believe that these potentialities are arranged in some sort of order in the individual chromosomes, since we know that both the potentialities and the chromosomes are there? The work of Morgan and others tends to show that certain facts in heredity are most easily explained by adopting such a theory, and there is no inherent impossibility in it in most cases, only there are apparent exceptions or difficulties in some instances which certainly require explanation, but these need not be regarded as fatal to the whole theory.

Dr. Walker objects to the expression 'law' instead of 'theory,' and there, of course, most would agree with him. Taught by past painful experiences most scientists to-day would refer to any attempted explanations of natural phenomena as 'theories,' not 'laws,' but by all means let us make use of these theories so long as they are useful.

J. S. DUNKERLY.

Penetration of Radio Waves.

SINGULARLY little seems to be known as to the extent to which radio (wireless) waves will penetrate into the ground, and yet information on this very point has become quite desirable inasmuch as there are now two or three geophysical methods of ore prospecting which definitely attempt to use radio waves for the detection of ore beneath the earth.

Experiments by one of the present writers, and others, in a mile-long tunnel at Montreal have indicated clearly that 40-metre waves could not be detected, at either end, when only a few hundred feet within the tunnel. Broadcasting waves (400 m.) appeared to do better and were detected, with the help of good amplification, throughout the tunnel under an overload of 700 feet of limestone and igneous rocks. Longer waves (10,000 m.) were detected yet more readily. But it remained uncertain whether these waves came into the tunnel through the air, or along the rails and electric wires, or whether they came through the rock. The only sure thing is that the 40-metre waves did not penetrate to the centre of the tunnel by any of these means. Experiments by the U.S. Bureau of Mines at a mine near Pittsburgh indicate similar results, for although initial experiments seemed to point to the passage of radio waves through rocks, yet further experience showed that rails or wires were acting as carriers.

Experiments with submerged submarines prove that radio waves will not pass more than about 50 or 60 feet into seawater, no matter what the wave-length. But the question of penetration into fresh water, damp rock, and dry rock remains uncertain. Moreover, in ore prospecting, distances are used immensely less than the wave-lengths employed, and it has been asked whether we have to contrast radiation and induction, a convenient distinction well brought out in Dellinger's paper ("Principles of Radio Transmission," Sci. Papers, Bureau of Standards, vol. 15, p. 441), although of course at a given point and instant there can be but one electric vector and one magnetic vector.

The real object of this letter is to express the hope that some wireless enthusiasts may have the opportunity of making experiments underground in cave, tunnel, or mine which is absolutely devoid of wires or other conductors, and where the windings from the entrance are sufficiently devious to preclude the passage of waves through air down to the receiving apparatus consisting of coil, amplifier, and receiver only. Accurate measures of signal intensity would be still more valuable.

A. S. EVE.
D. A. KEYS.

Bureau of Mines,
Washington, June 7.

Meiosis in a Triploid Tulip.

BRIDGES AND ANDERSON (*Genetics*, **10**, 418-441; 1925) have shown by genetic experiment that in Drosophila trisomic in respect of the X chromosome, the chromosomes concerned are in the two-strand stage at the time crossing over takes place, that any strand may cross over with any other strand and that "two strands which have crossed over with each other are as free to cross over with a strand from the third chromosome as with a strand from the original two chromosomes."

Synapsis in triploid Drosophila has not been figured, but the description of crossing over given above applies exactly to the mode of pairing of the chromatids in Fig. 1, which is a diagrammatic drawing of a pachytene trivalent chromosome in a triploid tulip. Fig. 2 is a commoner form of trivalent in the same variety, and indicates the probability of a diminution in crossing over towards the middle of the chromosome as compared with the diploid if crossing over is indeed

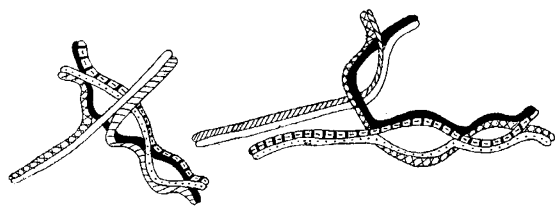

FIG. 1. FIG. 2

associated with pairing. A diminution from one end towards the middle region has been shown (Bridges and Anderson, *loc. cit.*).

It is not possible to suppose that this chiasmatypy or exchange of partners among the chromatids, whether in triploids or diploids, is a direct cause or consequence of genetic crossing over. The agreement between what is observed in the cells and what is required by the crossing-over hypothesis would, however, be explained if (1) pairing is a condition of crossing over, (2) pairing takes place between chromatids, not between whole chromosomes, and (3) chromatids remain together in pachytene and diakinesis for that portion of their length where they have been paired.

A full description of meiosis in various triploid tulips and hyacinths, together with a discussion of the points raised, will be published later.

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The Hythe Skulls.

I FEAR Prof. Parsons (NATURE, June 18, p. 893) has not recently consulted his own paper.

Miss Hooke writes (*Biometrika*, vol. 18, p. 22): "The Hythe crania are in all probability those of Kentish men, dating back to the fourteenth and fifteenth centuries."

Prof. Parsons wrote in 1908 when publishing his memoir (*Journal of the R. Anthropological Institute*, vol. 38, p. 422): "It is probable that we are dealing with the remains of Kentish people most of whom lived in the fourteenth and fifteenth centuries."

Miss Hooke writes (*loc. cit.*): "Measurements were made on 590 crania selected from at least double that number."

Prof. Parsons wrote (*loc. cit.*): "It may not be out of place to say here that the 590 skulls which have been measured consist of those which were picked out of the stack in 1851 and placed upon shelves, where they are now shown."