NOTES AND COMMENT

The Venice System for the Classification of Marine Waters According to Salinity

An international Symposium for the Classification of Brackish Waters, sponsored by the International Association of Limnology and the International Union of Biological Sciences, was held in Venice, 8–14 April 1958. From it derived the following statement on the classification of marine saline waters. The complete proceedings of the symposium are to be published soon, presumably as an IUBS colloquium.

At the final session of the Venice Symposium a revised classification of marine waters according to salinity was adopted and recommended for universal application. It is a somewhat modified Redeke-Välikangas system, with the addition of zones for higher salinities in order to include the whole salinity range found in the marine region.

The modification of the Redeke-Välikangas system (which was designed for the waters of northern Europe) is primarily confined to shifting the lower part of the mesohaline zone to the oligohaline zone in order to express ecological conditions encountered in southern Europe, South Africa, and some other areas. The term "brackish" as a classificatory term was avoided because of its ambiguous meaning, and the term "mixohaline" was proposed to indicate diluted sea water.

In order to express more adequately the conditions in such areas, for example as found in lagoons on the Mediterranean coast, the term "mixoeuhaline" was coined to include those coastal waters which have a salinity falling within the euhaline range but are at the same time of lower salinity than the adjacent sea.

For the sake of simplicity the various salinity zones have been defined by rather precise figures, but it was stressed that these figures are approximate, as indicated by the use of the ± sign.

The system adopted by the Symposium, with the approximate salinity ranges, is as follows:

Zone	Salinity ‰
Hyperhaline	>±40
Euhaline	±40–±30
Mixohaline	(±40) ±30–±0.5
Mixoeuhaline	>±30 but < adjacent euhaline sea
(Mixo-) polyhaline[1]	±30–±18
(Mixo-) mesohaline	±18–±5
(Mixo-) oligohaline	±5–±0.5
Limnetic (freshwater)	<±0.5

In view of the transitional character of the floral and faunal boundaries between zones within saline areas in nature, as well as their regional and local variation, any salinity classification can correspond only approximately with the zonation of the flora and fauna. It should also be remembered that reference given even to the best possible system will never give more than the average salinity conditions in a given water; additional details of the salinity range—both diurnal, seasonal, and annual, of the incidence of maxima and minima, and other highly varying features of paramount ecological importance—will always be necessary (cf. the halothermographs = hydroclimagraphs, by Hedgpeth 1951, in: Rep. Committee Treatise Mar. Ecol. Paleoecol. **11**).

In order to indicate waters of unstable or variable salinity (irrespective of mean values), the term "poikilohalinity" (adj. "poikilohaline"), in a sense slightly modified from that of Dahl (1956), could be used. The condition of stable or constant salinity could then be described as "homoiohalinity" (adj. "homoiohaline"). Explanatory terms of the type proposed by Rochford (1951, in: Austr. J. Mar. Freshw. Res., **2**) and R. Smith (1957, in: Ann. Biol., **33**, 1/2) might be useful. Subdivision of the adopted zones

[1] In this system the older and more familiar terms of the mixohaline series, polyhaline, etc., should be used in reference to the values of this system (the "Venice system"), and authors are requested to indicate that they are using this scheme in order to avoid misunderstanding.

covering more local conditions will also prove useful or necessary in many cases. As an example, in the Baltic Sea the following subdivisions of the meso- and oligohaline zones, based on biological observations, are important:

Zone	Salinity ‰
(Mixo-) mesohaline	
α-mesohaline	±18–±10
β-mesohaline	±10–±5
(Mixo-) oligohaline	
α-oligohaline	±5–±3
β-oligohaline	±3–±0.5

In other cases, as, for example, the Australian estuaries with their extreme, climatically conditioned salinity oscillations which render any strict system inapplicable, reference to universally adopted terms for waters of different salinity may at least facilitate description of areas and characterization of the fluctuation range.

It was agreed that any attempt to classify inland saline waters would be premature in view of our incomplete and scattered information, and the hope was expressed that some standard way of expressing the salt content of such waters could be adopted or recommended by the International Association of Limnology.

International Oceanographic Congress

The American Association for the Advancement of Science in cooperation with Unesco and the Special Committee on Oceanic Research of ICSU is planning and organizing an International Oceanographic Congress to be held during a two-week period from 30 August to 12 September 1959 at the United Nations Building, New York.

The purpose of the Congress is to provide a common meeting ground for all sciences concerned with the oceans and the organisms contained in them. The Congress will be devoted to the fundamentals of the marine sciences rather than to their applications.

It has been agreed by the organizing committee that the Congress will be centered around five symposia on the oceans:

1. The history
2. The boundaries
3. The deep sea
4. Dynamics of organic and inorganic substances
5. The marine life regime

1. *The history*—Includes discussions of the shape and structure of the ocean basins, the acting forces and processes, the origin of sea water and marine organisms, the stratigraphy of the deep sea and the climatic record.

2. *The boundaries*—Includes discussions of the coupling of sea and air, sea level, epicontinental sediments, estuarine and nearshore circulation (including the estuarine environment), influence of land masses on the behavior and distribution of marine organisms, and surface films and their importance in exchange processes.

3. *The deep sea*—Includes discussions of the geochemistry and physics of circulation, stirring and mixing in the ocean, nature and origin of bathypelagic life, distribution of pelagic sediment types (biological and physical interpretations), nuclear processes in pelagic sediments, and special characteristics of abyssal organisms.

4. *Dynamics of organic and inorganic substances*—Includes discussions of physical chemistry of sea water, biologically active substances in sea water, primary production, balance between living and dead organic matter in the oceans, exchanges between sea and air, exchanges between sediments and sea water, and vertical transport in the ocean.

5. *The marine life regime*—Includes discussions of the paleogeography of marine floras and faunas, biogeographical regions in the sea, evolution and adaptation in the sea, the behavior of marine organisms as influenced by environmental factors, physiology of marine plants, and the culture of