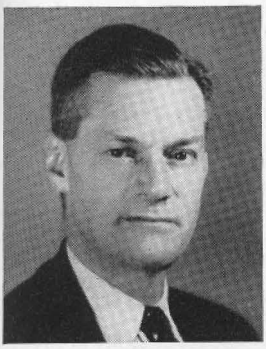
ever, this adjustable feature was omitted, since it was preferable to locate any bias appearing, and to correct it at its source rather than to introduce compensating bias at the repeater.

These developments brought the various d-c telegraph systems into line with the most modern standards, and made them suitable for the high-speed transmission required for the newer teletypewriter equipment. By the late 1920's, however, carrier systems began to assume the leading position in the telegraph field, and all the more recent larger developments have been associated with them. These will be discussed in a forthcoming article.



THE AUTHOR: B. P. HAMILTON was graduated by Columbia University in 1913 with the E.E. degree. He taught there for two years and then joined the Engineering Department of the American Telephone and Telegraph Company in 1915 to work on equipment design and later on field tests of high-frequency and voice-frequency carrier telegraph systems. Mr. Hamilton's work has also involved development problems in connection with the Key West-Havana submarine cable and transcontinental carrier telegraph systems. Since 1930 he has been engaged in developing voice-frequency carrier telegraph systems and applications to carrier telephone channels.

A TELEPHONE ARIADNE

In the maze of cabling of a telephone central office, or even in the smaller groups of wires run through walls of subscriber premises, individual conductors lose their identity to visual inspection. The telephone maintenance man or installer needs an identifying trace to permit him to follow the particular electrical path he is seeking, much as Ariadne's thread guided Theseus through the Cretan Maze on his return from combat with the Minotaur. Such a trace is now supplied by the 81-A test set recently developed by W. L. Betts and now in manufacture by Western Electric.

This set consists of a plastic, oval-shaped case containing two flashlight batteries, a small buzzer, a capacitor, a three-position switch, and two spring-type binding posts. With the switch in the central position, the set is off. With the switch moved to the C position for a continuity test, battery is connected to the binding posts, and wires of a closed circuit connected to them will cause the buzzer to operate. With the switch moved to the T position, tone from the buzzer is applied to the binding posts, and a pair of wires connected to them may be identified at a distant point by tone in a headset. The illustration shows the set housed in a transparent case, but the actual production cases are of a resilient black plastic. The small hole at the top is for a screw-driver adjustment of the buzzer. Weighing only sixteen ounces with batteries, the set measures approximately 1¾ x 3 x 4½ inches. It replaces the 66-A test set formerly used for the same purposes. An identical set, but marked "Western Electric" on its top instead of "Bell System," is coded the 81-AW and is available for users outside of the Bell System.