

# AROUND THE WORLD IN A FLASH

HOW MESSAGES ARE SENT VIA TELEPHONE, TELEGRAPH, RADIO AND TELEVISION

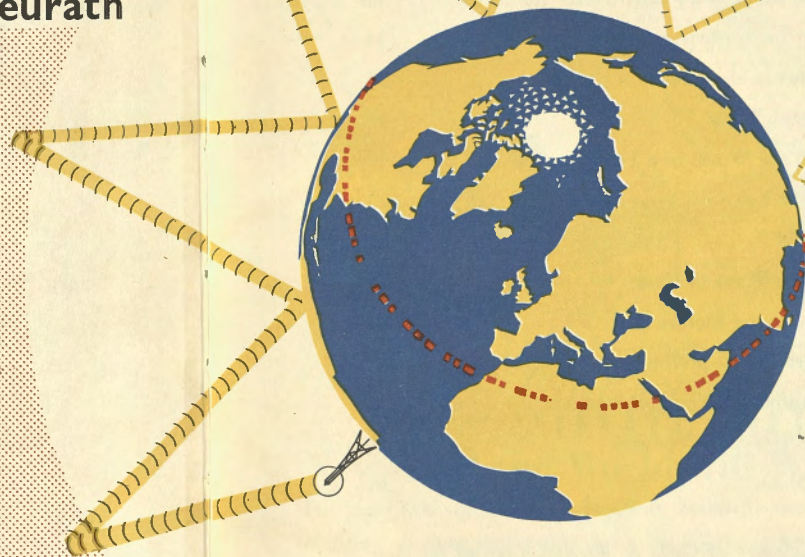


MARIE NEURATH

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Marie Neurath



ISOTYPE

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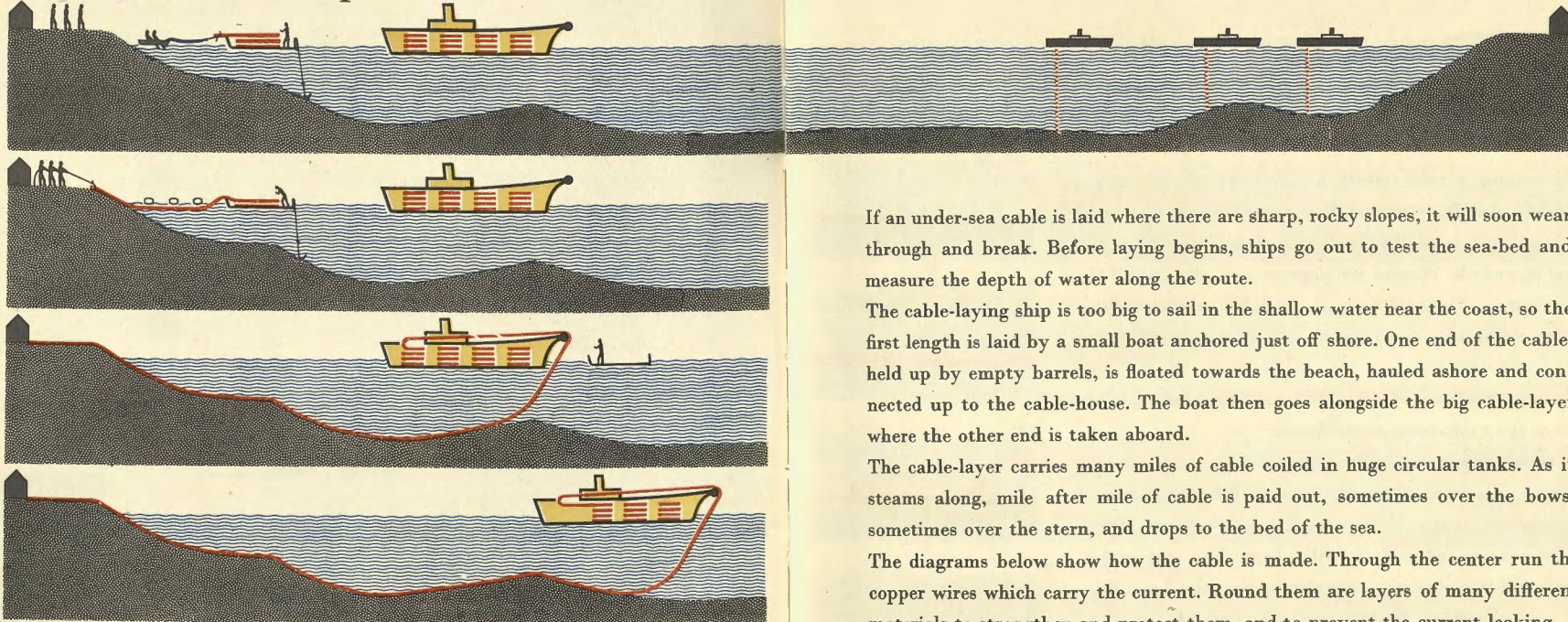
*We are grateful to the engineers of Cable & Wireless Limited for their collaboration in preparing the text and pictures of this book.*



## News that the World will Want to Hear

For years this volcano has been silent. Suddenly there is a rumbling and a burst of flame. Boiling lava pours down its slopes, setting fire to house after house. Two fast runners dash to the nearest telegraph office. Their village needs help, and the world wants to hear their news.

## Laying a Cable Deep on the Sea-bed

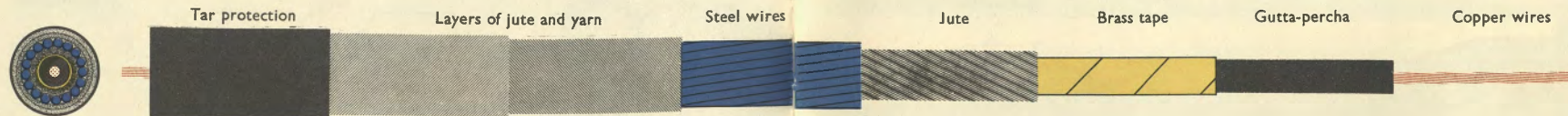


If an under-sea cable is laid where there are sharp, rocky slopes, it will soon wear through and break. Before laying begins, ships go out to test the sea-bed and measure the depth of water along the route.

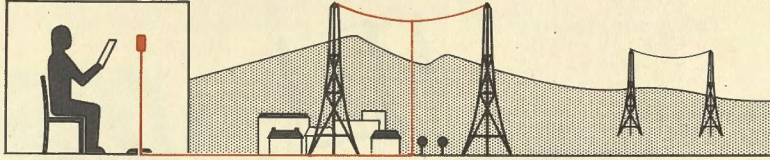
The cable-laying ship is too big to sail in the shallow water near the coast, so the first length is laid by a small boat anchored just off shore. One end of the cable, held up by empty barrels, is floated towards the beach, hauled ashore and connected up to the cable-house. The boat then goes alongside the big cable-layer where the other end is taken aboard.

The cable-layer carries many miles of cable coiled in huge circular tanks. As it steams along, mile after mile of cable is paid out, sometimes over the bows, sometimes over the stern, and drops to the bed of the sea.

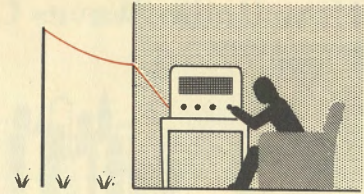
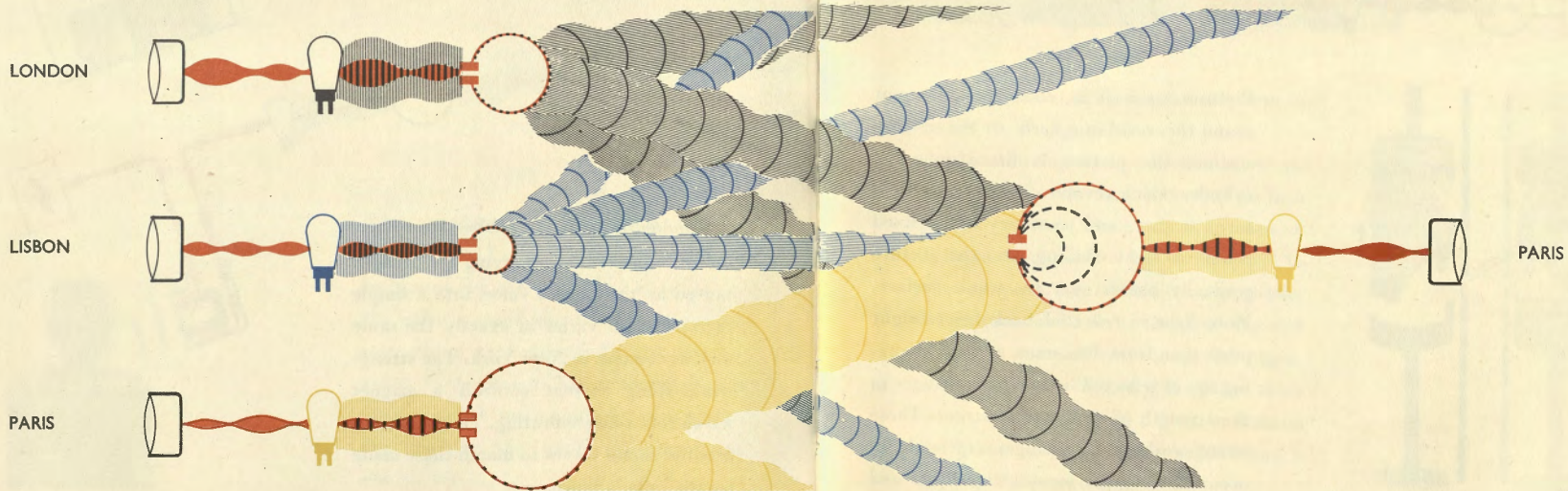
The diagrams below show how the cable is made. Through the center run the copper wires which carry the current. Round them are layers of many different materials to strengthen and protect them, and to prevent the current leaking.



## Picking Out the Voice You Want to Hear

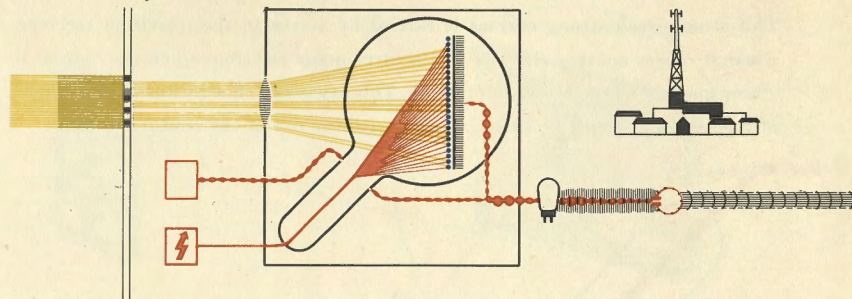


Of all the voices being broadcast, how can we choose just one to listen to? Each station fixes its sending set to send out waves of a chosen length. The stations all choose different wave-lengths. These waves travel in all directions; some reach your aerial.

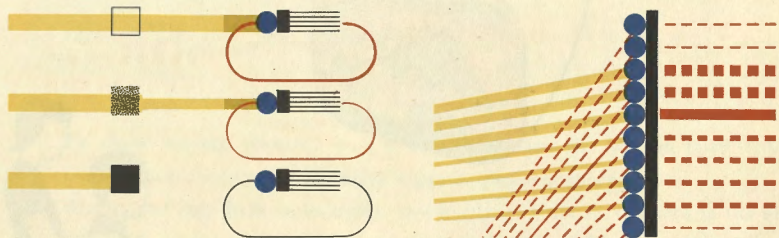


To pick out the station to which you want to listen, you fix your receiving set so that it collects most strongly the waves of the length sent out by that station. This is called "tuning" your set to that wave-length. This man has tuned his set to the wave-length of the Paris station.

## The Ray that Paints the Television Pictures

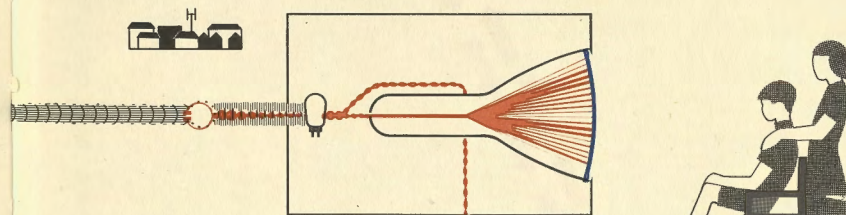


The surface of the plate on which the pictures are thrown is made up of many particles (shown in blue). A strong light falls on some, a weak one on others. Moving at terrific speed, the electron ray strikes each particle, one by one.



The strong light falls when the beam passes through a white part of the picture, the weaker light when it passes through darker parts.

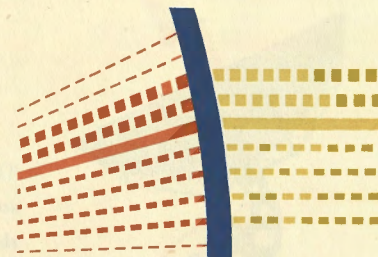
When the electron ray falls on a strongly-lighted particle, a strong current flows; when on a dimly-lighted particle, a weak current flows.



The strong-weak-strong simple current is changed to a to-and-fro current and then to waves. At the receiving set it is changed back into a strong-weak-strong simple current which causes a sweeping electron ray to be sometimes strong and sometimes weak in turn.

The strong-weak-strong ray of electrons sweeps across the back of the viewing screen (shown in blue). The screen is coated with a chemical which glows brightly where the ray strikes it strongly, dimly where the ray strikes it weakly.

So more light comes from some parts of the screen than from others. The bright and dull patches seem to our eyes to make up the picture itself.



Here we see what is happening on both sides of the viewing screen. Where most electrons strike the back the light shines strongest from the front.



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