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978-1-108-05269-6 - Talks About Wireless: With Some Pioneering History and Some
Hints and Calculations for Wireless Amateurs

Oliver Lodge

Excerpt

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P A R T I

RADIO IN GENERAL

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TALKS ABOUT WIRELESS

CHAPTER I

On Broadcasting

THE chief feature which distinguishes humanity from the rest of the animal creation is the power they have gradually acquired of communicating their experiences consciously and explicitly to each other and to subsequent generations. This is the basis of Education in its widest sense. Individuals are not limited to their own experience ; they have the benefit of the accumulated experience of their fellows and of all past generations since the dawn of civilization. Some kind of race memory seems to exist among animals too, but it is of a vague and indefinite and rather mysterious kind ; and if it can be called communication at all, it must be of an entirely unconscious order. Mankind, however, is able to transmit consciously information and experience. Contemporary information is conveyed through the newspaper press ; while historical and scientific information of the most varied

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and multifarious kind is contained in books. In other words, the art of speech and the permanent record of speech enabled by printing render accessible more information than any one individual can hope to assimilate. The educated man is one to whom all these resources are open : but the least laborious method of getting at it, to all except the serious student, is through the ear rather than through the eye ; in other words, most people prefer to learn by hearing rather than by reading. The living voice has a power of attracting attention more vivid than the pages of a book.

Unfortunately humanity, having learnt to speak, was not satisfied with a single code or language ; but each large community developed a language or code of its own : and accordingly much misunderstanding exists between different communities, since they cannot freely converse with each other ; and this must have been, and still is, a fruitful cause of misunderstanding and disputes, and even of wars. This planet is not a very large one ; and it may reasonably be hoped that at no distant future every part of humanity, every section of mankind, will have a better understanding of each other's outlook and aims and ambitions and hopes, through the medium of a common tongue : and every step that is taken towards

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intercommunion and the annihilation of distance must be of the utmost importance. Already books can be circulated all over the world, and by means of translation can be made accessible, even when their language is unknown. Moreover, the English-speaking race has spread over so great a part of the world that already the continents of America, Africa, and Australasia are inhabited in great part by English-speaking people, and thus communities and families spread over an immense area have friends and relations with whom intercourse is not only a matter of political and social understanding, but can be of a personal and domestic and affectionate character also.

The invention of the telegraph, and the laying down of cables, have, in the day and generation of many now living, come into active being, and have linked up the world in a way which was never experienced before. Not only information about the past is now accessible, but the living and daily experience of the present is also distributed to the ends of the earth.

Quite a short time ago the information so distributed was only accessible by reading; the transmission was effected by expert operators, and then found its way into print. Now, however, in the memory of those still young,

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a still more rapid and efficient mode of contemporary intercourse has become possible. The hearing of speech at one place is not limited to those within the reception of acoustic waves in the air ; but means has been found of converting those sound waves into ether waves, which, though they do not produce any effect on the human organism, and by our unaided senses are inapprehensible, yet by the use of instruments of reconversion the ether waves can be received and transmuted back into sound waves ; so that that wonderful instrument, the human ear, can receive them when thus reconverted. The human mind can thus interpret indirectly the ether waves, so as to extract from them information, in the same way as it used to interpret air waves in the case of the speech of neighbours and friends close at hand.

This is a step in advance of the utmost importance, and the consequences of it we do not yet fully foresee. This new method of communication is still in its infancy, and how it will develop no man can certainly tell ; but already we may reasonably look forward to the time when friends and relations in New Zealand will be able to communicate with those in the older countries, not through the medium of skilled operators and writing, but by direct

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speech. However that may be, we know already that the inhabitants of any one country can be linked together, irrespective of distance, in a way which was never before possible in the history of the world.

The extraordinary way in which the ether connects the worlds together, so that ether waves bring information about the physical and chemical constitution of distant stars, has been known for half a century, or to a minor degree for several centuries. The waves travel through the ether without loss, carrying their information with them, ready to be interpreted by any whose minds are open and who have the instruments necessary. The emission and reception of light is a very ancient system of broadcasting; the earliest receiving set is the human and animal eye.

INVENTION AND MEDITATION

The conscious utilization of ether waves is a modern and growing art, at first depending wholly on the human eye, enlarged and extended first by the telescope and then by the spectroscope. Twenty or thirty years ago no other instrument seemed possible: light seemed the only method of intercommunication through the ether. But the discoveries of Maxwell and

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Hertz made possible the artificial production of ether waves ; and the discoveries of some still living made it possible to control and modify those waves, so that they should have any desired rate of vibration, and so that they should be made to correspond with the intricacies and peculiarities of the consonants and vowel sounds which are used in ordinary speech.

Thus the present stage has been reached :

- (1) By discovering how to produce long waves ;
- (2) By discovering how to receive them ;
- (3) By discovering how to modify them ; and
- (4) By discovering how to receive the modifications in detail.

In these stages the invention of the telephone, one of the most remarkable inventions of last century, has played an extensive part. But the real miracle is, as always, the human ear and human eye, which are receiving instruments able to interpret mere vibrations or tremors into actual thought. Not that the instruments themselves affect the conversion : there is a step here which is really mysterious and which we do not understand, namely, the way in which the physiological mechanism is able to affect the mind. This is a mystery we have grown so accustomed to that we fail to realize

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the wonder of it. It is sometimes felt that wireless intercommunication itself is mysterious ; but it is no more mysterious than any other method of communication : in common speech we utilize the vibrations of the air ; in wireless speech we utilize the vibrations of the ether. The wonder is that we can utilize the vibrations at all, and that a thought can be conveyed from one mind to another by the motion and quivering of material particles.

This power, long possessed by the human race and utilized by them in a commonplace and customary manner, has now been extended. Some of the results we already begin to see. People living in remote country districts can now listen to the sound vibrations which are produced in any lecture or concert hall : and accordingly the entertainments of a town have become accessible to dwellers in remote valleys among the hills, or in the great plains of a continent. They think nothing about sound vibrations, nor about the ether waves into and from which those vibrations have been converted ; but they get the results. Hitherto life in the depths of the country has been felt by many to be isolated, dull, and monotonous ; it ought not to be so, and would not be so if people were educated, so that they could appreciate the marvellous

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processes of Nature which are going on around them ; they should be able to read and cultivate their minds even to greater advantage away from the distractions of a town ; but for the majority of people that is too much to expect, and accordingly there was a tendency to flock to the towns and desert the country. There is some hope that that uneconomical and rather sad movement can now be stemmed. Every village can now be supplied with sufficient light to make the winter evenings tolerable, and can be provided with sufficient entertainment through the labours of those who are producing and broadcasting speech and music. Poetry and literature can be brought home to them in an easy way, and even scientific information can be imparted ; so that their minds need no longer lie fallow and idle : they can have something to think about which will relieve the monotony, and cause them to take a rational interest in the Universe and in the wonders of existence.

For existence itself is the greatest marvel : a study of the processes by which it is continued and adapted and beautified, and the attempt to apprehend the meaning of it all—problems which have long occupied the minds of philosophers and students—should be, in their respective and relative degree, a source of enjoy-