

# Organ music comes right from the heart

Robert Cooke in Los Angeles

**W**ITH a bundle of electrodes, a high-powered computer, and a music synthesiser, scientists have designed a system that can use the human body's organs as a trembling, twitching symphony orchestra.

By hooking up different parts of the body to the computerised system, an entirely new kind of music — metabolic music — is possible.

A physiologist, Mr Hugh Lusted, and a graduate student, Mr Benjamin Knapp, both at the Stanford University School of Medicine, reported on their device last week at a meeting in Honolulu of the Acoustical Society of America.

What they described is a new type of electronic instrument that makes music directly from the electric signals found within the human body. Music is made by controlling the signals.

Scalp electrodes, for example, read the brain's electrical activity, a computer then picks out patterns and com-

mands a synthesiser to squeal in response.

Similarly, electrodes hooked up near the heart, or on the eyelids or kneecaps, convert nerve impulses into synthesised sounds.

In their report to the society, they wrote that their system, called Biomuse, "allows a musician to use his or her 'inner machinery' to generate sounds".

As a result, signals from the heartbeat or brain waves, for example, could be used to complement music made by traditional means.

They also think dancers could be wired to create music directly from the movement of their muscles.

"We also envision a use for this device to return the pleasure of playing music to paralysis victims," they wrote. "Since the device can use any available nerve or muscle electricity as a control signal, a disabled person can learn to make music even using eyelids."

A professional musician who tried the prototype — Mr John Chowning, head of Stanford's Centre for Computer Research in Music and

Acoustics — said he "found that with some ease and some rapidity I could learn to control certain dimensions" of the sound produced, such as loudness, pitch and timbre.

Mr Lusted said that, although he and Mr Knapp developed the Biomuse system on their own time, they have applied for a patent assigned to Stanford University.

Although he has been thinking of creating such a music system for years, Mr Lusted said, it was only recently that enough computing power became available at low enough cost to make it possible.

"We'd eventually like to write a programme in which an icon (human-like figure) comes up on the screen and you point to where you're going to have an electrode. You then programme the sound you want, such as a flute, from your head," Mr Lusted explained.

"You could get, say, a flute from your head, a piano from your arm, and a leg muscle could do a trombone. There are hundreds of sounds you can make." — *Newsday*.