Transvaalin was isolated from *U. burkei* (Transvaal slangkop) in approximately 0·01 per cent yield by shaking out concentrated aqueous extracts of the bulb with chloroform–alcohol (10 : 1). The glycoside was retrieved from the chloroform–alcohol shake by washing with water. The water extract was evaporated to dryness and the residue recrystallized from 96 per cent alcohol, yielding the glycoside with ultimate melting point 193–194° C. and $[\alpha]_D^{20} = -73{\cdot}26$ (methyl alcohol).

Analysis. C = 61·08, 61·19, 61·19, 61·02 per cent.
H = 7·714, 7·943, 7·952, 7·759 per cent.
Mol. wt. = 672.
Calculated for $C_{36}H_{56}O_{14}$: C = 60·66; H = 7·92 per cent. Mol. wt. = 713.

Both rubellin and transvaalin give negative Legal tests but react positively in the Molisch and Liebermann tests. The ultra-violet absorption spectra of rubellin and transvaalin are very similar and are practically coincident with that of scilliroside[3]. Rubellin and transvaalin have maximum absorption at 297 mμ with $\log E^{1\ \text{mol./litre}}_{1\ \text{cm.}} = 3{\cdot}80$ and at 299 mμ with $\log E^{1\ \text{mol./litre}}_{1\ \text{cm.}} = 3{\cdot}64$, respectively.

Rubellin reacts towards rats as a cardiac poison whether it was administered *per os* or by intraperitoneal injection. Transvaalin, however, even in large doses, only reacts as a typical rat poison, namely, by its action on the central nervous system.

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Paper Chromatography of Pterins

The detection and identification of pterins in small quantities was carried out by Schöpf and Becker[1] in the course of their classical work on this class of pigments. They employed a chromatographic technique using 0·004 *N* aqueous hydrochloric acid or 0·01 *N* methyl alcoholic hydrochloric acid solutions on micro-absorption columns of alumina or frankonite. The technique of paper chromatography has now been applied successfully to certain of the common pterins, and as a result a method has been elaborated for the rapid identification of very small quantities of these compounds such as may be obtained by extraction of individual butterfly wings. Indications that this method might be applied in the pterin series had been given by Crammer[2], who mentioned that xanthopterin and leucopterin could be concentrated by a paper chromatographic technique.

We have found that the butyl alcohol – acetic acid mixture of Partridge[3] is the most satisfactory solvent for the separation of mixtures of pterins, which were used as 0·1 per cent solutions in 0·5 *N* ammonium hydroxide. After development of the chromatogram and removal of the solvent, the paper was viewed in ultra-violet light, when the individual pterins were easily located by their characteristic fluorescence. The accompanying R_F values were obtained for the individual pterins (Table 1).

In the case of xanthopterin, three spots were generally obtained, of which (*c*) was ascribed to xanthopterin itself. The purple fluorescing material (*b*) was stated by Schöpf and Becker[1] to be a decomposition product of xanthopterin, but the exact nature of this compound is obscure. It was also observed in a number of butterfly wing extracts (see below). The nature of the third spot (*a*), which was less intense than (*b*) or (*c*), likewise remains unknown; it, too, was observed in some of the butterfly wing extracts.

Table 1

Pterin	R_F value	Colour of fluorescence
Leucopterin	0·12	Pale blue
Xanthopterin	(*a*) 0·08	Pale greenish-blue
	(*b*) 0·27	Purple
	(*c*) 0·38	Yellowish-green
Rhizopterin[4]	0·56	Bright blue

The method has been applied to extracts of the wings of various Pieridæ known to contain pterins, and the following components were identified (*a* and *b* refer to the unidentified spots obtained from xanthopterin in Table 1).

Table 2

Pieris brassicæ L.	♂♀	Leucopterin; (*b*)
P. napi L.	♂♀	Leucopterin; (*b*); uric acid
		Xanthopterin (trace)
Euchlœ cardamines L. (orange tips of wings only)	♂	Erythropterin (?)
		Leucopterin; (*a*); (*b*);
		Xanthopterin.
Catopsilia argante F.	♂	Erythropterin (?);
		Leucopterin; (*a*); (*b*)
		Xanthopterin
Gonepteryx rhamni L.	♂	Leucopterin; (*a*); (*b*);
		Xanthopterin

The species *E. cardamines* and *C. argante* were stated by Schöpf and Becker[1] to contain the red erythropterin, and it was observed that in these cases a reddish-yellow spot ($R_F = 0{\cdot}13$) was obtained immediately below the leucopterin spot. As pure erythropterin has not been available to us, we have been unable to identify this compound with certainty; but it does appear to correspond to the product described by the German workers. The isolation of uric acid from the wings of mixed Pieridæ (including *P. napi*) has been described by Tartter[5].

The insect *Onchopeltus fasciatus* Dall. (Lygæidæ) contains an orange-red pigment which is thought to belong to the pterin class, and this pigment has likewise been subjected to paper chromatographic analysis. The results showed that the colouring matter was a mixture of erythropterin, leucopterin, the purple fluorescing 'pterin decomposition product' and an additional compound with a pinkish fluorescence ($R_F = 0{\cdot}04 \pm 0{\cdot}02$). Other applications of this facile method of identification of pterins are at present being studied.

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