

It takes time to grow anything—even a business.

Never hesitate to ask for advice—everybody likes to give it.

After a woman's had a part in a play at a Little Theatre she's rushed for work around the house.

It is estimated that 87 per cent of the statues are erected to men who were once called cranks.

Obeys that impulse—quit your foolishness.

Home is a place where a wife can tell her husband what she thinks of him.

What would some families read if those solicitors didn't load them up with magazines "to help pay my way through college?"

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December 4, 1926.

Mr. T. A. Eastwood, Manager,
Michigan Bell Telephone Company,
Lansing, Michigan.

My dear Mr. Eastwood:

In our business the use of the long distance telephone is not merely a convenience but an assistance to our sales, engineering, manufacturing and purchasing departments, but is an absolute necessity.

The question is not "shall we continue to use the long distance telephone?" but, rather, "how could we do better, under the present high pressure system, without the long distance telephone?"

Now business is on the increase, more long distance calls result. Non-business calls decrease, more long distance calls are necessary.

Very truly yours,
MOTOR WHEEL CORPORATION.

W. H. Eastwood
Secretary

cc: 18

When business is on the increase, more long distance calls result. When business shows a decrease, more long distance calls are necessary.



Incubating the Vacuum Tube

Out of the Ceaseless Efforts of Scientists and Research Engineers Must Come the Improvements That Make the Modern Vacuum Tube What It Is.

By DR. ALFRED N. GOLDSMITH
Chief Broadcast Engineer, Radio Corporation of America.

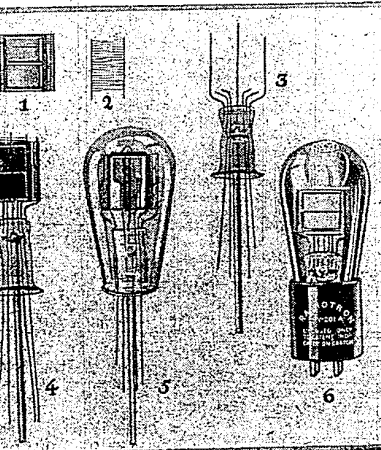
It is said that every bridge exists first in the mind of the civil engineer before it is flung across the river.



Dr. A. N. Goldsmith is a scientist, a sky-scraper exists in the mind of its architect long before the site is cleared and the caissons are driven down to bed-rock. Again, every great painting or statue is conceived in its ideal perfection by the artist's fertile mind long before it is realized in material form.

And so it is with radio—an achievement in practical form never comes until long after patient and inspired scientists and research engineers have dreamed of new physical principles and methods, followed by tireless experimenting until, despite all discouragements, they have achieved the chosen goal of a newer and a better way of accomplishing that which is most needed in the progress of radio.

Now at least three conditions must be met in order that a suitable product shall reach the ultimate consumer. First, there must be available the undivided services of learned men, with long experience and marked capacity for research, thoroughly acquainted with the problems, and with the de-



Six Steps in the Manufacture of Radiotron UV-201A

termination, knowledge and inspiration to develop new things and methods. But even the great scientists cannot make bricks without straw. They require elaborate facilities in the way of apparatus and material, so that the second point is the material, as the French would say, quite as much as the personnel. Thirdly, there is need for the co-ordination of all research and developmental efforts with those of production which must follow, for a successful consummation of the process. In this connection it is noted that so vast is the scope of modern science that no one can do more than to polish one facet of the diamond of scientific knowledge. Left to themselves, the labors of many qualified scientists might be lost either through needless and expending duplication of efforts on the same problem or through the failure so to co-ordinate their activities so as to cover every nook and cranny of the unsolved problem.

Organized Scientific Research
It is just here that the great industrial organizations come into their own in the field of applied science. It is in this connection that these great organizations can render a real service to society. These huge organizations, because of the very magnitude of their operations, can afford to provide elaborate facilities, can place problems before leading scientists, can assign each task to the right man, can co-ordinate efforts so that all parts of a given problem will be covered with the simultaneous and co-ordinated efforts of specialists. What is still more significant, these great industrial organizations can afford to continue year after year, despite discouragements, setbacks and long and costly delays, until the final outcome, be it successful or otherwise. Smaller organizations obviously cannot afford to stand the grueling tests of patience, with its terrific cost, which is part and parcel of pioneer development.

Now in so other portion of the field of radio are research and development so important as in the radiotron or vacuum tube. Consider, for example, the work of Dr. Irving Langmuir, who is known throughout the world for his scientific achievements. You are not likely to find Dr. Langmuir in his Schenectady research laboratory plotting vacuum tubes in a receiving set nor again studying the characteristics of tubes with an array of meters. To

into filament wire one-half a thousandth of an inch in diameter. Now thorium has the peculiar property when heated of pouring forth a flood of electrical particles, or electrons. It is, however, mechanically unsuited for filament use by itself. It would melt too easily for one thing. However, by placing the thorium in diffused form in the tungsten filament of better mechanical strength and thermal properties is obtained while still retaining the electronic proclivities of thorium.

Radiotron Standard Tube
The thorium in the thoriated tungsten filament forms a layer of really unimagable thinness on the filament. This layer of film is very quickly driven off, but the heat just as quickly boils out fresh thorium to the surface, there to form a fresh coating. And so it goes. The action is much like that of a sponge soaked with water which, reaching the surface, evaporates by the heat of the sun, yet the sponge all the while is being squeezed just enough to keep the surface constantly moistened with a fresh supply of water.

There is much that the present day vacuum tube owes to Dr. Irving Langmuir, as well as other scientists and research engineers who work in research laboratories devoted to vacuum tube development. It was Dr. Langmuir who in the course of his investigations of the so-called "Edison effect" in incandescent lamps found that as the vacuum was made higher and higher the available electronic emission from the hot filament became steadily greater until finally, when a vacuum tube was immersed in liquid air giving an extremely high vacuum the emission was ten thousand times its original value. This was an astonishing result, but when the experiments were repeated with another lot of filament wire no such increase in emission developed. In conclusion, it is evident that the really good vacuum tube has a pedigree that extends back to the research laboratory. It has been fathered by scientists of note. Its infancy has been spent in the laboratory; its childhood has been passed in the testing laboratory at the hands of none too kind skeptics; its youth has been devoted to production in the largest tube factories in the world, and in its prime of life it is ready to render the service which will bring credit to its sponsors.

Little Really Known of Cause of Cancer

Pointing out that the cause of cancer is not yet known to science, Dr. W. A. Evans, well-known writer on medical subjects, says that the most popular belief among laymen is that it is due to eating certain kinds of food. "The theory that cancer is caused by various articles of diet has little to sustain it," Doctor Evans writes in an article in Liberty. "Eating meat cannot be the cause of cancer, since Roger Williams found that nearly two-thirds of the cancer subjects in the Jeypore hospital were vegetarians. There is much confirmation of this observation that vegetarians are prone to have cancer."

"It is said that eating salt meat is the cause of cancer," Doctor Evans continues. "But cancer abounds in Australia, where they eat fresh meat almost altogether. It is said that eating canned meat causes cancer, but it prevails among persons who eat no canned meat."

"Among the multitude of food explanations of cancer, none of which has any foundation, are that it is due to eating fresh fish, dried fish, salt, tomatoes, cabbage, and other uncooked vegetables, and to drinking alcoholic beverages."

GOT A KICK SURE



"Somehow I never got a kick out of attending a circus—did you?"
"Sure I did—when I crawled under the tent."

Old Telegraph Line

The first telegraph line from the Atlantic to the Pacific was completed sixty-five years ago. It ran from St. Louis to San Francisco, connecting at the Missouri metropolis with wires to all parts of the East. The building of the eastern section from Omaha to Salt Lake City was commenced on July 4, construction proceeding at the rate of ten miles per day. At the same time the western section, from San Francisco to Salt Lake, was built.

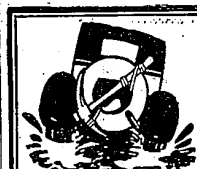
An Indiana man branded his daughter on the forehead because she stayed out late at night. What he should have done was to brand another part of her anatomy with a paddle.

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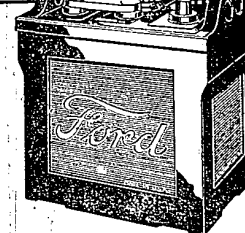
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