

the necessity for this substance in the nutrition of the tubercle bacillus is obvious.

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#### The action of potassium cyanide on the chlorophyll mechanism of *Nereocystis*.

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In connection with studies on the nature of the action of cyanide on cell respiration, it seemed of interest to test the effect which cyanide might have upon the mechanism of photosynthesis.

Strips 1x 10 cm. cut from the frond of the large, Pacific coast kelp *Nereocystis* were used, and oxygen production was taken as a measure of photosynthesis using Winkler's method for determination of oxygen.

That potassium cyanide (.00008 mol in the experiment given) can produce an apparently complete but reversible inhibition of photosynthesis is shown by the following condensed statement of results from a typical experiment.

TABLE I.

Each number in the table is the average quantity of oxygen produced (+), or consumed (—) in three duplicate determinations. Concentration of KNC in first test, .00008 mol.

Strip placed in.	First test.	Second test. All in light. No KNC.
	O <sub>2</sub> in c.c. thiosulfate.	O <sub>2</sub> in c.c. thiosulfate.
Light .....	+6.65	+6.89
Light KNC.....	+ .18	+6.82
Darkness .....	—1.10	+6.63
Darkness KNC.....	— .39	+5.80

<sup>4</sup>In this paper the term fat is used as a convenient expression for the ether acetone soluble substances.

Photodynamic sensitization occurs when strips are exposed to light in the presence of higher concentrations (in the experiment cited below .00016 mol.) of cyanide. Injury occurs in proportion to the concentration of cyanide, as shown by table 2, which gives the degree of recovery of the strips, and the mechanism of photosynthesis in terms of capacity to produce oxygen in pure sea water in light, after previous treatment with KNC in light.

TABLE II.

Strips of equal area placed in cyanide solutions (column 1) for nine hours in sunlight. Washed in sea water for eighteen hours and then tested for phototynthesis in pure sea water. Numbers in column 2 give the amounts of oxygen in c.c. thiosulfate produced (+) in a five-hour test.

Strip number.	1.	2.	Condition of strip at end of experiment.
	Conc. of KNC in sea water.	O <sub>2</sub> in c.c. Thiosulfate.	
1	Pure sea water	+7.05	Normal color.
2	.00016 mol. KNC	+4.81	Normal color.
3	.00032 mol. KNC	+3.14	Slight loss of color.
4	.00048 mol. KNC	+1.86	More loss of color.
5	.00064 mol. KNC	+ .28	Almost complete loss of color.
6	.0008 mol. KNC	+ .41	Almost complete loss of color.
7	.00112 mol. KNC	+ .22	Almost complete loss of color.
8	.002 mol. KNC	— .31	Complete loss of color.
9	.0032 mol. KNC	— .13	Complete loss of color.

Solutions of cyanide in sea water (about .0006 mol.) which produce permanent injury in light do not produce injury when the strip is placed in darkness, all other conditions remaining the same.

The possible significance and full details of the experiments will be given elsewhere.