

SECOND EDITION

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# GEOLOGY OF PETROLEUM

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A. I. LEVORSEN

*Sections on Hydrodynamics and Capillary Pressure revised and edited by*

FREDERICK A. F. BERRY

*University of California, Berkeley*



*W. H. Freeman and Company*

SAN FRANCISCO AND LONDON

Another explanation of the difference in the oil and gas content of nearby traps has been advanced by Gussow.<sup>37</sup> It is, in brief, that when a fold trap, for example, is filled with oil and gas, the oil is eventually forced out at the bottom of the fold, either because additional oil and gas enter the trap or because a loss of pressure brings about an increase in gas volume. The successive steps are shown in Figure 12-18. As the oil is forced out at the bottom, it moves up the dip and is caught in the next trap. The successive steps are shown in Figure 12-19, where trap 1 of A is equivalent to stage 3 of Figure 12-18. A sequence of pools, as in C, may be such that the down-dip trap, 1, is full of

574

## GEOLOGIC HISTORY OF PETROLEUM

Stage 1



Stage 2



Stage 3

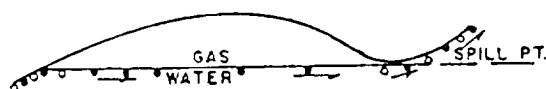


FIGURE 12-18

*The selective trapping of oil and gas. Stage 1: The oil and gas are above the spill point, and both will continue to be trapped until the free water is all displaced and the oil-water contact reaches the spill point. Stage 2: Gas continues to be trapped while oil spills out and goes on up the dip. Stage 3: Gas has filled the trap and spills out up the dip. Oil bypasses the trap and goes on up the dip. [Redrawn from Gussow, Proc. Alberta Soc. Petrol. Geol., June 1953, p. 4.]*

gas, the next, up-dip trap, 2, contains both oil and gas, the next, up-dip trap, 3, contains only oil, and the next, up-dip trap, 4, still contains water. Trap 4 will eventually be filled with oil from the excess spilled out from the lower traps, 1, 2, and 3.

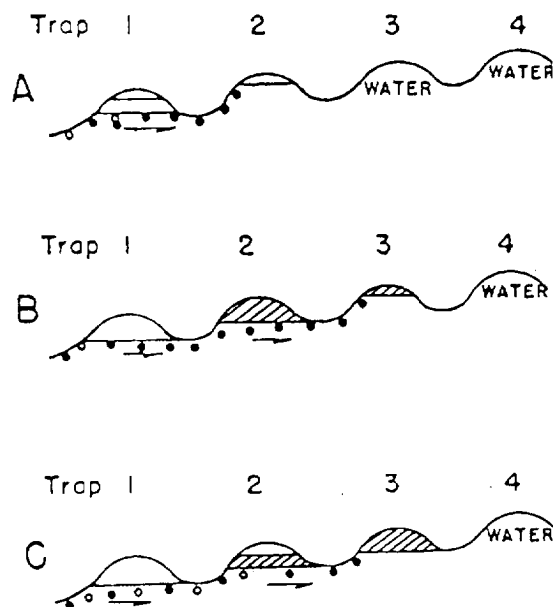


FIGURE 12-19

*In the series of traps at A, trap 1 is in the state of Stage 2 (Fig. 12-18): oil is being spilled out into trap 2. Traps 3 and 4 are full of salt water. In B, trap 1 has spilled all its oil into trap 2. Trap 2 is full of oil, and the excess is passing up the dip into trap 3. Trap 1 is full of gas. In C, trap 1 is unchanged, trap 2 has a gas cap (the excess gas coming from trap 2), trap 3 is full of oil, and trap 4 is still full of water but will be the next to be filled with oil spilling out of trap 3. [Redrawn from Gussow, Proc. Alberta Soc. Petrol. Geol., June 1953, p. 4.]*

37. W. C. Gussow, "Differential Trapping of Hydrocarbons," Alta. Soc. Petrol. Geol. Vol. 1 (June 1953) pp. 4-5; Oil in Canada, May 24, 1954, pp. 19-33.