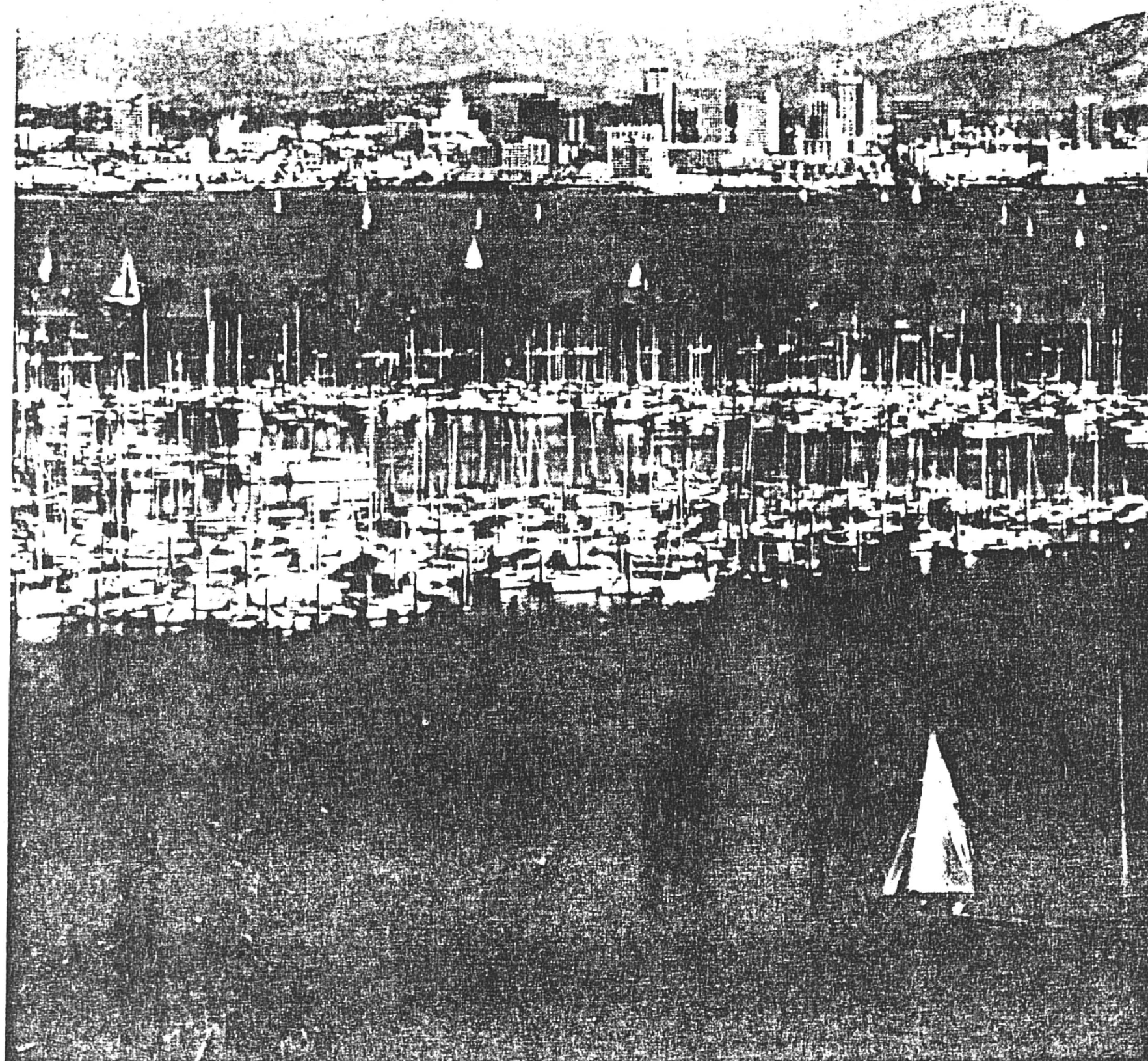


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FACTORS AFFECTING THE RELIABILITY OF PLASMA TRACE MINERAL DETERMINATIONS. Thamara Juswily, R. Batres, N.W. Solomon, O. Pineda and D.B. Milne. Massachusetts Institute of Technology, Cambridge, MA, 02139, USA; Institute of Nutrition of Central America and Panama, Guatemala City, Guatemala; and Grand Forks Human Nutrition Research Center, U.S.D.A., Grand Forks, ND, 58202, USA.

External contamination, prolonged fasting, meals, serum protein levels, hemolysis, infection and inflammation are among the variables that can influence the validity of circulating trace mineral determinations for zinc, iron and copper. We have compared concentrations of these three nutrients in plasma samples obtained simultaneously from both arms in 14 subjects in whom the right arm had been occluded at 40 mm Hg for 60 sec while the left arm remained free. Statistical comparison of paired samples showed a significant 4% increase in zinc from 77.3 ± 10.7 to 79.8 ± 8.4 $\mu\text{g/dl}$ ($p < 0.05$) and 24% increase in iron from 106.2 ± 40 to 127.8 ± 35.4 $\mu\text{g/dl}$ ($p < 0.001$), comparing the left arm levels with those from the right arm (mean + SD). Copper concentrations were 85.9 ± 13.3 and 90.3 ± 7.6 $\mu\text{g/dl}$, respectively, in the left and right arms, but the difference was not significant by paired t test analysis ($p > 0.1$). Seven consecutive plasma samples taken during a 6-hour fast in 5 subjects using a tourniquet and analyzed for zinc and copper revealed a coefficient of variation of 11.5% for zinc and 12% for copper. **CONCLUSIONS:** The inherent variability for zinc and copper are comparable. Tourniquets raise the concentration of iron and zinc in a nonrandom manner.