

hypothalamus is further evidence linking the central nervous system and endocrine glands in a manner that can affect both emotions and allergy.

The direct effect of food allergy on the central nervous system is well-documented. In his milestone publication, *Nervousness, Indigestion and Pain*¹ Walter Alvarez described his own experiences with what he termed, "dumb Mondays", characterized by sluggishness, ennui and difficulty in thinking occasioned by eating chicken habitually on Sundays. More recent books on this subject have supplied lengthy bibliographies in support of this thesis.^{9,10,16,24} These books document the extensive clinical experience showing that ingested foods can, in susceptible persons, induce a wide variety of neurological and psychiatric symptoms.

As early as 1700 reports appeared in the literature of convulsive seizures occurring after ingestion of specific common food substances.⁵ In 1916 Hoobler,⁹ described a child with irritability, fitfulness and insomnia following ingestion of an allergenic food.

In 1930 Rowe¹⁴ and Vaughn²³ introduced the term 'auto-intoxication' and pointed out that fatigue and weakness were common symptoms of food allergy and in 1954 Speer¹⁸ introduced the term 'allergic tension fatigue syndrome' so commonly seen in hyperactive and M.B.D. children. In 1952 Davidson⁷ enumerated the nervous and mental disorders that had been found associated with food allergy (Table II).

The mechanism of such a wide variety of symptoms may be traced to the action of allergen upon focal areas of brain tissue. As the work of Wilder Penfield clearly demonstrated, focal stimulation of

brain tissue can produce specific and repeatedly demonstrable effects.¹¹ The patho-physiology of allergens carried by the microcirculation of the brain to specific sensitized areas could well account for any or all of the above listed symptoms. Target organs of central nervous system allergy can include cortex, thalamus, limbic system, brain stem or hypothalamus with the latter responsible for widespread autonomic or endocrine disturbances. Chronic exposure to food allergens could thus produce continuing changes in catecholamines with behavioral alterations that do not quickly reverse.

Food allergy can be quite specific to a single food or to a family of foods. Often allergy to a specific food seems to be inherited. We have tested the cord blood of newborn babies before any food entered the gastrointestinal tract and found by Cytotoxic Food Testing, a sensitivity to foods to which one or both parents were allergic.

In some instances, there seems to be only the allergic tendency which is inherited and allergy to specific foods is then acquired through exposure. In this way, any food may be a potential allergen.

In some cases, as with angioneurotic edema, the reaction to a food may be instantaneous. More often it is delayed for 30 minutes to eight or ten hours. A longer time may indicate a sensitivity to some breakdown product of metabolism rather than to the whole food itself. Food allergy may be additive and with foods remaining in the body for several days, reactions can be delayed by that length of time.

The amount and frequency of feeding is important and we have demonstrated typical dose response cur-

TABLE I
DISEASES CAUSED OR AGGRAVATED BY ALLERGIC REACTIONS

<i>Respiratory System:</i>	Hay fever with rhinitis and conjunctivitis, bronchitis with symptoms from tobacco and petrochemicals, asthma and sensitivity to inhalants, foods and chemical and in all of these, an increased sensitivity to respiratory infections — all aggravated by food sensitivities.
<i>Skin:</i>	Angio-neurotic edema, urticaria (hives), pruritis (itching), eczema — again primarily from ingested food or contactant allergen worsened by food allergy.
<i>Digestive System:</i>	Apthous ulcers (canker sores), dyspepsia (indigestion), peptic ulcer, regional ileitis, Crohn's disease, constipation, diarrhea, colitis and rectal irritations.
<i>Cardio-Vascular System:</i>	Dysrhythmias, vaso-vagal attacks (syncope, fainting, giddiness), anginal pain, hypertension.
<i>Musculo-Skeletal System:</i>	Arthralgias, arthritis and myositis.
<i>Genito-Urinary System:</i>	Frequency, impotence and frigidity.
<i>Endocrine System:</i>	Hypothyroidism, hyperthyroidism and dysmenorrhea.
<i>Central Nervous System:</i>	Headache (including migraine), convulsions, tinnitus, vertigo, anxiety, hyper-irritability, hyperactivity, depression, lethargy, lack of energy, insomnia, inability to think clearly, thought disorders.

REFERENCES

1. ALVAREZ, W.: *Nervousness, Indigestion and Pain*, HOEBER, Paul, (Ed.) New York: pp. 488, 1943.
2. BOYLES, H. N.: The validity of using the cytotoxic food test in clinical allergy. *Ear, Nose Throat J.*, **56**: 35-43, April 1977.
3. BRYAN, W.T.K.: The cytotoxic test of food reactions, Unpublished manuscript.
4. BRYAN, W.T.K., BRYAN, M.: Cytotoxic reactions in the diagnosis of food allergy. *Laryngoscope*, **79**: 1453-1472, 1969.
5. CAMPBELL, M. B.: Allergy and epilepsy. In: *Allergy of the Nervous System*, SPEAR, FREDRICK, (Ed.), Springfield, Ill.: Charles C. Thomas, pp. 259, 1970.
6. DAVENPORT, H. W.: Why the stomach does not digest itself. *Sci. Amer.*, 226-87-93, 1972.
7. DAVIDSON, H. M.: Allergy of the nervous system. *Quart. Rev. Allerg. Applied Immun.*, **6**: 157, 1952.
8. HOOBLER, B. E.: Some early symptoms suggesting protein sensitization in infancy. *Am. Dis. Child*, **12**: 129, 1916.
9. MACKARNESS, R.: *Eating Dangerously — The Hazards of Hidden Allergies*, New York: Harcourt Brace, pp. 164, 1967.
10. MCGOVERN, J., KNIGHT, J.: *Allergy and Human Emotions*, Springfield, Ill.: Charles C. Thomas, pp. 166, 1967.
11. PENFIELD, W., ROBERTS, L.: *Speech and Brain Mechanisms*, Princeton, New Jersey: Princeton Univ. Press, 1959.
12. RANDOLPH, T. G.: Concepts of food allergy important in specific diagnosis, *J. Allergy*, **21**: 471-477, 1950.
13. RINKEL, H. J.: Role of food allergy in internal medicine. *Ann. All.*, **2**: 115-124, 1944.
14. ROWE, A. H.: Allergic toxemia in migraine due to food allergy. *Calif. West. Med.*, **33**: 785, 1930.
15. SEIYE, H.: The general adaptation syndrome and the disease of adaptation. *J. Clin. Endocrinol. Metab.*, **6**: 117, 1946.
16. SPEER, F.: *Allergy of the Nervous System*, Springfield, Ill.: Charles C. Thomas pp. 259, 1970.
17. SPEER, F.: *Food Allergy*, Littleton, Mass.: P.S.G. Publishing Co. Inc., p. 165, 1978.
18. SPEER, F.: The allergic tension-fatigue syndrome. *Pediat. Clin. N. A.*, **1**: 1029, 1954.
19. ULETT, G., ITH, E., PERRY, S.: Cytotoxic food testing in alcoholics. *Quart. J. Studies Alcohol*, **35**: 930-942, 1974.
20. ULETT, G. A., PERRY, S. G.: Cytotoxic testing and leukocyte increase as an index to food sensitivity. II. Coffee and tobacco. *Ann. Allergy*, **34**(3): 150-160, 1975.
21. ULETT, G. A., PERRY, S. G.: Cytotoxic testing in leukocyte increase as an index to food sensitivity. I. *Ann. Allergy*, **33**: 23-32, 1974.
22. UPDEGRAFF, T. R.: Food allergy and cytotoxic tests. *Ear, Nose, Throat J.*, **56**: 48-64, November 1977.
23. VAUGHN, W. T.: Allergic migraine. *J.A.M.A.*, **88**: 1183, 1927.
24. WUNDERLICH, R.: *Allergy, Brains and Children Coping*, St. Petersburg, Fla.: Johnny Reeds, Inc., pp. 170, 1973.