

Can Radio Waves be Heard Without a Receiver?



FROM time to time we hear of somebody claiming to be a "human wireless receiver," able to receive broadcast messages directly from the ether without the aid of a radio receiver. There are many cases on record also of people complaining that the wireless waves are upsetting their mental or their bodily health.

It is usual to regard these as cases of hallucination or, at any rate, of imagination, and to dismiss them at that.

I fail to see how it can be possible for anyone, however sensitive electrically he may be, to interpret wireless telephony directly through the body without the aid of some external device, and, so far as cases of this particular kind are concerned, I am afraid I am as sceptical as most other people.

Peculiar Effects.

AS regards the other question of radio waves affecting the bodily health, however, this is a possibility which is not so easily disposed of, for we know that radio waves produce high-frequency electric currents in any conductor, and although the human body would be regarded as a comparatively poor electrical conductor, in consequence of which the high-frequency currents set up would presumably be comparatively weak, this is really no criterion as to the effect which such currents might produce.

We know precious little about the electrical conditions of the body, and therefore we are quite unable to say, with any certainty, what effects even minute electric currents artificially set up might be expected to produce.

Personally, therefore, I should feel inclined to reserve judgment on the question as to whether some human beings might not be peculiarly sensitive to the effect of electro-magnetic waves.

In this connection we must remember that long before radio was even thought of various people have claimed to possess the "divining" power, and, although, so far as I am aware, this power has never been proved beyond question, there is a considerable body of opinion, even scientific opinion, in favour of it.

The "Divining" Theory.

THE interesting point in the present connection is that, according to the most acceptable theory of "divining," the power is due to a peculiar susceptibility on the part of the "diviner" to variations in the electrical conditions as between the earth and the air, these variations being brought about by the presence of liquid or mineral deposits in the earth.

The theory is, in fact, that the diviner is so sensitive to these differences in electrical conditions as he moves over the ground from one place to another that at particular points he will be so stimulated as to suffer muscular movements, the so-called

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is inclined to think not!

"divining rod" serving merely as an indicator of such movements. The virtue, if it be a virtue, resides not in the "rod," as is sometimes supposed, but in the "diviner."

Furthermore, to come to a much more familiar phenomenon, we have the hand-capacity or body-capacity effects which occur so frequently in the operation of a radio receiver.

It is true that these are sufficiently accounted for by the simple theory

Human Body," by Dr. W. E. Boyd, M.A., M.D., and which is published in the British "Journal of Radiology," March, 1930.

The author used for his experiments a two-valve direct-coupled amplifier, feeding into an Einthoven galvanometer. This galvanometer, under working conditions, had a sensitivity of about 200 divisions per millivolt. The human subject was connected to the grid of the first valve through a

Only recently a person wrote to us asking why he could once hear speech and music "coming from nowhere" without the aid of a radio receiver or other mechanical device whatsoever. Whether such a thing is possible or not is a matter of opinion. Dr. Roberts, whose views on this interesting phenomenon are recorded below, is, to quote his own words, "as sceptical as most other people." But there are other people of repute who disagree with him.

that the presence of a body—whether a human body or any other material substance—will affect the capacity conditions in the radio receiver in such a way as to precipitate reaction effects and generally cause disturbances in the receiver.

But that is not to say that one person may not have quite a different body capacity from another, and although no investigations (as far as I know) have been made on this point, it would be interesting to know whether the effect is purely a capacity effect—that is, regarding the human body as being simply an earthed conductor at zero potential throughout—or whether different persons have very different electrical influences upon the receiver.

"Magnetic" Persons.

WE are all familiar with the term "magnetic personality," and although we use the term metaphorically, I do not think anyone would be entitled to assert that it does not contain some grain of literal physical truth.

At any rate, whatever our attitude may be on these various matters, whether sceptical or open-minded, there is abundant evidence that the human body and, indeed, for all we know, the human brain as well, is susceptible in various subtle ways to electrical influences. It may be that in the future, when these effects are better understood, so far from regarding them as spurious, we may be able to turn them to good account.

These observations are prompted by a perusal of a very interesting paper, entitled "The Electric Field of the

variable condenser.

In most of the experiments carried out with this arrangement the human subject was a boy, who, owing to electrostatic charges being produced by the friction of ordinary clothes, had to be dressed up in a sleeveless suit made of copper gauze arranged so that different parts of the body could be investigated. It was found best to earth the skin surface of his feet.

Special Electrodes.

BY using special types of electrode and taking great care to avoid accidental effects due to friction with the clothes, friction of the hands of the operator, and even friction with the air, definite records were obtained of the electrical condition of different body regions.

It was shown conclusively that at particular points of the body there was produced a series of regular static potential variations relative to the earth and that these variations corresponded to the rate of the heart-beat.

Static Potentials.

IT is to be noted that no direct current of any kind could be present in the part of the circuit applied to the subject, owing to the interposition of the grid condenser. It seems, therefore, that at about each beat of the heart the whole skin of the body suffers a rise and fall in static potential.

The exact cause of this is not yet known, but it may relate to the blood flow in the skin capillaries rather than to the nerve impulse in the heart.

Again, using a somewhat similar arrangement, but with a different type of terminal or applicator, and moving this to different parts, it was found that every portion of the skin showed a potential difference relative to earth, and these potentials varied considerably from one part of the body to another. Indeed, the variations were so great that often the Einthoven galvanometer had to be de-sensitised from the condition mentioned above.

As would be expected, it was found that if the skin were wet or water-soaked the results were lessened—that is to say, a surface conduction was set up and the electro-static charges rapidly leaked away.

The detector arrangement, by virtue of its design, is continually sensitive only to alterations in static charge. If a non-variable charge is applied there is only a momentary response, the system soon adjusting itself again.

In this way any static effect that might be due to contact potential-difference between terminal and skin does not affect the results.

It was also found that the production of static electricity must be due either to minutely localised surface activity (as even a needle-point applicator showed differences between adjacent spots) or, as is more likely, to activity internal to the surface of the skin.

Mutual Interaction?

NOW we come to a striking paragraph in which the author summarises his conclusions. He says: "In view of these facts it becomes clear that the human body must be surrounded by a varying field of force of static origin, the variation being due to the charges originating in the body and also due to the continual readjustments accompanied by the redistribution of the lines of force of this field.

"An interaction of such fields must occur when people approach one another, and it is not difficult to visualise in a broad way the complex fields of force present in a large group of people.

"In this search there is some evidence that this field of static origin consists not merely of stationary lines or tubes of force, but possesses vibratory characteristics of a nature at present unknown, which vary in character with the origin and amount of potential concerned."

According to these highly interesting results the human being is not to be regarded as a neutral detached object, but as being electrically associated, perhaps very intimately, with surrounding objects and in particular with other human beings.—Dr. J. H. Roberts, in "Modern Wireless."

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