Wasserstoff bewirkte dagegen eine schwache Erhöhung der Aktivität gegenüber HCT. Diese Wirkungserhöhung dürfte auf einer Hemmung des Abbaus, vermutlich durch Aminopeptidasen beruhen. Daraufhin deutet auch, dass beide Präparate, [Bmp[1]]- und [N$^{\alpha}$-Acetyl-Cys[1]]-HCT leicht verlängerte Wirkung besitzen.

Interessanterweise zeigen alle Präparate, auch die am schwächsten wirksamen, Dosis-Wirkungskurven die praktisch parallel zu derjenigen von HCT verlaufen. Wir schliessen daraus, dass alle Präparate eine gleiche, spezifische und direkte Wirkung ausüben, wie HCT selbst. Bei der Applikation hoher Dosen wenig aktiver Präparate sind unspezifische oder indirekte Wirkung, z.B. durch Verdrängung endogenen, gewebsgebundenen Hormons, nicht von vornherein auszuschliessen.

Unsere Resultate zeigen, dass beim HCT, im Gegensatz etwa zu Gastrin, Parathormon oder ACTH, nicht ein begrenzter Teil (aktives Zentrum) der Peptidsequenz zur Auslösung der Wirkung genügt. Offenbar ist dazu praktisch die gesamte Peptidkette notwendig. SCHWYZER[10] hat diesen Wirkstofftyp als «rhegnylogisch» bezeichnet. Diese Bezeichnung bedeutet, dass im betreffenden Peptid die zur Stimulation des Rezeptors notwendigen Bereiche getrennt sind und durch weniger wichtige Sequenzbereiche unterbrochen werden. Nach dieser Vorstellung müssten in einem solchen Peptidwirkstoff die Wirkbereiche durch eine relativ starre, vorgegebene räumliche Struktur in die richtigen sterischen Verhältnisse gezwungen werden. Auf Grund einer Analyse biologischer und immunochemischer Befunde haben BYFIELD et al.[11] für HCT eine bevorzugte Konformation vorgeschlagen. Darin soll das Carboxylende des Moleküls durch nichtkovalente Bindungskräfte auf den N-terminalen, cyclischen Bereich zurückgefaltet sein. Allerdings hat eine Studie mittels hochauflösender magnetischer Kernresonanzspektroskopie[12] keine Hinweise auf eine solche bevorzugte Struktur in Lösung für HCT ergeben. Diese Resultate stehen aber nicht unbedingt im Widerspruch zu denen von BYFIELD et al.[11], da die bevorzugte Konformation dem Peptidhormon erst beim Zusammentreffen mit Antikörper- oder Rezeptormolekülen aufgezwungen werden könnte.

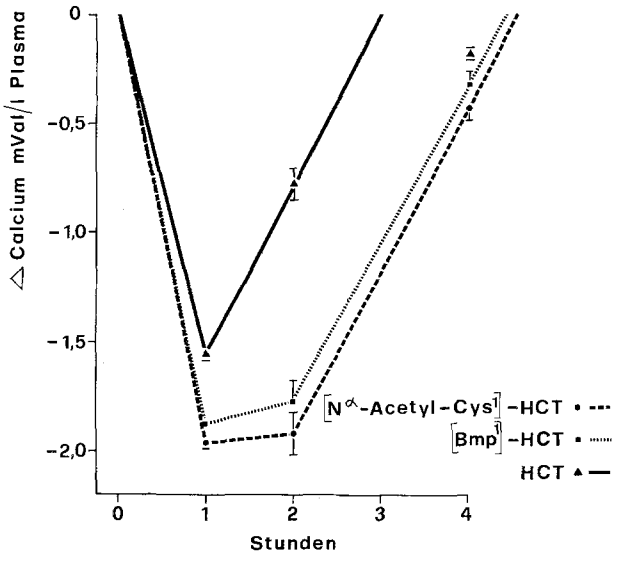

Fig. 2. Dauer der hypocalcaemischen Wirkung von [Bmp[1]]- und [Nα-Acetyl-Cys[1]]-HCT im Vergleich mit HCT (30 μg/kg s.c.). Jeder Punkt repräsentiert die Messwerte von 10 Tieren (± Standardfehler).

Die hier beobachteten Struktur-Wirkungsbeziehungen beim HCT zeigen eine überraschende Parallelität zu denen des chemisch ähnlich gebauten Hormons Oxytocin (als Übersicht vgl.[13]). Auch dort zeigen C-terminal verkürzte oder offenkettige Derivate starken Wirkungsabfall, anderseits besitzt auch Deaminooxytoxin eine etwas erhöhte Wirkung gegenüber dem unveränderten Hormon. Offenbar deuten diese sehr ähnlichen Struktur-Wirkungsbeziehungen von HCT und Oxytocin auf ein ähnliches metabolisches Verhalten beider Hormone in der Ratte.

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Epilepsy in Women. Oestrogen and Progesterone Plasma Levels[1]

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Summary. Comparison is made between numbers of fits and estrogen, progesterone plasma values during the menstrual cycle of women with epilepsy. All six cycles in women with ovulation had a significant positive correlation between estrogen/progesterone ratio and scores of fits. Three periods without ovulation all showed a significant correlation to estrogen variations.

It has long been known that in certain women suffering from epilepsy, the severity of fits varies with the menstrual cycle[2,3]. Therefore, a possible relationship to hormone levels has been suspected. In order to test this possibility we have measured oestrogen and progesterone on alternate days, in 7 women over 9 menstrual cycles, using a radioimmunoassay analysis. Of these women, 3 had cycles that were anovulatory and without a progesterone peak. The ovulatory cycles all showed a clearly significant correlation between oestrogen/progesterone ratio and the scores of fits based on the number of fits and the severity of fits, i.e. more severe fits were scored higher than less severe fits ($r = 0.52$, $p < 0.025$; $r = 0.64$,

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Comparison of 10 days of high E/P ratio to 10 days with low E/P ratio

Patient	Severity of fits		Number of days free from more severe fits	
	Follicular phase	Luteal phase	Follicular phase	Luteal phase
GA	99	46	1	2
EL	125	14	6	9
IW I	58	39	3	7
IW II	56	16	5	10
BA	34.5	1.5	8	10
RO	70	24	5	10
Mean ± SE	73.8 ± 13.4	23.4 ± 6.8	4.7 ± 1.3	8.0 ± 1.0
Student's paired *t*-test	$p < 0.01$		$p < 0.005$	

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$p < 0.005$; $r = 0.48$, $p < 0.05$; $r = 0.69$, $p < 0.005$; $r = 0.76$, $p < 0.005$). There was a corresponding correlation to oestrogen levels $r = 0.53$, $p < 0.025$; $r = 0.67$, $p < 0.001$; $r = 0.86$, $p < 0.0005$) in the anovulatory cases. A comparison between 10 days with high oestrogen/progesterone (E/P) ratios during the follicular phase, and low oestrogen/progesterone ratios during the luteal phase showed that the severity of fits was significantly higher during the follicular phase than during the luteal phase (see Table) ($p < 0.01$). Correspondingly, a clearly significant lower frequency of days free from more severe fits (secondary generalized convulsions in EL, IW, BA and RO. GA loses her muscular tension and falls down) was observed during the follicular phase ($p < 0.005$) (see Table). This is in agreement with LAIDLOW's[3] demonstration that fits are mildest during the luteal phase, and the oestrogen effect of a lowered electroshock threshold in rats[4] and the induction of Grand Mal by treatment of epileptic patients with oestrogen[5].

Juvenile Hormone Titers in Penultimate and Last Instar Larvae of *Pieris brassicae* and *Barathra brassicae*, in Relation to the Effect of Juvenoid Application

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Summary. JH titer was determined in the haemolymph of penultimate and last instar larvae of *Pieris brassicae* L. and *Barathra brassicae* L. The differences we observed were consistent with physiological differences between the two species.

Differentiation processes resulting in the metamorphosis of insects are commonly considered as direct consequences of a lowered juvenile hormone (JH) titer. Data on JH titers are surprizingly scarce, despite their importance for the understanding of physiological processes[4,5]. Until recently, appropriate chemical micro-analytical methods were not available and JH titers were determined by means of bioassay and expressed in terms of JH activity per unit volume. Even at present when gaschromatography, high pressure liquid chromatography and radioimmunoassay offer new and more selective methods for titer determinations, a relatively simple extraction procedure coupled with a highly sensitive bioassay cannot yet be considered an obsolete method. We admit that a JH titer determined in samples from the total blood may represent merely an average value and the effective titers near the target tissues probably differ from it to a certain extent. Nevertheless, the actual titer changes in the course of insect development are presumably of much greater extent than such titer variations within the insect body.

In the present investigations we have determined JH titers in penultimate and last instar larvae of two lepidopterous species exhibiting different sensitivities to JH analogues.

Material and methods. Larvae of the cabbage white butterfly, *Pieris brassicae* L. were fed on cabbage plants, those of the cabbage army worm, *Barathra brassicae* L. (= *Mamestra brassicae*) on an artificial medium originally for *Ostrinia nubilalis*[6]. Both species were reared at 25 °C under long-day conditions (18/6 h L/D). Under these circumstances, in *Pieris* the length of the 4th instar (incl. ecdysis) amounted to 40–46 h, that of the 5th (last) instar to 4.5–4.8 days. In *Barathra* the 5th larval instar lasted 72–80 h (incl. ecdysis), the 6th (last) instar 8.5–9 days.

Haemolymph samples of 150–450 µl volume were collected from CO_2-narcotized larvae of known age by clipping off one of the first abdominal prolegs with fine scissors. According to the size of the animals, each sample was derived from different numbers of caterpillars which were sampled simultaneously: 3–20 specimens in *Pieris*, 3–12 specimens in *Barathra*. In different age groups, 2–10 parallel haemolymph samples were taken. The extraction procedure, as well as the application of the *Galleria*-assay in examining the samples, was described earlier in detail[7,8]. Some minor modifications in methods were introduced.

JH titers were expressed in GU/ml haemolymph. One *Galleria* Unit (GU) indicates the amount of juvenile hormone activity (contained in 1 mg of the olive oil-paraffin wax mixture) applied in each test which causes

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