Letters to the Editor

CIRO CARIC'S TABLES

SIR,

I see various sets of tables mentioned from time to time in the *Journal* but never the *Tavole Nautiche* of Professor Ciro Caric, of Jugoslavia. It appears that they are almost unknown, although they were published some 25 years ago, and although the late Mr. H. B. Goodwin (whose opinion was considered to have weight in navigational matters by most people) wrote of them in the *Nautical Magazine* (Sept. 1926):

'Caric gives Addition- and Subtraction-Logs, and with the aid only of a Table of Logarithmic Haversines, arranged on a new principle so as to give the haversine of an angle and its supplement upon the same page, obtains by this means a method for zenith distance shorter than any in common use.'

In one of the editions of Inman, Goodwin himself worked out an 'All-log-hav' formula, but it was somewhat cumbrous, and certainly not short.

I myself would not claim for Caric that his working is any shorter than the usual cosine-haversine working, with N havs and L havs combined in one table: that is, as far as the number of figures and operations is concerned. It is page-turning that is saved. His L havs occupy 12 pages, and his addition-logs $1\frac{1}{2}$ pages. I think the mathematical beauty and the pleasing novelty of addition-logs, added to the fewness of the (rather large) pages, combined to make Caric's my favourite among the twenty or so workings of which I have knowledge; and it remains so today.

The table of L havs is quickly described. Each page is divided into a top half (of L hav x) and a bottom half (of L hav $180 - x$).

The addition-logs are not well known in this country, and if when working in logs an addition has to be performed, we usually 'come out of ' logs, do our addition, and then, if necessary, go back into logs again. This is unnecessary.

If we are working with log X and log Y, and want log $(X+Y)$, we know that $X+Y=X\{1+(Y/X)\}$, so that if a table is constructed with log X/Y as 'A' and log $\{1+(Y/X)\}$ as 'B' it is only necessary to add log X and 'B' to get log $(X+Y)$. Caric's little addition-log table only occupies $1\frac{1}{2}$ pages: for those who want to try out a bigger table there is Berkeley's *Addition-subtraction Logarithms to Five Decimal Places*, published by the White Book and Supply Company, New York.

The way I use Caric is as follows. The usual three things—the hour angle (P) using the D.R. long., the D.R. lat., and the dec. of the observed body—are of course required, and the *sum*, as well as the difference, of the lat. and dec. taken. (Both lat. and dec. are marked plus for N., minus for S., and the algebraic sum and difference taken.) It is the need to take *both* that makes me hesitate to claim that Caric's working is shorter than the cosine-haversine, for which only the difference is required. With this data my method uses, by way of work-form, a rubber-stamp frame with 10 spaces, which I fill as follows. The two *top* spaces are both filled from the *top* of the pages of the table, i.e. L hav P, and L hav (lat. $\sim$ dec.). The next row with figures from the *bottom* of the pages of the table, i.e. L hav $(180-(l+d))$, and L hav $(180-P)$.

Both sets of figures are then added, thus filling the third line of the frame. One of these totals will be the larger: whichever it is, copy it down at the foot of the *other* column. (Being a fool, I like fool-proof methods). In the frame above,

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I have supposed the left-hand total to be the larger. Write in the difference between the totals above the larger total copied down at the foot, and check by adding. Enter the addition-log table with this difference as 'A' and write the corresponding 'B' in the upper of the two remaining spaces. Add this 'B' to the total above it, and underline (to ensure you're not looking up the wrong figure), and find this final total in the table (top half of page) and you have your calculated Z.D. All that remains to get the intercept is to copy down your corrected obs. alt., and add. Any excess over 90 is Int. TO, any defect *from* 90 will be Int. FROM.

P, 'top'	*l*∼*d*, 'top'
l + *d*, 'bottom'	*P*, 'bottom'
sum_1	sum_2
'B'	'A'
L hav *ZD*	sum_1

I am unable to explain this working more succinctly, but the process is quite quick and simple.

Greatly to my surprise, there is no English or American edition of these tables, and now that Europe is 'partitioned' there is little immediate prospect of being able to obtain them. But their beauty and handiness remain unaffected, and I feel sure that sooner or later they will emerge from their regrettable obscurity, though it is too much to expect that the old Professor will live to see that day.

Yours faithfully,
B. R. Keir Moilliet.

CIRCUMVENTING THE DIMNESS OF THE RADAR SCREEN

Sir,

I am distressed at the way radar is being relegated from the forefront of the modern ship's wheelhouse to the darker recesses of her bridge. That daylight viewing of the P.P.I. requires the use of either shrouds or visors, or necessitates banishment of the screen to some dim corner seems to have become accepted; yet these are obstacles to good console-siting which might, I think, be circumvented.

As a young apprentice in the 1914–18 war, I found myself keeping a lookout from the bridge of one of the ships forming a convoy bringing American troops to the U.K. The sun shone from a cloudless sky but a fog lay low on the water—a fog so dense that generally nothing could be seen, though, on occasion, masts and funnels and sometimes even bits of the superstructure of near neighbours loomed up from the fog. On that bridge was a set of different coloured glass viewing screens, each complete with little frame and handle. Beautiful toys to help a weary youngster while away the time. Experimenting with these things I became impressed that one particular screen, an 'orangey-yellow' piece of glass if my memory serves me right, made our near neighbours stand out more clearly from the glare of the sunlit fog than they did when looked for with unaided vision.