4. Henze and Blair, The number of structurally isomeric alcohols of the methanol series; The number of isomeric hydrocarbons of the methane series, *J. Am. chem. Soc.* **53**, 3042–3046; 3077–3085.
5. George Polya, Kombinatorische Anzahlbestimmungen für Gruppen, Graphen und chemische Verbindungen, *Acta math., Stockh.* **68**, 145–253 (1937).
6. Richard Otter, The number of trees, *Ann. Math.* **49**, 583–599.

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Designing speedway tournaments

We reprint here, with kind permission, two letters sent by readers to Trevor Fletcher following the publication of his article *Speedway tournaments* in the December 1976 *Gazette*.

DEAR MR FLETCHER,

I read with interest your article *Speedway tournaments* in the December issue of the *Mathematical Gazette*. What you are actually trying to construct are Steiner systems $S(2, 4, r)$—i.e. systems consisting of $\frac{1}{12}r(r-1)$ 4-element subsets of an r-set, such that each pair of elements occur together in exactly one of the subsets.

The requirements $rn = 4h$ and $r - 1 = 3n$ imply that $r \equiv 1$ or 4 (mod 12), so that you get your possible values of r: 4, 13, 16, 25, etc. But I do not know if anyone has ever proved that such Steiner systems exist for all such values of r. The corresponding results for $S(2, 3, r)$—Steiner triple systems—do exist.

Yours sincerely,

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DEAR MR FLETCHER,

Your article in the *Mathematical Gazette* asks for somebody to write to you about the problem of designs of block size 4, any two of the r objects appearing in just one block. This problem has been completely solved by Professor Haim Hanani, sometime Rector of the University of the Negev at Beersheba, and now at the Haifa Institute of Technology. Namely, the condition that r is of the form $12m + 1$ or $12m + 4$ is obviously necessary (to make your parameters n and h come out as integers), and he has proved it sufficient. He gives one set of constructions in "The existence and construction of balanced incomplete block designs", *Annals of Mathematical Statistics* **32**, 361–386 (1961), and a set that he calls "simpler" in "Balanced incomplete block designs and related designs", *Discrete Mathematics* **11**, 255–369 (1975).

He and others have solved the further ("schoolgirl") problem, where $r = 12m + 4$, of arranging the heats in sessions, so that each rider appears just once in each session. You don't say whether speedway is such a tiring activity as to require this, but you incidentally make clear that it is possible when $r = 16$. Reference: Hanani, Ray-Chaudhuri and Wilson, "On resolvable designs", *Discrete Mathematics* **3**, 343–357 (1972).

Yours sincerely,

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Letters were also sent by Dr E. J. F. Primrose, of the University of Leicester, and Mr F. J. Budden, of the Royal Grammar School, Newcastle upon Tyne. Dr Primrose adds the following information: "In his book *Combinatorial theory*, Marshall Hall gives all block designs with $n \leqslant 15$ (his notation is different), so this includes the next four, with $r = 25, 28, 37, 40$. The case $r = 40$ is interesting: contrary to what you say in your final paragraph, this is a finite geometry. The 40 riders correspond to points of the three-dimensional projective geometry over GF(3), and the heats correspond to the 130 lines of the geometry."

University interviews

DEAR EDITOR,

Mr Haworth's letter in the June *Gazette*, about interviews for university places, raises the important question of the effect of the interview on the candidate. The style of interviews varies so much that many candidates, in my experience, are 'on edge' more because of uncertainty about the form that the interview will take than because of doubts about their specialist knowledge. This can hardly be to anyone's advantage.

May I suggest that universities could try to explain in their letter to the candidate how the interview will be conducted? More than this, could they say whom the candidate will meet, who will interview him, and what academic or other interests the interviewers have? Pupils often return to school not knowing to whom they spoke (in their nervousness they may have failed to 'catch' the names, or they may have met several people at the same time) and having been unsure how to frame a response to some questions, not knowing the questioner's speciality.

Yours sincerely,

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Reviews

What is modern mathematics? Pp 39. 70p. 1976. Obtainable (post free) from Yorkshire and Humberside Council for Further Education, Bowling Green Terrace, Leeds LS11 9SX.

This booklet has been written by a working party of the Yorkshire and Humberside Council for Further Education for the use of F.E. colleagues, especially those who use mathematics in teaching technical subjects to craft and technician students. It starts by listing the various factors which have influenced changes in school mathematics in the past fifteen years, and then describing the major projects, making extensive use of the Mathematical Association's report on *Mathematics projects in British secondary schools*. The Joint Matriculation Board's O level Syllabus C is commended, but there is no mention of the similar modern or compromise syllabuses provided by the other GCE boards, or of the CSE syllabuses which many F.E. students will have followed.

The section on the growth of teaching of modern mathematics in schools is based on two reports dealing with the state of affairs in 1971 and 1973–4; it would be interesting to have some more recent information.

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