

Address of Chairman Samuel Reber to the
Washington Section, A.I.E.E., at its
Fall Meeting in October, November
or December 1904.

Gentlemen:

It is with great pleasure that I welcome you at this our first meeting of the Branch for the coming year and to express the hope that we can broaden the scope of our local activities, better our acquaintance with each other, bring together all electrical engineers and those who are interested in electricity, extend the membership and increase the influence of our Institute. Our branch was only organized in April of last year with a membership of 28, which has been increased to 44. We have held ten meetings with an average of 58, and had, besides the papers presented at the New York meeting, 13 original papers. Last September the branch entertained the visiting British and Italian engineers who attended the International Congress at St. Louis and a number of our fellow members from other cities in a way that will cause the hospitality of our branch to be long remembered by our honored guests. As our Secretary has just announced satisfactory progress is being made in the matter of the Union Engineering Building in New York, the future home of the Institute. I have been asked by the Building Fund Committee to appeal to the members for subscriptions of such amounts as they may feel able to contribute. The amount the Institute expects to raise is \$325,000 and of that amount about one-third has as yet been subscribed.

The general subject for the evening is the transmission of intelligence. In the entire field of human activity there has been no greater agent in bettering both the intellectual and material progress of mankind and in broadening civilization than the part played by rapid dissemination of information by post, telegraph, telephone, cable and wireless communication. The results of such methods are so intimately connected with our daily life that we are prone to overlook the fact that they are all products of recent years and with the exception of the postal service all have been developed within the last 70 years, utilizing that most faithful servant of mankind - electricity.

The germ of the modern postal system of the world is to be looked for, obviously, in the earliest organized establishment of a staff of Government couriers. When, or under what precise circumstances, such establishment was first made available by a state for the carriage of the letters of private persons there is no satisfactory evidence to show. That there must have been, in early times, a connection more or less authorized, between the transmission of public and of private correspondence is highly probable. Even

financial reasons would soon dictate a formal permission to Government couriers to carry letters for individuals-under regulation and restriction, of course although at the outset such practice may well have been rather connived at than allowed. In the postal system of Spain and the German empire there is express record of such permission in the month of April 1544; and within fifteen or sixteen years that permission had grown into a legalized and regulated monopoly, whence the counts of Taxis drew part of their profits as postmaster-general. It may be noted that in Great Britain existing private letters of the 15th century some, perhaps, of the 14th bear endorsements which show that they were conveyed by relays of men and horses maintained under the control of the Government, and primarily intended for its special service. In several Continental states the universities had inland postal establishments of a rudimentary sort at an early date. The University of Paris, for example, organized a postal service almost at the beginning of the 13th century, and it lasted in a measure until the year 1719. In various parts of Europe merchantile guilds and brotherhoods were licensed to establish posts for commercial purposes. But everhwhere-as far as the accessible evidence extends-foreign posts were under state control.

With the exception of the primitive methods of communication at a distance by the aborigines of America by means of signal fires, columns of smoke and flashing of mirrors, the system of optical telegraphy described by Polybius, ascribed by him to Cleoxenes or Democritus, remained in vogue with but little improvement until 1789, when Claude Chappe invented the semaphore and connected Paris and Lille, 130 miles apart, by his system. When Napoleon was preparing for the invasion of England he connected in the same way Paris with all the ports on the west coast of France, thereby receiving constant and rapid details of the progress of the preparations.

The system of semaphoric communication rapidly spread throughout the Continent and Europe. In 1837 Cook and Wheatstone constructed a line of magneto-semaphoric signals. Shilling in 1825 devised an electro-magneto telegraph, but the laws relating to magneto induction had not been deduced and his apparatus was, therefore, of little value. Early in 1831 Joseph Henry, in this city, set up the first experimental electro-magneto telegraph involving the principles of Volta's battery and Sturgeon's electro-magnet, and by means of this arrangement was enabled to signal through a circuit about a mile in length. Ganos and Weber of Germany constructed their electro-magnetic telegraph a little bit later, but it remained for Morse, our own countryman, to invent and install a commercially practical system of telegraphy which he did in 1837, and it is in almost universal use throughout the

world at the present time. Steinheil of Germany in July, 1838, discovered that the earth could be used instead of the return wire, heretofore deemed absolutely necessary to complete the circuit, and thus contributed one of the greatest saving factors ever introduced in telegraphy.

A quarter of a century ago the simple Morse system of telegraphy was the only practical one in the United States. Now the duplex, the quadruplex and multiplex systems are extensively employed in commercial work, and the sphere of the electrical telegraph has been extended until it now includes fire and police alarms, stock tickers, printers, typewriting, and autograph telegrams.

Since the first exhibition of Professor Bell of the telephone at the Centennial Exhibition at Philadelphia in 1876, the telephone has become an intimate part of our daily life and there is not a single civilized country in which the telephone is not in daily use.

Until the discovery of gutta-percha, submarine telegraphy by means of cables was an impossibility. In 1843 Morse suggested the possibility of electrical communication between the United States and Great Britain, but not until more than twenty years afterwards was the first trans-Atlantic cable laid. A number of short cables were laid across rivers. The first attempt at laying the Atlantic cable was in 1857 by the U.S. Niagara and the British ship of war Agamemnon, and when about 300 miles from the Irish coast the cable parted. In the following year the same two ships, each having half the cable, completed the laying on August 5th. Despite the success in laying, however, the cable was practically useless. It took 67 minutes to transmit a message of 90 words from Queen Victoria to President Buchanan, and after a few more messages the cable ceased to work.

In 1865 another attempt was made, and after 1065 miles of cable had been laid out from Valencia it broke and was abandoned after vain attempts to grapple for the lost end.