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lateral thrusts of the head against the other fish. These thrusts and the attempt of the other fish to avoid them cause the two fish to circle with their bodies close together, or in actual contact, until one of them flees. The cod often accompanies its threat display with a loud low frequency sound, like a grunt....When the fish are close together the intimidating effect of the grunting sound is evident as the threatened fish often turns and flees at the instant the grunt is given....Often the initial response of the threatened fish was to raise all the median fins momentarily and then lower them again into the fast swimming position as the fish fled... A fish that did not flee or returned the threat when threatened adopted a posture which gave it the greatest protection against the bites of the attacking fish....A resisting fish was not easily frightened and the circling sometimes lasted several minutes, often with an inconclusive ending, when the two fish appeared to have no further interest in each other and slowly swam apart. The fully developed periods of aggression Braithwaite observed seemed to coincide with the cycle of the year of the wild cod. We are speaking here of cod of the North Sea region. She observed that "maturing cod in captivity appeared completely indifferent to each other from December to the middle of February, three weeks before spawning. This period is a time of low feeding intensity in wild cod and during part of this time the cod move to the spawning grounds." (Graham; "The first migrations to the spawning grounds take place at the onset of first maturity. They commence in February and end in April, and they bring the cod in dense concentrations....") Braithwaite; "The formation of dense shoals on the spawning grounds may be facilitated by this lack of aggression....(then) Aggressive behaviour in the captive cod during the spawning period increased the probability that only the most vigorous males would spawn, spaced out the aggressive males and reduced their abortive attempts to spawn with unripe females." (Graham; "After spawning, active feeding commences and the fish disperse and seek suitable feeding grounds. During the period June to September, which is the most intensive feeding period, the recuperating spawners are concentrated in areas where herring, their major food, are known to be abundant. In September, the cod leave the feeding areas and become more dispersed, and not until the return of the spawning season do they concentrate once more.") Braithwaite; "...The dispersal of cod which begins in August or September coincides with the onset of intense aggression in the captive fish." Braithwaite offers a detailed description of the spawning of cod. The dominant male by aggressive behaviour has declared a territory. "He won't tolerate other fish within a certain distance of himself • until the spawning time and he gets a female in who doesn't really respond to his threatening approach. That's the test of the maturity of the female; she doesn't turn away. She is completely passive." From Braithwaite's report; "Usually the females, and those males that were without a territory, formed a loose shoal in one end of the tank....Occasionally a female left the group and, swimming very slowly, entered the territory of a male....The male fish, on seeing The Annual Gaelic Mod Held First Pull Week in August Home of Gaelic College Summer School 2,3 & 5 Week Courses in



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