TABLE I

MOLAR COMPOSITION OF SAPS EXPRESSED AS PER CENT. OF HALIDE

	A	B	C	D	E
	Sea water Bermuda	*Halicystis* Bermuda	*V. macrophysa* Bermuda	*V. macrophysa* Tortugas	*V. ventricosa* Tortugas
Cl + Br	100.00	100.00	100.00	100.00	100.00
K	2.15	2.58	86.24	82.33	94.74
Na	85.87	92.80	15.08	18.55	5.73
Ca	2.05	1.36	0.288	0.02	Trace
Mg	9.74	2.49	Trace ?	0.08	Trace
SO_4	6.26	Trace ?	Trace ?	0.04	Trace

Analyses: B by Dorcas.[2]
A, C by Van der Pyl.[3]
D, E by Cooper.

which had been filled with water. The accompanying graph is for a 20 per cent. solution and is applicable for temperatures not below 15° F. The graphs for the lower temperatures are not shown here. They are similar but the factors are correspondingly greater.

As ethylene glycol is easily procured under the trade name prestone, and as the cost is low, the procedure as given above for the measurement of evaporation should have a rather wide application.

A. L. BAKKE
J. M. AIKMAN

IOWA STATE COLLEGE

SPECIAL ARTICLES

THE CELL SAP OF VALONIA AND HALICYSTIS

PHYSIOLOGICAL and morphological study of *Valonia* has made it evident[1] that the Bermuda plant formerly known as *V. ventricosa* is a species of *Halicystis*. In order to correct the label for the cell-sap analyses formerly published [2, 3] and to extend the comparison, further analyses of sap of undoubted *V. ventricosa* are here presented. This sap was collected, taking care to avoid contamination, from cells gathered on the reefs at the Dry Tortugas keys, Florida. Samples of sap from *V. macrophysa* growing in the moat of Fort Jefferson, about a mile from these reefs, were likewise analyzed for comparison with the Bermuda species.

Potassium was determined as perchlorate; sodium as sodium chloride; calcium as calcium oxide; magnesium as magnesium pyrophosphate; halide by titration with silver nitrate; and sulphate as barium sulphate.

The maximum errors to be expected, from the determination of a known solution, are: potassium 0.5 per cent. too low; sodium 3.0 per cent. too high; halide 0.3 per cent. low; when porcelain is used. The determina-

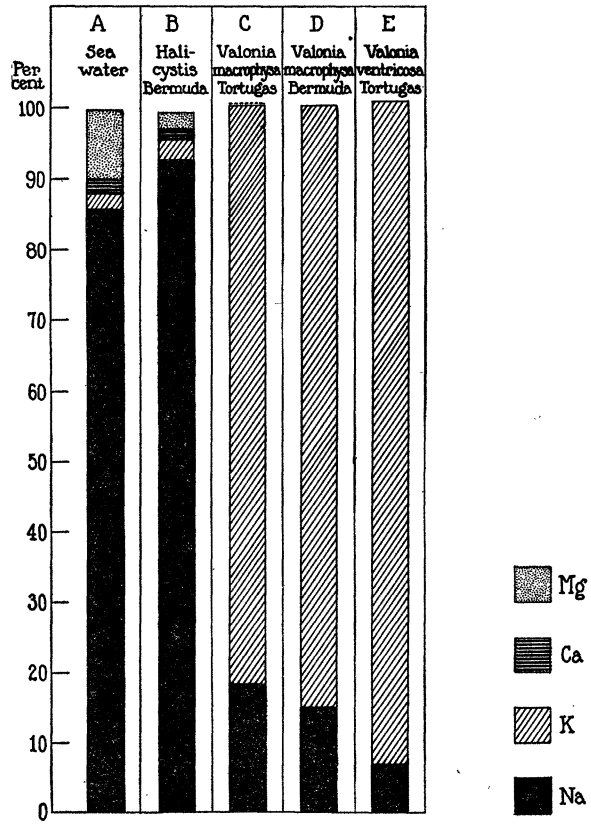

FIG. 1. Graph showing molar concentration, expressed as per cent. of halide, of the chief elements in the saps of *Valonia ventricosa*, *V. macrophysa*, and *Halicystis*, compared with sea water.

[1] Blinks, L. R., SCIENCE, 1927, lxv, 429.

[2] Osterhout, W. J. V., and Dorcas, M. J., *J. Gen. Physiol.*, 1924–25, vii, 633.

[3] Osterhout, W. J. V., *J. Gen. Physiol.*, 1922–23, v, 225.

tions for *V. ventricosa* were made in fused quartz, so the errors should be smaller.

The results of these new analyses, together with former ones, are listed in Table I and presented graphically in Fig. 1. The striking dissimilarity between *Halicystis* and *Valonia ventricosa,* with which it formerly was identified, is very noticeable. The genus *Valonia,* on the other hand, falls into a natural group, although each species is distinct enough in its sap for chemical diagnosis. The *V. macrophysa* from Fort Jefferson is seen to vary in the opposite direction from *V. ventricosa* with reference to the Bermuda species. The presence in it of more sodium, as well as of measurable amounts of calcium, magnesium and sulphate, raises the suspicion of contamination or of injury. It seems possible from our experience that these cells are not healthy in the summer. They are much shorter lived in the laboratory than *V. ventricosa,* and readily form zoospores, to the destruction of the protoplasm. Their electrical conductivity is higher than that of the Bermuda species, and it is possible that there is an entrance of sea-water ions and an exit of potassium.

The amount of potassium found in *V. ventricosa* is consistently greater than in *V. macrophysa.* This is evident from Table II, which shows analyses of saps from cells exposed to varying conditions.

Grateful acknowledgment is made to the Carnegie Institution of Washington for use of the facilities of its Marine Biological Laboratory at Tortugas.

SUMMARY

Comparison is made between the saps of *Valonia ventricosa* of Florida and the Bermuda *Halicystis,* formerly known as *V. ventricosa.* An even higher percentage of potassium is found in *V. ventricosa* than in *V. macrophysa,* while *Halicystis* has been shown to have very little.

W. C. COOPER, JR.,
L. R. BLINKS

THE ROCKEFELLER INSTITUTE
FOR MEDICAL RESEARCH

THE PROBABLE AMOUNT OF ULTRA-VIOLET RADIATION OBTAINED INDOORS THROUGH ULTRA-VIOLET TRANSMITTING GLASS

THE recent advances in heliotherapy have led to the development of a number of ultra-violet transmitting glasses and glass substitutes which are designed to give ultra-violet radiation indoors. One of the best transmits from 50 to 60 per cent. of the solar radiation between 290 and 320 mμ when it is new and about 30 per cent. after it has aged. If it is used in a solarium there is no doubt that a patient exposed to the direct rays of the sun under it would get about as much ultra-violet radiation in three hours as he would get in one hour in the open sunshine, provided the intensity of the sunlight remained the same. But ultra-violet transmitting glass is also being sold for school and office windows, and the question arises as to how much ultra-violet radiation can be obtained in a room where it is installed. A worker indoors would not sit in the direct sunlight because of the glare and, although the illumination in a room falls off rapidly from window to wall, it is perhaps safe to assume an average illumination of ten foot-candles. One would like to know, therefore, how much ultra-violet radiation reaches a point inside where the

TABLE II
SAP CONTENT OF VALONIA VENTRICOSA

	A		B		C		D		Av.: B, C, D
	Molar	Per cent.	Molar	Per cent.	Molar	Per cent.	Molar	Per cent.	Per cent.
Cl + Br	0.620	100	0.588	100	0.605	100	0.697	100	100
K	0.587	94.74	0.537	91.35	0.574	94.90	0.654	93.85	93.37
Na	0.35	5.73	0.057	9.70	0.038	6.28	0.046	6.60	7.53
Ca	Trace	.....	0.0007	0.12	0.0006	0.09	Trace	.....	0.11
Mg	Trace	.....	0.0003	0.05	0.0002	0.03	Trace	.....	0.04
SO_4	Trace	.....	Trace	.....	Trace	.....	Trace	.....	.....
	Freshly gathered June, 1927.		Three weeks in changing sea water. August, 1926.		Three weeks in closed bottle of sea water. Aug., 1926.		Collected Aug., extracted Nov. 23, 1926, at New York. Sea water unchanged and slowly evaporating to about 85 per cent. of original volume.		