Editorial

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This special issue of the *European Journal of Applied Mathematics* is devoted to papers on free boundary problems, largely for Hele-Shaw or Stokes flows. The majority of the papers were presented at a meeting[1] on these topics held in Oxford in August 1998, 100 years after H. S. Hele-Shaw first described his cell [2], and 40 years on from the classic experiment of Saffman & Taylor [4]. The conference delegates sent a message of good wishes to P. Ya Polubarinova-Kochina (below), whose paper in 1945 [3], together with that of Galin in the same year [1], may be said to have initiated the modern study of the Hele-Shaw free boundary problem. We learned with great sadness of Polubarinova-Kochina's death this year, at the age of 100; her active scientific career spanned some 75 years.

As part of the preparation for the conference, with the assistance of K. A. Gillow we have assembled a 600-paper bibliography on Hele-Shaw and Stokes flow; it can be found at `www.maths.ox.ac.uk/~howison/Hele-Shaw/`. We hope it will be useful to the many researchers in these areas, which even after a century of investigation will clearly retain their mathematical and practical interest for many years to come.

References

[1] GALIN, L. A. (1945) Unsteady filtration with a free surface. *Dokl. Akad. Nauk. S.S.S.R.* **47**, 246–249 (in Russian).

[2] HELE-SHAW, H. S. (1898) The flow of water. *Nature* **58**, 33–36.

[3] POLUBARINOVA-KOCHINA, P. YA. (1945) On the motion of the oil contour. *Dokl. Akad. Nauk. S.S.S.R.* **47**, 254–257 (in Russian).

[4] SAFFMAN, P. G. & TAYLOR, G. I. (1958) The penetration of a fluid into a porous medium or Hele-Shaw cell containing a more viscous liquid. *Proc. Roy. Soc. Lond.* **245A**, 312–329.

Pelageya Yakovlevna Polubarinova-Kochina (1899–1999)