No detectable removal of previously fixed radiocalcium occurs after treatment with $NaHCO_3$ or Na_2CO_3.

No removal of U occurs when sections are treated with 0·025 N solutions of sodium chloride or sodium phosphate.

(8) Nearly all (e.g., from 95% to 98%) the U fixed to sections of whole bone can be removed by glycol-ashing or microincineration at 700°C. About 70% of the U fixed to previously glycol-ashed sections can be removed by further glycol-ashing.

(9) The U is removed almost entirely from sections of whole bone by decalcification with HNO_3 1:1,000.

(10) A remarkable amount of U gets fixed to decalcified sections of bone, e.g., from 60% to 80% of the U which is bound to notdecalcified control sections. The distribution of U is uniform in recent and old structures in decalcified bone. The greater part of the U thus fixed can be removed by the use of HNO_3 (1:1,000 × 20′)

Fixation of U also takes place in strips of the fibrous layer of periosteum peeled off from bone compacta. The treatment for 20′ with HNO_3 1:1,000 greatly reduces the *alpha* activity of these pieces.

In *conclusion*, U and Ca^{45} show much the same distribution patterns in sections of bone treated *in vitro* with solutions of these elements. The results obtained with the use of U under some conditions (see experiments reported at 7, 9, 10) are, however, apparently different from the results of similar experiments made with radiocalcium[1]. Such differences seem to indicate that the fixation of the two cations to bone ground substance *in vitro* may not obey the same rules.

R. Amprino

Institute of Anatomy, University of Turin, March 15, 1953.

Résumé

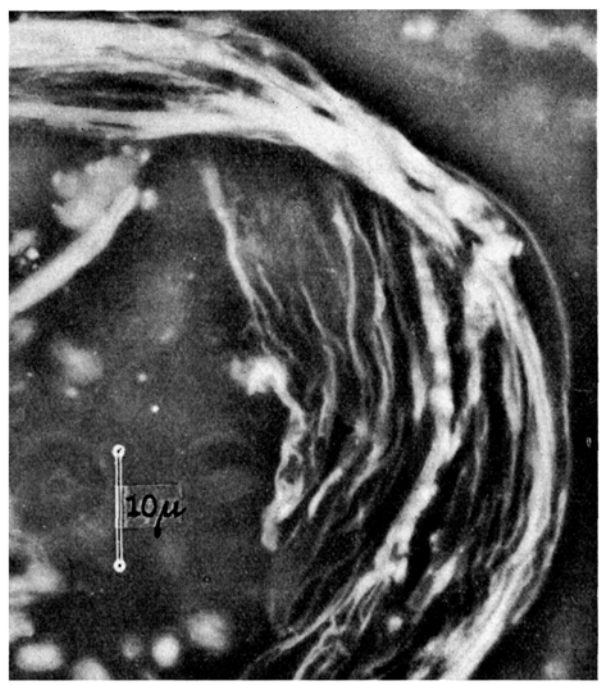
L'auteur a étudié par la méthode autoradiographique la fixation *in vitro* de l'uranium à la substance fondamentale du tissu osseux. Des coupes minces d'os compact total frais ou fixé, d'os minéralisé et d'os décalcifié ont été soumises à l'action de faibles solutions d'uranium. Les résultats de cette recherche sont comparés à ceux que l'auteur avait obtenus précédemment par l'emploi du radiocalcium et du radiophosphore.

La distribution de l'U est qualitativement identique à celle du Ca^{45} et du P^{32}: c'est-à-dire qu'une quantité plus importante d'U se fixe par unité de volume de substance osseuse aux parties moins calcifiées, récemment formées. D'autre part, on a observé des différences assez considérables entre la fixation du Ca^{45} et de l'U; en particulier, ce dernier se fixe *in vitro* non seulement aux cristaux minéraux, mais aussi aux composants organiques de la matrice osseuse.

[1] For the fixation of Ca^{45}, *cf.* R. Amprino, Exper. *8*, 380 (1952).

Membrane Structures in Mucus

In fresh untreated specimens of mucus from the human pharynx and nasal cavity, in saliva, expectorations and gastric contents, and in secretions of the isolated duodenal pouch of a dog, extremely thin membranous structures are regularly seen by the microscope method of the author[1]. Some of these may cover an area of up to several millimeters. Twisted packets of membrane, seemingly identical with Curschmann spirals, are frequently observed in normal expectorations. Sometimes these untwist and unfold into curtain-like formations. Whether the membranes are formed by alteration of the mucus surface or by direct secretion is uncertain. In any case, their influence on the permeability of mucus is obvious.



A typical membrane formation from pharyngeal mucus.

A. Wilska

Institute of Physiology, University of Helsinki, March 15, 1953.

Zusammenfassung

Im Schleim verschiedener Herkunft sind ausserordentlich dünne Membranbildungen mit der lichtmikroskopischen Kontrastmethode des Autors zu beobachten.

[1] A. Wilska, Nature *171*, 353 (1953).

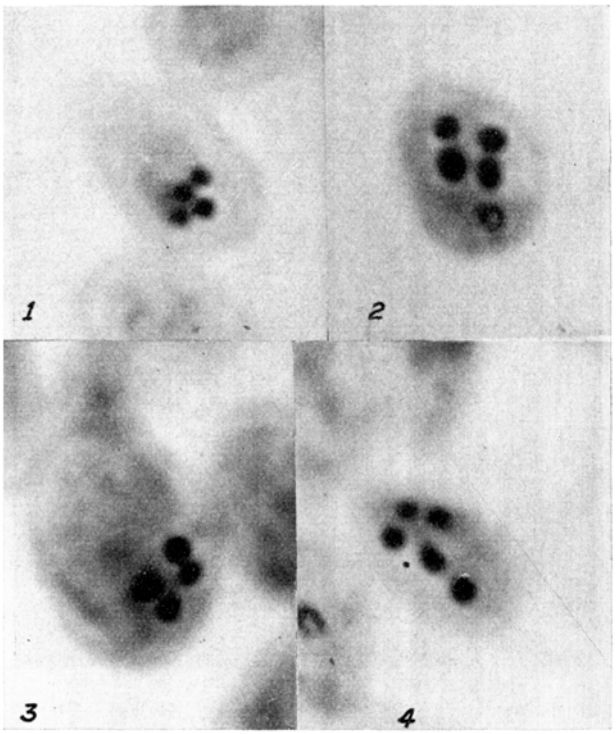
Extra Reproduction of a Chromosome in Yeast

In spite of the lack of unanimity of opinion regarding the time of reproduction of chromosomes, there appears to be justification for the belief that multiple chromonemata are present at various stages of mitosis[1]. It is remarkable that a chromosome which is compound even at the microscopic level "splits" exactly and separates at anaphase into two and only two daughter chromosomes. It may, occasionally, split into three instead of two chromatids as reported by Huskins[2]. What appears to be a similar but rare phenomenon was observed by us in two strains of diploid yeast.

Normal mitosis of our two chromosome control brewery yeast as seen in Feulgen preparations has already been described elsewhere[3]. Figure 1 illustrates an early anaphase showing two pairs of chromosomes. When one

[1] B. P. Kaufmann, Bot. Rev. *14*, 57 (1948).
[2] C. L. Huskins, Amer. Nat. *81*, 401 (1947).
[3] S. Duraiswami and M. K. Subramaniam, Exper. *7*, 422 (1951).

of the chromosomes splits into three instead of two, the early anaphase configuration is that presented in Figure 2. Two such instances alone were noticed in the slides of the control strain.



Longest diameter of Cell.
Fig. 1.—4·0μ. Fig. 2.—3·2μ. Fig. 3.—4·0μ. Fig. 4.—3·2μ.

Recently, investigations on the cytology of an unmodified diploid isolated after exposure of the two chromosome control yeast to camphor for 90 days led to the location of a few cells showing the identical aberration thus confirming the reality of the phenomenon. Figure 3 is an early anaphase and Figure 4 shows five instead of four daughter chromosomes at a comparable stage.

While the completion of the process of budding would ordinarily produce a pair of cells of identical chromosome constitution, those in which an extra splitting of one of the chromosomes has taken place would result in two cells, one with the normal complement of chromosomes and the other with three. Although late ana- and post-anaphases showing such a segregation have not been located up till now, cells having three chromosomes have occasionally been met with in the preparations. Since the diploid chromosome number is two, cells with three chromosomes have to be considered triploid. Stable triploids have not been isolated so far.

The occurrence of triploids as a result of mitotic aberrations[1] during division of a tetraploid has already been reported. That they can also arise in a diploid by an extra splitting of one of the two chromosomes is suggested by the evidence presented here.

While the triploids observed by us are unstable even during early vegetative divisions, there are claims of isolation of stable triploids[1] by mating haploid with diploid spores. The origin of triploids as a result of mitotic aberrations in diploids as well as tetraploids emphasizes the need for confirming genetic investigations on yeasts with cytological observations.

S. DURAISWAMI, S. K. SREEPATHI RAO and M. K. SUBRAMANIAM

Cytogenetics Laboratory, Department of Biochemistry, Indian Institute of Science, Bangalore-3, April 1, 1953.

Résumé

La division d'un chromosome en trois chromatides, au lieu de deux, est décrite et figurée dans deux lignées de levures diploïdes ($2N = 2$). Il est montré que les levures triploïdes peuvent résulter d'aberrations mitotiques.

[1] B. RANGANATHAN and M. K. SUBRAMANIAM, Proc. Nat. Inst. Sci. India. *14*, 389 (1948); J. Ind. Inst. Sci. *34*, 235 (1952). – M. K. SUBRAMANIAM, Proc. Ind. Acad. Sci. [B] *37*, 27(1953).

[1] C. LINDEGREN and G. LINDEGREN, J. Gen. Microbiol. *5*, 885 (1951). – S. POMPER, Nature *170*, 892 (1952).

Über Seeigelmerogone

Etwa 3000 unbefruchteten Eiern von *Sphaerechinus granularis* wurde eine kleine Plasmakappe, die den Kern enthielt, abgeschnitten und die entkernten Eier mit *Psammechinus microtuberculatus* bzw. *Paracentrotus lividus* besamt (heterosperme Merogone). In etwa der Hälfte der Fälle erfolgte Befruchtung und Furchung.

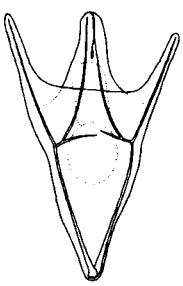


Abb. 1. 8 Tage alter Pluteus von *Paracentrotus lividus* (Vergrösserung 150:1).

Die überwiegende Menge der Keime entwickelte sich nicht über das Blastula- bzw. frühe Gastrulastadium hinaus. In einigen wenigen Fällen schritt die Gastrulation weiter vor, und es wurden kleine Skelettdreistrahler oder grössere, unregelmässig geformte Skelettstücke gebildet. Kontrollfixierungen im 2- und 4-Zellenstadium ergaben haploide Chromosomenzahl.

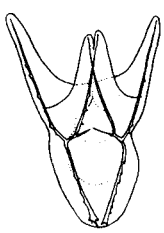


Abb. 2. 8 Tage alter Merogon von Sphaerechinus-granularis-Plasma und Paracentrotus-lividus-Kern (Vergrösserung 150:1).

2 Merogone der Kombination Sphärechinusplasma und Psammechinuskern sowie 13 Merogone der Kombination Sphärechinusplasma und Paracentrotuskern konnten bis zu schönen Pluteis mit 4 wohlausgebildeten Fortsätzen herangezüchtet werden. Die Larven nahmen