assume that the width of the crack given above represents the average spacing between the adjacent crystallites, we find that the total volume of the cracks is of the same order of magnitude as the volume actually occupied by the perfect crystallites. This is certainly much too high an estimate. But it now becomes not improbable to assume that the total volume of the cracks equals within a few per cent the volume of crystallites. The compressibilities being of the order of 10^{-6} cm.²/kgm., we see that even at pressures of about 10,000 atmospheres the relative change of volume is only a few per cent. Hence, it is not impossible that practically the whole change of the volume is due to the decrease of the size of the cracks.

Hence we see that the measured compressibilities may be considerably larger than those which would be found if we dealt with a perfect crystal. But this means that the exponents of the forces of repulsion between the ions are considerably higher than 9. If this should be confirmed, it would necessitate also a revision of some of the conclusions drawn from previous data. It is perhaps worth noting that J. E. Jones (*Proc. Roy. Soc., A*, vol. 106, pp. 441, 463; 1924; and vol. 107, p. 157; 1925) finds for some gases considerably higher exponents from different considerations.

Since the system of cracks in a real crystal is of prime importance also for a great number of other properties, such as conductivity of dielectrics, optical phenomena (Smekal, *l.c.*), and electrical break-down strength (Rogowski, *l.c.*), it may perhaps be possible to investigate this question by the study of the above-mentioned properties under high pressures.

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The Beta-Hormone.

THE oestrous cycle is but one phase, and the less important phase, of the whole sexual cycle. There are *no* mammals in which the reproductive phase of the cycle (pseudo-pregnancy) does not also occur—either regularly or under given conditions. But there are *some* (the primates) in which no oestrous phase appears, since the whole cycle consists of a pseudo-pregnancy. Pseudo-pregnancy depends upon a hormonal function of the ovary, and is entirely independent of the presence of ova, fertilised or unfertilised, mature or immature (Wiesner, 1927). It becomes necessary, therefore, to decide whether pseudo-pregnancy is caused by the same hormone or hormones as that which invokes the oestrous cycle.

Alpha hormone (oestrin—the cornifying factor) in particular must be tested. But Wiesner has shown that alpha does not produce the typical changes of pseudo-pregnancy. Moreover, an already existing pseudo-pregnancy can be interrupted by injections of alpha.

In an attempt to explain the mechanism of the sexual cycle, the assumption was made that there existed a second ovarian hormone which was required to act in two ways: (a) to prevent alpha causing oestrus (in animals where alpha occurs during the second phase—be it pseudo-pregnancy or pregnancy); (b) to produce the typical changes of pseudo-pregnancy which cannot be produced by alpha.

Recent work done by Wiesner in 1927–28 and by ourselves aimed at the isolation of this hormone or the factors of which it consists. Now we have found that the corpus luteum contains a substance

which can be extracted and causes at least some of the effects ascribed to this hypothetical beta-hormone.

The method of extraction was one of those which were used in the preparation of rho-one (ρ_1)—that particular 'pituitary' hormone which causes oestrus and ovulation in the diphasic animal (Wiesner and Crew, 1928). The simplest method is that of shaking an aqueous suspension of finely divided substance of corpora lutea (cattle) after addition of sulphosalicylic acid (conc. about 15 per cent). A precipitate forms, and filtration leaves a large part of the beta in the liquid; the evaporation of this extract at 56° and the removal of the sulphosalicylic acid from the residue by means of alcohol leaves a water soluble substance the injection of which can produce effects required of beta by the working hypothesis. For it prevents the atrophy of the uterus in ovariectomised mature mice, a phenomenon appearing normally in all castrated animals; the muscular layers of the uterus of the experimental animals showed full development. The epithelial cells are increased in number and size; high epithelial activity prevails. The uterus never appears to be dilated by fluid (as it is after injections of alpha). The vaginal epithelium is *not cornified*, but forms a *layer of high mucous cells*—as in pregnancy or pseudo-pregnancy.

The effects caused by this substance, the beta-factor of the ovarian hormone, permits one to conclude that it is one, if not the factor, which is responsible for the second phase of the sexual cycle (pseudo-pregnancy) in diphasic animals and for its equivalent (premenstruum) in monophasic animals.

Further purification of the extracts and a study of the effects of beta is the object of experiments now in progress; the formation of that particular vaginal epithelium which can be recognised in a small excised piece of the vaginal wall and is characteristic for the second phase is used as the test for the presence of this ovarian hormone, which is the second, but most probably not the last one to be extracted and described.

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Practical Television and its Problems.

THOUGH I see that it is largely taken from a foreword written by so high an authority as Sir Ambrose Fleming, I should like to put on record my strong dissent from a sentence in the review of A. Dinsdale's book "Television," in the supplement to NATURE for Mar. 9. The statement that I object to is: "The great obstacles to radio television to great distances at present are the disturbances caused by fading, Morse signals, atmospherics, and all the other causes which mutilate the broadcasting of speech and music."

On the contrary, as a matter of fact, if the difficulties occasioned by all these troubles were entirely eliminated, there would remain two fundamental, and, so far as present methods are concerned, insuperable difficulties against obtaining really successful practical radio television.

The first, which applies to all television, either by radio or by wire over distances either long or short, is, that with present mechanical methods it is only possible to produce transmitting or receiving apparatus with which the pictures can be divided into numbers of units which, for real success, would have to be multiplied at least by hundreds, if not by thousands.

The second difficulty applies only to television by