

and less compact than the metaphase spindle. One can see the underlying yolk granules through it whereas this is impossible in metaphase. These facts suggest that there is a streaming of the interfibrillar substance—the matrix between the rigid fibres—towards the centrospheres and that the movement of the chromosomes is somehow connected with the currents thus produced.

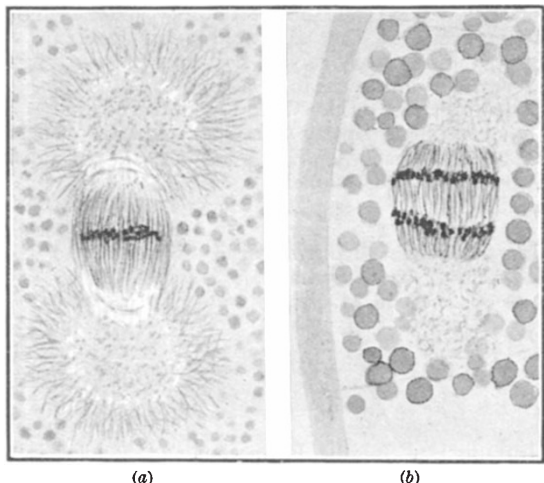


FIG. 1 (a). Early metaphase of the first cleavage division in a diploid parthenogenetic *Artemia*. Intranuclear formation of the spindle. $\times 590$.
(b) Anaphase of a late cleavage division in a polyploid parthenogenetic *Artemia*. The centrospheres are here weakly developed as compared with the first cleavage. Note that the polar regions are denser than the space between the two sets of chromosomes. $\times 1,320$.

As soon as the chromosomes reach the ends of the spindle, they lose their regular arrangement in planes and form more or less spherical clumps. This is consistent with the assumption that the rigid fibres act as supporting structures and at the same time separate the chromosomes from each other. The spindle remnant is always to be seen in telophase. It is noteworthy that in the first cleavage division the chromosomes, after leaving the spindle and assuming the clumped telophase arrangement, may continue their movement towards the centrospheres.

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¹ *Z. wiss. Zool.*, **142**; 1932.

The Discovery of *Acanthinula harpa*, Say, in Central Siberia

In the course of a study of the molluscan fauna of Siberia, carried out under the auspices of the Smithsonian Institution during 1932 and 1933, a point has come to light which appears to merit special notice. This concerns the discovery of the gastropod mollusc, *Acanthinula harpa*, Say, in central Siberia. This species has long been known to occur in Europe, North America, and the eastern fringe of Asia (Kamchatka, etc.), and its apparent absence from the central part of Siberia led Dall¹ to believe that migration into that territory had been delayed by a transgression of the sea, or of glacial ice, over at least a part of this region.

The collection of *A. harpa* in three different localities in the central part of this region, namely, near the River Ket (to the north of Tomsk) at a point situated two hundred and ten kilometres above the River Ob; on the western shore of Lake Baikal, in the vicinity of the village of Listvinichnoye; and on the eastern shore of the same lake, twenty-five kilometres north-east of the mouth of the River Selenga, indicates that this is a circumboreal species, and obviates the need, on these grounds, of the hypothesis noted above.

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¹ Dall, W. H., "Land and Freshwater Mollusks". Harriman Alaska Expedition, **13**, New York, 1905.

Activities of Life and the Second Law of Thermodynamics

I AM at one with Profs. Donnan and Guggenheim in hoping that this discussion will end soon, but ask leave to explain why I think that their supposed paradox¹ is merely a third mare's nest.

It is a well-known, and indeed obvious, fact that entropy has different values according as it is measured with reference to atoms or molecules or other units. Profs. Donnan and Guggenheim have re-discovered this, hail it as a paradox, and claim that because this paradox exists my arguments must be unsound. As well might they rediscover the 'paradox' that temperature has different values according as it is measured on the Centigrade and Fahrenheit scale, and try to use this as ammunition against anyone who mentions temperature.

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¹ NATURE, **133**, 869, June 9, 1934.

Crocodiles or Alligators

PROF. RITCHIE need have no fear that the name *Crocodylus* for the crocodiles in general will be replaced in future by *Champsia*¹. It was unfortunate that Dr. Werner's blunder should have appeared in so authoritative a work as "Das Tierreich" but it was at once corrected by Dr. Stejneger in *Copeia*, No. 3, p. 117, Oct. 1933. The type of *Crocodylus*, both by absolute tautonymy and by subsequent designation, is *niloticus*—the *Lacerta crocodylus* of Linnæus (in part).

¹ NATURE, **133**, 835, June 2, 1934.

MALCOLM SMITH.

Constitution of Astacin

ASTACIN, the pigment of the lobster and of other crustaceans, is a derivative of β -carotene, that is, 5, 6, 5', 6'-tetraketo- β -carotene or 4, 5, 4', 5'-tetraketo- β -carotene. It forms a dioxime, $C_{40}H_{48}O_2 = (NOH)_2$, which besides the two oxime groups also contains two enolic hydroxyl groups. On heating with *o*-phenylenediamine, astacin gives a di-phenazine derivative, $C_{52}H_{56}N_4$. It is therefore a new type of carotene derivative.

Chemical Institute,
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June 2.

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L. LOEWE.