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Wireless Wonders of Tomorrow

By Guglielmo Marconi

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Photo by International GENERAL SQUIRRES

Twenty years ago wireless telegraphy was relatively in its infancy. Ten years hence the latest development of this new science—wireless telephony—may have made it possible for the business man sitting in his office in London to ring up his neighbor in New York or Chicago. This is a development quite within the bounds of achievement. Technically, it is a much simpler matter than that of telephoning from England to America by means of an undersea cable.

I believe I am right in stating that the greatest under-water distance through which ordinary telephony has been conducted to date is not more than 250 miles, and that this has only been accomplished experimentally by employing apparatus such as could not in its present form be put into general use for commercial purposes. The longest telephone cable actually operating today is about 100 miles in extent. As a matter of fact ordinary cable telephony has not yet taken place between England and Holland, although these two countries have such intimate commercial relations that there can be no question about the demand.

The trouble in under-water cable telephony lies in the very pronounced distortion which takes place after the electrical waves, which are the equivalent of the vocal sounds, have passed a few miles through the cable. Even in the twenty-odd miles between England and France it has been found necessary to place on the ocean bed special appliances for overcoming this distortion. These appliances add considerably to the expense and upkeep of the circuit.

Now, it is a curious fact that, although an electrical oscillation projected through an under-sea cable becomes rapidly distorted, an electrical wave radiated across the ether by a modern wireless apparatus retains its original characteristics however great the distance over which it may travel.

In wireless telephony we convert the modulations of human speech into equivalent modulations of the electrical waves, and radiate them through the ether until they strike the aerial wires of a receiving apparatus. There they are reconverted into sound waves such as can be recognized by the human ear. As the ether is so elastic as to allow these electrical waves to maintain their original form, the question of reception is little more than that of magnifying the incoming signals.

Wireless speech has already taken place across the North Atlantic ocean, but the apparatus employed was of an experimental, rather than a commercial character, and therefore development is necessary before one can record transatlantic conversation as a commercial possibility.

To conduct uninterrupted speech over sea distances similar to that between London and New York will require, at any rate with our present-day experience, considerable power at the transmitting end. Until a few weeks ago I might have been tempted to estimate this power at the electrical equivalent of over 1,000 horse-power, but the experiments which I have been engaged upon recently on my yacht, the *Electra*, lead me to modify my estimate. Hitherto, as everyone connected with wireless is aware, we have always found it necessary to keep in reserve on commercial wireless circuits a large amount of electrical energy for the purpose of breaking through terrestrial electrical disturbances. The sources of these disturbances are not always clear, but they are such that at intervals during the day, and notably in the summer months, they set up in the wireless receiving apparatus such a din of meaningless noises that it is difficult to read the systematically transmitted signal.

This new apparatus, which has been developed by engineers of my company, makes it possible for us to still the mixed wireless and non-wireless impulses so that we obtain on our automatic recorders, or in the telephone receivers only the signals sent out by the distant wireless stations. I think that one of the outcomes of this invention will be the employment of smaller powers than have hitherto been considered necessary for covering certain distances.

It is still a little premature to talk of the day when everyone will possess his individual wireless telephone, particularly one of the portable variety, which may be carried about and used at will; but I am not going to suggest that it will never be possible for a large number of circuits to be used within the same area.

This does not mean that there is not already a valuable field of practical usefulness for the wireless telephone. The field is greater than is generally realized today, and I regret to say that its application to industrial needs is taking place more rapidly in other countries than in this one. In Holland, for instance, the Amsterdam stock exchange circulates by wireless telephone at frequent intervals daily the latest financial information, and this is received simultaneously in nearly 200 banks in Holland by means of apparatus constructed by the Marconi company. I am informed that the arrangement has given great satisfaction and a considerable impetus to business.

What Holland can do can be done equally well in this and other countries, and the information radiated need not be confined to financial matters. All that is needed is a fair opportunity for conducting the possibilities and for conducting a similar service.

A few weeks ago representatives of the Times newspaper talked by wireless telephony between Southwold in Suffolk and Zandvoort in Holland. On that occasion they conversed freely for 50 minutes from the respective wireless telephony stations, and I hope that you may be permitted shortly to show that our experiments have a very practical application, and that by linking up the wireless circuit with the telephone wires at the English and Dutch ends it may be possible for anyone in London possessing a telephone apparatus to ring up the exchange in London, ask for the wireless route to Amsterdam, and speak to a corresponding subscriber in Amsterdam. In this case the telephonic message from London to Southwold would be relayed automatically by wireless across the North sea, reconverted to land wire message between Zandvoort and Amsterdam, and received in Amsterdam exactly in the same way as a short-distance call over the ordinary circuit.

The Anglo-Dutch wireless telephone circuit operates on a wave length which permits of very sharp tuning, and causes no disturbance to the wireless circuits employed by the military, naval and air services. It would, in fact, be possible to multiply these routes and have quite a number of wireless circuits to the continent working in collaboration with the land lines.

While the experiments at Southwold are about to demonstrate the immediate practicability of wireless for trunk routes, whether they be overland or overseas, a series of experiments in another part of this country has demonstrated that it is now possible to speak by wireless in one direction. This discovery will remove the objection that conversations can be overheard by those for whom they are not intended.

The only commercial use for which wireless telephony has so far been sanctioned in this country is that of establishing a communication between the Bar Lightship in the Irish channel and the offices of the Mersey docks and harbor board in Liverpool. Intercommunication is conducted almost every hour of the day with this apparatus by men who have had no special training, and without any interference with the wireless service conducted at the mouth of the Mersey by the Seaford station belonging to the British post office. It is absurd to think that this is the only place where a useful service can be performed by wireless telephony.

I need hardly dwell on the growth of wireless telephony in connection with aerial communications. I believe I am right in stating that every British machine regularly flying between London and the continent has been fitted by the Marconi company with the wireless telephone, and we have numerous instances where these instruments have contributed to the safety of the services, and performed other valuable functions.

We have also demonstrated to one of the railways the possibilities of wireless telephonic communications as an auxiliary to the ordinary telephone lines, and it may be that now government control has been removed from railway operations, some progress will be made along the lines indicated by us.

I have suggested that the day has not arrived for the so-called pocket wireless set. The sensitiveness of wireless receivers has been so greatly increased in recent years that it is possible even now to possess portable apparatus capable of receiving signals from high-powered stations in hundreds of miles distant, but this is quite a different matter from transmitting signals. For wireless transmissions it is still necessary to raise a wire a considerable height above the transmitter, and if serious distances have to be covered it is also necessary to have a source of electrical power greater than can be at present conveniently carried by an individual. How near we have approached the ideal of a portable transmitter was demonstrated by the Marconi company a few months ago when the London fire brigade conducted wireless telephonic communications between one of their tenders on Purney Earth and their headquarters at Southwold. A distance of some seven or eight miles. In this case the aerial wire was hung from the branches of a small tree near the roadside, and the apparatus employed was stored in a small space at the back of the vehicle.

One thing is certain, the science of wireless telephony will not stand still. Like the ordinary telephone, it is passing through a period when it lacks official encouragement, and is dependent for its salvation entirely upon those who are engaged in its development.

In 20 years the mysterious all-pervading ether will be surging with human speech conveyed by ether waves. Whispered conversation with friends in lands as remote as Australia will probably be commonplace, and science, having revealed to humanity another wonder of nature, will have forged thereby a fresh link in the much-desired chain of international fellowship.

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History of Opium in China
Opium for use as a medicine was introduced into China in the Thirteenth century by Arabs. The introduction of opium smoking was not until the Seventeenth century and came from India. The first edict prohibiting this was by the Emperor Yang Cheng

Lincolns

Lincolns should not be washed with water often. Water rots the surface and makes places for microbes to settle.

This One Sounds Logical
First Professor—Everything I tell that boy goes in one ear and out the other.
Second Professor—You're wrong. Some can't cross a stream.—Science and Invention.

Two of a Kind.
New girl (timidly)—I suppose you're fine look, huh?
Young Mistress—Hush me, no; I don't know a thing about it.
New girl—Then we'll get so famous, I hope. I don't either.

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CHAPTER XV.—C

—13—

And Burr was hearing something distinct and it seemed not surprising that Alan had nodded his head at Alan without reply to Alan's stolid listening. Someth forward; he straightened something came; again ened. Four times Alan motions. Burr was hear four long blasts of distre was no noise but the gal blasts!" He recalled old outside the radio cabin. was hearing blasts whi blow!

He moved on and too He was a good wheelman seemed to be stender o and, somehow, to steer an old man steered. His illu ing could do no harm, ered; they were of con Burr and to him.

Alan fought to keep hi to his duty; they must nearly at the position wh arison last had heard t blasts; searching for a boats in that snow, was less. With sight even alon light's beam shortened to dred yards, only accident Number 25 up for rescue, could carry the ship whi —or the blasts of distress still floated and had stea heard.

They were meeting f heavy floss, and Alan gav these by balls to the brig answered and when possib er avoided the floss; when do that it cut through the rowed ice bending and cr the bows took strumce, d tenting shapes. Now anothe appeared before them; wh dissipated to a bare glow ing snow, he saw a vague man moving the searchlig see it, for he swung the shadow was so dim, so s Alan sought for it again halted; he could see notli he was surer, somehow, seen.

"Something dead abea shouted back to the brigge.

The bridge answered the searchlight pointed forwar just carried the snow in a which the light failed to t the flurry suddenly, silen spar, a shadow emerge— of a ship. It was a steame a long, low-lying old ves lights and without any fi net slanting up just for after deckhouse; it follel of the sea. The sides and works gleamed in ghostly cence, it was refraction of light beam from the ice at the ship, Alan's brain tol the sight of that soundles, ship materializing from screen of snow struck a tree him.

"Ship!" he halted. "At ahead, sir! Ship!"

The shout of quick echoed to him from the b derfoot he could feel a nev the deck; the engines, stopped, were being set ful tern. But Number 25, sheering off to right or left t collision, steered straight t

The struggle of the engh the momentum of the fer others had seen the gleami at least, had heard the hal per's instant decision had t starboard; he had havi the wheelman, "Hard ov through the screws turned. Number 25 steered straight flurry was blowing before again; back through the sn shrouned shimmer ahead Alan leaped away and up to house.

Men were struggling there per, a mate, and old Burr held the wheel. He clung t one in a trance, fixed, start his arms, stiff, had been hol ber 25 to her course. "I struck him and bent him at the mate tugged at the wh was torn from the wheel an made no resistance to the blows; but the skipper, in struck him again and knock the deck.

Slowly, steadily, Number sponding to her helm. The ed away, and the beam of came beside the beam of steamer; they were very clo clear that the searchlight, turned to keep on the oth shot above its shimmering lighted only the spars; and, r rose and fell between ships sucked closer. "Gather 'th an effort; it seemed app all the power of its screws a fairly drawing it on—opp the last resistance before gl Thon, as the water fell again seemed to slip and he dray the other vessel; they mou by side . . . crashed . . . crashed again. That see threw all who had nothing t ear upon the deck; then N