Carty—The Engineer and The Man

By FRANK B. JEWETT

AFTER more than fifty years' continuous connection with the Bell System, it was eminently fitting that General Carty's last official act should be to preside at a meeting of the Board of Directors of Bell Telephone Laboratories and at the conclusion of the meeting to tender his resignation as a Director of the Laboratories and Chairman of its Board. General Carty's interest has been so predominantly concerned with research and development, and the Laboratories are so peculiarly the result of his foresight and initiative that his connection with our work is particularly intimate.

In relinquishing his active connection with the organization he loves so much, and in entrusting to the stewardship of the men he has trained and worked with, that part of it which has been his primary concern and principal joy for many years, General Carty must feel that the structure he had labored so long and so hard to create will continue to grow as he has envisaged it, and that he can without regret go about the enjoyment of a well deserved leisure in whatever way fancy or inclination dictates.

Mr. Gifford's appreciation, and Mr. Gherardi's appraisement of General Carty and his work, together with the biographical note, which appears elsewhere in the RECORD, amply cover the scope and value of his achievements. To attempt anything further in similar vein would be reiteration, and yet I would feel deprived of a privilege were I not at this time to add my word of tribute to one who has meant so much in my life. Under the circumstances it seems not inappropriate for me to write in a somewhat more personal fashion. In what follows I have attempted to show how General Carty appeared to us who were his intimate assistants. The illustrations chosen are picked at random from the book of memory. A chapter illustrative of his methods, energy, far-sighted vision and insight into human behavior and reactions could easily be written about a score or more of major things he has done and which have molded largely the development and future of the Bell System.

Those of us who will remain for a time longer as active participants in the further development of electrical communications in the Bell System view General Carty's retirement somewhat like dropping the trusted pilot as we enter an unknown sea. For so many years have we been accustomed to turn to him to check our course and to point out hidden rocks that the thought of having to go ahead unaided comes somewhat as a shock. We may have been good mates — are we capable of being good skippers?

To most of us General Carty was recognized as a distinguished man and a wise leader when we, veritable greenhorns, entered the family of the Bell System. We who were privileged to have long years of close contact and intimate association with this remarkable man learned that this reputation

General Carty at his desk

for distinction and wisdom is well deserved. We learned also that in addition he has a knowledge of human beings and a trait of loyalty which engenders sentiments of respect and admiration which are far deeper than any that can be attributed merely to an appreciation of intellectual capacity. All of us of the generation which followed most closely in Carty's footsteps can testify to the value of his teaching and guidance. Most of us can remember innumerable incidents of personal kindness and consideration, and other incidents where he bravely shouldered, as his own, responsibility for mistakes of which we were the authors. To him this was natural for were we not members of his "gang"?

All of this does not mean that General Carty was always an easy man to work for or with. Equally vivid with our other and more lasting remembrances of the man who we know will continue to be our friend, are recollections of long hours of interminable labor in doing and redoing of jobs until the perfect answer demanded by his meticulous search for every pertinent fact had been obtained. Who of us can forget those times when flesh and mind cried out for rest and yet we kept pegging on because the "boss" willed that we should.

To him truth has always been all important, and the leaving to chance or supposition any definitely ascertainable fact, little short of a crime. No

detail, however trivial, which has a bearing on the result sought is too small to receive his attention. Sometimes the artistry with which this attention to the apparently inconsequential is made the capstone of a sparkling success is vividly illustrated.

A striking example of this occurred in connection with the ceremonies of the burial of the Unknown Soldier at Arlington. It is an incident known to few and yet it made a deep impression on those of us who did know.

The burial ceremonies were to mark the first great use of the recently developed public address system as a means of enabling tens of thousands in widely scattered groups to participate in a common ceremony. The Bell System had committed itself to an assurance of success. On this assurance untold thousands of citizens wrought to a high pitch of emotional intensity by the deep solemnity of the occasion were to assemble on the slopes at Arlington, in and around Madison Square Garden and at the great Civic Auditorium in San Francisco. They were to hear the great of the world pay a nation's final tribute to its fallen dead and were to join in unison in the prayers and anthems for those dead.

Was the occasion to be an impressive and august success or a miserable fiasco? It all depended on the perfect functioning of complex telephone equipment and on the skill and fidelity with which the distinguished actors played their several parts.

Every facility of the Bell System, material and human, had been concentrated on the job under General Carty's leadership. The equipment and lines worked perfectly, the operating force was drilled for every emergency. The services would go off without a hitch if only the actors would do their part. But would they? Could they be depended upon to obey instructions or would they under the tension of the occasion be carried away by their emotions and wreck everything?

It was a danger which all who knew foresaw and feared. To most it was an unavoidable hazard that must be risked but to Carty it was something that must and could be guarded against.

What were the hazards? Mainly they were two—either that the speakers would talk too loud or too low, or worse yet, that under stress they would wander from their assigned place. The first danger was relatively easy to forestall. Amplifiers could do much if only they had proper directions. They were within our control and the operators were drilled and drilled again to meet any emergency of too much or too little volume. But the second danger was not so easy to guard against. If only the speakers would stand in one place and not wander about all would be well. Obviously they could not be chained in position or locked in an enclosure. One doesn't deal with the high and mighty in that fashion. We must depend on each individual following exactly his instructions and they must be simple instructions—simple beyond the chance of being forgotten or misunderstood.

Carty called for a little square of carpet, some tacks and a hammer. After a careful trial he personally tacked the carpet just where he wanted it and gave to each speaker the stern instructions "Stand on the carpet." None forgot. How could they? The successful achievement of the nation's day of homage was credited largely to the marvels of science and engineering which the Bell System had

brought into play. Few ever knew of the carpet and tacks or of the part they had played in the affair as the result of the knowledge of a man.

An earlier time, another place, a problem of a wholly different sort and the making of a decision that was to revolutionize long distance telephone communication and open the door on the direct path to world-wide telephony.

San Francisco in the winter of 1909 was a dreary place. The wreckage of the earthquake and fire was still only partially cleared away and but the beginnings made on the vast rebuilding operations. Even the weather did its best to accentuate the dreariness. Only the citizens were buoyant and, as if nature had not doled out troubles aplenty, they were busy planning the great Panama Pacific Exposition which was to climax the restoration of the metropolis. Therein lay the pressure which resulted in the decision—they wanted San Francisco put in regular telephonic communication with the eastern cities when the Fair opened. Like their Argonaut forbears, they knew no such phrase as "It can't be done."

In common with everything else, the telephone situation was a mess. Vast sums of money were needed and new facilities of every sort must be provided. Among others Mr. Vail, Mr. Carty, Mr. Gherardi and I were in San Francisco. The need for a transcontinental telephone service was presented to Mr. Vail. Being an Argonaut himself he both understood and sympathized with the appeal and had never heard of "Can't." The fact that we could then only give service for a thousand miles or so and knew of no way greatly to extend the distance left him entirely cold. San Francisco was only two or three times as far from New York as Chicago and Carty must tell him he could promise his friends what they wanted and what he knew would greatly benefit the Bell System.

But Carty would not promise. He had heard the Siren Song before and knew he must be sure of a favoring breeze before entering between Scylla and Charybdis.

The result was long tedious nights following long tedious days devoted to the immediate problems of rebuilding a shattered plant. Each evening found us in a huddle until well past midnight. Every conceivable factor was considered and subjected to Carty's merciless analytical attack. The more purely engineering aspects of the problem were soon disposed of though nothing was taken for granted. He had to be shown that a line could be built and maintained across the mountains and the desert; that the bay could be crossed with a satisfactory cable, and a thousand and one other things.

It was early apparent that the crux of the problem was a satisfactory telephone repeater or amplifier and probably one which would operate in tandem arrangement on loaded lines. Did we know how to develop such a repeater? No. "Why not?" Science hadn't yet shown us the way. "Did we have any reason to think that she would?" Yes. "In time?" Possibly. "What must we do to make 'possibly' into 'probably' in two years?" And so on night after night without end almost.

Finally he took the plunge (we with him), said "yes" to Mr. Vail's stereotyped query, the die was cast and a new and hectic era in what is now Bell Telephone Laboratories began.

New faces began to appear in the

Laboratories—the faces of men who knew little about telephony but much about what telephony was based on. Under the never relaxing pressure of an insistent and searching mind strange things began to happen. Queer leads were followed up, frequently to barren terminations. Out of it all, however, came success and the fulfillment, six months ahead of time, of the promise made on faith and reasoned understanding in 1909.

Nor was the success a meagre one. It was bountiful and with spare anchors to windward. When the transcontinental line was formally opened each repeater station was equipped not with one kind of amplifier but with three kinds! Further, the field of our knowledge was strewn with pay dirt of many different kinds. All of which, if space permitted, would lead to further tales of the lands into which General Carty led us.

We might learn for instance, how even before the final work on the transcontinental line was finished we were embarked on the great transatlantic experiment which so nearly proved the finish of some of us before it was finally successfully completed. The tale of it is a saga of scientific romance and high diplomacy involving many personages in many ways but always under the dominant guidance of one man.

Personal recollection could easily develop a book of interesting incidents relating to General Carty and his work. They would be as diverse as the planning of the Walker-Lispenard Building foundations and the creation of the National Research Council. Each, however, would in part but repeat and emphasize those fundamental characteristics which are the powerful tools of his success. They are tools which are equally applicable to every kind of problem to which he directs his attention.

Being what he is it is little wonder that outside as well as inside the Bell System thoughtful men give heed when Carty expresses an opinion and that a great American statesman once said "Carty can see farther and around more corners than any man I ever met."