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done little to diminish the country's economic reliance on the multinationals.

Oil is Venezuela's most important product, accounting for 77 percent of the government's income and 95.6 percent of the country's exports in 1975. It constitutes Venezuela's only major industry and helped create a large middle class, much of it employed in oil-related enterprises. Nationalization occurred after a series of laws enacted in the early 1970s gave the Acción Democrática Party government increasing shares of oil revenues, power to set oil prices, and authority to approve all changes in oil company operations (including those affecting exploration and volume).

Much has remained the same, however. Although the government plans to eventually merge the 14 state-run oil companies into 5 or 6 firms, each has thus far retained the personnel of its multinational predecessor. (Even before nationalization, most oil company employees were Venezuelan; only 37 of Shell's 6,000 workers, for example, were foreigners.) The state continues to rely on the multinationals for technology, marketing, exporting, and refining (two facilities, owned by Shell and Exxon in Curacao and Aruba, refine more Venezuelan crude than does Venezuela). These service contracts enable the multinationals to take more money out of the country, Bye suspects, because the foreigners no longer re-invest in the Venezuelan plants.

Meanwhile, the government's net oil income has dropped: It is investing heavily in oil and other heavy industries and must pay indemnification (\$1 billion over five years) to the multinationals. Left out, Bye contends, are Venezuela's poor, who should be the major beneficiaries of the 1976 nationalization.

Spain's Armada

"Why Did the Armada Fail" by Sean O'Donnell, in *Oceans* (Mar. 1979), P.O. Box 10167, Des Moines, Iowa 50340.

In July 1588, King Philip II of Spain sent his supposedly invincible Armada of 130 ships to Calais on the English Channel. There the fleet, led by the inexperienced Duque de Medina-Sidonia, was to rendezvous with a Spanish army based in the Netherlands and then launch an invasion of Britain.

In one of history's greatest military blunders, the troops did not appear—messages between the Armada and the army had been muddled. Alone, the Armada's slow and unwieldy warships engaged Queen Elizabeth I's Navy of light, maneuverable ships (some commanded by Sir Francis Drake) armed with long-range cannon. The British sank one Spanish galleon, severely damaged five others, and blocked the Spaniards' southern escape route back down the channel, forcing them to sail north around Scotland. An autumn storm in the North Atlantic destroyed almost half of the fleet, smashing several ships against Ireland's rocky west coast.

Why was the Armada so vulnerable? O'Donnell, science correspon-

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National Maritime Museum, London.

After a two-week running battle in 1588 against the British Navy, the Spanish Armada sailed homeward. But almost half the fleet was destroyed in an Atlantic storm off Ireland.

dent for the *Irish Times*, writes that recent investigations of Spanish shipwrecks off the Irish coast provide some answers. Only two dozen of the Armada's ships were big galleons built for both battle and heavy seas; most of these rode out the storm and returned safely home. The ships now being raised, however, were smaller wide-beamed merchantmen built for the calmer waters of the Mediterranean. These were pressed into service for the planned invasion. One ship now being examined, the *Santa Maria de la Rosa*, supplies a case in point: Its keelson (the timber bolted to the keel to reinforce it) is of "unusually small dimensions" for an Atlantic vessel. O'Donnell concludes that it was one of the "fragile Mediterranean hybrids" hastily outfitted for war.

Another reason why the Armada fared so badly: inferior armament. Pieces of cannon lifted from the Spanish wrecks have been found with off-center bores, which would cause the cannon to burst upon firing. That, O'Donnell suggests, may explain why Spanish gunners were able to sink "just one tiny and noticeably insignificant boat" during the two-week running battle with the British.