219 ± 23 and 218 ± 20 (*1*); and 222.4 ± 22.4 and 219.6 ± 24.1 (*5*) based on measurements with two different, commercially available, potassium ion–specific electrodes. To evaluate the applicability of this algebraic extrapolation, I calculated values for K_{f_I} for each of the measurements made above *p*H 9 (*5*, tables 1 and 2). The values obtained ranged from 162 to 74, the ionic strengths from 0.004 to 0.015, but most were in the range 0.011 to 0.015 with K_{f_I} in the range from 80 to 95. The logarithms of these experimental values for K_{f_I} were plotted against $I^{0.5}$. The resulting scatter diagram indicated convincingly that a graphic extrapolation using any reasonable function of $I^{0.5}$ was not possible. It was, however, clear that the value of K_{f_I} that should be used in the neighborhood of $I = 0.011$ to 0.015 was closer to 90 than it was to 220.

It should also be clear that increases in ionic strength above 0.015 would be expected to cause a further decrease in the value of K_{f_I}, although present knowledge does not provide quantitative guidance for such extrapolation. The extrapolation equation used by Mohan and Rechnitz (*5*) gave values within a factor of two—not 25—of those published previously at higher ionic strengths.

The experiments of Mohan and Rechnitz have provided new evidence of the existence of $KATP^{3-}$ in aqueous solutions. Because their measurements were made at low ionic strengths they have been able to provide an estimate of the "thermodynamic" value of the formation constant, K_{f_0}, and thus one could estimate the standard free energy of formation of this ion. However, in most biological fluids the ionic strength is much higher than the range covered by their measurements or by any extrapolation method known to be applicable. Therefore, in practical situations one must use the "concentration" constant, K_{f_I}, measured as close to the desired ionic strength as possible. For $KATP^{3-}$, O'Sullivan and Perrin (*4*) reports $K_{f_{0.1}} = 14$ at 25°C, Melchior (*2*) reports $K_{f_{0.2}} = 10$ and $K_{f_{0.3}} = 7$, also at 25°C.

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22 October 1970

Although Melchior does not dispute the numerical values for the formation constant of the $KATP^{3-}$ complex obtained in our study (*1, 2*), his critique implies that our values differ from earlier estimates because of effects of ionic strength and suggests that the earlier values are fully satisfactory for calculations in biological media. We cannot accept Melchior's contention, even his technical points, for the following reasons.

1) Contrary to Melchior's assertion, ours is not an extrapolation method. Rather we have made our measurements directly in a region of ionic strength where meaningful activity coefficients may be used. Thus, our method yields thermodynamic rather than conditional values.

2) Melchior does not take into account the effect of the supporting electrolyte used to control ionic strength in the earlier studies. As we have explicitly pointed out (*2*), an apparent lowering of the formation constant will be produced if the cation of the electrolyte associates with ATP. No additional cations are used in our study.

3) As Melchior himself points out, there is no reliable method for extrapolating our thermodynamic formation constant values to media of high ionic strength. A rough estimate has shown (*2*) that our value would still substantially exceed earlier values at 0.2*M* ionic strength, even if the leveling effect of the electrolyte cation is neglected.

Finally, we cannot support Melchior's suggestions that conditional values for formation constants should be used in biochemical calculations in preference to thermodynamic values. Indeed, we feel that the use of nonthermodynamic quantities is only justified as an expedient when rigorous values are not available. In those studies where electrolytes used to maintain ionic strength contain ions not even present in biological media, the validity of the resulting conditional constants is especially questionable.

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Skull from Spruce Swamp: Case of Cranial Dysraphism?

Included in Powell's report (*1*) on a possible case of aboriginal trephination was a photograph of the skull from Spruce Swamp Burial 1. On the basis of that photograph and on my experience as a neurosurgeon, I believe that the defect shown resulted from an encepholocele or meningoencepholocele. The cranial aperture exactly in the midline is a characteristic feature of these conditions. Through this hole, present at birth, meninges (membranous coverings of the brain) with or without rudimentary brain tissue herniated, and the protruding mass formed a bed in the soft infant bone. Brain pulsations were transmitted through the aperture and met against the bone edge, which caused the bone to "build up" at the edge that received most of the pulsations.

The skull may become "saucerized" also by benign tumors within it and growing out of it, or resting upon it, especially in young individuals. When this process is present exactly in the midline and an aperture is pierced through the skull at the bottom of the "saucer," a diagnosis of congenital cranial dysraphism seems mandatory.

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