

## a Caregiver and a Terminally Ill Parent-in-law

40 families who had lost a family member older than 65 were interviewed. In 13 cases, the daughter-in-law had cared for one of her husband's parents throughout the illness. There are many difficult problems to overcome when caring for aged terminally ill parents. Also, after the patients died, the care giver must cope with her own grief as well as the grief of other family members.

One patient had expressed a desire to die in her own home. The son and daughter-in-law wanted to grant her final wish, but members of the community expressed the opinion that the patient should be cared for in a hospital because she could no longer take nourishment by mouth. As a result, the daughter-in-law ended up caring for the patient in the hospital.

During the process of giving care, the relationship between daughter-in-law and mother in-law underwent a great change. The atmosphere in the home prior to the illness had been tense at times. The situation changed into one in which the patient preferred to be cared for by the daughter-in-law rather than other members of the immediate family. On the other hand, the daughter-in-law grew to love her parent although this was a very difficult period for her because she had to deal with the complex issues of illness, death and grief.

If nurses could foster better relationships among family members, as has happened in this case, the family would be able to deal with the grief better when the terminally ill patient dies.

## Masaaki TANAKA and Yoshimitsu SHINAGAWA : Analysis of Heart Rate Fluctuations I

The human heart rate has been known to fluctuate, apparently in a random manner. An elaborate investigation has revealed that the power spectrum of the fluctuation depends on the frequency  $f$  as  $1/f$ . Such a fluctuation is called a  $1/f$  fluctuation and appears in various phenomena, including traffic on a highway and the internet. In this paper a fractal model is proposed which associates a fractal structure with the  $1/f$  fluctuation. The model is ascertained numerically. This model, however, describes only a local  $1/f$  fluctuation accompanied by a ventricular contraction. In order to explain the global  $1/f$  fluctuation, that is, the heart rate  $1/f$ -like fluctuation observed experimentally, a phase model is also introduced.

## Hiroshi FUJINO and Jun TANEMURA : Relation of Word Comprehension Establishment and Pre-Verbal Behavior in Developmental Language Disorder

This study was designed to investigate the development of pre-verbal behavior related to acquisition of word comprehension ability in infants with a developmental language disorder. Eighteen cases were evaluated by Taguchi's "Scale of Language Development." First, we stud-

ied the correlation of the scores of the "word comprehension" and each subcategory of the "basic behavior of language development." Second, we classified the subjects into contrasting word comprehension groups: established and unestablished groups. These groups were compared from the standpoint of pass or fail on each item of the "basic behavior of language development." Subsequently, we examined one case (No. 8) who progressed markedly in language development from the first to the second evaluation. The results were as follows. First, strong correlations were recognized between the "word comprehension" and the "interpersonal relationship" and the "symbolic behavior." Second, thirteen items were selected relating to word comprehension establishment. Among the thirteen items, six items were supposed to be related to "pointing," two items to "imitation" and two items to "symbolic play." An especially strong statistical relationship was found between word comprehension establishment and "pointing" and "imitation." Case No. 8 progressed in "pointing," "imitation," "symbolic play" and word comprehension simultaneously. These results suggest that such pre-verbal behaviors as "pointing," "imitation" and "symbolic play" are strongly related to word comprehension establishment.

### **Mitsushiro NAGAO, Noriki NAGAO and Shuji MATSUEDA : Marathoner's Injuries as Observed at Medical Relief Stations**

The purpose of this study was to study the problem of injuries to runners by examining runners who came to medical relief stations during a marathon. The chief complaints of the runners who came to the first-aid stations were ascertained at the 17 km and 35 km points of the Kawaguchi Lake marathon race. The questions asked included their age and how many times they had taken part in full marathon races. The runners who had not participated in many full marathon races complained about blisters and plantalgia. It is necessary to select proper running shoes and use them properly to prevent these disorders. Thirty eight percent of all runners who came to the aid stations at both the 17 km and 35 km points complained of pain in the gastrocnemius. The runners who ran long distances and had participated in many full marathon races complained of pain in the hamstring. It is important that runners should stretch the hamstring and other muscles in the lower extremity after running. The runners who ran long distances also complained of pain in the lateral side of their knee joints. It is necessary for them to take another look at their running form or restructure the insole of their shoes.

### **Hiroko MINE and Kenji NINOMIYA : Changes in Properties of Coagulase Negative Staphylococci Adhering to the Fingers by Aging**

Sixty strains of coagulase negative staphylococci (CNS) were isolated from 20 healthy young people in their twenties and 40 CNS strains were obtained from 15 healthy old people in their fifties. The species of the isolated CNS were determined by using Api Staph. Forty one strains