

These results confirm the findings of Follett and Heller² that, besides vasotocin, lungfish glands contain an oxytocic principle different from that of bony fishes and similar to that of amphibians. They show, however, that the pharmacological spectrum of this oxytocic hormone (or mixture of oxytocic hormones) in the Amphibia and Dipnoi investigated differs from that of mammalian oxytocin. The occurrence of yet another neurohypophysial hormone, in addition to the five already identified, may thus have to be envisaged.

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Anti-coccidial Activity of Halogenonitrobenzamides

In the course of a search for new anti-coccidial compounds we have prepared and examined the prophylactic activity of a number of halogenonitrobenzamides against *Eimeria tenella*.

The compounds, mixed in the food at 0.01 or 0.02 per cent w/w, were fed to young chicks for 8 days, starting one day before inoculation with sporulated oocysts. The criteria of activity were comparisons of deaths, blood in the droppings, and caecal lesions.

Several compounds showed good prophylactic activity in these preliminary tests (Table 1), but after more detailed examination (Table 2) one of these, 2-chloro-4-nitrobenzamide¹ ('M and B 5921'), was selected for further investigation both alone and in association with sulphaquinoxaline. In particular, a mixture composed of 3 parts 'M and B 5921' and 2 parts sulphaquinoxaline showed good activity against experimental *E. tenella*, *E. necatrix* and

Table 1. PROPHYLACTIC ACTIVITY AGAINST *Eimeria tenella*

Halogen and position	Position of NO ₂	CONR ₁ R ₂		Per cent in food	Relative activity
		R ₁	R ₂		
2-Cl ('M and B 5921')	4	H	H	0.01	+++
2-Cl	4	CH ₃	H	0.02	+
2-Cl	4	C ₂ H ₅	H	0.02	+++
2-Cl	4	nC ₃ H ₇	H	0.02	+
2-Cl	4	isoC ₃ H ₇	H	0.02	+
2-Cl	4	nC ₄ H ₉	H	0.02	0
2-Cl	4	CH ₃	CH ₃	0.02	+
2-Cl	4	C ₂ H ₅	C ₂ H ₅	0.02	+++
2-Br	4	H	H	0.01	++
2-Br	4	CH ₃	H	0.01	++
2-Br	4	C ₂ H ₅	H	0.02	+++
2-Br	4	CH ₃	CH ₃	0.01	++
3-Cl ('M and B 5888')	5	H	H	0.01	+++
3-Br	5	H	H	0.01	++
3-Br	5	CH ₃	H	0.02	+++
3-I ('M and B 5889')	5	H	H	0.01	++
Reference compound—nitrofurazone				0.01	+++

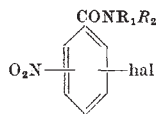


Table 2. COMPARATIVE PROPHYLACTIC ACTIVITY AGAINST *E. tenella* IN CHICKS

Expt. No.	'M and B' No. or name	Per cent in food	Survivors in treated groups		<i>E.D.</i> ₅₀ ‡ as per cent drug	Survivors in untreated controls	
			Proportion*	Corrected (per cent)†			
1	5888 §	0.025	5/5	100	0.007	5/15	
		0.0125	9/10	85			
		0.006	4/9	17			
		0.003	1/5	20			
		0.025	15/15	100			
	5889 ¶	0.0125	14/15	90	0.01		
		0.006	5/15	0			
		0.0125	15/15	100			
		0.006	11/14	68			
		0.003	4/10	10			
5921	Nitro-furazone	0.02	10/10	100	0.007		
		0.01	14/15	90			
		0.005	4/10	10			
		0.025	20/20	100			
		0.0125	17/20	73			
2 and 3 ¶	5888	0.025	20/20	100	0.01	9/20	
		0.0125	17/20	73			
		0.006	11/20	18			
		0.0125	20/20	100			
		0.006	18/20	82			
	5921	Nitro-furazone	0.003	5/20	0	0.005	
			0.01	20/20	100		
			0.005	17/20	73		
			0.0025	11/20	18		
			0.005	17/20	73		

Medication from 1 day before until 7 days after infection when results were determined.

- * Numerator=No. of survivors; denominator=No. of chicks infected.
† By Abbott's formula (ref. 5).
‡ Dose which saved 50 per cent of chicks obtained graphically using de Beer's method.
§ 'M and B 5888' = 3-chloro-5-nitrobenzamide.
¶ 'M and B 5889' = 3-iodo-5-nitrobenzamide.
|| Results of two comparative tests added together.

E. acervulina infections when fed at 0.02 per cent w/w. The nitrobenzamide appeared to be less effective than sulphaquinoxaline against *E. acervulina*, but more effective against the other two species.

The mixture affected the development of the second generation schizonts of *E. tenella* and inhibited the early developmental stages of *E. acervulina*.

Detailed comparisons of activity against different laboratory strains of *E. tenella* have shown interesting variations.

The halogenonitrobenzamides are analogous to the active dinitrobenzamides^{2,3} in which one nitro-group has been replaced by halogen. Hepworth⁴ similarly found that replacement of one of the nitro-groups in 4,4'-dinitrocarbanilide by halogen gave a compound which retained anti-coccidial activity.

A full account of the biological investigations will be submitted for publication in due course.

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PATHOLOGY

Calcification in the Intervertebral Disk

THE human intervertebral disk is a structure in which degenerative changes are very common, often appearing as early as the third decade. Consequently it is not surprising that foci of calcification are frequently found in the intervertebral disks of apparently normal subjects. However, little information is available on the exact nature of the mineral phases and the possible significance that these may bear in relation to the underlying changes in the matrix. At present X-ray diffraction is the most sensitive method for identification of the various calcium compounds which can occur in the body.