To discover whether there is a similar relationship for collisions in the Dover Strait, the 40 collisions there from 1 June 1967, when the present recommended traffic routing system was introduced, until 28 February 1971 were analysed. The number of vessels registered was taken from the world-wide distribution of ships published in Lloyd's Register of Shipping Statistical Tables.

A linear correlation coefficient r of 0·92 was found and the slope of the regression line was calculated to be 0·4. These results are very much in agreement with the Japanese results, but there are some worrying features about the analysis. Firstly the collisions relate to a period from 1967 to 1971 whereas the Lloyd's data relate to 1 July 1971 only. Over the collision period the distribution of ships is likely to have changed with the increasing numbers of very large ships being built. However, the numbers of all ships are so large compared to the number of collisions that this will probably not affect the situation very much. Also the total number of collisions per year is very small, 14 was the maximum over the period considered so that a year by year analysis would in any case be of little value. Secondly it is questionable whether the world-wide distribution of ships is the correct one to use for the collision rate in a local area, or whether it would not be more sensible to use a measure of the actual number of ships at risk in that area. It is not clear what Shiobara used in his analysis. The report on the Dover Strait survey of 27 to 29 April 1971 gave details of ships positively identified, so from this a distribution by gross tonnage of ships at risk in that area can be prepared. Comparing this to the world-wide distribution there are considerable dissimilarities, the main one being in the far fewer smaller ships (100–499 tons) in the Dover Strait distribution compared to the world-wide distribution. To draw too many conclusions from this is difficult as the results for the Dover Strait are based on a small sample which may not be representative.

Repeating the regression analysis, however, and using this data, the linear correlation coefficient r is about 0·62 with a regression line slope of 0·2. It would therefore be useful to repeat this analysis if more extensive data were available. As a further illustration of the difference between the two analyses, graphical illustrations of each are given in Figs. 3 and 4 respectively.

REFERENCES

1 Marine Traffic in the Dover Strait. An exploratory survey and analysis of collisions. Preliminary Report. *N.P.L. Eng. Sci. Report 1–71*, March 1971.

2 Marine Traffic in the Dover Strait. A survey of traffic: 27 April 1971 to 29 April 1971. *N.P.L. Mar. Sci. Report 2–71*, July 1971.

3 Beattie, J. H. (1971). Traffic flow measurements in the Dover Strait. This *Journal*, **24**, 325.

4 Fujii, Y. and Shiobara, R. (1971). The analysis of traffic accidents. This *Journal*, **24**, 534.

'By the Mark'

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YACHTSMEN, like other mariners, are being encouraged to 'think metric'—to become accustomed to metres in Tide Tables, Pilots and Light Lists, and to make

use of the new metric charts as and when these become available. Along with these changes to books and publications we can expect the introduction of metric tide gauges, and of echo sounders calibrated not in feet or fathoms but in metres. In a few years time even those yachtsmen who normally never correct their charts, or who do not think about renewing them until they are covered with cocoa stains, will be forced to work in metres.

No doubt we shall get accustomed to the change, but there is one small item of equipment which apparently has not been metricated—the humble lead line. Admittedly its use is now greatly restricted, but any sea-going vessel should surely carry one, as a stand-by in the event of failure of the echo sounder and for periodical checks on its accuracy. It will obviously be inconvenient to perpetuate the traditional markings when fathoms are forgotten.

The Hydrographer of the Navy has introduced the following markings for survey work, where lead lines are still used—mainly to calibrate echo sounders for variations of the speed of sound in water.

1, 11 and 21 metres	—one strip of leather
2, 12 and 22 metres	—two strips of leather
3, 13 and 23 metres	—blue bunting
4, 14 and 24 metres	—green and white bunting
5, 15 and 25 metres	—white bunting
6, 16 and 26 metres	—green bunting
7, 17 and 27 metres	—red bunting
8, 18 and 28 metres	—blue and white bunting
9, 19 and 29 metres	—red and white bunting
10 metres	—leather with a hole in it
20 metres	—leather with a hole in it and 2 strips of leather
30 metres	—leather with a hole in it and 3 strips of leather
40 metres	—leather with a hole in it and 4 strips of leather
50 metres	—leather with a hole in it and 5 strips of leather
All 0·2 metre markings	—a piece of mackerel line

One advantage of this system is that the metre markings almost correspond to the fathom 'marks' of the conventional lead line. A 20 metre (or 10 fathom) line is adequate for most yachting purposes.

While it is not suggested that European standardization is necessary, it does seem desirable that all British seamen should use common markings, and that the working system already used by the Hydrographer would be suitable for this purpose.

The Treble Bearing Problem

Charles H. Cotter

It may come as a surprise to many navigators that the interesting and valuable, although seemingly little-used, method in which three successive bearings of a single fixed mark are used to find course made good, has a history of not more than about half a century.