A Look at Electrical History - A Visit with Charles Dalziel

The year is 1941. You are an assistant professor of Electrical Engineering at the University of California, Berkeley. You are awarded a grant by the California Committee on Relation of Electricity to Agriculture.

Purpose: To find the effects of sub lethal electrical currents on the human body. You decide to use healthy human subjects. The subjects are given physical examinations and electrocardiograms. Only subjects in good physical condition are used.

Subjects grasp a 12 inch length of bare copper No. 6 wire in one hand and the other hand is placed on a brass plate. Current is passed through the person from the left hand to the right hand. The subject is asked to drop the wire. After dropping the wire the experiment is repeated using more current, again and again, until the subject can no longer keep his hand on the eight inch diameter brass plate.

Assistants are then used to hold the subjects hand on the brass plate and the experiment continues until the subject can no longer drop the wire because he cannot let go. This experiment is repeated with 28 subjects and the maximum let-go currents are tabulated and analyzed.

Frequencies are changed from 60 cycles per second to 180 cps, then 500 cps, then to 1000 cps and the experiments are repeated. It is found that the average 60 cycle let-go current for men is 16 milliamperes and the average let-go current for women is 11 milliamperes.

Your name is Charles Dalziel and you have just begun. You will establish criteria on fibrillation currents using dogs, pigs, calves, and sheep. You become the authority on dangerous electric currents. Your experimentation will establish the principles for protecting persons from the hazards arising from the use of electricity, and your findings will be used for the notes to the Tables in Article 725 of the National Electrical Code.

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