the eye can be maintained at normal (=normal body pCO_2) by metabolic CO_2 production, but when body pCO_2 is elevated, diffusion from the cornea is adequate to bring aqueous pCO_2 to the normal value.

This work was supported by NIH Grant GM AI 16934.

1971 #30

A NOMOGRAM FOR CO_2 EQUILIBRIA IN COLD WATER ELASMOBRANCHS

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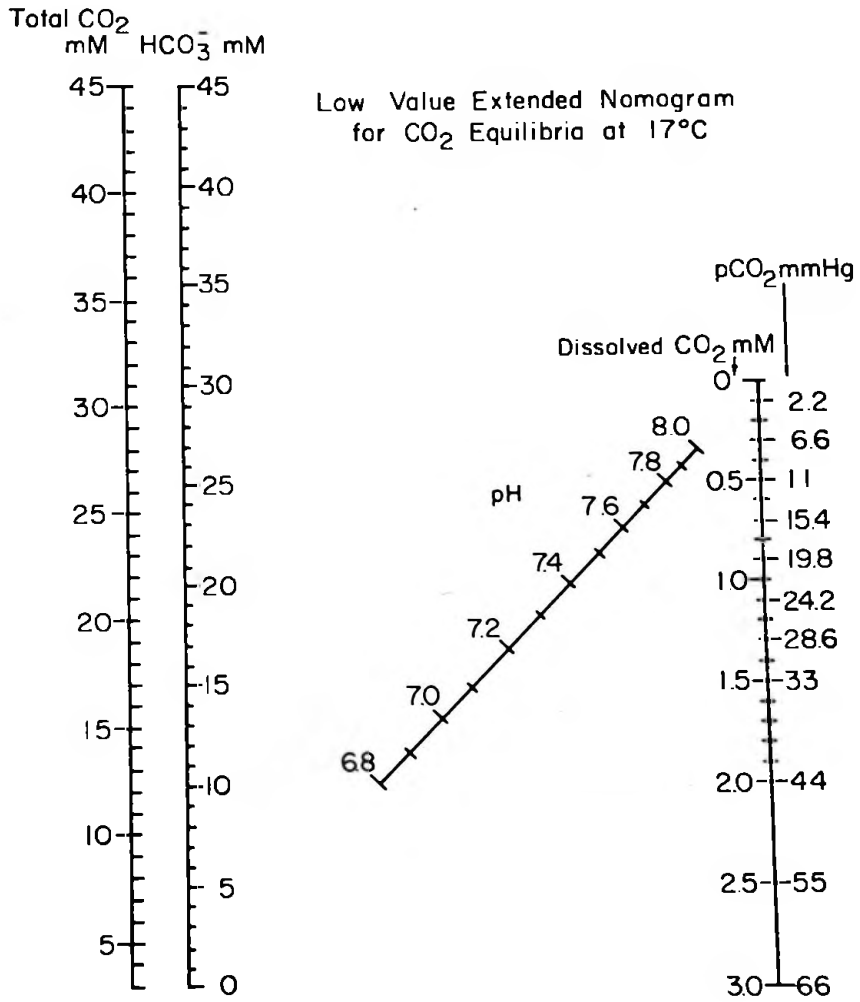
Nomograms for CO_2 equilibria in mammalian physiology texts or monographs cannot be used for most fish work, because they do not extend to low pCO_2 and HCO_3^- values, and are based on CO_2 solubility at 37° in plasma of about 300 mOsm.



The above nomogram extends that of McLean (Physiol. Rev., 18:495, 1938) to zero pCO_2 and HCO_3^-, and uses the solubility data of CO_2 in elasmobranch plasma at 17°C from Albers and Pleschka (Resp. Physiol., 2:261, 1967). The solubility is 0.73 that in pure water, whence α = 0.045 mM CO_2 per pCO_2 as mm Hg.

At 17° and pH 7.5, the pK_a' of HCO_3^-/CO_2 in elasmobranch plasma (about 1000 mOsm) is 6.1 (Albers and Pleschka, ibid.). This pK_a' is the same as that for mammalian blood (300 mOsm) at 37° (Severinghaus et al., J. Appl. Physiol., 9:197, 1956). The reason for this is that pK_a' rises with falling temperature; and pK_a' falls with rising ionic strength (Harned and Bonner, J. Am. Chem. Soc., 67:1026, 1945). The present nomogram can therefore be used for any situation in which the pK_a' is approximately 6.1; the far right column could then be appropriately altered for differing solubilities of CO_2 when desired.

This work was supported by NIH Grant GM AI 16934.

1971 #31

ACUTE TOXICITY OF A MIXTURE OF POLYCHLORINATED BIPHENYLS (AROCLOR 1221) AND DDT IN A MARINE TELEOST *(Fundulus heteroclitus)* AND EFFECT ON SERUM OSMOLALITY, Na^+ AND K^+.

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Polychlorinated biphenyls (PCBs) are a group of chlorinated hydrocarbon compounds which are similar in structure to DDT and share the same properties of persistence, stability with respect to heat and acid, and lipid solubility which make DDT a threat to the biological environment. These compounds have a wide spectrum of industrial applications such as ballast for fluorescent fixtures, plasticizers, heat transfer agents, and carbonless reproducing paper (Environ. Sci. Tech., 4, 814-819, 1970). Aroclors (Monsanto Company Trandmark) are mixtures of PCBs. The last two digits of the number which identify each of the mixtures indicate the weight percent of chlorine, for example, Arochlor 1221 contains 21% chlorine. Even though PCBs have been available commercially for 40 years it was not until 1966 that they were identified and reported in the environment (New Scien., 32, 612, 1966). Since then they have been reported in many organisms (BioSci., 20. 958-964, 1970) and (Bull. Environ. Contam. Tox., 5, 171-180, 1970) although there is little published data on the toxicity of these compounds to marine life. It has already been suggested (Science, 173, 1146-1148, 1971) that the sensitivity of teleosts to DDT involves impairment of osmotic regulation by inhibition of the Na^+, K^+-activated adenosine triphophatase (Na, K-ATPase) The present study explores the toxicity of a mixture of polychlorinated biphenyls in a marine teleost and its effect on osmoregulation as compared to DDT.

For each experiment ten sea-water-adapted *Fundulus heteroclitus* (5 males and 5 females, each about 5 grams) were placed in an aluminum or enameled metal container holding 2 liters of sea water and maintained at 14-16° C throughout the exposure time. In the control containers 2 ml of 100% ethanol were added. In the experimental containers Aroclor 1221 (kindly supplied by Monsanto