

'Matador' With a Radio Stops Wired Bull

Modified Behavior in Animals Subject of Brain Study

By JOHN A. OSMUNDSEN

Afternoon sunlight poured over the high wooden barriers into the ring as the brave bull bore down on the unarmed "matador" — a scientist who had never faced a fighting bull.

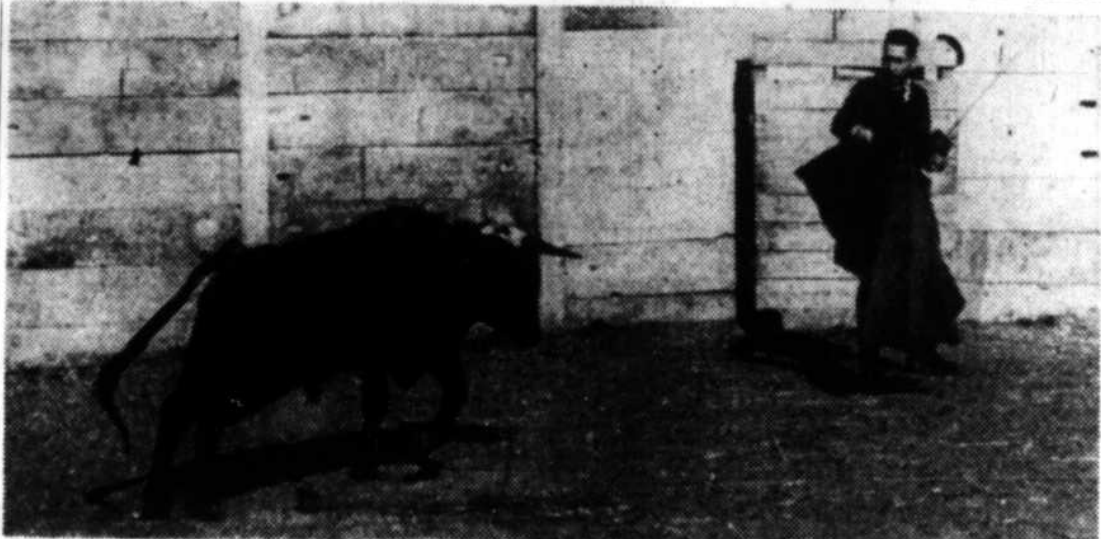
But the charging animal's horns never reached the man behind the heavy red cape. Moments before that could happen, Dr. José M. R. Delgado, the scientist, pressed a button on a small radio transmitter in his hand, and the bull braked to a halt.

Then, he pressed another button on the transmitter and the bull obediently turned to the right and trotted away.

The bull was obeying commands from his brain that had been called forth by electrical stimulation—by the radio signals—of certain regions in which fine wire electrodes had been painlessly implanted the day before.

The experiment, conducted last year in Cordova, Spain, by Dr. Delgado of Yale University's School of Medicine, was probably the most spectacular demonstration ever performed of the deliberate modification of animal behavior through external control of the brain.

Dr. Delgado was trying to find out what makes brave bulls brave — just as other of his experiments have aimed at finding the biological basis for emotions, personality and behavior in man and other animals through electrical stimulation of their brains.



Dr. José M. R. Delgado of Yale University's School of Medicine facing a charging bull



Bull, halted in mid-charge by command from Dr. Delgado's transmitter, raises dust cloud

He has been working in this field for more than 15 years. Techniques that he and other scientists have recently developed have been refined to the point where, he believes, "a turning point has been reached in the study of the mind."

"I do believe," he said in a

recent lecture, "that an understanding of the biological bases of social and antisocial behavior" and of mental activities, which for the first time in history can now be explored in a conscious brain, may be of decisive importance in the search

for intelligent solutions to some

of our present anxieties, frustrations and conflicts."

Dr. Delgado said in an interview recently that he was particularly concerned with what he called the "gap between our understanding of the atom and

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