafter it increases, and at about 22 minutes the slope is seen to decrease somewhat. Other experiments have shown a counting time that eventually settles on a plateau, or even starts on a decline. Chemical modulation and habituation could account for these features. The response curve depends strongly on initial conditions.

The method is expected to be effective also on certain animals, and applications to animal control are therefore envisioned. The nervous system of mammals is similar to that of humans, so that the sensory resonances are expected to exist, albeit with different frequencies. Accordingly, in the present invention subjects are mammals.

The described method and apparatus can be used beneficially by the general public and in clinical work. Unfortunately however, there is the possibility of mischievous use as well. For instance, with small modifications the method of FIG. **1** can be employed to imperceptibly modulate the air flow in air conditioning or heating systems that serve a home, office building, or embassy, for covert manipulation of the nervous systems of occupants.

The invention is not limited by the embodiments shown in the drawings and described in the specification, which are given by way of example and not of limitation, but only in accordance with the scope of the appended claims.

REFERENCES

P. M. Morse and H. Feshbach, METHODS OF THEORETICAL PHYSICS, McGraw-Hill, New York, 1953

R. F. Thomson, FOUNDATIONS OF PHYSIOLOGICAL PSYCHOLOGY, Harper & Row, New York 1967

I claim:

1. Apparatus for manipulating the nervous system of a subject, the subject having an ear, comprising:

generator means for generating voltage pulses;

induction means, connected to the generator means and responsive to the voltage pulses, for inducing at the ear subliminal atmospheric acoustic pulses with a pulse frequency less than 15 Hz.

2. The apparatus according to claim **1**, further comprising means for automatically controlling the voltage pulses.

3. The apparatus according to claim **1**, further comprising means for monitoring the voltage pulses.

4. The apparatus according to claim **1**, for exciting in the subject a sensory resonance that occurs at a resonance frequency less than 15 Hz, the apparatus further comprising tuning means for enabling a user to tune the pulse frequency to the resonance frequency.

5. The apparatus according to claim **4**, further including a casing for containing the generator means, the induction means and the tuning means.

6. The apparatus according to claim **1**, wherein said induction means comprise:

means for generating in the atmosphere a gas jet, the latter having a momentum flux; and

modulation means, connected to the generator means and responsive to said voltage pulses, for pulsing the momentum flux with a frequency less than 15 Hz;

whereby subaudio acoustic pulses are induced in the atmosphere.

7. Apparatus for manipulating the nervous system of a subject, the subject having an ear, comprising:

generator means for generating voltage pulses;

a source of gas at a pressure different from the ambient atmospheric pressure;

a conduit having an orifice open to the atmosphere for passing a gaseous flux;

valve means, connected to the source of gas and the conduit to control the gaseous flux;

means, connected to the generator means and responsive to said voltage pulses, for operating the valve means to provide an oscillation of the gaseous flux with a frequency less than 15 Hz.

8. The apparatus according to claim **7**, further comprising vessel means for smoothing fluctuations of the gaseous flux caused by fluctuations in the pressure of the source of gas.

9. A method for manipulating the nervous system of a subject, the subject having an ear, comprising the steps of:

generating voltage pulses; and

inducing, in a manner responsive to the voltage pulses, at the ear subliminal atmospheric acoustic pulses with a pulse frequency less than 15 Hz.

10. The method according to claim **9**, for exciting in the subject a sensory resonance that occurs at a resonance frequency less than 15 Hz, further comprising the step of tuning the pulse frequency to the resonance frequency.