be found in EP culture fluids collected at various intervals; (ii) prolonged passage of EP cells in the presence of high-titer SV_{40} antiserum did not cure the "infection;" (iii) EP cells were resistant to superinfection with SV_{40}. The data strongly suggest that viral nucleic acid is permanently present in some tumor cells. Under certain conditions these cells can introduce this genetic information to indicator cells and thereby initiate viral synthesis. The tumor cells themselves appear to be unable to synthesize infectious virus. There is no evidence to indicate whether the viral nucleic acid is in a proviral or incorporated state (*5*).

The term "virogenic state" may be useful to describe this state. A similar virus-cell relationship may exist in tumors or transformed cells induced by other papova or adenoviruses and perhaps in certain human tumors of suspected viral etiology. Latent viral infections, such as *Herpes simplex*, may persist by a similar mechanism.

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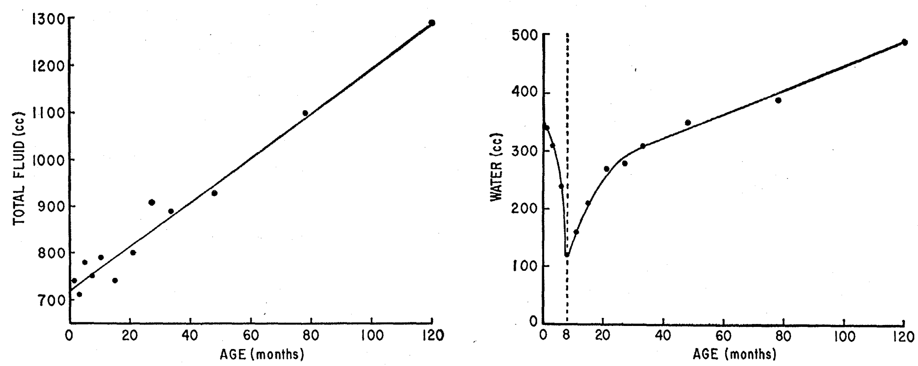

Fig. 1. (Left) Total mean daily fluid intake, by age in months. (Right) Mean tap-water intake per day, by age in months. Note that at all ages, tap water provides less than half of all fluids consumed.

Water Intake of Normal Children

Abstract. *Estimates of daily total fluid intake and of tap-water consumption of normal children were made in four dissimilar geographic areas in the United States. (Total fluid intake increased and, relatively speaking, tap-water consumption decreased, with age.) Of basic importance in fluoridation programs was the observation that even older children rarely drank as much as 500 ml (about 1 pint) of tap water daily.*

Excellent documentation exists in the literature supporting the fact that when drinking water contains 1.0 part of fluoride per million, a marked reduction in the dental-caries rate in children results. Yet the pediatric literature contains surprisingly little reliable information concerning the water intake of normal children. Similarly, systematic data have not been presented in journals devoted to diet and nutrition (*1*). In order to determine the actual daily intake of fluoride necessary for caries reduction, an effort has been made to determine the daily water intake of children.

As Neumann has pointed out (*2*), most information on tap water intake in children is in the form of assumptions written "without reference and evident foundation in fact." His own study involved 312 Long Island children under the age of 6. Average daily tap-water consumption, including that added to frozen fruit juices, was 294 ml. The ratio between means for the lowest third and the top third was 1 : 7.4, which emphasizes the variability in tap-water intake among the children studied.

Crosby and Shepherd (*3*), working in Perth with groups of kindergarteners, aged 3 to 5, and school girls, aged 12 to 15 years, also took season of the year into consideration. In both groups fluid intake of water and fluids, mainly water, increased markedly during the summer. The mean volume drunk by the kindergarten group in winter was 319 ml, and this increased to 458 ml per day in summer. Consumption by the older girls averaged 871 ml in winter and 1829 ml in hot weather. Again, volumes of daily water consumption varied considerably among children in the same age groups. In a general way, however, water intake was about the same in the children in the northern United States and those in southern Australia.

Finally, Galagan *et al.* (*4*), in a careful study of climate and fluid intake, found that intake per pound of body weight was highest among infants and decreased with age and that it varied directly with temperature. No substantial differences were observed between boys and girls in the amount of fluid consumed.

In order to learn more about this important feature of childhood behavior, a preliminary study was carried out by one of us (F.J.M.) in Kalamazoo, Michigan, during the 1959–60 school year. Designed to estimate the water intake of normal children, during the fall, winter, and spring of 1960–61, this investigation was expanded to widely separated geographic areas with pronounced climatic differences. It is the purpose of this paper to report our findings and to interpret them.

Altogether, 797 children were studied. Of these, 83 were residents of Miami, Florida; 177, of Atlanta, Georgia; 250, of Los Alamos, New Mexico; and 287, of Kalamazoo, Michigan.

Studies in all four cities were carried out with the protocol developed in 1959–60, as follows. Mothers of infants and children seen in private office

Table 1. Total fluid and water consumed in various age groups (total 797 children).*

Age	Fluid per day (ml)		Water per day (ml)	
	Mean	SE of mean	Mean	SE of mean
	Breast-fed children			
0–6 mo	50	17	19	7
	Bottle-fed children			
0–2 mo	740	77	342	26
2–4 mo	707	43	314	54
4–6 mo	783	29	238	75
6–9 mo	754	58	120	26
9–12 mo	793	43	160	59
12–18 mo	737	41	208	34
18–24 mo	799	30	267	56
24–30 mo	907	95	283	24
30–36 mo	894	47	312	22
	Older children			
3–5 yr	926	33	349	27
5–8 yr	1102	40	389	38
8–12 yr	1290	116	493	191
12 and older	1247	107	301	146

* Data on the four separate cities studied may be obtained from the authors of this report.

practice were asked to cooperate in a study of food and fluid intake of normal children; they were advised not to influence their youngsters to drink more or less than usual, but merely *record* everything taken by mouth for a 48-hour period. When children were of school age, mothers were asked to make the measurements on a weekend. Otherwise, any convenient 2-day period was used. Cards were furnished to simplify recording all food, milk, water, fruit juices, and so forth, together with entries for methods of preparing formula, mixing juices, soup concentrates, or dried milk. Volumes were recorded in ounces.

Mothers chosen to participate in the test were those we felt would be cooperative and reliable. And it was perhaps significant that a number of them discarded original records they felt were incomplete or otherwise unsatisfactory, requesting additional forms to use at a later time.

Data cards were collected, tabulated, and analyzed. The daily findings in the four cities, by age, and in terms both of total fluid and tap-water intake, have been shown in Fig. 1 and set out in detail in Table 1.

Several features of these data are noteworthy. First, mean tap-water intakes resembled those reported by others (*2–4*), and were consistently less than half the total daily fluid volume consumed for all age groups. As the standard error of the means show, intake tended to be uniform in the children studied. It was apparent also that total fluid intake increased with age and that, proportionately, consumption of tap water decreased.

The study excluded the summer months in the hope that differences in fluid consumption would be observed between children spending the fall, winter, and spring in the North or the Far West and those living in Georgia and Florida, where more clement weather usually prevails. No differences whatever were observed in total fluid intake, a finding at variance with that reported by others (*3–5*). In the age range from 2 to 9 months tap-water consumption (Table 1) may have been less in Michigan than in the other areas, otherwise, again, no differences were noted. In the light of negative observations by Galagan *et al.* (their Table 2, in *4*), breakdown by sex was not undertaken.

Finally, daily intake of tap water of 500 ml or more (roughly, 1 pint) was rarely reported, even among older children. Dehydration is no problem among normal children resident in the United States, but this relatively limited average intake ought to be kept in mind when programs of fluoridation of drinking water are under consideration (*6*).

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Translocation in the Giant Kelp Macrocystis

Abstract. *Experiments with C^{14}-labeled bicarbonate demonstrate that organic products of photosynthesis are transported through the stipe tissue of* Macrocystis. *Depending upon conditions, not all of which have been fully ascertained, the direction of transport may be either predominantly apical or toward the base of the plant.*

Sieve-filament members, structurally similar to the sieve elements in the phloem of many vascular plants, occur in the giant kelp *Macrocystis* (*1*). However, as yet, there is no absolute proof that the sieve filaments of *Macrocystis* function in transport as do the sieve tubes of vascular plants; indeed, transport of any substance through intact stipes of this or related algae is still open to question (*2*).

Crafts (*3*) calculated rapid rates of transport from measurements of the amount of exudation from freshly cut stipes of this alga. This exudate was assumed to have originated from the sieve filament members of the "phloem" because, "the sieve tubes of the phloem are the only specialized elements capable of such rapid conduction."

Convincing evidence for translocation of organic products through stipes of *Macrocystis* has been presented by Sargent and Lantrip (*4*). They found that the daily increase in dry weight in the apical region of a frond exceeded the daily product of photosynthesis in that region, while the mature blades produced an excess of photosynthate. They concluded that some of the excess organic products formed in the blades near the surface and some distance behind the apex must be transported to the less organically rich, actively growing apical region. Also the rate of photosynthesis of whole fronds during the summer was greatly in excess of the rate of growth; therefore, these workers predicted that some translocation basally, and storage in the haptera might occur. The stored product was presumed to supply the holdfast and young developing fronds and sporophylls with an energy source for spring growth.

The use of radioisotopes should facilitate the confirmation of some of this earlier work, and in addition disclose the tissue or tissues participating in translocation, the substance or substances translocated, and the mechanisms of translocation. In this preliminary study, two short-term experiments have been conducted.

An intact plant of *Macrocystis* was collected by a diver from the sublittoral zone at Corral Beach, Malibu, California, on 27 November 1962. The plant was carried to the laboratory and deposited in an aquarium containing 60 gallons of natural sea water at a temperature of 17°C. A mature intact blade (No. 44 back from the apex) was placed in a rectangular transparent plastic reaction chamber which was open at the top. The reaction chamber was immersed to within half an inch of the open top so that only a few inches of stipe and the bladder of blade No. 44 were exposed to the air above the chamber; the rest of the plant remained in the natural sea water. The reaction chamber (16 by 4¼ by ½ inch) was filled with about 500 ml of freshly prepared and sterilized artificial sea water medium ASP-2 (*5*), to which was added a few milliliters of a $NaHCO_3$ solution labeled with C^{14} (about 1 mc). Three 20-watt fluorescent lamps, giving a light intensity of 8 klux, were placed against the glass wall of the aquarium so that they faced the flat surface of the blade in the reaction chamber. The remaining portion of this side of the aquarium was masked with thick black paper to prevent light from reaching other parts of the plant.