month the human adrenal gland already contains adrenalin, and beginning with the fifth month it can also be demonstrated more abundantly in Zuckerkandl's body. The noradrenalin content of the human fœtus has scarcely been studied at all. Therefore, we have attempted to make a chemical determination of the noradrenalin and adrenalin in human fœtal adrenals and Zuckerkandl's body at different stages of the intrauterine period.

The series comprised nineteen cases ranging from 230 up to 4,270 gm., in which determinations were performed by the micromethod. In collecting the material, particular consideration was given to its freshness. Noradrenalin and adrenalin were determined in a trichloracetic extract according to v. Euler's and Hamberg's iodine oxidation reaction[2], carrying out oxidation both at pH 4 and 6.

During the last three months of the intrauterine period the total catechols of the adrenals averaged 71 μgm. The corresponding figures for the aortic bodies were 40 μgm. and 11 μgm. respectively. The ratio between the catechols of the aortic bodies and the adrenals remained constant throughout fœtal life. The total catechols of the adrenals and aortic bodies per kgm. of body-weight were somewhat less than the corresponding amount in normal adult adrenals (in cases of sudden death).

A considerable part of the total catechols in the adrenals consisted of noradrenalin; in three-quarters of the cases noradrenalin accounted for more than half, which is notably more than in adult humans. The preponderance of noradrenalin in the aortic bodies was even more pronounced, amounting on an average to five-sixths of the total catechols during the last three months of intrauterine life.

The concentration of catechols in the fœtal adrenals was found to be considerably less than in the adult glands (1 : 50), due to the large cortex characteristic of fœtal life.

No clear correlation could be established between concentrations of catechol in the organs studied and difficulties of labour. Normal amounts of catechol were found even in prolonged asphyxia.

A full account of this work is being published elsewhere[3].

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Spontaneous Parthenogenesis in a Fish

THE guppy, *Lebistes reticulatus*, is a viviparous fish the reproductive physiology of which has been well studied (bibliography in Gordon[1]). A female, *D*9, of English domestic stock of this species born October 5, 1950, was separated from adult males twelve days after birth. The litter of which she was a member were placed in separate jars when thirty-nine days old. The first sign of differentiation of the anal fin into a gonopodium was seen in one of her brothers twelve days later, the family being raised at 20° C. The isolated female, at the age of 216 days, bore a female offspring which died at the age of 304 days. The mother was then mated to a male litter-mate, and bore four litters of at least twenty-six, of which twenty-four were females and one male. The male mated with *D*9 died before the birth of the second litter, consisting of seven females and one male which were separated from each other at the age of four days. One of these females, *DD*20, gave birth to three young at the age of 193 days.

The first example of unexpected births could be explained by fertilization of the female by an adult male during her first twelve days or by an immature brother during the first thirty-nine. The second could only be explained by fertilization of a female aged less than five days by a male of the same age, which, however, showed no sign of gonopodial differentiation until thirty-eight days old. Even if the gonads matured early, it is difficult to see how internal fertilization could have been achieved with an unmodified anal fin. Winge[2], after prolonged experience, states that "males and females should be separated as soon as the sex can be determined, i.e., 2–3 weeks before maturity is reached".

Amateur breeders have described parthenogenesis in fish verbally on several occasions; but do not seem to have published any repetition of their observation under controlled conditions. Considering the ease with which artificial parthenogenesis can be obtained in some vertebrate groups[3], the same phenomenon would be expected to occur spontaneously, and has been reported[4].

(*February* 14, 1953. Three further anomalous litters have been born. All nine fatherless fish old enough for the sex to be recognized are females.)

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Somatic Reduction Division in the Development of the Sea Urchin

IN the sixteen-cell stage of the sea urchin egg, four micromeres occur around the vegetal pole. At the following division, which is delayed in the micromeres[1], these cleave off 'small micromeres', which behave in many respects differently from the rest of the embryo[2]. They do not flatten against their neighbours, appear optically empty in dark-field illumination, and cannot be vitally stained, for example, by nile blue sulphate. In all these respects the small micromeres resemble the polar bodies[2]. This suggests a deeper similarity, namely, that the small micromeres function as 'somatic polar bodies', the division leading to their formation implying a reduction of the chromosome number.

Studies were made of sections of *Paracentrotus lividus* (Lamarck) from Naples. The diploid chromosome number of this species[3] is 36. In three embryos with the micromere division in late telophase to early anaphase, the number was found to be 18. In some embryos with early anaphase stages and the chromosomes in two different sections, the chromosome number of the two groups varied between 17 and 21,