S. No.	Indicator	Colour change	pH range	Remarks
1	8-Allyl umbelliferone	Pale blue to blue	7·1–8·1	The solution is turbid at 7·1 and clear at 8·1
2	3-Acetyl-5-methyl umbelliferone	Blue to green	5·1–7·1	Solution is yellow
3	5 : 7-Dihydroxy-4-methyl-coumarin-3-acetic acid	Blue to bluish green	6·1–7·1	In alkaline solution yellow
4	7 : 8-Dihydroxy-4-methyl-3-acetic ester	Indistinct changes	4·1–6·1	..
5	5-Hydroxy-4 : 7-dimethyl coumarin	,,	7·1–8·1	Turbidity in acid solution
6	3-Phenyl umbelliferone	Blue to green	6·1–7·1	Alcoholic solution is bright blue in fluorescence both in daylight and U.V.
7	8-Allyl-4-methyl umbelliferone	Blue to deep blue	3·1–8·1	Alcoholic solution is blue fluorescent only in U.V.
8	7-Methoxy-3-phenyl coumarin	No prominent changes	3·1–10·1	Alcoholic solution fluoresces violet in daylight and deep blue in U.V.
9	7-Methoxy-4 methyl coumarin	,,	,,	Acid : pale violet ; Alkali : pale blue in U.V.
10	5-Methoxy 4 : 7-dimethyl-coumarin-3-acetic acid	,,	,,	Acid : nil ; Alkali : pale blue in U.V.
11	5 : 7-Dimethoxy-4 methyl coumarin-3-acetic acid	,,	,,	Acid : yellow ; Alkali ; blue in U.V.
12	7 Methyl coumarin	,,	,,	Acid : nil ; Alkali : yellow in U.V.
13	4 : 7-Dimethyl coumarin	,,	,,	Acid : nil ; Alkali : pale blue in U.V.
14	5-Methoxy-4 : 7-dimethyl coumarin	,,	,,	Acid : pale yellow ; Alkali : pale blue in U.V.
15	8-Methoxy coumarin	,,	,,	Acid : nil ; Alkali : nil in U.V.
16	3-Acetyl-7-methoxy coumarin	,,	,,	Acid and alkali light blue in U.V. No prominent difference

The British Drug House. The acid and alkali under 'Remarks' are 2N bunch reagents. Quartz test-tubes were employed in all tests. A few drops of very dilute alcoholic solution of the indicators were used in each case.

It is seen from the above table that all the compounds (1 to 7) with a free hydroxyl in position 7 as in umbelliferone yield promising results. On the other hand, coumarins without a free hydroxyl (8 to 16) as a class do not yield prominent changes in fluorescene with changing pH. These observations support Jensen's[4] conclusion that coumarins act as indicators only when a free hydroxyl is present in the molecule.

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EXTENSION OF THE MAESTRICHTIAN SEA INTO THE PUNJAB SALT RANGE

IN the Mesozoic sequence of the Salt Range, beds younger than the Neocomian have not hitherto been recognised and it is believed[1] that towards the latter part of the Cretaceous, uplift resulted in a considerable recession of the Tethys to the west. Micro-palæontological examination of collections made by us in 1946 from the Nammal Gorge (32° 40′ : 71° 48′), indicates that the Ranikot beds (Palæocene) are underlain by a bed of foraminiferal limestone containing the well-known Upper Cretaceous genera *Globotruncana* and *Omphalocyclus* From this evidence, it is concluded that an arm of the Mæstrichtian sea which covered Sind and Baluchistan must have extended well into the Salt Range upto about longitude 72°.

In his recent account of the geology of the Salt Range, Dr. E. R. Gee[2] has, on lithological considerations, classified the Jurassic-Cretaceous sequence at Kalabagh (32° 58′ : 71° 33′), the western limit of the Salt Range, as follows:—

Palæocene	Ranikot beds with laterite at base
L. Cretaceous	Lumshiwal sandstones
Upper Jurassic	Belemnite beds
Jurassic	Baroch limestones
	Variegated stage