

What's Behind IRE?*

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MY ASSOCIATION with radio goes considerably back of the date on which IRE was formed. Let me tell you a little bit about how difficult it was for radio engineers to get together in those early days. There were several "wireless" companies engaged either in radio communication or in manufacturing radio equipment or both. I remember most of the successive De Forest Companies (including the De Forest Wireless Telegraph Co., American De Forest, and Atlantic De Forest) which, about the time that De Forest broke off with them, became the United Wireless Telegraph Company. I also remember the Collins Wireless Telephone Company, a very different Collins from the company of that name that we know today. Of course, there were also the Marconi Wireless Telegraph Company of America and Harry Shoemaker's company in Jersey City, which I think was called International something or other. There doubtless were others, but those are the only ones that come to mind at the moment. Oh, yes, there was one more, the United States representative of German radio. That organization was originally called Telefunken Wireless Telegraph Company of America, but later became the Atlantic Communications Company.

In these pre-IRE days, each of the wireless companies was an exceedingly self-contained and closely guarded unit. A man working for one of them could easily lose his job if his boss found out that he had had lunch with a man working for another one of them. It was the day of secrets and of what we would now call unethical competition. You all have probably heard the story of how the Marconi Company tried to report the International Yacht Races from a ship-borne transmitter in lower New York Bay, and how the Shoemaker company tried to prevent the success of that demonstration by jamming the Marconi receiver. Radio countermeasures existed even in the early 1900's.

Fessenden's National Electric Signaling Company and the Stone Wireless Telegraph Company in Boston were probably the two organizations which first initiated reasonable, well-planned development programs, and recognized that wireless telegraphy was actually a matter of engineering. I give Fessenden credit for being the first realistic electrical engineer to apply the principles of electrical engineering to the development of radio. At the very least, we must credit him with recognizing that what was needed in a radio transmitter was a continuous radio-frequency alternating current developed in a tuned antenna. John Ambrose Fleming, the great British scientist and the man who wrote the first bible of radio engineering in our language, was so imbued with the contrasting Marconi spark techniques that, in the first edition of his famous "Principles of



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Electrical Wave Telegraphy," he expressed doubt that the Fessenden continuous-wave system would in fact radiate electromagnetic waves. That criticism was based on Fleming's view that no energy would be radiated unless there was what he called an electrical "whip crack" to snap the waves off the antenna. Of course, the criticism was eliminated from later editions of Fleming's book.

The engineer is human, and like other humans, he is gregarious. In spite of the 1900 type of "classification" that was placed on those early radio engineers by their employers, they did meet from time to time, and they did not hate each other just because they were employed by different organizations. Gradually over the period running from approximately 1900 to 1908, the desire to get together and to discuss their puzzles became stronger and stronger. They commenced to realize that the answers to their technical problems depended upon matters of fact, many of which could not be determined without experiment, and that those problems were generally common to all of the companies, rather than individual to any one of them.

With this background, and under a date line of May 14, 1908, more than 42 years ago, Robert H. Marriott, who was then Assistant Scientific Manager of the United Wireless Telegraph Company, sent out a circular letter to a number of engineers in the various wireless companies of that day. I think that that was the first specific attempt to form a radio engineering society drawing its membership from any and all companies. In any event, I believe you would be interested in the contents of Bob Marriott's 1908 letter. It reads as follows:

"Dear Sir:

"You have often thought no doubt that Wireless Telegraphy would be developed faster if those engaged in it would work together more.

"The Electrical Engineers have come together in the United States by forming the

American Institute of Electrical Engineers. This institution has helped to make better Electrical Engineering, better Electrical Engineers, and better feeling between competitive firms.

"Why should not we form the Institute of Wireless Engineers and pattern it after the American Institute of Electrical Engineers. The American Institute of Electrical Engineers' plan as applied to Wireless people would be briefly as follows:

First: Any person interested in Wireless with proper recommendations, etc., would be eligible to associate membership.

Second: Any person having done valuable, original work in Wireless would be eligible to full membership.

Third: Any person whom the Society, by vote, should decide upon would be eligible to honorary membership.

Fourth: Meetings would be held once a month, at which papers on Wireless subjects would be read and criticized.

Fifth: Every member and associate would receive a copy of the paper read, together with the criticisms, thus giving absent members the same information as those present.

Sixth: A library of Wireless publications would be accumulated as rapidly as the funds of the Institute would permit. Each member or associate member would have access to this library.

Seventh: The Officers and Committees would be about as follows: President, Vice-President, Manager, Treasurer, and Secretary.

Committees: Executive Committee, Committee on Finances, Committee on Papers, Board of Examiners, Library Committee, Editing Committee, and necessary special committees appointed from time to time.

Eighth: The dues would be possibly about \$10.00 per year.

"I believe an organization formed on a plan similar to the above would materially improve Wireless, increase the knowledge and ability of members, avoid friction between employees, between employees and employers, and to some extent between Wireless companies.

"Would you join such an organization as outlined? If so, please write me and give expression of your views in regard to the matter in order that an organization may be formed on the right lines. Also such an organization might contemplate the establishment of a beneficiary association in connection with the Institute.

Yours very truly,

R. H. Marriott

Ass't., Scientific Manager
United Wireless Telegraph Co.
42 Broadway, New York

Bob's efforts to get the engineers together on a common meeting ground produced results. He got about sixty replies to his letter and only one or two of those who wrote to him were negatively inclined.

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ary of 1909 he was able to form a temporary organization and in March of the following year a meeting was held in the Engineering Societies Building, New York, when a constitution was adopted. One of the organization thus founded was "The Wireless Institute," and Bob Marriott was elected its first President. At the second meeting of the Wireless Institute, in April of 1909, Bob Marriott presented a paper on the plans and purposes of the society. In that lecture he gave a list of suggested subjects for papers to be presented at future meetings. To give you an idea of what radio engineering was in those days, his list of 26 proposed topics is presented below:

1. "The Recent Wireless Bills Before Congress"
2. "The Berlin Convention"
3. "The Regulation of Amateur Stations"
4. "Unnecessary Interference"
5. "Static"
6. "How to Get Business on the Boat"
7. "How to Handle Messages Rapidly"
8. "The Present Field for Wireless"
9. "How Business Can Best Be Handled in Case of Distress"
10. "How to Prevent Wireless Stations from Damaging Property"
11. "The Care of the Motor-Generator"
12. "The Care of the Storage Battery"
13. "The Key, Vibrator, and Switches"
14. "The Induction Coil and Transformer"
15. "The Condenser"
16. "The Helix; Coupling and Tuning"
17. "Aerials"
18. "Receivers"
19. "Tuners, Jiggers, Syntonizers, Selectors, Etc."
20. "Wireless Waves"
21. "The Wireless Telephone"
22. "How to Make the Wireless Institute of the Greatest Benefit"
23. "How and What Wireless Operators Should Be Taught"
24. "How Weather Conditions Affect Wireless"

25. "Simple Methods for the Operator to Test and Repair Instruments"
26. "Telephone Receivers."

Papers relating to almost all, if not all, of these topics have since been presented and published.

The Wireless Institute continued its activities, with New York headquarters, holding meetings and publishing proceedings until it joined with the Society of Wireless Telegraph Engineers to form our present Institute of Radio Engineers.

The Society of Wireless Telegraph Engineers had been formed earlier in Boston, Mass., on February 25, 1907, but I understand that membership in the SWTE was first recruited only from the technical staff of the Stone Wireless Telegraph Co. Later that Society admitted men who worked for Fessenden and for other wireless organizations. When the Fessenden Company moved from Brant Rock to Brooklyn, the Society of Wireless Telegraph Engineers lost a substantial part of its membership, but, by the same token, the potential membership of the Wireless Institute in New York was increased. I think that this situation, together with the idea that the members of both societies were intensely loyal to their fledgling organizations, may well have been the main-spring that drove them into consolidation and the organization of The Institute of Radio Engineers. Looking at the Institute today, it is hard to realize what the membership situation was in 1912. It is difficult to believe that when The Institute of Radio Engineers was formally established on May 13, 1912, its membership comprised 22 men from the Society of Wireless Telegraph Engineers, 22 men from the Wireless Institute, and one man (Greenleaf Whittier Pickard) who belonged to both. The original list of only 45 members included a number of people who are still active in radio engineering, among them Lee De Forest, Lloyd Espenschied, Alfred N. Goldsmith, Arthur Van Dyck, and myself. The Organization Committee comprised Bob Marriott, Alfred N. Goldsmith, and myself, and the first President of The Institute of Radio Engineers was Bob Marriott.

As you all know, Alfred Norton Goldsmith has been Editor, not only of the PROCEEDINGS OF THE I.R.E. from the date of the first issue, January, 1913, but also of the *Wireless Institute Proceedings* that was still earlier. We owe him great tribute for the way in which he has developed our publication. There is no doubt that very soon after its appearance in 1913, it became recognized as having the stature of an important engineering periodical, and, of course, today it is accepted as the leading publication in the electronics field. Similarly, Bob Marriott rates our gratitude for his persistent effort, in the face of many difficulties, to get a radio engineering organization started. Unless someone else had done what Bob did, we would have no Institute of Radio Engineers today. I think that we should all recognize our debt to him, and that we should take every opportunity to express our appreciation of his services to the profession of radio engineering. Bob, at present, is healthy, but because he spends most of his time at his home in Brooklyn, his present activities in our field are mainly confined to writing. He is almost as young as I am, having been born in 1879.

In closing, let me answer a question that has come up from time to time. That question is, "How did it happen that the Radio Engineers started an organization of their own instead of joining with the American Institute of Electrical Engineers as a subdivision of some kind?" The answer is that the radio men, even in those earlier days, felt that they had so many problems of mutual interest that they would need to have monthly meetings of their own. They were not satisfied with the idea of perhaps one or two radio papers per year, sandwiched in between meetings devoted to what the Germans call "heavy-current" electrical engineering. The matter was discussed with the American Institute of Electrical Engineers, but the charter members of The Institute of Radio Engineers felt that they needed and that they could develop a successful professional society of their own. I think you will agree that succeeding events have proved that they were correct.

Supplemental Note on "What's Behind IRE?"

In a brief discussion which followed my presentation of the talk "What's Behind IRE?" I was asked why The Institute of Radio Engineers had not been named the American Institute of Wireless Engineers. In the first place, the adjective "American" was omitted from the name because the founders desired to have the IRE a truly international organization. As you all know, we have Sections outside of the United States, we have many non-American members, and we have long made it a policy to elect a Vice-President from some nation other than the United States of America. For this reason, among others, the Institute obtained international recognition. As to the use of the word "Radio" instead of "Wireless," my recollection is that the new word "Radio" was coined at a meeting of the group which later became the Institute's Standardization Committee. For some years it had been recognized that wireless telegraphy utilizing waves radiating

from an antenna was entirely different in character from the early forms of wireless telegraphy (for example, as used by Preece and Lodge) which were based on magnetic or electrostatic induction or on ground conductivity. Since the members of the Institute were interested in *radiated* waves, the title of the organization was chosen so as to indicate that fact.

Incidentally, in the preliminary report of the Committee on Standardization of the Institute, issued to members on September 10, 1913, there appears the following definition:

"Radio Telegraphy and Radio Telephony: Further divisions of radio communication. It is proposed that the term 'Wireless' shall be entirely eliminated, as inaccurate and inappropriate."

The same report defined radio frequencies as those above 20,000 cycles per second

and audio frequencies as "the normally audible frequencies lying between 20 and 20,000 cycles per second." The definition of radio frequencies carries the following rather interesting footnote:

"It is not implied that radiation cannot be secured (at) lower frequencies and the distinction from audio frequencies is merely one of convenience."

The membership of the first Committee on Standardization comprised the following:

Robert H. Marriott
Alfred N. Goldsmith
John V. L. Hogan
A. E. Kennelly
Roy A. Weagant
Greenleaf W. Pickard.

The Committee had held more than fifty meetings prior to the publication of its preliminary report in the fall of 1913.