experiment with "Jimmy." The Philadelphia Zoological Garden, until a few months ago, neither had the facilities nor adequately trained observers nor, for that matter, any interest, to follow the physiological and behavioral changes that took place during the last years of "Jimmy's" life. And thus, from the viewpoint of a psycho-biologist, this very interesting and valuable subject passed away without enriching our knowledge. At present, under the leadership of the new director, Dr. R. Macdonald, steps are being taken to use the animals of the garden as something more than mere exhibits. It will, however, take some time to obtain and organize a sufficiently competent staff to carry out his plans.

"Jimmy" did not wait.

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SELENIUM IN NATIVE RANGE PLANTS OCCURRING ON SOILS DERIVED FROM PERMIAN OR TRIASSIC (?) SEDIMENTS

SELENIFEROUS vegetation in Wyoming is, as has been pointed out before,[1] confined primarily to geological formations of Cretaceous and Eocene age. The Sundance formation, which is of Jurassic age, yields no seleniferous vegetation, at least from type sections examined so far.

During the past summer the Department of Research Chemistry of the University of Wyoming observed several hundred acres of seleniferous woody aster and narrow-leafed vetch growing upon red soils derived from the Chugwater formation in central Albany County, Wyoming. The Chugwater is in whole or in part of Permian or Triassic (?) age. Further inspection supplemented by chemical analyses brought out the fact that two horizons in the Chugwater formation were capable of supporting toxic seleniferous vegetation, one a sandstone member near the middle of the Chugwater formation and the other a limy sandstone in the basal portion of the Chugwater. The basal portion of the Chugwater in this locality is believed to be the stratigraphical equivalent of the "Embar" of central Wyoming. Of the two sandstone members it was found that the middle member carried considerably more selenium than the basal member. One sample from the middle sandstone member gave 10 parts per million of selenium. The average of a composite sample was found to be 2.4 parts per million.

The mere presence of selenium in rocks and soils of any geological formation has economic significance, in so far as native range plants are concerned, only when it becomes absorbed in quantities to be toxic. Finding seleniferous range plants in certain sandstones of Permian and Triassic (?) ages greatly enlarges the scope of the selenium problem.

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[1] O. A. Beath and co-authors, *Jour. Amer. Pharm. Assoc.*, 23: 2, February, 1934.

SOCIAL BEHAVIOR OF THE NORMAL AND CASTRATED LIZARD, ANOLIS CAROLINENSIS

EXPERIMENT reveals for the first time in any reptile species the presence of a true social hierarchy which differs in many respects from that of fowls. Nineteen males of *Anolis carolinensis,* ranging in weight from 7.5 grams to 3.9 grams, were found to arrange themselves in a series of dominance ranking which was closely correlated with weight. The largest males stood at the higher end of the scale (group I), the smallest at the lower end (group III), while those intermediate in size stood intermediate in the scale of dominance (group II).

Eight males in Group I ranked high in dominance with an average weight of 6.12 grams, five males in Group II ranked intermediate with an average weight of 4.96 grams, while the six males in Group III ranked low in dominance and their average weight was 4.73 grams.

Ninety-eight combats between males were carefully observed and recorded in detail. The males of Group I and II fought six encounters each, while those of Group III fought an average of three combats each.

The urge to acquire and to hold a certain restricted territory against other males was very marked. The resident male (one that had been in a particular cage for 24 hours or more) won 90 combats, but only eight fights were won by the non-resident (one introduced into the cage less than 30 minutes previous to the encounter).

This urge to hold territory was the more striking, since 38 encounters out of the total of 90 were won by resident males that weighed less than their opponents. The evidence indicates that resident males fight more viciously and more persistently than non-resident males.

The fighting pattern was found to consist of a chain of reflexes which, in a typical combat, at least, were expressed in almost an unvaried temporal sequence. Eight of these reflexes were expressed overtly, making it fairly easy to study the pattern objectively.

This fighting pattern has also been observed in castrated males and females but less in normal females. It is, therefore, inferred that the ovarian hormonal complex inhibits fighting reflexes in normal females.

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