Zusammenfassung. Der «negative Pasteureffekt» in *Brettanomyces*-Hefen kann durch O_2, Gärprodukte der Hefen, Diäthyläther, Aldehyde, Ketone und andere Carbonylverbindungen, sowie durch DPN beseitigt werden.

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Die Wirkung von Hybridenwein auf die Leber

Unter Hybridenwein versteht man das Gärungsprodukt des Traubensaftes von Kreuzungen aus europäischen, sogenannten Edelreben und resistenten amerikanischen Reben. Mehrere Autoren (PAGES, LÉOBARDY, BREIDER et al.) behaupten, dass nach Genuss solcher Weine bei gesunden Organismen Leberschädigungen auftreten würden. Diese Frage ist aber aus manchen Gründen noch keineswegs abgeklärt. Über die Wirkung von Äthanol auf eine vorgeschädigte Leber liegen bereits zahlreiche Untersuchungen vor (Übersicht KLIEWE[4]). Da aber noch unbekannt ist, ob und warum Leberschäden nach Trinken von Hybridenwein auftreten können, wurde unter anderem zunächst untersucht, ob eine durch Allylalkohol vorgeschädigte Leber im Vergleich zu Äthanol und Edelwein durch Hybridenwein unterschiedlich ungünstig beeinflusst wird.

Weisse männliche Ratten in den engen Gewichtsgrenzen von 145–155 g erhielten 3 Tage lang das hochwertige Standardfutter «Altromin», am Tag vor Versuchsbeginn Gerste. Unmittelbar vor dem Versuch wurden sie nach dem Gewicht aussortiert. Alle Lösungen verabreichten wir mit der Schlundsonde. Jedes Tier erhielt 2 ml der zu testenden Lösung (Kontrolle: Wasser). 1 h danach wurden 0,6 ml eines frisch hergestellten, 3,5%igen Allylalkohols («Merck») appliziert. Danach blieben die Tiere 10 h lang ohne Futter und Flüssigkeit; nach weiteren 38 h wurden sie nach Kopfschlag und Entbluten – jeweils ein Kollektiv einzeitig – aufgearbeitet.

In geringer Abweichung von den Angaben von EGER[5] wurde die Oberfläche der gesamten Leber (Ober- und Unterseite) sowie die der nekrotischen Stellen nach flächenhafter Projektion ohne Berücksichtigung der Lappenwölbungen planimetrisch erfasst und der prozentuale Anteil der Nekroseflächen an der Gesamtoberfläche zur statistischen Auswertung herangezogen.

Als Testlösungen dienten ein weisser Hybridenwein von einer FS_4-Hybride (Äthanol nach der ADH-Methode = 12,79 Vol.%, Invertzucker = 2,6 g/l, freie SO_2 = 49 mg/l), ein Edelwein (Siebeldinger Mönchspfad, Äthanol nach der ADH-Methode = 11,65 Vol.%, Invertzucker = 1,7 g/l und freie SO_2 = 50 mg/l. Zucker- und Alkoholgehalt wurden an den Hybridenwein angeglichen. Zur Kontrolle diente unvergälltes Äthanol (12,79 Vol.%) und Wasser (Ergebnisse siehe Tab. I und II).

Daraus ist zu ersehen, dass der Allylalkoholschaden der Leber durch Äthanol, Edelwein und Hybridenwein bei gleichem Volumen und gleichem Alkoholgehalt in dieser Reihenfolge zunehmend verstärkt wird. Dieser Befund ist mit einer hohen Wahrscheinlichkeit statistisch gesichert. Der Versuch mit Äthanol allein bestätigt gleichzeitig die Ergebnisse von EGER[5].

Summary. Experiments on rats revealed that liver damage caused by allyl alcohol (measured by the rate of necrosis) is enhanced by alcoholic beverages such as ethanol and European or hybride wine. In this respect, wine seems to cause more damage than mere alcohol.

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Hygiene-Institut der Universität Mainz, 19. Oktober 1960.

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[2] J. DE LÉOBARDY, Bull. Office int. Vin *269*, 3 (1953).
[3] H. BREIDER, G. REUTHER und E. WOLF, Der Züchter *29*, 317 (1959).
[4] H. KLIEWE, Ärztl. Praxis *19*, 671 (1959).
[5] W. EGER, Medicina exp. *1*, 84 (1959); Virchow's Archiv *328*, 536 (1956); Arzneimittelforsch. *10*, 601 (1957).

Tab. I. Der Einfluss alkoholischer Getränke auf den Allylalkoholschaden der Leber

Testlösung	*n*	Mittlere Nekroserate in %	s. d.
Allylalkohol allein	9	27,5	± 5,6
Äthanol	9	38,3	± 3,4
Edelwein	7	50,9	± 7,5
Hybridenwein	9	78,1	± 13,7

Tab. II. Statistische Vergleiche

Vergleich der Versuchsgruppen	*t*	*P*
Allylalkohol: Äthanol	5,070	< 0,001
Allylalkohol: Edelwein	7,228	< 0,001
Allylalkohol: Hybridenwein	10,257	< 0,001
Äthanol: Edelwein	4,628	< 0,01 (> 0,001)
Äthanol: Hybridenwein	8,487	< 0,001
Edelwein: Hybridenwein	4,666	< 0,01 (> 0,001)

The Blood Flow of the Cerebral Cortex Determined by Radioactive Krypton^{85}

A quantitative method for the determination of regional blood flow in the brain has been developed by KETY et al.[1]. The method was based upon measurement of the incorporation rate of an inert radioactive gas, and the technique required decapitation of the experimental animal. Hence only one measurement per tissue could be made in each animal. The method described below is a modification of the method of KETY et al.[1] in which tissue sampling has been replaced by external counting over the exposed surface of the brain, enabling multiple measurements of the blood flow in the same area of the cerebral cortex to be carried out.

The radioactive inert gas used was krypton^{85} (Kr^{85}) which emits practically only low energy β-radiation. Saline equilibrated with Kr^{85} was injected into one common carotid artery in a cat under light nembutal anesthesia. A gyrus of the parietal cortex of the same side was exposed by a small craniotomy and resection of the dura.

[1] S. S. KETY, W. M. LANDAU, W. H. FREYGANG, L. P. ROWLAND, and L. SOKOLOFF, Fed. Proc. *14*, 85 (1955).

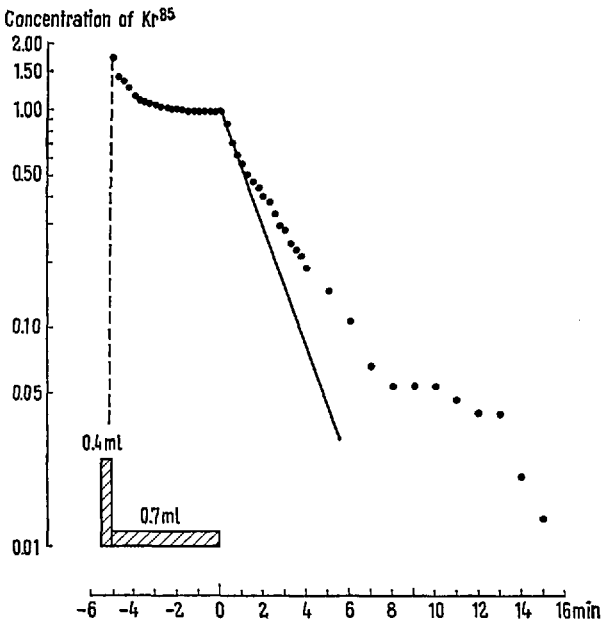
The exposed pial surface was covered with a 0.01 mm thick sheet of 'Mylar' (Dupont), a relatively gas-tight polyesther film. The sheet was fitted to the opening in the dura so that no air bubbles and only a minimal fluid layer remained between the sheet and the brain. A small end-window Geiger-Müller tube (General Electric type MD. 4. H., or Philips 18745) was mounted 0.5 mm above the 'Mylar' sheet. A lead-shield was employed so that a cortical area of a diameter of 6.5 mm was recorded from. A gentle stream of air was continuously replacing the air between the GM-tube and the 'mylar' sheet. The GM-tube was coupled to an ECKO ratemeter (type n 522. B) with the time constant set at 1 sec and the signal was recorded by an ink-writing recorder (SPEEDOMAX, time constant 1 sec).

The intracarotid injection of the saline containing Kr^{85} was made through a thin polyethylene cannula inserted into the cut lingual artery. A continuous infusion pump was used and about 0.5 ml of the saline was injected during the first $^1/_2$ min followed by about 0.5 ml in the next 5 min. Then the injection was abruptly stopped. The counting rate over the brain at the end of the injection was usually about 4000–5000 min. By interposing a layer of aluminum foil, it was calculated that about 90% of the emissions recorded originated from a tissue layer of 0.6 mm. Practically complete clearance of Kr^{85} from the cortex was obtained in 15–20 min. Injection into a peripheral vein did not cause a significant rise above cortical background radioactivity. Thus the curve recorded was only determined by the Kr^{85} taken up by the cortex during the intracarotid injection and by the subsequent outwash by arterial blood containing insignificant amounts of recirculating Kr^{85}. A semilogarithmic plot of the recorded curve was made after correction for background radioactivity. It was assumed that all the tissue compartments counted from had the same blood/brain partition coefficient of 0.9 for Kr^{85} as determined for the cortex as a whole by LASSEN[2]. Assuming also that the various tissue compartments had the same concentration of Kr^{85} at the end of the injection, it can be shown that the average blood flow of these compartments in ml/g/min is equal to the numerical value of the product of the blood/brain partition coefficient and the exponential coefficient of a monoexponential curve fitted to the initial part of the desaturation curve (Fig.).

The blood flow of the parietal cortex of the cat was found to vary considerably depending on the experimental situation studied, especially the respiration of the animal was important. Values ranging between 0.4 and 1.6 ml/g/min were recorded. This is in agreement, as to order of magnitude, with the results of KETY et al.[3]. Repeated measurements of cortical blood flow in the same animal and under the same conditions demonstrated that the coefficient of variation of the random experimental error does not exceed 8%.

The present technique reveals that even so small a cortical tissue block as that counted from in these studies consists of components differing with respect to clearance rate of Kr^{85}. This is evident from the consistent deviation of the desaturation curve from the monoexponential curve expected in a homogeneous system. This observation necessitated the use of a stepwise injection of Kr^{85} as described above in order to obtain approximately the same Kr^{85} concentration in all tissue compartments at the end of the injection. When applying the method to an experimental situation differing from that of the present studies, the duration and the relative injection speeds may have to be changed somewhat in order to approximate most closely to this condition.

With due consideration to the slope of the Kr^{85} clearance curve in a control study changes of the slope may be taken to indicate variations in perfusion. The method has also been used in a continuous fashion by continuously infusing the isotope over $^1/_2$–1 h. The level of the resulting cortical radioactivity is inversely related to blood flow, and calibration of the curve can be made by the above described discontinuous clearance method.



Krypton^{85} concentration in the cerebral cortex of a cat. The blood flow is calculated as 0.9 times the numerical value of the exponential coefficient of the monoexponential curve fitted to the initial part of the desaturation curve (the straight line on the Figure).

Zusammenfassung. Der radioaktive indifferente Luftbestandteil Krypton^{85} (in Ringer-Flüssigkeit) wird in die Arteria carotis communis injiziert und die Radioaktivität über der freigelegten Gehirnoberfläche verfolgt. Die Methode ergibt reproduzierbare quantitative *corticale* Perfusionswerte und eignet sich auch für andere Gewebe.

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Laboratory of clinical Neurophysiology, University of Lund (Sweden), October 17, 1960.

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STUDIORUM PROGRESSUS

Molecular Mechanism on the Energy Transfer and Conversion in the Photosynthetic System

This paper describes an attempt to develop a physical model for the transfer and conversion of the excitation energy in the photosynthetic system. According to the recent experimental results[1] on the system, it must be

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