

ambient stratification encountered by the convection event; it does not depend explicitly on rotation. The implications of the work to deep water formation in the Labrador Sea and elsewhere are discussed.

#### **Geyser periodicity and the response of geysers to deformation**

Ingebritsen S.E. & Rojstaczer S.A., *Journal of Geophysical Research*, 1996, 101 B/10 (21891-21905). In English. Numerical simulations of multiphase fluid and heat transport through a porous medium define combinations of rock properties and boundary conditions which lead to geyser-like periodic discharge. Within the rather narrow range of conditions that allow geyser-like behavior, eruption frequency and discharge are highly sensitive to the intrinsic permeabilities of the geyser conduit and the surrounding rock matrix, to the relative permeability functions assumed, and to pressure gradients in the matrix. In theory, heat pipes (concomitant upward flow of steam and downward flow of liquid) can exist under similar conditions, but the simulations suggest that the periodic solution is more stable.

#### **Generation of intermediate water vortices in a rotating stratified fluid: laboratory model**

Afanasyev Y.D. & Filippov I.A., *Journal of Geophysical Research*, 1996, 101/C8 (18167-18174). In English.. It is hypothesized that a formation mechanism of anticyclonic eddies (lenses) is the outflow of intermediate waters down the canyons of the continental shelf. The horizontal injection of fluid into the rotating stratified surroundings at the equilibrium density level was reproduced in the laboratory. The experiments demonstrate that such an injection forms an anticyclonic eddy. The periphery of the eddy is formed by the jet flow. The main features of the laboratory flow are consistent with those of the 'young' eddy observed recently in the Gulf of Cadiz.

#### **Principles and practice of hydraulic modelling of braided gravel-bed rivers**

Young W.J. & Warburton J., *Journal of Hydrology (New Zealand)*, 1996, 35/2 (175-198). In English. This paper outlines the principles of the hydraulic modelling of braided gravel-bed rivers, describes the practical limitations of this approach and compares model and prototype characteristics. Modelling procedures are based on the principles of hydraulic (dynamic) similarity. Models of braided river systems involve mobile bed modelling of complex two-phase flow. However, restrictions imposed by scaling ratios for gravitational acceleration, fluid viscosity and fluid density make it impossible to achieve full dynamic similarity, except with a length scale of unity. Therefore model experiments use approximate dynamic similarity, which is to be satisfied only requires similarity of relative depth between the model and prototype.

#### **Are pore size distributions in microfiltration membranes measurable by two-phase flow porosimetry?**

Zeman L., *Journal of Membrane Science*, 1996, 120/2 (169-185). In English. The issue of evaluating equivalent pore diameter distributions in membrane microfilters from gas-liquid (g-l) porosimetry data has been critically examined. Experiments performed with one isotropic and one composite anisotropic membrane in both possible orientations revealed conspicuous dependence of the obtained (g-l) porosimetry peaks on imposed pressure ramp rates,  $\rho$ . For two experiments, the observed effects of  $\rho$  could be reconciled with predictions of the Schlesinger-Bechhold theory. The data obtained with the thin top layer of the composite membrane facing intruding air directly did deviate somewhat from the theory. Pores characterized by (g-l) porosimetry are likely of the 'throat type', and their size distribution is considerably more narrow than that obtained for the 'node-type' pores by SEM-image analysis. A single bivariate distribution function was constructed for these two distinct pore populations.

#### **Gas sparging to enhance permeate flux in ultrafiltration using hollow fibre membranes**

Bellara S.R., Cui Z.F. & Pepper D.S., *Journal of Membrane Science*, 1996, 121/2 (175-184). In English. This study focuses on the use of gas-liquid two-phase crossflow to overcome concentration polarisation in the ultrafiltration of macromolecular solutions as applied to hollow fibre membrane systems. The experimental work was conducted on a purpose built pilot-plant scale rig with albumin and dextran as the test media. The effect of gas injection on the permeate flux and membrane sieving coefficient was examined at different trans-membrane pressures, feed concentrations and gas to liquid flow ratios. The results were encouraging, with flux enhancements of 20-50% obtained for dextran and 10-60% for albumin, when air was injected into the system over the range of process variables examined. The sieving coefficient of albumin was considerably reduced when gas-liquid two-phase cross-flow was used.

#### **Prediction of slurry convection in hydraulic fractures**

Clark P.E., *Journal of Petroleum Science and Engineering*, 1996, 15/2-4 (389-391). In English. The possibility of convective transport during hydraulic fracturing is discussed. Earlier experiments led to a complete analysis of the system which resulted in the development of two dimensionless groups that are useful for predicting the importance of convection in slot flow. This paper describes the dimensionless groups for Newtonian and non-Newtonian fluids, and presents evidence that they can be used to describe slurry flow in a slot. Horizontal versus vertical transport of fracturing fluid slurries is dictated by the forces available to drive the flow in each direction (horizontal,  $F_H$  and vertical  $F_V$ ).

#### **Liquid holdup in horizontal two-phase gas-liquid flow**

Abdul-Majeed G.H., *Journal of Petroleum Science and Engineering*, 1996, 15/2-4 (271-280). In English. The purpose of this study was to simplify and improve the mechanistic model developed by Taitel and Dukler (1976) for estimating the liquid holdup in horizontal two-phase flow. An experimental study was first conducted to develop a data bank used for evaluation and improvement. The holdup data were obtained using an air-kerosene mixture flowed through a test section consisting of a horizontal pipe 2-in (50.8 mm) in diameter and 118 ft (36 m) long. The flow patterns observed were stratified, slug and annular. Based on the measured data, it was found that Taitel-Dukler model tends to overestimate liquid holdup for stratified wavy, slug and annular