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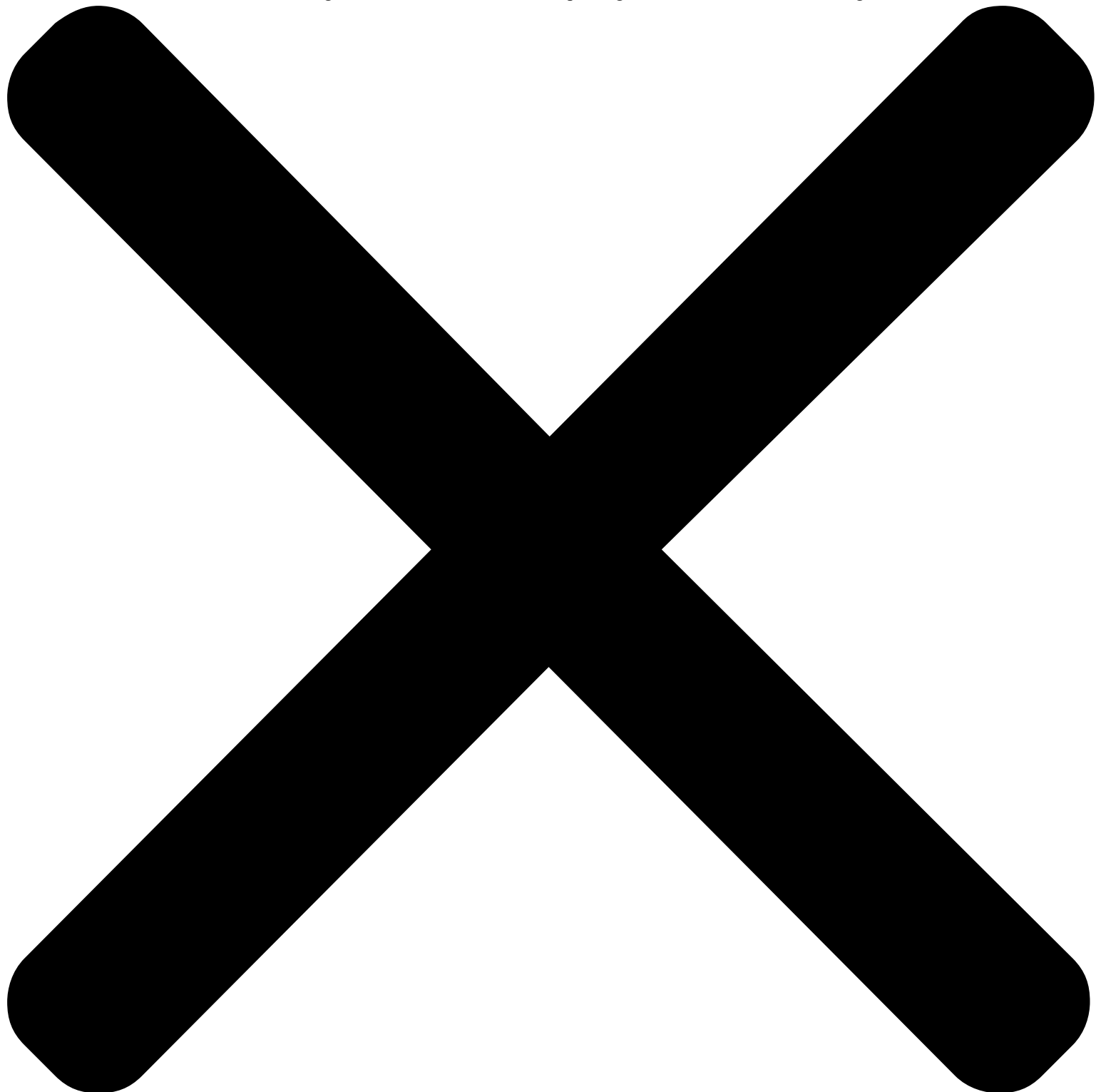
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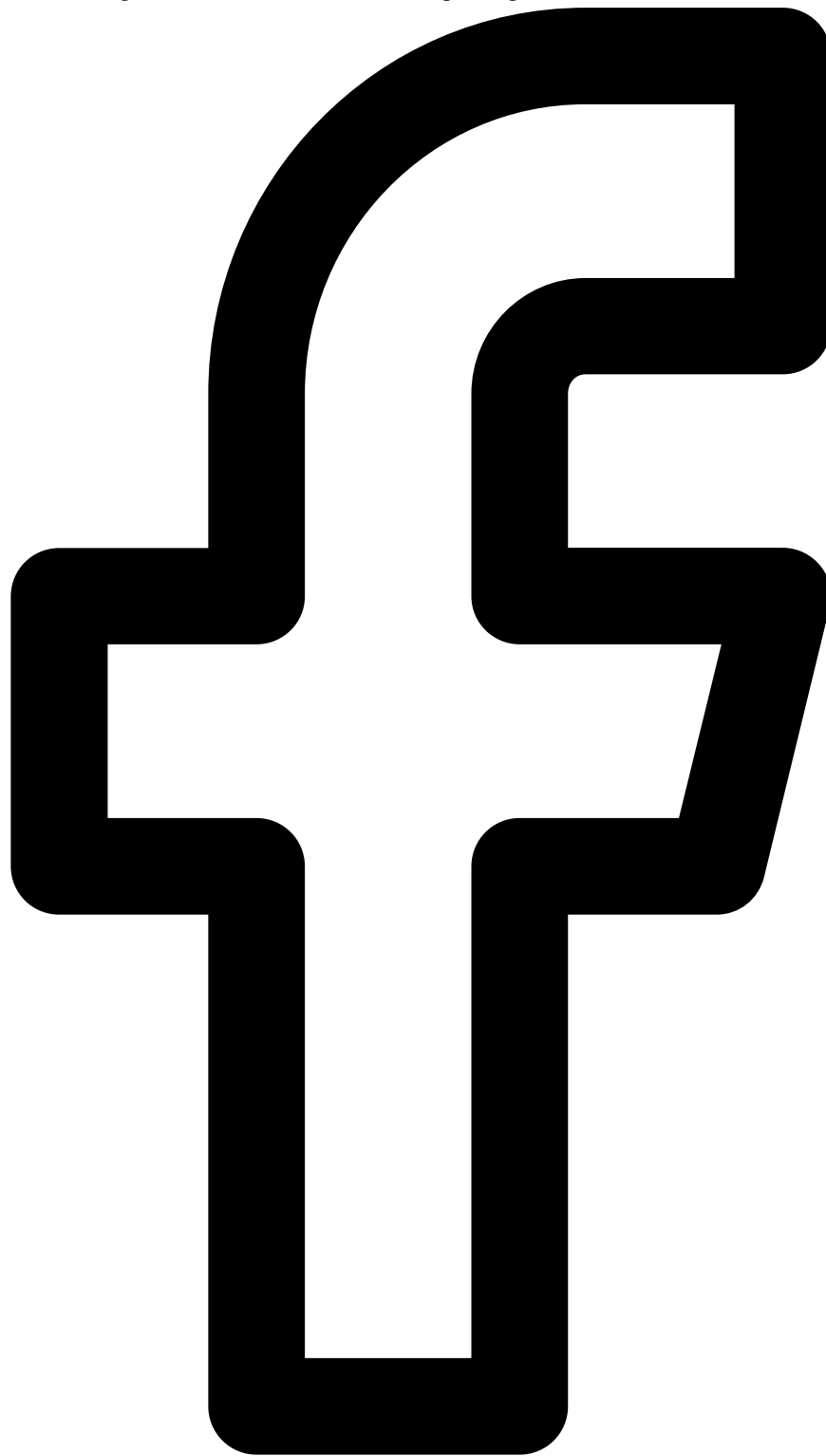
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GeoNotes: A disturbance in the force

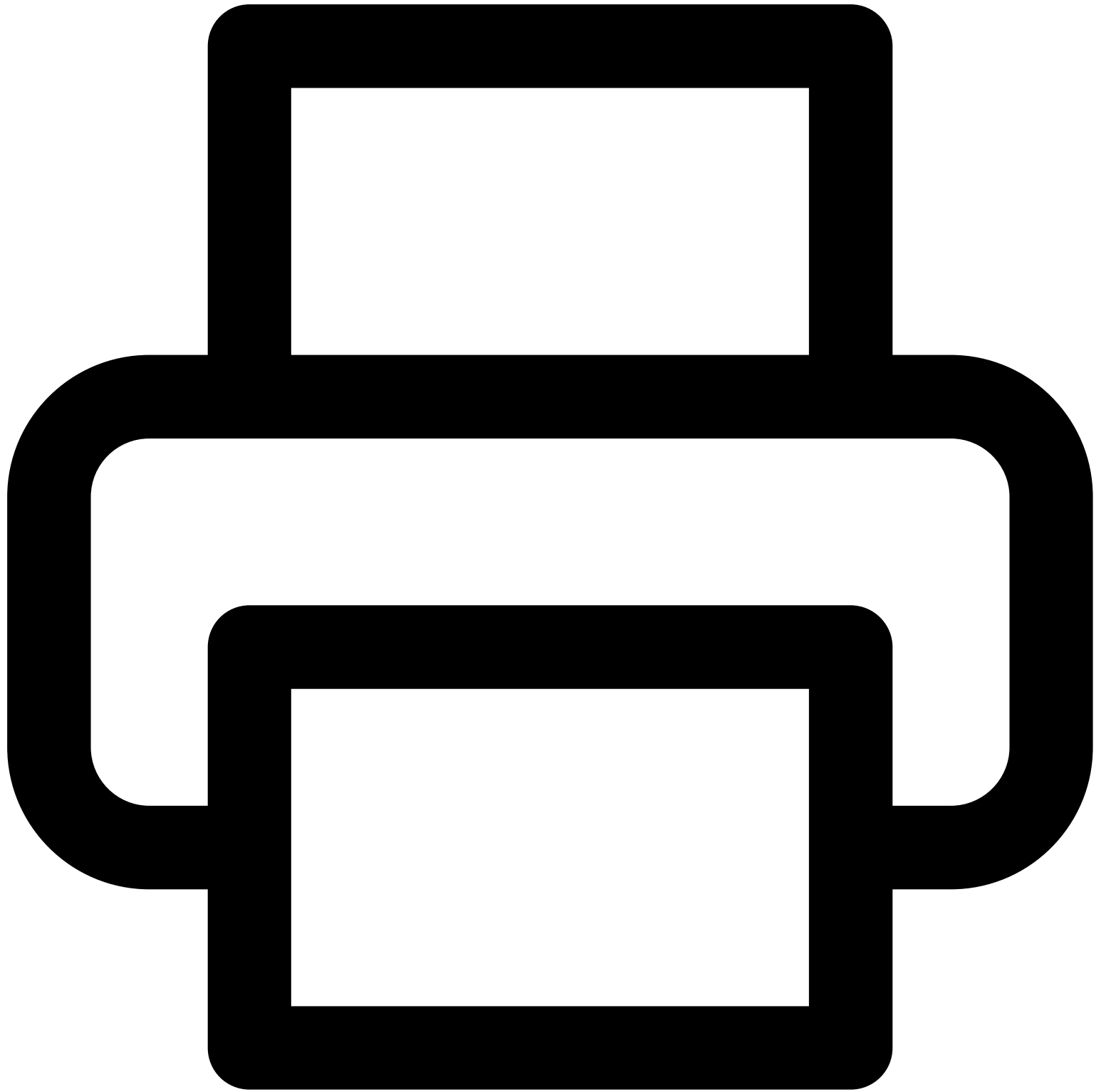
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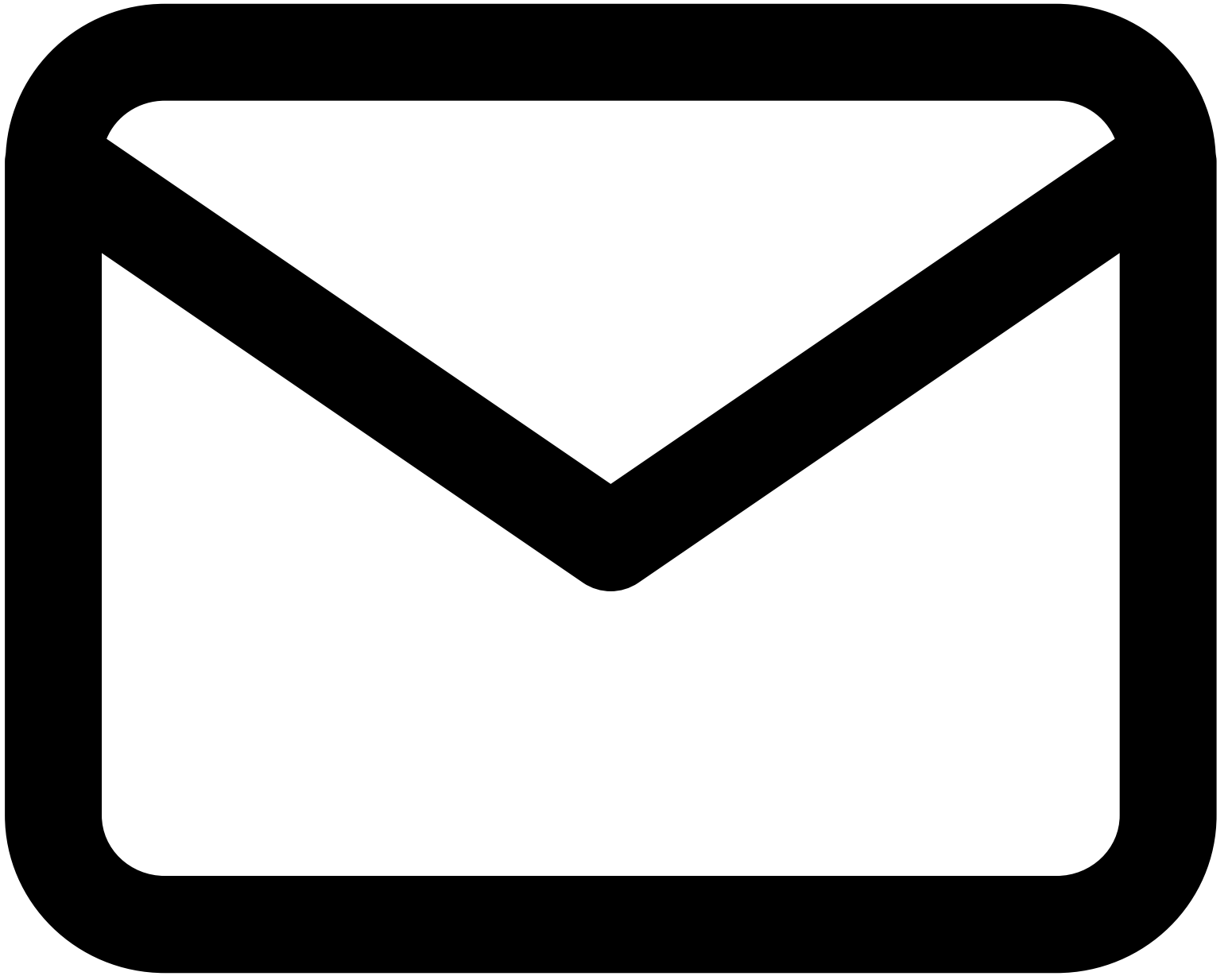
By [Denis Foley \(https://bigbendsentinel.com/people/denis-foley/\)](https://bigbendsentinel.com/people/denis-foley/)

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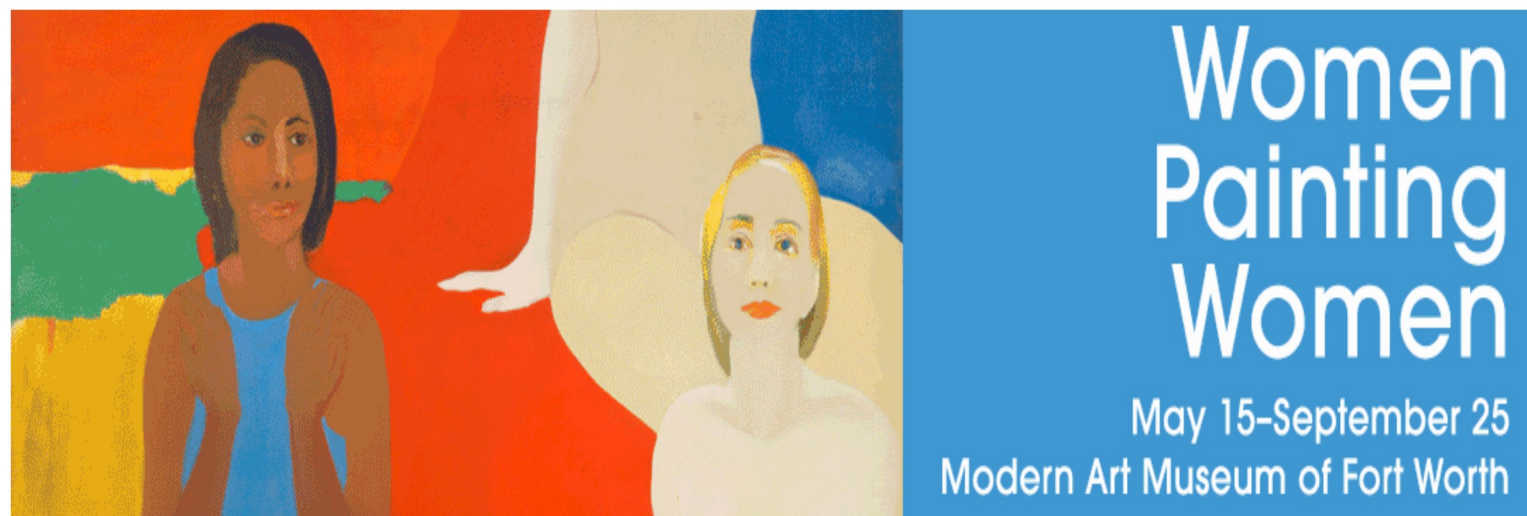
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In early April I attended a seminar hosted by the West Texas Geological Society at UTPB on “Understanding Induced Seismicity — Earthquake Monitoring, Seismologic Analysis, Geological Characterization, Mechanistic Analysis.” I am curious about why we are experiencing so many small earthquakes around our neighboring Permian Basin.

As reported in an earlier “GeoNotes,” West Texas and the Panhandle are areas of large faults in the planet’s crust, and some of those are still moving at times. Most famously, the fault system near Valentine, Texas, on Aug 16, 1931, slipped to the tune of a 6.0-6.5 Richter scale event. Nearer in time was the 5.5 event on the northeast end of the Del Norte Mountains in 1995. But the recently reported events to our north and northeast are something else. They are being influenced by injection of oil field produced brine back into the crust.

Oil wells almost always produce a combination of oil and brine. The oil is separated from the water for sale, and the brine is piped or hauled away to be injected into a disposal well. With the ramp up of oil and water production with all the drilling and frac completions in the Permian Basin over the past 10 years, there has been a huge increase in the volumes of brine being injected into disposal wells.

The speakers at the WTGS conference were from our Texas Bureau of Economic Geology. In 2016-17, the 84th Texas Legislature passed Section 16 of House Bill 2 which established and funded TexNet. TexNet is a statewide listening system for earthquakes, and it is being moved around to listen to oil field injection related tremors. This legislation was mostly in response to urban development growing out over the Fort Worth Basin which has been producing oil since 1917. New drilling made economic by fracking and brine injection activity in the FWB began causing small earthquakes. So the TexNet seismic listening array was created to provide science-based management and regulation of brine injection. I think there is an earthquake sensor at Sul Ross State University from which data is used by TexNet.



(<https://www.themodern.org/exhibition/focus-jill-magid>)

The BEG scientists showed statistics that almost all of the brine injection induced seismicity is below 4.0 on the Richter scale, and most is below 3.0. Damage to surface structures begins in the 5.0 to 6.0 range. The tremor measurements are being used by the Texas Railroad Commission to moderate and sometimes shutdown injection when faults become active because the pore pressures around them have been changed by fluid removal and/or injection. So Midland, Pecos and Orla are at risk of small earthquakes which could damage homes and other structures.

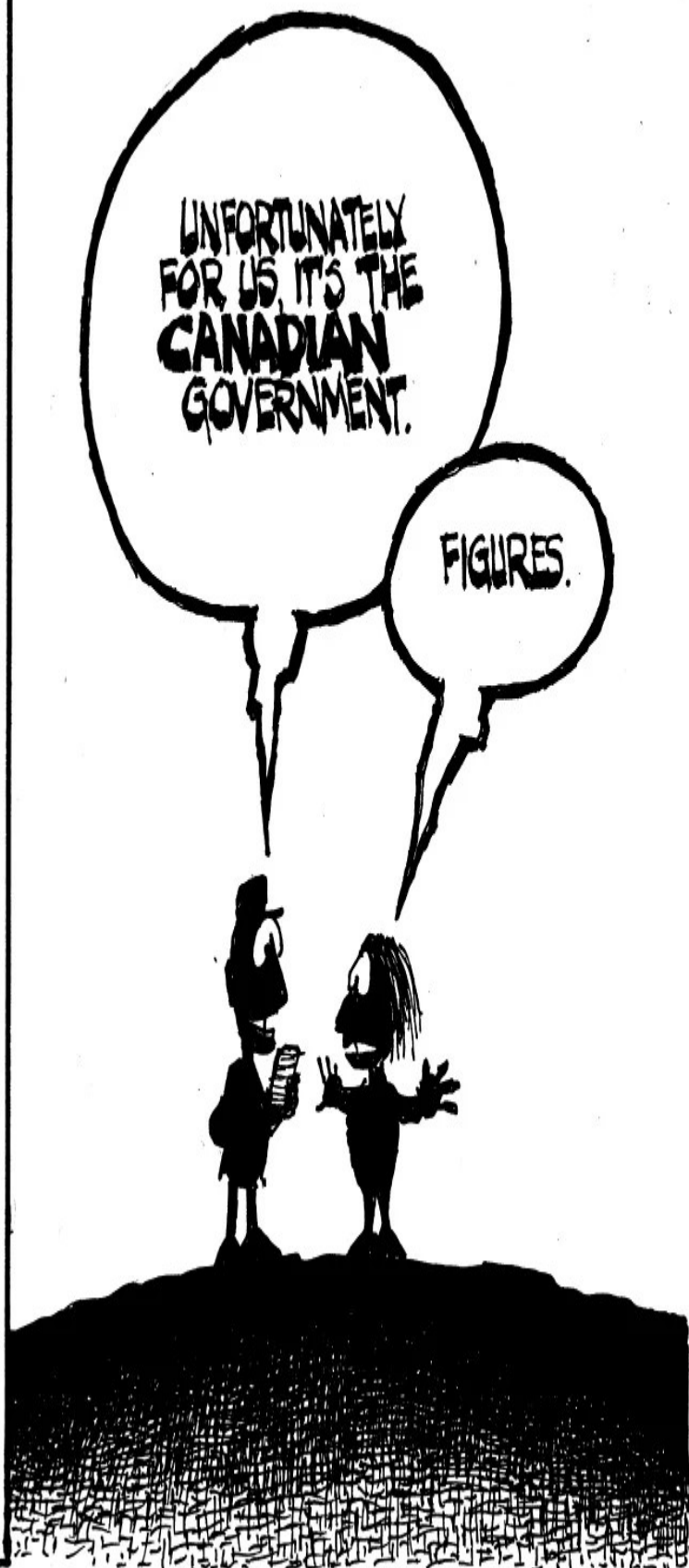
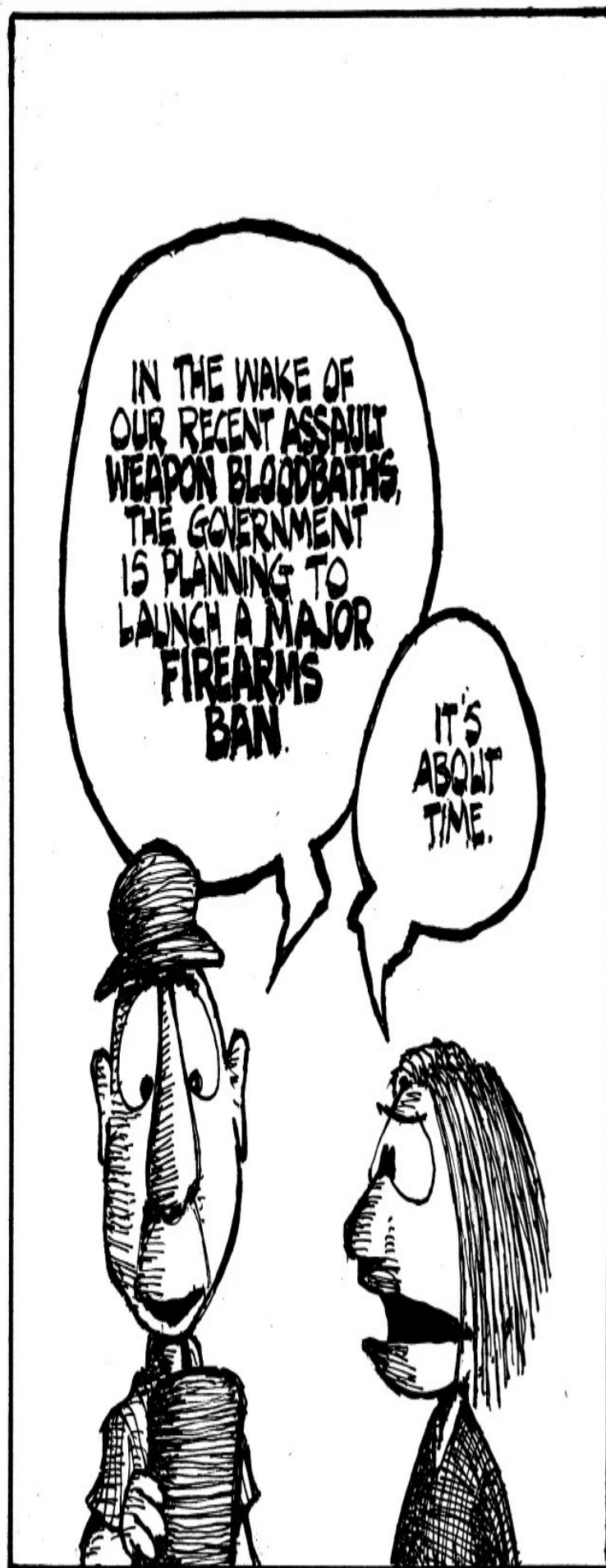
I have never felt an earthquake and would like to. I was hoping for one of the 4.0s while I was in this class at UTPB, but no luck that day. Nuts.

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The Adventures of Dick Decent ©'22

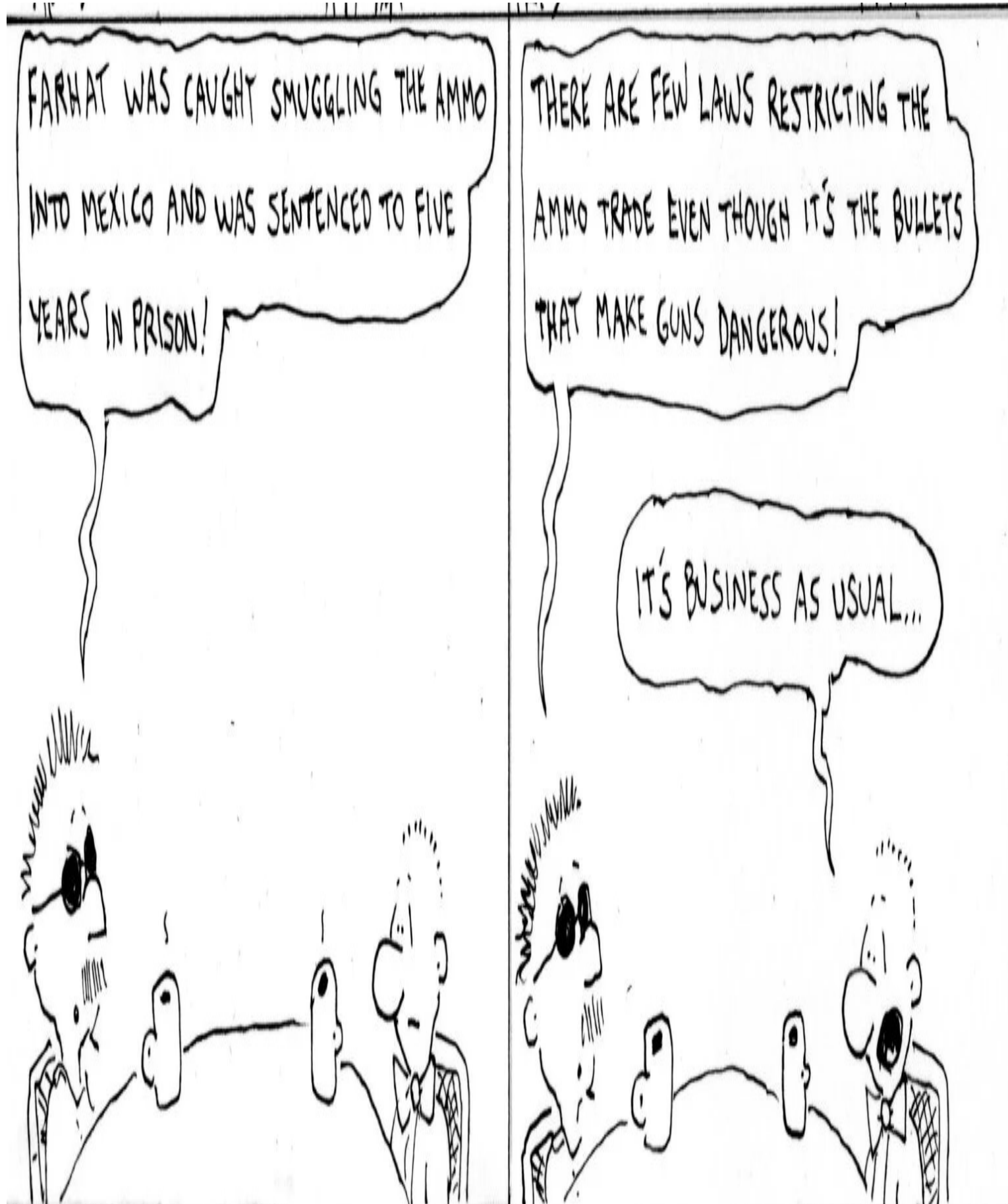
Jim Bridger Big Bud Jafinel

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THE SUPPLIER WAS OASIS OUTBACK IN UVALDE, THE SAME STORE WHERE SALVADOR RAMOS, THE UVALDE KILLER, PURCHASED HIS GUNS AND AMMO!





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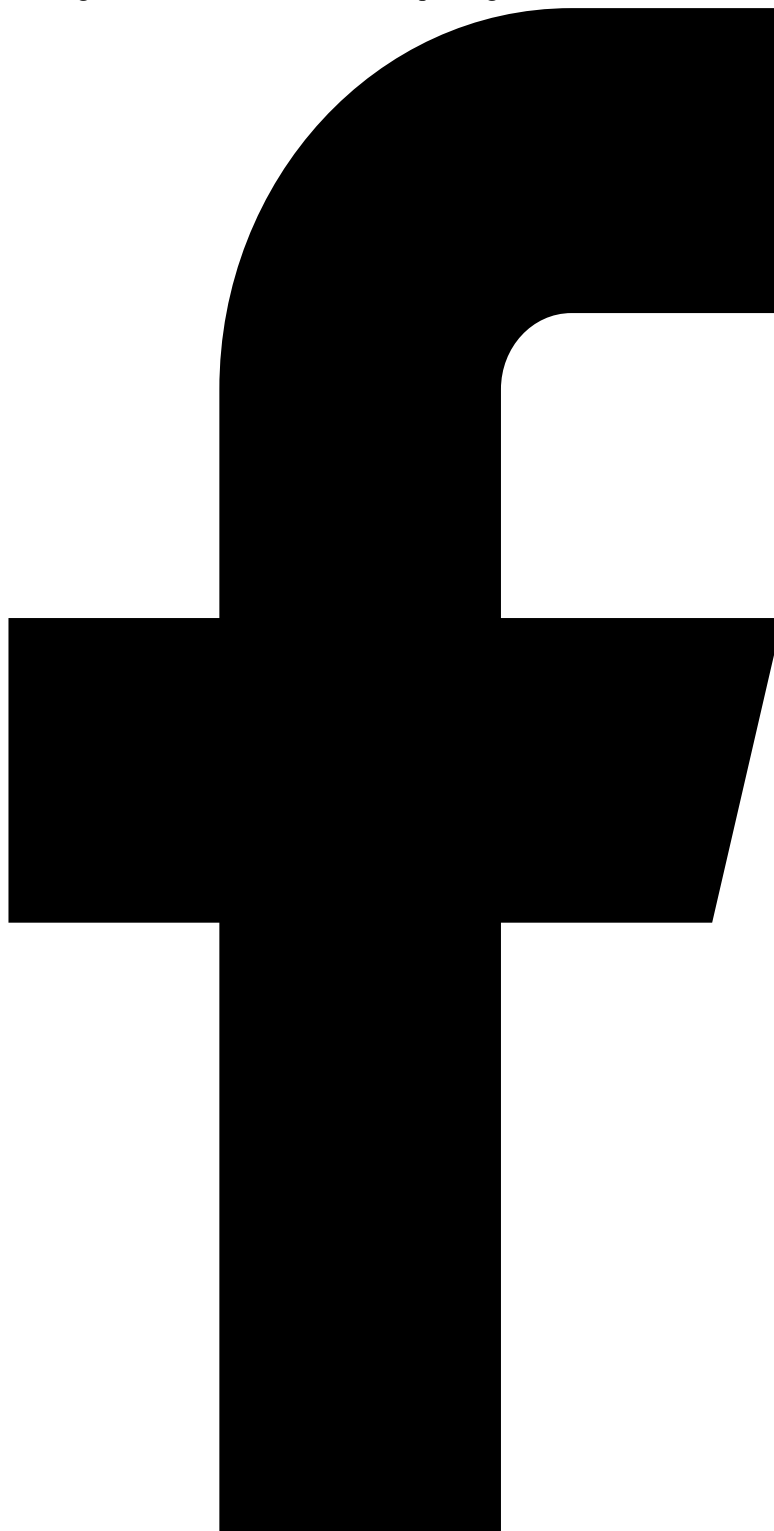


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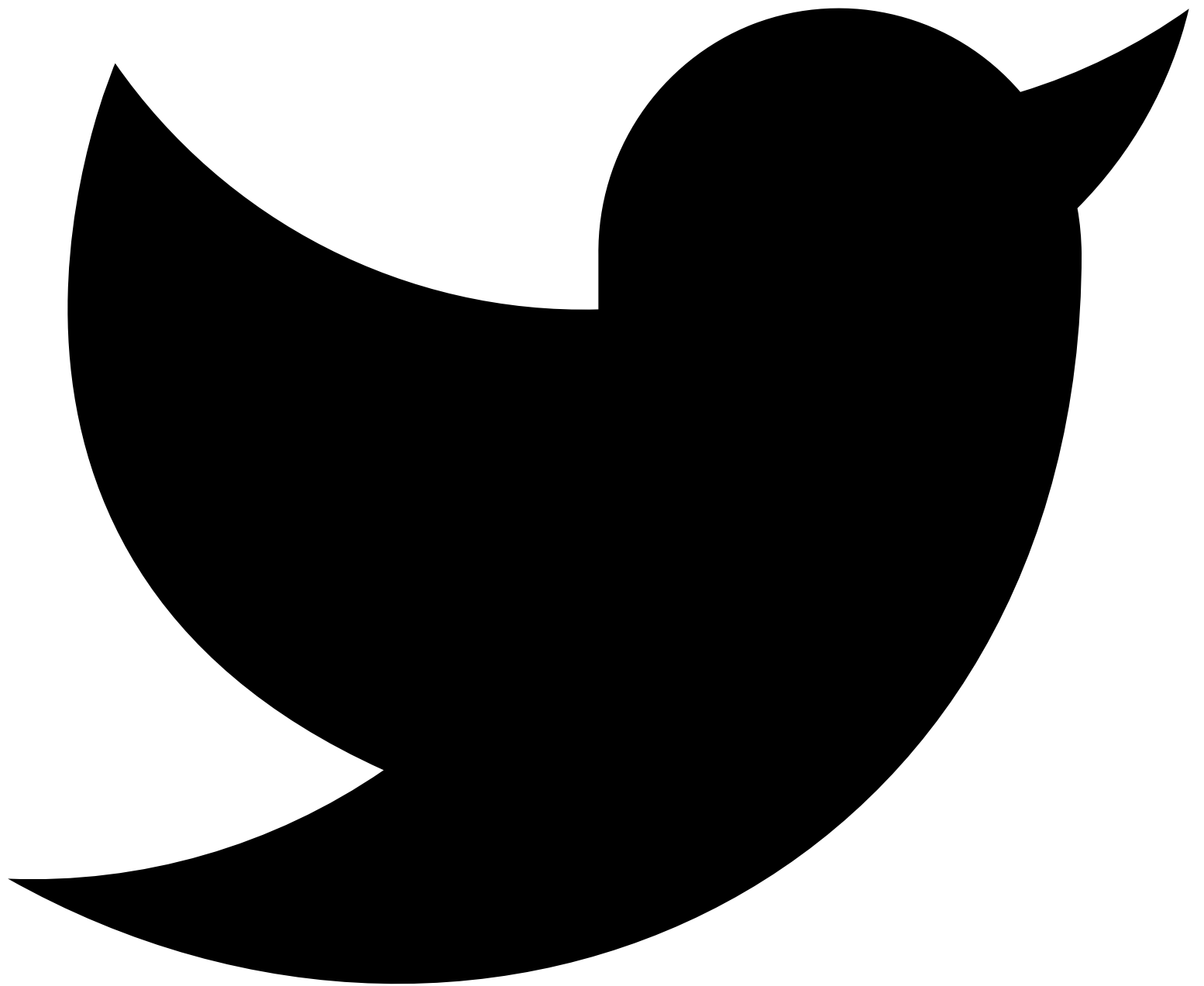
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