

ANTI EATING: REVIEW OF ORGANIC AND PSYCHOLOGICAL CAUSES OF VOMITING

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This article is concerned with disgust, nausea and vomiting. The origin of vomiting behaviour is generally attributed to and classified into six major groups: a) Pathological and physiological, b) motion sickness, c) chemical, d) physical, e) psychological and f) morning sickness during pregnancy. Whereas the etiology of pathological and physiological, chemical and physical vomiting is well established, motion sickness and morning sickness are less clear and may be caused by complex psychological factors. Lost local orientation is believed to lead to motion sickness. Many psychological interpretations such as unwanted pregnancies, negative daughter-mother-relationships, attention seeking motivations etc. are found in the literature as causes for morning sickness.

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Introduction and Problem

A healthy growing human body needs, besides other things, well selected food to compensate for lost energy. In one of the main research fields of the first author, namely the "psychology of eating" one is sometimes confronted with the organism's aversions to special substances. As Rozin and Fallon (1987) pointed out, there are four types of causes of rejection of food:

- (1) *Distaste* is caused by sensory factors. A bad taste (especially bitter) and smell, including a non-acceptable texture (Logue et al. 1981), motivates a person to a mild form of rejection, e.g. black coffee in American culture, cheese in China, sometimes uncooked fish.
- (2) *Danger* is motivated by the anticipation of harmful effects, e.g. poisonous, putrefied or allergy causing food. Eating such things is extremely dangerous.
- (3) *Inappropriate* are foodstuffs which belong to the non-food area for humans such as wood, rocks, sand, clothes, paper. These have little nutritional value, if any.
- (4) *Disgust* is a mixture of sensory and idealistic aversions causing the rejection of certain substances as food, e.g. faeces, blood, mucus and is closely linked with nausea or vomiting.

Nausea and vomiting are anti-eating functions to protect the organism against dangerous substances or situations. Harmful effects, on human beings, do not lie exclusively in poisoned or putrid substances i.e. the biological dimension. There is also psychic protection against aversive stimuli. Besides these functions, there are many other reasons for nausea and vomiting.

In order to describe the phenomenon of vomiting and its causes, we first have to give a definition. Vomiting or emesis is defined as the forceful expulsion of gastrointestinal contents through the mouth. It is accompanied by salivation, contraction

of the pharynx and the muscular system, and is often preceded by the build up of nausea. However, vomiting can occur in the absence of any premonitory nausea. The person is able to exert temporary control over the vomiting, sufficient to ensure that it is delayed until reaching the bathroom when the food just comes up, usually in small quantities. There are internal (e.g. sickness) or external (e.g. being on a ship) reasons for vomiting. Vomiting can have organic (e.g. physical, chemical, physiological) or psychological reasons. The phenomenological description runs from disgust through nausea (queasy feeling) to vomiting (spitting ingested food). The frequency list of the subject index in literature on vomiting is found as follows:

- (1) motion sickness,
- (2) illness,
- (3) eating disorders,
- (4) psychological reasons and conditioned reflex,
- (5) chemotherapy,
- (6) special cases such as
 - a. pregnancy,
 - b. early childhood,
 - c. infancy,
- (7) others.

We don't intend to discuss the physiological aspects of brain functions, especially in the cortical eating center and in the hypothalamus, neither do we speculate concerning the role played by the area in the vicinity of the parotid gland and the labyrinthum. In general, no simple reasons for vomiting exist, since the somato-psycho-social uniqueness of the human being is grounded on complex mechanisms. Nevertheless, an attempt has been made to review and classify the field to find more explanations for special cases of psychologically caused vomiting such as motion sickness or morning sickness in early pregnancy. Until now these phenomenon have been regarded by physicians as purely somatic (caused by hormonal threshold) and by psychoanalysts as purely psychosocial (defence of the pregnant state and growing foetus). The reason why morning sickness is so interesting, in this field, is that the pregnant woman is a person supposed to be a healthy basis for the growing organism. One condition of healthiness is eating and not vomiting.

Literature review

In our review we go from the relatively simple organic reasons for vomiting to the more complicated psychological causes.,

1. Organic disorders — Pathological and physiological reasons

The act of vomiting is heralded by nausea when there is an initial reflux of duodenal contents into the stomach. Retching then follows, involving a series of vigorous contractions of abdominal, thoracic and diaphragmatic muscles with the glottis closed, the gastric contents flow into the lower oesophagus. Finally, there is powerful and sustained contraction of the abdominal muscles, the diaphragm descends, causing a large rise in intra abdominal pressure leading to vomiting itself. A wide variety of both gastrointestinal and other disorders may lead to vomiting. Vomiting

which is delayed more than one hour after meals is said to be typical of peptic ulcer, gastric carcinoma, gall bladder disease and intestinal obstruction. Early morning vomiting is typically associated with pregnancy, alcoholism and metabolic disturbance such as uraemia (Morgan, 1985). A broad field of vomiting-causes lies in infections (bacterial, parasitic, viral) and intoxications of spoiled food (Oliver, 1990).

Vomiting is a common sequel of gastric reduction procedures after surgical treatment (e.g. for obesity). Systematic studies (Griffen et al., 1977; Halmi, 1980; Mason, 1981) support this fact and point out that it is a serious burden to many patients. Mason (1981) reported that in the year following surgery 17 per cent of the members of one cohort reported vomiting "frequently" and 53 per cent reported vomiting "occasionally"; comparable figures for another cohort were 11 per cent and 39 per cent. In another study by Mason (1981) patients reported vomiting more than twice a week of whom 66 per cent continued vomiting after one month falling to 33 per cent after 6 months, 18 per cent after a year and 10 per cent after two years.

Lilian et al. (1986) report of green vomiting. They observed 45 new borns (weight more than 2000g) initially presumed normal with bilious vomiting in the first 72 hours. Data indicated that approximately two infants per thousand show these symptoms.

2. *Motion sickness*

Nausea is the most commonly reported symptom of motion sickness. It is a profoundly unpleasant, subjective experience related to the epigastric region, heralding the approach of frank vomiting. The act of vomiting automatically constitutes a more severe case of motion sickness than one in which only nausea is present, although the end result of this particular facet of the syndrome may well be more serious, e.g. in survivors of sea or air disasters.

The term "nausea" is derived from the Greek word *naus* meaning a ship. Sailing-induced rotation was believed to possess therapeutic power by early 19th century psychiatrists and even in the later part of that century physicians still sent patients on a voyage for the sole purpose of inducing vomiting. Motion sickness has long been a cause of great concern, Cicero claimed that "he would rather be killed than again suffer the tortures of *nausea maris*" (Marti-Ibanez, 1954). Schwab (1943) examined a large number of US naval staff members suffering from chronic sea sickness. He divided these patients into type I and type II groups. The former were those who became sick, not only at sea, but on a wide variety of other forms of transport (one speaks of *kinetosis*). The type II individuals had little previous history of motion sickness and only became seasick during severe weather conditions. Psychologists have recently stated that the disturbance of the balance organs in the ear, together with some stimulation of the vomiting centre in the brain are not the only causes for sea-sickness. The reflexes of the visual system and a general disturbed orientation also play an important role (Stadler, 1987).

The modern version of motion sickness is space or canal sickness. There have reportedly been at least 16 cases of space sickness among astronauts and cosmonauts during weightless flights. Astronaut Russell Schweickart, the lunar module pilot of the Apollo 9 mission, in March 1969, suffered mild nausea from the beginning of the flight and it terminated in frank vomiting when he attempted to don his space

suit prior to entering the lunar module. Stewart (1985) administered a questionnaire to 17 astronaut candidates to collect data on signs and symptoms of motion sickness. Two experiences most frequently mentioned on the questionnaire were disorientation and upset stomach. Vomiting during space flight may result from elevated stomach pH, disorientation, or a combination of both factors. In experiments in which subjects have been rotated at speeds ranging from two to ten revolutions per minute on a rotating platform or a 'slow rotating room' the main symptoms of canal sickness were found to be nausea and vomiting (Graybiel et al., 1960, 1967). Even in a large space platform nausea, vomiting and other symptoms of canal sickness may ensue for the same reason. Using the Wesleyan University elevator device, Crampton (1955) examined a number of physiological variables in an attempt to find a reliable indicator for forthcoming nausea and/or vomiting. The subjects were exposed to a symmetrical wave motion having an amplitude of 7.5 ft. and a frequency of 15.6 cycles/min., where the mid-wave-velocity was 400 ft./min. The principal finding was that the onset of pallor consistently preceded the report of nausea, and nausea always preceded vomiting.

Ordy and Brizzee (1980) studied the susceptibility to motion sickness in 104 squirrel monkeys, assessing the effect of combined vertical rotation and horizontal acceleration, phenotype, sex, morning and afternoon testing, and repeated test exposures on incidence, frequency, and latency of emetic responses. The highest emetic incidence (89 per cent with a frequency of 2.0 during 60 min. and a latency of 90 min. from onset of testing) occurred at 25 rpm and 0.5 Hz linear acceleration. The results indicate that squirrel monkeys represent a suitable primate model for studies of motion and space sickness.

Money and Cheung (1983) studied the effect of removal of the vestibular apparatus of the inner ear in mongrel dogs. It was observed that the emetic response to certain poisons was impaired. The authors concluded that the inner ear is part of the normal mechanism for vomiting in response to poison, and that one of the physiological functions of the inner ear is to facilitate the emetic response to poisons. It seems likely that this mechanism, whereby the vestibular apparatus facilitates the emetic response to poisons, is the basis of motion sickness.

3. Chemical causes of vomiting

Any consideration of vomiting due to functional causes must take into account the basic physical and reflex mechanisms involved in the act of vomiting (Jewell, 1983). In the floor of the fourth ventricle there is also a chemo-receptor trigger zone which may activate the vomiting centre in response to metabolic disturbances or the emetic effect of poison, drugs and pharmacological substances. Drug abuse is often associated with vomiting. The central theme of research is alcohol, but other fields are not neglected.

The therapeutic role of chemical drugs is of great importance. In some special cases, secondary effects, such as vomiting, are observed (e.g. with cancer-chemotherapy). For the health establishing effect these non-intended sequences are tolerated. McClung et al. (1988) studied the effect of Ipecac. Ipecac is a natural product composed of emetin, cephaeline, and psychotrine. Emetin is the strongest pharma-

cological element which produces nausea, vomiting and diarrhoea. It has been used since 1812 as an amebicide. The chronic administration of Ipecac can result in unusual symptom complexes such as chronic diarrhoea, vomiting etc. Mescaline is the active alkaloid of peyote and is chemically related to epinephrine. It was studied in the 1950s and received much attention. Peyote has an intensively bitter taste and often causes nausea and vomiting. In other cases the negative effects of chemical substances are used as conditioning elements in behaviour-therapy. The drug Antabuse, used in alcohol aversion therapy, causes a profound physical reaction, including nausea, vomiting and other symptoms of massive autonomic arousal.

An everyday danger exists in possible food poisoning. Oliver (1990: 75f) listed as main sources: fish and shell-fish toxins, mushroom toxins, miscellaneous chemicals such as heavy metals, monosodium glutamate etc. The predominant symptoms of foodborn diseases are nausea, vomiting, diarrhoea, cramps and fever (Oliver, 1990: 7).

4. *Physical causes of vomiting*

The quantity of things eaten can be so high that the stomach repulses the swallowed stuff. This is a rare example of a physical cause of vomiting. More often one can observe an actively initiated vomiting in cases of "uncontrolled" eating. There are three fields of uncontrolled eating, namely eating disorders, consumption of poisoned or spoiled food, or accidental swallowing of hard inedible things such as safety pins, buttons, screws by children. Self-induced vomiting (Fairburn, 1980) is widely discussed in the context of eating disorders especially bulimia nervosa (Palmer, 1979). Fingers, rolled up sheets of paper, or handles of tooth-brush etc. are stuck down the throat. These actions are either self-induced in order not to get fat (these cases are psychologically caused and defined later) or used by helpers to get rid of the swallowed noxious material.

5. *Psychological reasons of vomiting*

Very few studies deal with vomiting as a psychic phenomenon. The concept of vomiting due to physio-psycho-social causes has long been recognised only for childhood and pregnancy. But the view that psychological factors may play a paramount role in vomiting is not a new one. Hurst (1919) wrote about a seven year old child who developed hysterical vomiting. Brady (1986) presented the case of a 21 year old female displaying psychogenic nausea and vomiting.

In the following section we list examples for explanations from learning-, motivational- and social-psychological theories such as conditioning, attribution, and body-image for the discussed problem.

a. Classically conditioned response

Learned taste- and food-aversions are linked with the subjective feeling of indisposition after the "consumption of food which is accompanied by vomiting. The connection of illness and substance is (even after only one contingency) very effective. Seligman and Hager (1972, Introductor) call this phenomenon anecdotically "Sauce Beamaise-Phenomenon" and attribute this to a biological prepared-

ness against a bodily danger (Seligman, 1970). The "internal malaise" (opposed to peripheral pain, Pelchat and Rozin, 1982: 341) is a strongly affective reaction. The sequence is as follows: Consumption of a stuff, that is spoiled by poison, bacterially infected, contaminated by X-Rays etc. against which the body shows repellent reactions. Taste and smell will be experienced as aversive and the food will be avoided in future situations. Retching eliciting stimuli such as allergic substances (Kaufman, 1954), chemotherapeutic strategies in cancer treatment and behavioural therapeutic strategies have a special function.

Aversive conditioning is an effective strategy in extinguishing unaccepted behaviour (Rachman and Teasdale, 1969). In general two aversive stimuli are used: Electric shock and/or chemical induced vomiting. Lamon et al. (1977) pointed out that "nausea" is "the optimal aversion stimulus in aversion therapy with alcoholics".

Nausea and vomiting in anticipation of chemotherapy often develop in patients undergoing cancer treatment. The first proposal by Leventhal et al. (1988) is that postchemotherapy nausea and vomiting (anxiety and secondary nausea occurring later in time) are unconditional responses. These UCRs then become conditioned to various stimuli in the chemotherapy environment and thereby take the form of conditioned responses. In a study by Weddington et al. (1984) deep-muscle-relaxation-hypnosis controlled these conditioned reactions in 6 female patients aged 24-56 years. Anticipatory emesis recurred when hypnosis was not used. During a subsequent session in which hypnosis was reinstated, anticipatory emesis was again controlled (Redd et al., 1982). Nesse et al. (1980) discussed nausea in cancer chemotherapy and suggested that pretreatment nausea is a classically conditioned response. A 52 year old woman had no symptoms before her first treatment session but showed severe nausea and vomiting 12 hours after each injection. Another woman aged 20 years had become "hypersensitive to the smell of the clinic". The nausea persisted upto her most recent visits which were only follow-ups. The clinic building did have a distinctive odour, but it was not nauseating except for the patients. A controlled study of leukemic children showed that they developed a conditioned taste aversion to a specially flavoured ice cream after it was paired with chemotherapy treatment (Bernstein, 1978).

b. Motivation and emotion

Three phenomenal aspects describe emotional and motivational states: a) physical arousal, b) expression or reaction, c) special subjective feelings. Strong affective responses are sometimes accompanied by gastrointestinal reaction up to nausea and vomiting. Patients with vomiting symptoms, had significantly greater anxiety, depression and somatic sub-scale than patients with dieting symptoms. Tylden (1968) saw vomiting as a physiologically-based, response to the high level of stress they were experiencing. Children often vomit when they are anxious, i.e. when they cannot fight or flee or express their feelings in words. Often these anxieties are caused by fear of their parents anticipated loveless behaviour. There is an intensification of normal adolescent anxieties related to secondary sexual development and changes in body size and shape. This intensified anxiety may be produced by some of the physical changes that accompany a disease and its treatment including nausea and vomiting (Kellerman and Katz, 1977). Similarly 50 per cent of Hill's

(1968) patients' vomiting began as a recurrent reaction to stress in childhood. Episodic intense or severe anxiety may undoubtedly be accompanied by nausea and vomiting in certain individuals. A regular relationship between the occurrence of psychogenic vomiting and the experience of stress has been emphasized by Rosenthal et al. (1980). Clarke et al. (1987) presented the case report of a 40 year old insulin-dependent, diabetic woman with day and night time vomiting that was associated with anxiety. Concerning hostility Anon (1968) explored organic and psychological causes for intractable vomiting emphasizing the difficulty in making diagnostic distinctions.

Leibovich (1973) described the clinical picture of the psychogenic disorder of vomiting. This term is applied when vomiting is the result of an emotional disturbance or of a more profound psychic upset and only when no organic pathology is found. Vomiting was even seen as the effect of eating at the time when strong emotional arousal occurred. Rosenthal et al. (1980) claimed that patients who vomit have difficulty in handling anger. Inability to resolve their aggression results in vomiting as if by a displacement mechanism, which allows indirect expression and avoidance of unwanted feelings, vomiting leads in some way to relief of unpleasant feelings. Hill (1968, 1972) also implies that hostile feelings may lead to vomiting. Cellesi and Giordano (1972) studied four 5-10 year old victims of nervous vomiting and identified similar psychodynamic factors, family situations, and personalities in each case.

c. Personal and social problems

The discrepancy between individual motives and cultural demands often lead to severe conflicts in behaviour. Vomiting can be expressed as a symptom of an extreme tension between personal and social claims. Some cases may serve as examples: Rosenthal et al. (1980) emphasised that patients with history of vomiting lack assertiveness, find it difficult to limit demands which are placed upon them and exhibit a variety of conflicts in managing their lives and relationships. Further patients with psychogenic vomiting were reported to be passive, disliked confrontation, and showed poor assertiveness. Psychoanalytic reports emphasise immature sexuality and fear of heterosexuality as causal mechanism in psychogenic vomiting (Cleghorn and Brown, 1964). Hill (1968) emphasised the pathogenic effects of being entrapped in a hostile relationship, others point to the problem faced by women who are forced into a passive compliant social role which grossly limits their assertiveness autonomy (Rosenthal et al., 1980; Knapp, 1967). An everyday observation, of mother-child-relationship as regards, eating, gives hints for social conflicts in this field too. The mother who is rigid in terms of the amount of food she believes should be eaten as well as the appropriate time in which to do so is likely to find herself faced with an unhappy infant who is forced to vomit because it has been overfed or has waited too long or cried too hard and is unable to eat when the "magic hour" finally arrives.

The most severe symptom of epidemic vomiting is found in eating disorders, especially the syndrome of "bulimia nervosa" (Russel, 1979; Halmi, 1985; Gilbert, 1986). One of the first explanations of this phenomenon stems from a feminist's perspective (Boskind-Lodahl, 1976) and focuses on real or perceived rejections as the source of the eating disorder as a consequence of appearance and body preoccupation (Slade, 1985). Bulimia nervosa can be described as follows: Uncon-

trolled binge-eating attacks remind to the woman that body-weight might increase and her figure might no longer fit with the expectations of society of a beautiful woman. So some (mostly physical) techniques such as purgation and vomiting (Lacey and Gibson, 1985) or chewing and spitting out (Mitchell et al., 1988) are used to get rid of the foodstuff eaten or being eaten. Bulimia nervosa may become a self-perpetuating vicious circle of daily binge eating and vomiting. In a recent detailed report of 35 patients with bulimia nervosa Fairburn and Cooper (1984) described regular spitting out, regurgitation and rumination of food in 37.1 per cent cases. 579 women who fulfilled self-report diagnostic criteria for bulimia nervosa were thereby identified. They had grossly disturbed eating habits and half vomited at least daily.

6. *Pregnancy*

Approximately 50 per cent of normal women living in industrialised societies experience nausea and vomiting during the first 10 to 12 weeks of pregnancy (Fairweather, 1968). Wolkind and Zajick (1977) interviewed 96 out of 105 women attending an antenatal clinic in London in an attempt to understand why it is that only 50 per cent of women have such experiences. No physiological theory alone can answer all the questions raised by the phenomenon. Psychological theories have, however, been advanced in an attempt to explain: firstly, why half the women do not experience the symptoms and secondly, why in some women the symptoms do occur and continue beyond the first trimester of pregnancy. Dilorio (1985) investigated the incidence and characteristics of nausea and vomiting among 78 pregnant teenagers (aged 17-19 years). Data from a 15 item questionnaire indicate that 56.8 per cent of the subjects experienced nausea and vomiting.

In general, vomiting takes place in the morning so that it is called "morning sickness during pregnancy". The scientific term is "hyperemesis gravidarum". Medical and psychological explanations compete in this field. The medical explanation of hyperemesis gravidarum points out the alteration of the hormone threshold (this is also seen by Davenport et al. (1972) concerning cyclic vomiting in puberty, i.e. at the beginning of the menstruation cycle of girls). Pregnant women experience many changes bodily, especially as regard the internal secretion. They become heavy, fat and clumsy. Blood flow from the legs to the heart is slower than normal. Feet and legs swell up. Breathing becomes more difficult, since the lungs cannot dilate normally. The pressure on the stomach causes pain. The symptom "hyperemesis gravidarum" is medically interpreted as being caused by endocrinological changes and by the pressure of the growing foetus on the inner organs. Vomiting can also be seen as biological protection mechanism to withhold even very small amounts of dangerous, toxic substances from the foetus since the first phases of development are highly sensitive to disturbances of any kind. This could explain why "morning sickness" is observed especially during early pregnancy. A physiological speculation concerning morning sickness during pregnancy lies in its resemblance to motion sickness. Perhaps the altered body-state with the growing belly causes an unstable sensation in the inner ear. This might be generalised to the parotid gland and could give a feed-back to the vomiting centre in the brain.

Concerning the psychological explanations, Glatzel (1973) pointed out that, in pregnancy, women develop special appetites ("picae gravidarum") and aversions

to one food or another without material explanation. The reasons for the changes of hyperphagia to aphagia are still unknown. Glatzel (1973) himself stresses a psychological background in form of anxious defence and emotional phantasies concerning pregnancy and the growing child. We have to mention here that there is nearly no systematic empirical evidence on the appetite and vomiting behaviour of pregnant women. Molinski (1972) as well as Hertz and Molinski (1980) explained, from the psychological standpoint, that the vomiting behaviour of a pregnant woman is a defence mechanism against the child and/or the man. But this is unconscious and has to do with a problematic mother-daughter-relationship. Another explanation of vomiting during pregnancy may be that the woman wants to show the new state. Since in the first few months nothing can be seen she builds up a morning ritual to reassure herself that she is pregnant and has some stable signs for it. This ceremony is well accepted (since vomiting in normal life is negatively evaluated). Perhaps the attention seeking component is high. However, these theoretical standpoints have not been proved yet.

Some case studies may set spot-lights in the field: Prospective data on 86 pregnant women (mean age 25.9 years) were analysed to investigate the relationships between the pregnancy symptoms of nausea and vomiting and various demographic, social, and psychological factors (Fitzgerald, 1984). No significant differences were discovered along demographic or social dimensions between subjects reporting no nausea and those showing severe nausea during the first trimester of pregnancy. Subjects showing both nausea and vomiting during the first trimester reported significantly more (a) unplanned, undesired pregnancies and (b) negative relationships with their own mothers than first trimester groups experiencing nausea alone or no symptoms. Also those with continuing nausea and vomiting in the third trimester, when compared with those having no symptoms, tended to have reported (a) significantly more psychological/psychiatric problems in the first trimester and (b) were significantly more negative in the assessment of their own maternal relationship. Palmer (1973) attempted to detect female vomiters in a sample of 138 women under prenatal care. He found that the vomiters tended to be of low body height and from low income societies. Tylden (1968) concluded that vomiting and hyperemesis are expressions of stress in a susceptible group of pregnant women. Hyperemesis is more likely to occur in women who have had repeated severe stresses and many previous illnesses, particularly gastrointestinal and gall bladder diseases. Barrucand (1968) interviewed 24 women, collected their MMPI-data and others on the uncontrolled vomiting during the first 3-4 months of pregnancy. The most common dominant factor (22 cases) was their emotional immaturity, primarily associated with a mother relationship. The subjects' youth was stressed. Many were first born, had marked social isolation and self-centered vital interests. The pregnancies were almost always unwanted. Fear of adult life was nearly constant, often observed in 'abusive mother-dependent daughter' situations.

Summary

Vomiting is a defence mechanism against body-damaging influences. It can be caused physically, chemically, spontaneously or be self induced as a consequence

of some noxious events. The oral defence mechanism runs from disgust through nausea to vomiting.

Disgust is described as an emotion that has the following characteristics (Rozin and Fallon, 1987): (a) a characteristic facial expression, (b) an appropriate action (removing oneself), (c) a physiological expression (nausea and later vomiting), (d) an emotional state (revulsion). Disgust as Raulff (1982) has stated is a person centered protection against diffuse, slimy secretion (as excrements, fish etc.) and putrescence, decomposed organisms (as mould and mushrooms, cheese, haut gout etc.) and might be dissolved by gastrosophic actions (Raulff forgot black and poisoned stuff). *Nausea* is feeling queasy. It is to be observed during commotion, migraine, abuse, gastrointestinal and digestive disorders, appetite disorders and strong emotional stimulation. *Vomiting* is the strongest expression of the aversive defence mechanism. There are some drugs which initiate vomiting and drugs that depress nausea and vomiting. In general, a person feels relief after vomiting. One gets rid of a harmful and dangerous substance. There are plenty of reasons for vomiting (mostly physical disorders). Interesting are the so called unknown reasons (migraine, early morning sickness and even sea-sickness).

Though mainly considered to be an organic reaction with biological roots there are some white spots on the map of explanation that are filled with psychological interpretations. Psychological reasons for vomiting are in general caused by aversive conditioning. Disgust, nausea and vomiting are sometimes protective. One may interpret these mechanisms as guardian symptoms of the organism against serious damaging influences in general.

The anti-eating function of vomiting provides a poor rationalisation for motion sickness and morning sickness during pregnancy. Up to now, these symptoms cannot simply be explained by common theories. Motion and morning sickness are more or less "terra incognita" on the landscape of nausea and vomiting.

REFERENCES

- Anon
1968 : "Psychogenic vomiting", *British Medical Journal*, 4:344.
- Barrucand, D.
1968 : "The Psychogenesis of Repeated Vomiting in the Pregnant Woman", *Annates Medico-psychologiques*, 2: 618-626.
- Bernstein, I.L.
1978 : "Learned taste aversions in children receiving chemotherapy", *Science*, 200:1302-1303.
- Boskind-Lodahal, M.
1976 : "Cinderella's Step Sisters: A Feminist Perspective on Anorexia Nervosa and Bulimia", *Journal of Women in Culture and Society*, 2:342-356.
- Brady, J.P.
1986 : "Behavioural Analysis of a Case of Psychogenic Nausea and Vomiting", *Journal of Behaviour Therapy and Experimental Psychiatry*, 17:271-274.
- Cellesi, M. and D. Giordano
1972 : "Nervous Vomiting", *Medicina Psicosomatica*, 17: 229-239.
- Clarke, D.J., A.C.White and
D. Rowan
1987 : "Treatment of Vomiting with Relaxation Therapy", *Psychiatric Journal of University of Ottawa*, 12:49-50.

- Cleghom, R.A. and W.T. Brown
1964 "Psychogenesis of Emesis", *Canadian Psychiatric Association Journal*, 9: 299.
- Oliver, D.O.
1990 *Foodborne Diseases*, London: Academic Press.
- Crampton, G.H.
1955 "Studies of Motion Sickness: XVII. Physiological Changes Accompanying Sickness in Man." *Journal of Applied Physiology*, 7:501-507.
- Davenport, C.W. et al.
1972 "Cyclic Vomiting", *Journal of the American Academy of Child Psychiatry*, 11: 66-87.
- Dilorio, C.
1985 "First Trimester Nausea in Pregnant Teenagers: Incidence, Characteristics, Intervention". *Nursing Research*, 34: 372-374,
- Fairbum, C.G.
1980 "Self-induced Vomiting", *Journal of Psychosomatic Research*, 24: 193-197.
- Fairbum, C.G. and P.J. Cooper
1984 "The Clinical Features of Bulimia Nervosa", *British Journal of Psychiatry*, 144: 238.
- Fairweather, D.V.I.
1968 "Nausea and Vomiting in Pregnancy", *American Journal of Obstetrics and Gynaecology*, 102:135.
- Ferholt, J. and S. Provence
1976 "Diagnosis and Treatment of an Infant with Psychological Vomiting", *Psychoanalytical Study of the Child*, 31: 439-459.
- Fitzgerald, C.M.
1984 "Nausea and Vomiting in Pregnancy", *British Journal of Medical Psychology*, 57:159-165.
- Gilbert, S.
1986 *Pathology of Eating: Psychology and Treatment*, London: Routledge and Kegan Paul.
- Glatzel, H.
1973 *Verhaltensphysiologie der Emahrung: Beschaffung, Brauchtum, Hunger, Appetit*, Munchen: Urban und Schwarzenberg.
- Graybiel, A., B. Clark and J.J. Zariello
1960 "Observation's on Human Subjects Living in a 'Slow Rotation Room' for Periods of Two Days: Canal Sickness", *AMA Archives of Neurology and Psychiatry*, 3: 55.
- Graybiel, A. et al.
1967 "Vestibular Experiments in Gemini Flights V and VII", *Aerospace Medicine*, 38: 360-370.
- Griffen, W.O. et al.
1977 "A Prospective Comparison of Gastric and Jejuneal Bypass Procedures for Morbid Obesity", *Annals of Surgery*, 4:500-507,
- Halmi, K.A.
1980 "Gastric Bypass for Morbid Obesity", *Obesity*, ed. A.J. Stunkard, Philadelphia: Saunders.
- 1985 : "Review: Classification of Eating Disorders", *Journal of Psychiatric Research*, 19: 113-119.
- Hertz, D.G. and H. Molinski
1980 *Zur Psychosomatik der Frau. Entwicklungsstufen der weiblichen Identitat in Gesundheit und Krankheit*, Berlin: Springer.
- Hill, O.W.
1968 "Psychogenic Vomiting", *Gut*, 9: 348.
- 1972 "Functional Vomiting", *British Journal of Hospital Medicine*, 7:755.
- Hurst, A.J.
1919 "Hysterical Vomiting", *Transactions of the American Gastroenterological Association*, 22:110.
- Jewell, D.P.
1983 "Symptomatology of Gastrointestinal Disease", *Oxford Textbook of Medicine*, Vol. 1, 12.11, Oxford: Oxford Univeristy Press.

- Kaufman, W.
1954 "Some Psychosomatic Aspects of Food Allergy", *Psychosomatic Medicine*, 16:10-40.
- Kellerman, J. and E.R. Katz
1977 "The Adolescent with Cancer: Theoretical, Clinical and Research Issues", *Journal of Pediatric Psychology*, 2: 127.
- Knapp, P.H.
1967 "Purging and Curbing: an Inquiry into Disgust, Satiety and Shame", *Journal of Nervous and Mental Disease*, 144: 514.
- Lacey, J.H. and E. Gibson
1985 "Controlling Weight by Purgation and Vomiting: A Comparative Study of Bulimics", *Journal of Psychiatric Research*, 19: 337-341.
- Lamon, S. et al.
1977 "Human Classical Aversion Conditioning: Nausea versus Electric Shock in the Reduction of Target Beverage Consumption", *Behavioural Research and Therapy*, 15: 313-320.
- Leibovich, M.A.,
1973 "Psychogenic Vomiting: Psychotherapeutic Considerations", *Psychotherapy and Psychosomatics*, 22: 263-268.
- Leventhal, H., D.V. Easterling,
D.R. Nerenz and R.R. Love
1988 "The Role of Motion Sickness in Predicting Anticipatory Nausea", *Journal of Behavioral Medicine*, 11:117-130.
- Lilian, L.D., G. Srinivasan, S.P.
Pyati, T.S. Yen and R.S. Pildes
1986 "Green Vomiting in the First 72 hours in Normal Infants", *American Journal of Disease of Children*, 140: 662-664.
- Logue, A.W. et al.
1981 "The Acquisition of Taste Aversion in Humans", *Behaviour Research and Therapy*, 19: 319-333.
- Marti-Ibanez, F.
1954 "Philosophical Perspectives of Motion Sickness", *International Record of Medicine*, 167: 621-626.
- Mason, E.E.
1981 *Surgical Treatment of Obesity*, Philadelphia: Saunders.
- McCiung, H.J. et al.
1988 "Intentional Ipecac Poisoning in Children", *American Journal of Diseases of Children*, 142: 637-639.
- Mitchell, J.E. et al.
1988 "Chewing and Spitting Out Food as a Clinical Feature of Bulimia", *Psychosomatics*, 29: 81-84.
- Molinski, H.
1972 *Die unbewußte Angst vor dem Kind als Ursache von Schwangerschaftsbeschwerden und Depressionen nach der Geburt mit zwölf anschließenden Falldarstellungen*, München: Kindler.
- Money, K.E. and B.S. Cheung
1983 "Another Function of Inner ear: Facilitation of the Emetic Response to Poisons", *Aviation, Space and Environmental Medicine*, 54: 208-211.
- Morgan, H.G.
1985 "Functional Vomiting", *Journal of Psychosomatic Research*, 29: 341-352.
- Nesse, R.M. et al.
1980 "Pretreatment Nausea in Cancer Chemotherapy: A Conditioned Response?", *Psychosomatic Medicine*, 42: 33-36.
- Ordy, J.M. and K.R. Brizzee
1980 "Motion Sickness in Squirrel Monkey", *Aviation, Space and Environmental Medicine*, 51: 215-223.
- Palmer, R.L.
1973 "A Psychosomatic Study of Vomiting of Early Pregnancy", *Journal of Psychosomatic Research*, 17: 303-308.
- Pelchat, M.L. and P. Rozin
1982 "The Special Role of Nausea in the Acquisition of Food Dislikes by Humans", *Appetite* 3: 341 -351.
- Polivy, J. and C.P. Herman
1985 "Dieting and Bingeing: a Causal Analysis", *American Psychologist*, 40, 1: 193-201.

- Rachman, S. and J. Teasdale
1969 *Aversion Therapy and Behaviour Disorders*, London: Routledge and Kegan.
- Raulff, U.
1982 "Chemie des Ekels und Genusses", *Die Wiederkehr des Körpers*, ed. D. Kamper and C. Wulf, Frankfurt/M.: Suhrkamp.
- Redd, W.H. et al.
1982 "Hypnotic Control of Anticipatory Emesis in Patients Receiving Cancer Chemotherapy", *Journal of Consulting and Clinical Psychology*, 50: 14-19.
- Rosenthal, R.H. et al.
1980 "Diagnosis and Management of Persistent Psychogenic Vomiting", *Psychosomatics*, 8: 326.
- Roizin, P. and A.E. Fallon
1987 "A Perspective on Disgust", *Psychological Review*, 94: 23-41.
- Russell, G.
1979 "Bulimia Nervosa: An Ominous Variant of Anorexia Nervosa", *Psychological Medicine*, 9: 429-448.
- Schwab, R.S.
1943 "Chronic Seasickness", *American International Medicine*, 19: 28-35.
- Seligman, M.E.P.
1970 "On the Generality of the Laws of Learning", *Psychological Review*, 77: 406-418.
- Seligman, M.E.P. and J.L. Hager
1972 *Biological Boundaries of Learning*, New York: Appleton-Century-Crofts.
- Slade, P.
1985 "A Review of Body-image Studies in Anorexia Nervosa and Bulimia Nervosa", *Journal of Psychiatric Research*, 19: 255-265.
- Stadler, M.
1987 *Psychology of Sailing: The Sea's Effects on Mind and Body*, London: Adlard Coles.
- Stewart, R.
1985 "Psychology of Space Flight: II. Suggested Bases of Space Motion Sickness, Perceptual Disorientation and Elevated Stomach pH", *Perceptual and Motor Skills*, 60: 189-190.
- Tylden, E.
1968 "Hyperemesis and Physiological Vomiting", *Journal of Psychosomatic Research*, 12: 85-93.
- Weddington, W.W. et al.
1984 "Anticipatory Nausea and Vomiting Associated with Cancer Chemotherapy", *Journal of Psychosomatic Research*, 28: 73-77.
- Wolkind, S. and R. Zajick
1977 "Psycho-social Correlates of Nausea and Vomiting in Pregnancy", *Journal of Psychosomatic Research*, 22: 1.