

sailing ships however have changed so drastically since they were last built that we can be fairly certain, no matter how they first reappear, that a few years will show a new profile on the sea.

As a paper exercise it seems to be possible to prove that it would be economic here and now to build sailing ships which could compete with power. There are certainly some parts of the world such as parts of the Pacific where the use of small sailing ships for cargo never really stopped. A new schooner built for this trade would involve comparatively minor risks with comparatively minor technological advances. In the world at large however where ships have to run to schedules and to operate in and out of modern ports with specialist cargo handling gear the picture has a larger element of doubt. The unknown quantity in most estimates of commercial viability must be in the development costs for novel equipment and there must inevitably be novel equipment in any large new cargo sailing vessel if only because the old equipment is no longer available or economic.

Another factor which may tend to be ignored in viability exercises is the difference in building new sailing ships in direct economic competition with new motor ships and in building them in competition with a surplus supply of the latter. Again the question of career structures and crew training must be taken into account and any retraining of a substantial part of the merchant marine of the world cannot be envisaged as a short time project and to an extent controls the path towards any substantial saving in fuel.

However you approach it, however, oil fuel is valuable and the wind is free. These facts are inescapable and it seems entirely logical that there must be some return to the use of wind power for the world's shipping. Perhaps we should make an effort not to regard the fuel burner and the sailing ship as intrinsically different and concentrate on aspects of saving fuel in fleet or even world terms rather than on a ship for ship basis.

ERRATUM

'Kalman Filter Techniques'

M. J. Dove whose paper 'Kalman Filter Techniques in Marine Integrated Navigation Systems' was published in the January number of the *Journal* was described as coming from *Southampton College of Technology*. This should have read *School of Maritime Studies, Plymouth Polytechnic*.