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Atrophy does not involve acceleration of tissue enzyme action.

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The thesis that atrophy, such as occurs in normal involutionary tissue absorption, in muscle whose nerve supply has been severed, etc., involves a change either in autolytic enzyme content or in its activation, is not supported by experiments of the writer. It has been shown by him[1] that in the larval frog, where, during metamorphosis extensive atrophy occurs, the histological picture resembles closely those of polymyositis, dermatomyositis, etc., as described by Strümpell, Jacoby, Steiner, et al., and that in the case of this amphibian, there is no acceleration of autolysis *in vivo* nor *in vitro* and where thyroid is used to accelerate metamorphosis, as Gudernatsch first showed, the time of completion of the process is reduced two thirds; even in this case, there is no change in rate of autolysis. In another set of experiments, the left sciatic of a rabbit was cut under asepsis, the wound healing, as far as it was permitted to go, without bacterial interference; after a week, the muscles affected were compared as to power for autolysis *in vitro* after the method of Salkowski and here, again, no acceleration of rate of enzyme action was determined.

I know of but a few citations in biochemical literature to investigations along these lines. All of these[2] seem to bear out the same conclusion. Grund, for instance, in an experiment similar to the one above, found the ratio residual nitrogen to total nitrogen to be less than one, and while residual nitrogen involves more than products of hydrolysis of muscle proteins, yet the point is significant; at least there is no increase in tannic acid non-precipitable nitrogen as one would certainly postulate if autolysis is increased in atrophying muscle.

The hypothesis is advanced that in atrophying tissue some

[1] PROC. this society, 1912 and 1913; *Amer. Journ. Physiol.*, 36, p. 1, 1915; *Journal Biol. Chemistry*, 19, p. 421, 1914.

[2] Rumpf und Schumm, *Deutsch. Zeitschr. für Nervenheilk.*, 20, p. 445; *Deutsch. Arch. für klin. Med.*, 79, p. 158; Grund, *Arch. f. exper. Path. und Pharmak.*, 67, p. 393.

change, perhaps in the permeability of the muscle, or in the blood supply, permits the rapid drainage of products of hydrolysis to take place, thus gradually reducing the tissues in amount. In some cases, phagocytosis, stimulated by a precedent lesion, assists in the process of transfer of materials. In involution of the mammalian uterus, there may be a different factor at work, for it has been shown by Slemons[1] that a rise of total nitrogen in the maternal urine occurs after birth and that this is likewise true if the fetus is removed by Cæsarian section, pointing to a relation to the involution of the uterus and likewise to acceleration of proteoclastic enzymes, for uteri are notoriously slow in autolyzing. Langstem and Neubauer and Ferroni obtained acceleration in uterine involution. The point is at present being studied in this laboratory.

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Note on action of corpus luteum upon the mammary glands.

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Our experiments were made upon virgin rabbits. The corpora lutea of the cow were rubbed up with sterilized water and injected hypodermically every three days for a month. The rabbits were of the same size. Care was taken that no sepsis ensued by the injection. It was found that the mammary glands enlarged to a considerable extent, more than twice the original size. They also contained milk. Upon their removal after death and hardened, sections were made and stained. Under the microscope there was about a ten-fold increase in the number of glands compared with the occasional ones in the virgin rabbit.

[1] *Bull. Johns Hopkins Hosp.*, 25, p. 195, 1914.