

in PP, but obviously lower at all stages. This is because the development of this species proceeds more slowly (see the Table of BALTZER in section I). There are considerable variations in the incorporation rate of the hybrid PS. Nevertheless, the data available indicate clearly that its RNA turnover is greatly reduced compared to both parental species. As with DNA content, this is detectable even in the blastula stage (see Figure 3 in CHEN, BALTZER, and ZELLER⁸). Similar to AP the inhibition of RNA activity is again less pronounced than that of DNA synthesis (68% instead of 50% of PP).

From the results described above the following conclusions can be drawn: (1) During normal development there is an increase in the metabolic activity of RNA, even though its total quantity remains fairly constant. In all three sea urchin species there is a striking similarity in the pattern of RNA turnover and that of DNA synthesis. (2) For the hybrid combinations there is a definite reduction in the metabolic activity of RNA in contrast to its total content which has been shown to be as normal as the maternal controls. In PA it decreases gradually at the maintenance period, and in AP and PS it is lower than that in both parental species at all stages. It should be mentioned that DNA synthesis in these hybrids is also inhibited to various degrees. Therefore, in both cases, normal as well as hybrid development, there is a close relation between RNA turnover and DNA synthesis.

Results of various investigations into RNA turnover in growing cells have demonstrated that there is probably little or no degradation and resynthesis of cellular RNA (for references see BERG²⁴). On the other hand, as already mentioned, recent work suggests that new synthesis of messenger RNA occurs in the sea urchin blastulae¹⁷⁻¹⁹, or still earlier²⁰. Since the messenger RNA is unstable and occurs only in small quantities compared to the bulk of ribosomal RNA (see MIRSKY²⁵), it would be hardly detectable by the straight chemical determination of total RNA. The sensitive isotopic technique appears more adequate to disclose such changes, as has been shown in the present study. Unfortunately, we have no information as to what extent the synthesis of messenger RNA

or other macromolecular compounds was involved in the incorporation process studied by us. Our data also do not allow us to decide whether the labelled adenine was incorporated into nuclear or cytoplasmic RNA. According to MARKMAN¹⁶, this precursor is mainly incorporated into the nuclei, but it is likewise possible that there are exchange reactions of RNA in the cytoplasm²⁶⁻²⁸, especially at the mesenchyme blastula and gastrula stages. The latter possibility has to be considered in view of the results obtained for the hybrid combinations AP and PS, whose relative rate of isotope incorporation, as already mentioned, is higher than their DNA synthesis.

Zusammenfassung. (1) Es wurde bei den Seeigelarten *Paracentrotus* ♀♂, *Arbacia* ♀♂ und *Sphaerechinus* ♀♂ sowie den drei Bastarden *Par* ♀ × *Arb* ♂, *Arb* ♀ × *Par* ♂ und *Par* ♀ × *Sphaer* ♂ für eine Reihe von Entwicklungsstadien die Anzahl der Kerne pro Keim bestimmt (Tabelle). Der morphogenetischen Hemmung der Bastarde entsprechen herabgesetzte Kernzahlen und parallel eine Herabsetzung der DNS-Synthese. (2) Es wurde bei den genannten reinen Arten und den Bastarden der Umsatz der RNS bestimmt. Er geht in allen Fällen, bei den reinen Arten wie bei den Bastarden, der DNS-Synthese parallel.

P. S. CHEN and F. BALTZER

Zoologisches Institut der Universität Zürich and
Zoologisches Institut der Universität Bern
(Switzerland), December 21, 1963.

²⁴ P. BERG, Ann. Rev. Biochem. 30, 293 (1961).

²⁵ A. E. MIRSKY, Naturwissenschaften 50, 277 (1963).

²⁶ L. I. HECHT, P. C. ZAMECNIK, M. L. STEPHENSON, and J. F. SCOTT, J. biol. Chem. 233, 954 (1958).

²⁷ L. I. HECHT, M. L. STEPHENSON, and P. C. ZAMECNIK, Proc. Nat. Acad. Sci. 45, 505 (1959).

²⁸ E. S. CANELLAKIS and E. HERBERT, Proc. Nat. Acad. Sci. 46, 170 (1960).

CONGRESSUS

Czechoslovakia

G. J. MENDEL Memorial Symposium 1865-1965

Brno/Brünn, August 1965

At the beginning of August 1965, a G. J. MENDEL Memorial Symposium will be held in Brno/Brünn, Czechoslovakia, under the patronage of the Czechoslovakian Academy of Sciences. Two days will be reserved for scientific lectures, and two days for visiting the Mendel Institutes.

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Committee of Organization: Professor Dr. B. NĚMEC.
Secretariate: Dr. M. SOSNA, Na cvičišti 2, Prague (Czechoslovakia).

Switzerland

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European Biological Section of the International
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Registrations and titles of papers with abstracts of about one typed page, double spaced, should be sent by September 1st, 1964 to the Secretary of the Symposium, Institute of Experimental Gerontology, Nonnenweg 7, Basel (Switzerland).

Prof. F. BOURLIÈRE,
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