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ABSTRACTS OF THE COMMUNICATIONS.

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Cell Division and Cell Regeneration. I. Uronychia transfuga.

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1. Although many experimenters have studied the regenerative power of different kinds of protozoa no one has observed the variations in this power at different age periods after division.

2. *Uronychia transfuga* is a marine hypotrichous ciliated protozoon about 100μ in length. It may be cut in any plane with a fine pointed scalpel and the pieces will live for several days, thus showing a hardiness which makes it a good subject for experimentation.

Under conditions of culture in the laboratory (at Roscoff, France) the cell divides about once in 36 hours, the period between divisions being marked by definite changes in size of the cell and in arrangement of the nuclear elements (macronucleus and micronucleus).

3. Experiments to test the regenerative power were made upon cells immediately after division; on cells from 12 to 18 hours after division; on cells immediately before division; and on cells during division. The cells, in all cases, were cut with a scalpel under a microscope, full records of 75 experiments being kept.

4. If cut immediately after division the fragments continue to live for at least three days, but that fragment alone regenerates which contains macronuclear material and the micronucleus. The other fragment contains a variable amount of macronuclear material but no micronucleus. In two of the thirteen successful experiments on cells in this stage, neither fragment regenerated.

In other cases regeneration of the micronucleus-holding fragment was completed in from twelve to eighteen hours.

5. In cells cut from twelve to eighteen hours after division and after full size is attained, the results are similar to those on cells immediately after division. The micronucleus-holding fragment alone regenerates, the other fragment, containing only macronuclear material lives for several days but fails completely to regenerate. This result was obtained in twelve different cases.

6. If cut just prior to division both fragments regenerate within 24 hours, the one fragment containing only macronuclear material, the other, containing both macronucleus and micronucleus. The latter regenerates more rapidly than the former. One cell regenerates without a micronucleus.

7. If cut during the early stages of division three completely regenerated cells result, one of which (the fragment cut off) contains no micronucleus. Division continues in the original plane, the result being one normal cell and one minute cell perfect in all respects save size. Regeneration of the micronucleus-holding cells is more rapid than that of the third fragment. This result was obtained in fourteen cases.

If the cells are cut during the later phases of division the results are similar to those obtained by cutting immediately after division. One fragment regenerates, the other fails. This result was obtained in seven out of eight experiments on cells in this stage, the other one gave regeneration of both fragments.

8. The experiment shows a considerable variation in the power to regenerate in this form; this power is lowest immediately after division, but it gradually increases with age after division until it reaches a maximum immediately before the next division and during the early phases of division.

During division it decreases to a minimum in the later stages and immediately after division.

9. The results might be interpreted by the assumption of a specific substance, possibly enzymatic in nature, which accumulates with age of the cell until a condition analogous to saturation is reached. With the formation of the new cell-organs this substance, it may further be assumed, is exhausted and regeneration

is impossible save with the full complement of cell organs (macro- and micronucleus and cell protoplasm).

10. Experiments in cutting *Paramecium caudatum* were also made. Here regeneration of the cell does not occur save under exceptional conditions which I shall report at length upon later. A frequent result is the formation of monsters with from two to fourteen mouths; an abnormality due to some derangement of the cellular mechanism through the removal of a small portion of the cytoplasm.

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Iodine as a skin disinfectant in animal surgery.

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In experimental physiology where it is necessary that the animal be allowed to recover after the removal of an organ or the establishment of a lesion, the operative procedure is carried out under full anæsthesia and with aseptic or antispetic precautions as in human surgery. The preliminary disinfection of the skin by scrubbing with soap and water and the subsequent washing with bichloride, carbolic or alcohol, takes considerable time and in most cases must be done after the animal is anæsthetized; besides where the operative field includes the head or face there is always danger of the eyes being accidentally injured by the irritative fluids. Then again, after operation everyone has experienced the difficulty of keeping the dressing properly applied to the wound which must be protected from outside contamination unless the animal be kept in aseptic surroundings—a condition practically impossible in most laboratories. Any method, therefore, which will materially save time and trouble and at the same time not increase the risk is particularly desirable in animal surgery and such a method, I believe, is to be found in the use of iodine as a skin disinfectant.

Iodine was first applied in human surgery about fifty years ago by Bryant[1] and Boinet[2] and recently it has come into vogue

[1] *Brit. Med. Journ.*, 1910, I., p. 1003.

[2] *The Lancet*, 1910, CLXXIX., p. 1888.