Franck and collaborators[3] for chlorophyll solutions. In these cases, however, the effect is much smaller. The accompanying table shows the result of measurements with polycyclic hydrocarbons (some of them carcinogenic) and some other fluorescent substances under comparable conditions. Wherever a quenching effect of oxygen was observed, it was completely reversible.

PERCENTAGE QUENCHING OF FLUORESCENCE BY OXYGEN AT 1 ATM. PRESSURE IN ETHANOL SOLUTIONS CONTAINING 0·01 mgm./ml.

Anthracene	60·0
Chrysene	85·7
Pyrene	87·7
Rubrene	68·0
1 : 2-Benzanthracene	86·3
9 : 10-Dimethyl-1 : 2-benzanthracene	86·7
1 : 2 : 5 : 6-Dibenzanthracene	88·2
3 : 4-Benzpyrene	91·7
20-Methylcholanthrene	86·6
Ethyl chlorophyllide	32·1
Eosine	0
Thiochrome (in *iso*-butanol sol.)	27·5
Quinine sulph. (in 0·1 NH_2SO_4 in methanol	17·5
Acridine " " " "	0

Every elementary process of quenching is represented by a chemical reaction. The well-known ability of the polycyclic hydrocarbons to form photo-oxides[4] suggests the following primary process:

$$(HC)^* + O_2 \rightarrow (HC)^+ O_2^- \rightleftharpoons (HC)O_2,$$

where the optically excited hydrocarbon molecule (HC)*, which has a lower ionization potential, transfers an electron to the oxygen molecule, thereby forming the photo-oxide, which is partially ionic in its character[5]. This process, which is reversible, suggests a type of reversible oxidation-reduction of the hydrocarbon.

It seems that the 'self-quenching' which is observed at higher concentrations of the fluorescent substance can be interpreted by an elementary process:

$$(HC)^* + (HC) \rightarrow (HC)^+ (HC)^- \rightleftharpoons (HC)_2,$$

where the excited hydrocarbon molecule (HC)* reacts with an ordinary molecule (HC), eventually leading to a dimer. It has been shown[6] that anthracene solutions give di-anthracene on irradiation, and it is suggested that in the case of benzpyrene (and other fluorescent substances where self-quenching occurs) a similar dimerization takes place under the influence of light which in general is reversible in the dark. This is supported by our observation that in this region the fluorescence yield can often be represented by the common hyperbolic equation if the total concentration of the hydrocarbon in solution is substituted for the concentration of the quenching substance.

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A New Salmonella Type

A NEW Salmonella type has been isolated by us from the mesenteric gland of a normal pig. It ferments, with the production of acid and gas, glucose, mannitol, arabinose, dulcitol, rhamnose, trehalose, sorbitol, lævulose, mannose, galactose and xylose; and does not ferment lactose, sucrose, adonitol, erythritol, inulin, raffinose and salicin. It is indole-negative and H_2S-positive, reduces nitrates to nitrites and does not hydrolyse urea; in Stern's medium it is positive; in Bitter's medium it is positive with glucose, arabinose and rhamnose, and negative with dulcitol; on Simmons' agar it is positive with glucose, arabinose, dulcitol and rhamnose; it does not liquefy gelatine and is *d*-tartrate-, *l*-tartrate-, mucate- and citrate-positive. Its antigenic structure is VI$_1$.VIII; ←→*e,n*...(phase 2 is still under examination).

We suggest the name *S. bonariensis* for this new type.

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Structure of the Branchiæ of *Carcinus maenas*

NOTHING is known concerning the histology of the branchiæ of *Carcinus mœnas*, except for a brief account using Bouin-fixed material[1]. By fixation in Champy, whole-mount preparations of strips of a lamella stained in iron alum hæmatoxylin show that a system of branching tube-like structures is present.

The exact morphology of these structures is difficult to determine, but it is believed that they are tubes or sculpturings in the cuticle. Seen from above (*P*, Fig. 1) they form a series of connected

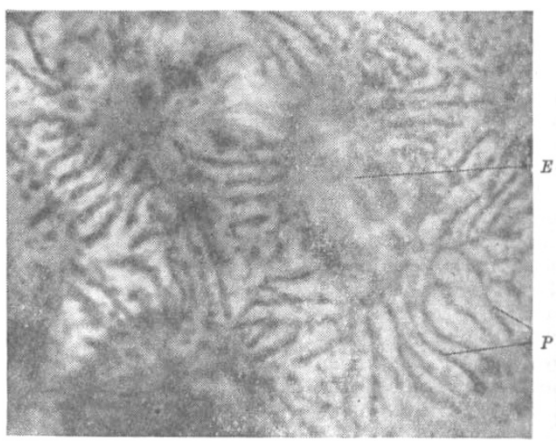

Fig. 1.

systems extending radially out from certain areas, corresponding in position with the large pillar cells (*E*), which lie directly beneath.

In transverse section of the lamella, shown diagrammatically in Fig. 2, the structures are seen as a