is a frozen domain uninhabited and uninhabitable.

The Arctic is not a whole unit by itself; it is only a zone of the earth. Just as one can not understand our planet completely without studying it as a part of the universe, so one can not grasp the reality and the purpose of the Arctic except in relation to the continent and to the entire globe. The Polar regions have an important part in the economy of the globe. Henri Poincaré, celebrated French scientist, did not hesitate to say that "they are more interesting than all the rest of the earth". In fact, they play a particular part in the physical sciences of every section of the globe. Every branch of physical or natural science, before proposing the solution of its own problem, must put the question "What happens in the neighborhood of the Pole?"

Although nearly entirely explored, the Arctic is not yet known in detail except for a narrow band along its coasts. Our global war and its aviation, penetrating more and more profoundly the Arctic plateau, will discover not only its regions but also its strategic value and will soon make us know it better. Just as the Arctic cannot be separated from the globe and from the universe, so no science furnishes a whole to itself: each of the sciences is merely a section of knowledge or of the universal science on which it depends. Each scientific world has its Arctic zone more or less unkown and unexplored.

It would be the task of each scientist of the new generation to fly over his own table-land, to penetrate it, to explore it, to find its Pole. You will need to have just as much courage, just as much energy and intelligence to reach these polar regions of your sciences as was needed by Peary, Nansen, Nobile, Schmidt and Charcot in the exploration of the polar regions of the globe.

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ENGINEERING

Electronics Provided World With Ignition Rectifier

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Excerpt from an address before the Science Talent Institute.

➤ ABOUT 1930, the use of stainless steel and light metals was rapidly expanding, particularly in transportation equipment, and methods for rapid electrical welding were devised. For welding of such metals it is necessary to use a rapid sequency of accurately measured pulses of electric current, accurately timed. Mechanical switches, because of their inertia, were not practical for controlling these current pulses. It was very natural by this time to turn to electronic science for the answer, and because of the large currents involved, an electro-ionic type of tube was indicated and particularly the mercury arc tube, with its indestructible mercury pool cathode made electron emissive by means of a cathode spot.

However, the only reliable means for starting a cathode spot known at that time was that of mechanically breaking a circuit comprising the mercury pool and an auxiliary electrode, and again mechanical inertia introduced insuperable difficulties. What was wanted was a purely static means for initiating the cathode spot at great frequency and under perfect control.

Electronic science gave a beautiful solution to this problem. A rod of high resistance material was stuck down into the mercury, and current passed down through the rod into the mercury. Analysis of electrical conditions at the junction of the rod with the mercury indicated that there would be there a large concentration of current, and an intense field, just the conditions for starting a cathode spot. Experiment bore out this expectation. Sure enough, when a few amperes passed down the resistance rod, a cathode spot appeared on the adjacent mercury. This could be done as quickly and repeatedly as desired. The small current for thus initiating the cathode spot could be readily handled by a more usual thermionic, grid-controlled, electro-ionic tube. After the cathode spot was formed, thousands of amperes needed by the weld would pass through the mercury arc tube. Thus the ignitron was born. It immediately found wide application in thus electronically controlling the welding of these new materials.

It was then found that the use of this gift of electronic science, the mercury-arc ignitor, permitted a radically new design of the high-power mercury-arc rectifier with a better efficiency and greater reliability than had been attained before. Hence we find that in the great expansion of production of aluminum and magnesium occasioned by the war, the tremendous direct currents needed for electrolysis are being supplied by the new ignitron mercury arc rectifiers.

These examples are only a few of the instances where electronic science is modifying and improving the apparatus of the electric-power industry. We may be quite sure that the next steps in electrical engineering will include further improvements in electro-ionic apparatus, and wider applications.

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Iraq, the traditional site of the Garden of Eden, in normal times exports large quantities of oil and dates.