is more likely to reach and stimulate these cells to melanoma production than chemical carcinogens. Recent studies by LANCASTER[4,5] have drawn attention to the relatively high incidence of malignant melanoma on the exposed part of the body and in geographical locations with more sunlight hours. These studies suggest that solar radiation is a factor in the production of malignant melanomas in man. This however does not exclude the possibility that in some instances chemical carcinogens may be responsible for malignant melanoma production, for there is no reason to suppose that the melanocyte at the dermo-epidermal junction is totally inaccessible to chemical carcinogens, or refractory to such stimulation.

The factors responsible for converting the melanocytes in the skin or the naevus of man into a malignant melanoma are as yet not precisely established but the collective evidence now indicates that endogenous factors such as genetic[6-8] and hormonal[9], and extrinsic factors such as ultraviolet radiations[4,5] and chemical carcinogens may all be involved. It remains for future research to establish the relative importance of these factors in the production of malignant melanomas in man.

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Zusammenfassung

Die Bedeutung von Erb- und Hormonalfaktoren bei der Entwicklung des malignen Melanomes wurde vor allem früher hervorgehoben. Es scheint, dass auch karzinogene Stoffe (Chemikalien) und ultraviolette Bestrahlung von wesentlicher Bedeutung sind.

Change of Threshold During Dark Adaptation Measured with Orange and Blue Light in Cats and Rabbits

Recently the change of threshold during dark adaptation has been measured in cats and rabbits by determining the light energy necessary for a constant electroretinographic response after light adaptation with strong and moderate lights (DODT and ELENIUS[1]). Two phases were found in the dark adaptation curves obtained after strong light adaptation, the break occurring on an average after 15 min in the dark in cats and 40 min in rabbits. The electroretinographic dark adaptation curves of cats and rabbits show two phases of change of threshold, and resemble the course of sensory dark adaptation measured in the human peripheral retina, where the initial part of the curve is usually ascribed to the cones and the second part to the rods. In agreement with this theory, KOHLRAUSCH[2] showed that the break in the adaptation curve of the human peripheral retina occurred later and the total change of threshold was smaller if measurements were made with lights of long wavelengths than if they were made with white light or lights of short wavelengths. This effect of the test wavelength on the shape of dark adaptation curve has since been confirmed by using the microelectrode technique in the frog eye (GRANIT[3]) and in the cat (GRANIT[4]; BARLOW, FITZHUGH, and KUFFLER[5]).

The aim of the present experiments was to see if there is a similar change of spectral sensitivity during dark adaptation in the electroretinographically measured dark adaptation curves of cats and rabbits. This problem has become particularly interesting as it has been shown that in cats the maximum of spectral sensitivity (measured electroretinographically) is at 556 mμ when flicker stimulation at high rates (above 30/s) and strong stimuli are used; whereas in rabbits, under the same conditions, the spectral sensitivity curve closely follows the rhodopsin absorption curve (DODT and WALTHER[6]).

In 3 cats and 4 pigmented rabbits the change of threshold during dark adaptation has been measured with white light (Xenon arc) and with orange and blue light (narrow band double interference filters, λ_{max} 605 and 462 mμ). The cats were decerebrated or anesthetized with Evipan. The rabbits were anesthetized with Urethane. Flaxedil was given to all anesthetized animals and they were artificially respirated. The light used for light adaptation and the test light both illuminated the same area (3 cm in diameter) of an opal glass disc placed 15 mm in front of the eye, except in one cat and one rabbit where both beams were focused in the dilated pupil in order to make light adaptation as effective as possible and to facilitate the measurement with colored test lights in the beginning of dark adaptation. The duration of light adaptation was 15 min in all experiments.

Typical results are illustrated in Figure 1 (cat) and Figure 2 (rabbit). Figure 1 shows that in the cat the 'cone phases' of the dark adaptation curves measured with orange light (open triangles) and blue light (open squares) are clearly separated (the curves are made to coincide in full dark adaptation = zero ordinate). This

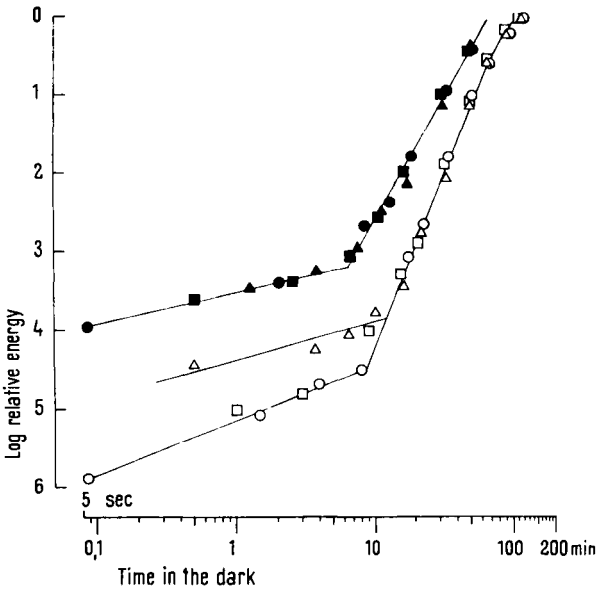

Fig. 1. Cat, Evipan anesthesia, Flaxedil and artificial respiration, pupil dilated with Homatropine and Veritol (Knoll) drops. Dark adaptation curves plotted in log relative energy at threshold (energy necessary for an electroretinogram of constant size, 10 μV b-wave) against log time in the dark. The curves are made to coincide at the threshold preliminary measured in fully (3 h) dark adapted eye. Test light: white (circles), 462 mμ (squares) and 605 mμ (triangles). Light adaptation: white light, duration 15 min, retinal illumination in first light adaptation about 1.05×10^6 Trolands (open symbols), in second light adaptation 0·6 log units weaker light (filled symbols)

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[4] R. GRANIT, Acta physiol. scand. *7*, 216 (1944).

[5] H. B. BARLOW, R. FITZHUGH, and S. W. KUFFLER, J. Physiol. *137*, 327 (1957).

[6] E. DODT and J. B. WALTHER, Exper. *14*, 142 (1958); Pflüg. Arch. *266*, 175 (1958).

result was found in all cats examined. In Figure 1 the difference of the thresholds for 462 and 605 mμ is about 0·8 log units at 1 min in the dark. This difference then becomes gradually slightly smaller until, after the break in the curve at about 10 min in the dark, the relative sensitivities for 462 and 605 mμ are practically the same as in the dark adapted state. As calculated from the relative spectral sensitivity measured with fast flicker and with single flash stimulation, the total Purkinje shift in the electroretinographic response of the cat corresponds to a difference in change of relative energy for 462 and 605 mμ of about 1.6 log units (DODT and WALTHER[6]). Therefore, the separation of dark adaptation curves of Figure 1 by only 0.8 log units does not correspond to a total Purkinje shift and suggests that there is visual purple activity already before the break in the curve. This view is supported by the experiments where the cat's eye was light adapted with 0.6 log units weaker light. In this case, there was no separation of the 'cone phases' of the dark adaptation curves (Fig. 1, filled symbols). In rabbits, this type of result was found in all animals examined. As illustrated in Figure 2, the break in the rabbit's dark adaptation curve appears later than in the cat.

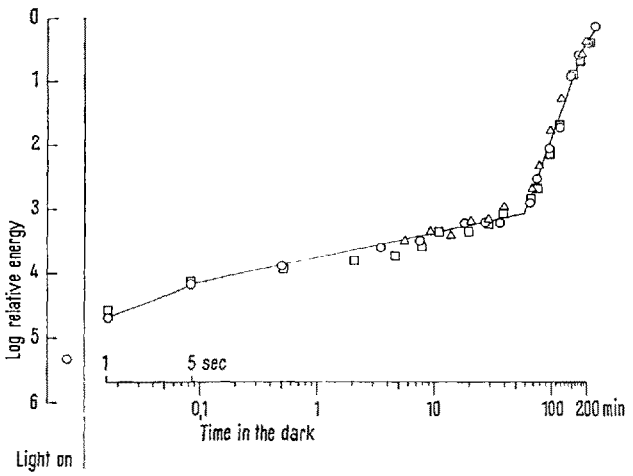

Fig. 2. Rabbit, Urethane anesthesia, Flaxedil and artificial respiration, pupil dilated with Homatropine and Veritol drops. Dark adaptation curve plotted as in Figure 1 but using 25 μV b-wave as a constant index. Preliminary dark adaptation for 4 h. Light adaptation (white light, duration 15 min, retinal illumination about 7.5×10^5 Trolands). Test light: white (circles), 462 mμ (squares) and 605 mμ (triangles)

It must be concluded *either* that the so-called 'cone phase' in the electroretinographic dark-adaptation curve of the cat and rabbit is not mainly due to cones, *or* that in both these species the electroretinographic spectral sensitivity curve can be almost the same when determined by cones as when determined by rods.

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Zusammenfassung

Bei Kaninchen und Katzen wird während Dunkeladaptation die für schwellennahe Antworten konstantei Amplitude im Elektroretinogramm notwendige Lichtenergie bestimmt. Nach Helladaptation (15 min, Reizschwelle am Ende der Helladaptation 10^{-5} bis 10^{-6} der Dunkelkontrolle) zeigt sich in der Dunkeladaptationskurve ein Knick ähnlich dem, der beim Menschen den Übergang der Zapfen- zur Stäbchenadaptation anzeigt. Beim Kaninchen sind die für 462 und 605 mμ gemessenen Reizschwellen vor und nach dem Knick mit den im dunkeladaptierten Zustand erhaltenen Werten identisch. Unter gleichen Bedingungen wird bei der Katze bis zum Knick eine Purkyně-Verschiebung gesehen, jedoch fehlt diese nach Helladaptation an ein schwächeres Licht, während der Knick nachweisbar bleibt.

pH-Dependant Action of NaCl on Isolated Guinea Pig's Ileum

NaCl solutions added to small strips of guinea pig's ileum, isolated in an oxygenated Tyrode bath at 36°C, elicit quite opposite reactions depending on the acid or alkaline pH.

At pH values $\geq$ 8·0, the administration of small volumes of a 10% solution (in Tyrode) of NaCl (final concentration: $2 \times 10^{-3} - 1 \times 10^{-2}$) is followed by a reversible contracture; by adding graded quantities of NaCl solution, it is possible to obtain a 'characteristic curve' for NaCl; a plot of 1/concentration against 1/effect[1] for NaCl is given in Figure 1.

At pH values $\simeq$ 5·3, the introduction of NaCl solution (in Tyrode at the same pH) in the bath does not elicit any contracture; on the contrary, NaCl decreases the effects of well known stimulants such as acetylcholine and histamine. By using the same transformation as in Figure 1, it is possible to demonstrate that the antagonism of NaCl is competitive against both acetylcholine and histamine: actually in presence of NaCl the straight lines describing the action of the agonist show an increased slope with identical intercept (Fig. 2 and 3).

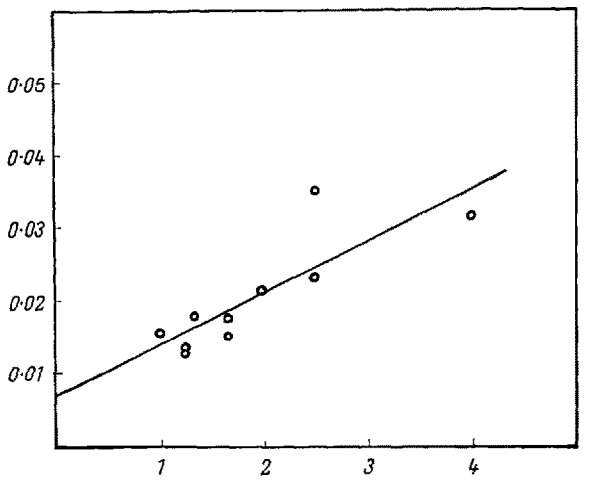

Fig. 1. Action of NaCl at pH = 8,1. – Ordinate: y = 1/effect (height of contraction, in mm); abscissa: x = 1/concentration $\times 10^2$.
Formula: $y = 0{\cdot}00658 + 0{\cdot}007236\,x$. $r = +0{\cdot}83153$.
$0{\cdot}001 < P(n=8) < 0{\cdot}01$

[1] H. LINEWEAVER and D. BURK, J. Amer. chem. Soc. *56*, 658 (1934).