8^{16} was correctly computed in five minutes, 5^{10} in twenty seconds and 6^{10} in seventy seconds.

Division was a slower process and 9 digits divided by 3 took times varying from two and a half to seven and three quarters minutes.

Square roots of 6 digit numbers were extracted in less than a minute while cube roots took longer. Curiously enough, the memorising of a number of 27 digits was not done successfully, although he could repeat questions which had been put to him and their answers after some days had elapsed, and would break off calculations in the middle to ask for milk or cigarettes, taking up the calculations again where he had broken off. His methods of working were not discovered, but he had obviously memorised the squares of two digit numbers, and less completely the products of two digit numbers.

Though the arithmetical powers of this boy were surprising, they were not comparable with those of some of the calculating prodigies described by Rouse Ball in "Mathematical Recreations and Essays".

The boy was a good illustration of cases of arrest of mental development in which normal or even phenomenal mental capacity is observed in certain limited directions such as memory, calculating ability, musical ability, etc. He was so defective in respect to other mental faculties that he was unable to adjust himself to ordinary conditions of life, and became an inmate of the mental hospital.

He died in the hospital at nineteen years of age. The autopsy disclosed that he had a softened patch, probably an old hæmorrhage, in the right occipital region of the brain, about the size of a small hen's egg. A recent hæmorrhage at the same place of the brain was the cause of his death.

H. W. DUDGEON.
H. E. HURST.

Cairo.
Feb. 24.

Determination of Sex

THOSE who are interested in the heredity of sex will be grateful to Prof. MacBride for again exposing in these columns[1] the *naïveté* of some early views of this problem (which he attributes to Morgan). Especially will they be reassured by his conclusion. He points out that sex is essentially the same thing wherever it occurs. He concludes :—"It seems clear that there are fundamentally *opposed* male and female constitutions, but that the constitution of every individual is a mixture of the two, and that the structural manifestations of sex depend on the *proportion* of these constitutions and on which gains the upper hand in development" (italics mine).

This view is somewhat similar to that reached by way of experimental genetics. Thus Goldschmidt, reviewing his experiments since 1910[2], states that "the resulting sex is dependent upon two genetic somethings, one of which shifts sex towards the female, the other towards the male side". Again, Morgan's colleague Bridges[3] says that "both sexes are due to the action of *opposed* sets of genes, one set tending to produce the characters called female, and the other to produce the characters called male. These two sets of genes are not equally effective, for in the complement as a whole the female-tendency genes outweigh the male-tendency genes and the diploid (or triploid) form is a female. When the *relative number* of the female-tendency genes is lowered by the absence of one X, the male-tendency genes outweigh the female and the result is the normal haplo-X male."

Thus, as my italics show, the experimental geneticist seems to agree with what Prof. MacBride has expressed in more generally intelligible language ; not only in admitting the essential sameness of sex in all organisms but also in understanding the function of proportion in its determination in some of them. Unanimity among the different branches of biology has therefore been reached after a long period of divergence, from entirely different data and, what is more, apparently unawares. Such an event, surely, should not be allowed to pass without notice and without applause. The usual view that the chromosome theory of sex determination criticised by MacBride was a special hypothesis put forward by McClung in 1902[4] and therefore not attributable to Morgan, who accepted the hypothesis only in 1911[5], should perhaps also not pass without mention.

C. D. DARLINGTON.

John Innes Horticultural Institution,
London, S.W.19.
March 14.

[1] NATURE, **133**, 359, March 10, 1934.
[2] *Quart. Rev. Biol.*, **6**, 127 ; 1931.
[3] *Amer. Nat.*, **56**, 59 ; 1922.
[4] *Biol. Bull.*, **3**, 43–74 ; 1902.
[5] *Science, N.S.*, **32**, 839 ; 1911.

I AM delighted to find that such a distinguished cytologist as Dr. Darlington "Though a long compass round be fetched" has arrived at somewhat similar conclusions to those to which I myself have been led respecting the nature of sex. I do not, of course, view the 'gene' in the same light as he does, but since in an article shortly to be published in NATURE I have given my views as to the nature of the gene, Dr. Darlington and I need not quarrel about the matter now.

E. W. MACBRIDE.

43, Elm Park Gardens,
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March 17.

Ergine

RECENTLY we showed[1] that the four ergot alkaloids (ergotoxine, ergotinine, ergotamine and ergotaminine) by treatment with alcoholic potassium hydroxide give rise to a crystalline base ergine, which constitutes about half the parent molecule.

We have since proved that ergine is the amide of an acid, $C_{15}H_{15}N_2.COOH$, and further analyses of ergine and its salts show that the formula for ergine requires correction to $C_{16}H_{17}ON_3$ in agreement with the formula for the acid now isolated.

Jacobs and Craig have published a paper[2], in which they have described the action of alkali upon ergotinine and the isolation of a crystalline acid, $C_{16}H_{16}O_2N_2$, which they name lysergic acid. We have no doubt that this is identical with that prepared by ourselves from ergine.

S. SMITH.
G. M. TIMMIS.

Wellcome Chemical Works,
Dartford,
Kent.
March 27.

[1] *J. Chem. Soc.*, 1543 ; 1932.
[2] *J. Biol. Chem.*, **104**, 547 ; 1934.