the originally *distal* end of the stem, regardless as to whether the distal or proximal end of the stem had been directed centrifugally or centripetally in the experiment and regardless of the fact, that as in the higher speeds, the contents of the perisarc tube were compressed into the end of this tube which was directed centrifugally in rotation. This compression varied with the centrifugal force involved, but at the higher speeds, the contents which filled the tube for a distance of four centimeters, would be compressed, in the experiment, into a space measuring about five millimeters. When regeneration took place, the red pigment which marks the future hydranth pole could be seen collecting in the compressed protoplasm and gradually it migrated up the tube of perisarc until it reached the end of this tube, whereupon the tentacles and other parts of the normal hydranth appeared.

That the red pigment has no rôle as a "formative stuff" has already been shown by Morgan according to evidence derived from another method of approaching the point and the present set of observations appears to show that if any stratification of "formative stuffs" occurs in the normal stem of the hydroid, whereby hydranth forming stuffs and stolon forming material are relegated to their respective ends of the stem, these stuffs are not responsive to the action of centrifugal force in the degrees used in the experiments or else they become rearranged when the centrifugal action has ceased. The generalization may be made that polarity in *Tubularia crocea* cannot be altered by the action of centrifugal force, in shifting "organbildende Bezirke" from one end of the hydroid stem to the other.

17 (542)

## Creatin and creatinine metabolism during convalescence after typhoid fever.

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On account of the apparently intimate connection between "muscle efficiency" and the output of creatinine in human urine

it seemed of some moment to investigate the creatin and creatinine excretion during convalescence from acute febrile disease. Patients convalescent from typhoid fever were selected because during the course of this disease there is considerable loss of muscle tissue, and on that account if creatin or creatinine take part in the synthetic processes of muscle regeneration, their utilization for this purpose might be more easily detected than in conditions where the metabolism is less active. Young adults and children were used exclusively, since it is reasonable to suppose that in such subjects anabolism occurs at its height.

The diet in all cases consisted of milk, eggs and cereals exclusively.

The following tables are compiled from the records of analyses which were made during two weeks of convalescence in each of these cases.

From these tables it may be noted that when creatinine is ingested under the conditions of these experiments a large part of the material is recovered in the urine, but there is always a loss which remains to be accounted for. When creatin is fed it can not be recovered as creatin in the urine, unless the patient is on a diet very rich in protein and the amounts of administered creatin are large. A slight increase in creatinine excretion which at times follows the ingestion of creatin is too small to warrant any conclusion.

The occasional presence of creatin in the urine of these patients is not to be explained by any observation made clinically. All of the patients were without fever during the convalescence and relapses occurred in no instance. The presence of even traces of creatin in urine under these circumstances is of interest in its bearing upon the earlier observations of Munk.[1]

[1] *Deutsch. Klinik*, 1862, p. 300.

Case I. (Weight 50 K.)

| Day of Observation. | Amount of Urine, c.c. | Total N, gm. | Creatinine, gm. | Creatin, gm. | Remarks. Amount Fed.[1] |
|---|---|---|---|---|---|
| 1 | 1,820 | 9.12 | 0.910 | | |
| 2 | 1,450 | 8.96 | 0.838 | | |
| 3 | 1,150 | 8.26 | 0.810 (average 0.853 gm.) | | |
| 4 | 1,400 | 7.09 | 0.994 | | 0.47 gm. creatinine |
| 5 | 1,930 | 8.84 | 0.965 | | |
| 6 | 1,480 | 9.89 | 0.915 | | (recovered 0.3 gm.) |
| | | | Case II. (Weight 28.6 K.) | | |
| 1 | 850 | 4.70 | 0.456 | | |
| 2 | 1,430 | 9.35 | 0.448 | | |
| 3 | 1,770 | 12.72 | 0.478 | | |
| 4 | 1,490 | 7.99 | 0.440 (average 0.455 gm.) | | |
| 5 | 1,730 | 12.27 | 1.073 | | 0.94 gm. creatinine |
| 6 | 1,910 | 11.52 | 0.439 | | (recovered 0.62 gm.) |
| | | | Case III. (Weight 60 K.) | | |
| 1 | 1,150 | 10.99 | 0.831 | 0.005 | |
| 2 | 2,020 | 10.72 | 0.997 (average 0.914 gm.) | 0.004 | |
| 3 | 1,100+ | 9.74+ | 0.781+ | 0.006 | |
| 4 | 1,720 | 11.15 | 1.734 | none | 1.639 gm. creatinine. |
| 5 | 1,710 | 10.12 | 0.968 | 0.058 | (recovered 0.82 gm.) |
| | | | Case IV. (Weight 28.1 K.) | | |
| 1 | 1,000 | 6.63 | 0.250 | 0.105 | |
| 2 | 1,150 | 6.53 | 0.220 | 0.125 | |
| 3 | 1,010 | 8.63 | 0.287 (average 0.252 gm.) | 0.063 | |
| 4 | 1,000 | 8.09 | 0.310 | 0.074 | .3 gm. creatin. |
| | | | Case V. (Weight 45.9 K.) | | |
| 1 | 1,305 | 3.27 | 0.741 | —— | |
| 2 | 1,120 | 9.01 | 0.605 | —— | |
| 3 | 1,790 | 4.00 | 0.895 | 0.004 | |
| 4 | 1,410 | 10.41 | 0.635 (average 0.719 gm.) | 0.036 | |
| 5 | 1,105 | 8.34 | 0.500 | 0.046 | 0.66 gm. creatin. |
| 6 | 1,220 | 9.70 | 0.588 | 0.010 | |
| | | | Case VI. (Weight 59.5 K.) | | |
| 1 | 1,260 | 9.88 | 0.788 | —— | |
| 2 | 1,650 | 12.56 | 0.765 (average 0.776 gm.) | —— | |
| 3 | 1,700 | 10.01 | 0.935 | 0.018 | 1.31 gm. creatin. |
| 4 | 1,720 | 10.41 | 0.989 | 0.017 | |
| 5 | 1,430 | 11.29 | 0.667 | —— | |
| | | | Case VII. (Weight 40 K.) | | |
| 1 | 1,300 | 32.57 | 0.438 | 0.065 | |
| 2 | 580 | 25.23 | 0.451 | 0.109 | |
| 3 | 1,370 | 34.94 | 0.444 (average 0.444 gm.) | 0.107 | |
| 4 | 1,410 | 32.99 | 0.524 | 1.411 | 3 gm. creatin. |
| 5 | 840 | 26.46 | 0.616 | 0.338 | |

[1]The amounts of creatin and creatinine given were computed from the weight of substance on the basis of quantitative estimation by Folin's method.