conclude that the whole of this work requires confirmation.

In *Nature* of May 27, Häggqvist and Bane³ now report a litter including one diploid and two "triploid" rabbits, after a colchicine treatment said to be essentially the same as that used for producing tetraploidy in frogs. This work, again, was achieved without benefit of chromosome counts. One of the "triploid" rabbits was a male with normal sexual instincts, one was a female. Both showed large size. As a criterion for "triploidy", erythrocytes from the two animals were stated to be about 50 per cent larger than in other rabbits. Original data were withheld for future publication, and there was no note of the number of preparations made, nor the mode of calculating volume of erythrocytes. The sperm heads in the male were stated to be about 50 per cent larger than normal. As admitted by Häggqvist and Bane themselves, the disturbed spermatogenesis expected of a triploid was not evidenced by any variation in the size of sperm-heads.

Häggqvist and Bane quote Beatty⁴ (mistakenly quoted as Beatty and Fischberg⁵) for a method of determining heteroploidy by analysis of nucleoli. This work was concerned with the special problem of analysing heteroploidy in non-mitotic cells in which, *ipso facto*, the possibility of counting chromosomes was excluded. We should like to record our opinion that, in all normal circumstances, claims for polyploidy must rest on chromosome counts and not on indirect evidence. Our own work with polyploid mouse embryos is so based⁶⁻⁷, and recently (unpublished) we have identified several triploid $9\frac{1}{2}$ -day mouse embryos (this being exactly half the full gestation period). With rabbits, Häggqvist and Bane state, "In determining the degree of polyploidy, a chromosome count can scarcely be considered in this case". Here, we cannot agree; a chromosome count seems to us to be both essential and practical, being simply a routine matter of examining preparations of skin—or, better, of the cornea of an eye; with the male, a testicular biopsy could be made. We feel that the onus is on Häggqvist and Bane to produce unambiguous evidence in support of their startling claim for triploid adult rabbits. Their claim, if verified, would evidently be of extraordinary interest and importance.

Note added in proof. During the printing of our letter, two further papers have appeared concerning Häggqvist and Bane's rabbits^{8,9}. In one of these papers (Melander⁹) a detailed examination of numerous cell divisions in the "triploid" male shows that the animal is neither triploid nor polyploid, but contains many aneuploid and diploid mitoses. The testes show in addition a number of triploid cell divisions.

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¹ Häggqvist, G., *Proc. Koninkl. Nederl. Akad. Wetensch.*, **21**, 405 (1948).

² Fischberg, M., *Genetica*, **24**, 213 (1948).

³ Häggqvist, G., and Bane, A., *Nature*, **165**, 841 (1950).

⁴ Beatty, R. A., *Nature*, **163**, 644, (1949).

⁵ Beatty, R. A., and Fischberg, M., *Nature*, **163**, 807 (1949).

^{6,7} Fischberg, M., and Beatty, R. A., *9. Jahresbericht der Schweiz. Ges. für Vererbungs-forschung, Arch. der Julius Klaus-Stiftung für Vererbungs-forschung*, **25**, 22¹ and 54² (1950).

⁸ Häggqvist, G., and Bane, A., *Hereditas*, **36**, 329 (1950).

⁹ Melander, Y., *Hereditas*, **36**, 335 (1950).

Nitrification of Amino-Acids

In the reported discussion of the "Nitrogen Cycle in Nature" at the Newcastle meeting of the British Association, reference was made to Prof. J. H. Quastel's observation that "all the amino-acids studied nitrify readily with the striking exception of methionine". The report does not mention cystine in this connexion. In the course of work in progress here, we have in one experiment found cystine to cause marked inhibition of nitrification. The addition of amino-acids such as glycine or glutamic acid to batches of soil resulted in a rapid increase in ammonia, usually within two to four days, after which the ammonia values fell as nitrification proceeded. In the case of cystine, however, deamination was slower, reaching a maximum for ammonia in twenty-eight days, while the nitrate of the soil decreased slowly during the same period. At the end of six weeks, when nitrification of the other amino-acids had reached its maximum, only 10 per cent of the nitrogen in cystine had been nitrified and 75 per cent of it was recovered as ammonia.

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¹ *Nature*, **164**, 812 (1949).

As shown in our earlier paper¹, many amino-acids are nitrified during soil perfusion, at rates comparable with that of an equivalent concentration of ammonium ions; but the rates are dependent on soil conditions. With an acid soil, glycine is nitrified more readily than ammonium chloride or sulphate; with an alkaline soil the rates are about the same. This is due to the fact that the optimal rate of nitrification requires somewhat alkaline conditions (pH 8). Amino-acids, owing to the fact that they do not liberate a mineral acid, apart from nitric, on nitrification, do not depress the pH of soil as much as occurs with ammonium chloride or sulphate. Cysteine, however, is exceptional in giving rise, on oxidation by soil heterotrophs, to sulphuric acid, and the fall of pH of soil due to cysteine oxidation is largely responsible for its depressed rate of nitrification. There appears to be no serious interference with the course of nitrification of ammonium ions by cysteine during soil perfusion, except for a general slowing down due to increasing acidity.

The phenomenon is altogether different from that encountered with the nitrification of *DL*-methionine. This amino-acid is not nitrified at all during a period (about eleven days at 25°C.) when an equivalent concentration of cysteine has undergone about 50 per cent nitrification, and ammonium chloride about 80 per cent. Moreover, whereas the addition of cysteine does not diminish the rate of nitrification of ammonium chloride more than 10 per cent during the first ten days of soil perfusion, the addition of methionine completely suppresses the rate of nitrification of ammonium ions in this period. This highly inhibitory effect of methionine on nitrification is also given by methionine sulphoxide and is unique among the amino-acids so far investigated by us. A study of this phenomenon, and its interpretation, is the subject of a communication which will shortly be sent to press.

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¹ Quastel and Scholefield, *Nature*, **164**, 1068 (1949).