no effect on transmission tested an hour later, and, as expected (*8*), actually increase habituation when animals are tested immediately after treatment. The experimental design of these short-term experiments consisted of selecting a specimen at random from the stock population, mounting it in the usual manner, testing the habituation rate 1 hour after mounting, then exposing the specimen to intense (100 db) tone pulses for 1 hour, retesting the habituation rate immediately after the treatment, and finally, allowing a 1-hour recovery period and testing again. Individual specimens exhibit increased habituation when tested 2 minutes after treatment (Fig. 1E), but recovery from this short-term depression occurs in 1 hour. Thus, short-term effects are unlikely to influence our results.

Our conclusion is that long-term use of the pathways between the afferent neuron and the giant interneurons during maturation leads to the development of a pathway that is less plastic. We do not know how permanent the effect is because we have not yet systematically tested at long intervals after removing treated specimens from the stimulus.

It is significant that the change was not a mere increase or decrease in efficacy; no difference was detected when single stimuli were used. Instead, the lability of the system was altered: the habituation curve was not shifted, but its slope was changed.

We have no evidence as yet about the site of the change, but this is a monosynaptic pathway and the postsynaptic cells are accessible for intracellular recording. Hence we feel that this preparation is an excellent candidate for the cellular analysis of a developmental change.

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3. The decibel reference is 20 micronewtons per square meter.
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Consequences of a Nationwide Ban on Spray Adhesives Alleged to Be Human Teratogens and Mutagens

Abstract. *A report of an association of chromosome breakage and birth defects with spray adhesive exposure resulted in a ban on the sale of these products and nationwide publicity warning exposed women. Six months later the ban was removed; the association could not be confirmed. Replies to questionnaires sent to medical genetics centers throughout the United States revealed that more than 1100 inquiries had been received and more than 1200 working days were expended because of the issue. Eleven exposed women underwent diagnostic amniocentesis, and one elected to abort her fetus. Eight other women who were exposed also elected to do so, but without first undergoing diagnostic amniocentesis. The episode illustrates some of the unexpected and unnecessary consequences that can arise from the false identification of an environmental agent as a mutagen or teratogen.*

In August 1973, the United States Consumer Product Safety Commission announced a reported association between exposure to some spray adhesives and chromosomal breakage and birth defects. The sale of these products was abruptly banned, and they were recalled from the market (*1, 2*). The Commission widely publicized a warning to all those exposed, particularly pregnant women, and urged them to consult a physician concerning chromosome studies. The ban was withdrawn in 6 months because the purported associations could not be confirmed, and no toxicity of the substances in question could be demonstrated. In fact, the results of reexamination of the original slides by other investigators did not confirm the first interpretation of increased chromosome breakage in those exposed (*3*).

The medical subspecialists for exposed individuals heeding the Commission's advice were primarily the medical geneticists, especially those doing genetic counseling and providing services in cytogenetics. Some centers were reported to have been deluged for requests for counseling and diagnostic services as a result of the Commission's announcements (*1*).

In an attempt to estimate the minimum impact of this episode, we sent questionnaires in May 1974 to all individuals in the United States listed in a national directory (*4*) as providing services both in diagnostic cytogenetics and genetic counseling (Table 1). They were asked to estimate the number of inquiries received, the number of chromosome studies of those who had made inquiries, the total number of working days expended because of this episode, the number of amniocenteses performed, the number of induced abortions, and any other adverse outcomes. They were also asked to comment on any possible beneficial consequences of this episode for those exposed.

There were 190 replies from independent units of which 182 were from active independent centers (Table 1) (*5*). There was a great range in the number of reported inquiries at these centers. More than one-third of the centers reported no inquiries

Table 1. Response categories to questionnaire and inquiries reported by those independent active centers which replied.

Active independent centers reporting	
No inquiries	52
1 to 5 inquiries	68
6 to 10 inquiries	31
11 to 15 inquiries	8
16 to 20 inquiries	8
21 to 25 inquiries	2
> 25 inquiries	7
"Some" inquiries	6
Subtotal	182*
Individuals with collaborative arrangement†	40
Inactive independent centers	8
No reply	5
Total	235

*At the 176 centers reporting an exact number of inquiries, the mean was 6.81 queries. The maximum number of queries reported was 200. The 25, 50 (median), and 75 percent quartile boundaries were 0, 3.2, and 7.6, respectively. The (minimum) total number of queries at these 176 centers was 1198. †Individuals with a separate listing in the directory who are affiliated with an individual at an active independent center from whom a reply was received. See also (*5*).

Table 2. Frequency of chromosome studies at 130 active independent centers receiving inquiries concerning spray adhesives.

Frequency of studies	Centers (No.)
0	49
1 to 5	58
6 to 10	13
11 to 15	4
16 to 20	2
21 to 25	1
> 25	1
"Some"	2*
Total	130
Range	0 to 44
Mean* †	2.97
Quartiles*	
25 percent	0
50 percent (median)	2.0
75 percent	4.2
Total studies (minimum)‡	380

*Those replying "some" were excluded from calculations of mean, quartiles, and minimum total studies. †Standard deviations were not calculated because of the observed skewed distribution. ‡At centers providing exact estimates.

despite the extensive national publicity. At the 130 centers reporting inquiries, 49 did no chromosome studies (Table 2). A median of 4.6 working days was spent on this issue by the centers reporting inquiries (Table 3).

No direct beneficial effects of this episode for those who were counseled were reported, although one person suggested that an indirect benefit had been to make individuals more aware of genetic counseling services. With regard to other outcomes, a total of 11 amniocenteses were reported from eight centers. In one woman, increased chromosome breakage was reported in cells cultured from amniotic fluid (an observation which may have been due to viral contamination) and an elective abortion was done (*6*). Three centers reported that they were aware of a total of eight women who, without first undergoing diagnostic amniocentesis, elected to have abortions because of concern about their exposure to spray adhesives.

These data are minimum estimates of the impact of this issue. They do not include results on women who may have consulted family physicians or obstetricians but were not referred to genetic centers. They do not include data from genetic units not listed by the directory (although we are unaware of any, and it seems that the directory lists many inactive individuals), nor do they include the experience of the five centers that did not reply (*7*). Moreover, there is no estimate of the nature, extent, or consequences of anxieties created by this issue, but we are aware of no ready measure of these.

The centers reporting the greatest number of queries were in Minnesota (where many of the substances were made, and where there apparently was heavy industrial exposure) and, for unexplained reasons, the Pacific Northwest. One respondent noted that a local newspaper had given the issue extensive publicity, which may have prompted many inquiries to his unit. A further study we carried out in New York State suggested that centers receiving no inquiries concerning spray adhesives see fewer patients for genetic counseling of any type than those who reported receiving queries (*8*). In addition we analyzed the results in a subset of the total of 182 active independent centers: 36 major genetic units known through their publications to be active in genetic counseling. The median (7.5) and mean (16.9) number of inquiries at these were more than double the experience (3.2 and 6.8, respectively) in the total group of 182 active independent centers replying. Only 1 of the 36 major centers reported receiving no inquiries, compared to 52 of the total 182. Thus, at least some of the factors affecting the number of queries received appear likely to be the location of the target population, variation in local publicity, and the size of the referral population of the centers.

Table 3. Frequency of working days expended at 130 active centers receiving inquiries concerning spray adhesives.

Frequency of working days	Centers (No.)
0	12
1 to 5	54
6 to 10	31
11 to 15	9
16 to 20	2
21 to 25	0
> 25	14
Some	5*
No estimate provided	3*
Total	130
Range	0 to 160
Mean †‡	10.43
Quartiles †	
25 percent	2.4
50 percent (median)	4.6
75 percent	9.4
Total working days (minimum)§	1273

*Of the 130 independent active centers receiving inquiries, there were eight nonrespondents concerning working days of which five reported doing chromosome studies and three did not report any such studies. We have classified the five which reported doing cytogenetic studies as expending "some" working days on this issue. †The calculation of mean, quartiles, and minimum total working days is for the 122 centers providing exact estimates. ‡Standard deviations were not calculated because of the skewed distribution observed. §At centers providing exact estimates.

Variation in the belief of the evidence cited as supporting toxicity and the extent of the anxiety expressed by the counselees may have contributed to the variation in the total number of chromosome studies, but we have no direct data on this.

The possibility that any substance to which there is extensive population exposure may be teratogenic or mutagenic is, of course, a real one, and the report of suspicion of an effect should be taken seriously. The consequences of the episode reported here, however, illustrate the need to distinguish suspicion of toxicity from evidence for toxicity. If there is nationwide publicity concerning possible mutagenic or teratogenic hazards of a substance, the recent legalization of abortion in the United States and the ready availability of prenatal diagnostic procedures make it likely that many women will avail themselves of amniocentesis (if it appears appropriate to the suspected outcome) and, even in the absence of definitive information, will abort fetuses they believe to be at risk.

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5. Our questionnaire requested that, if two or more affiliated individuals received an inquiry from us, one of them would prepare a summary of their center's experience. In one instance, however, separate replies were received from two individuals apparently affiliated with the same unit, without indication as to whether their reports overlapped. In this case, only the reply of the individual reporting the greater number of queries was included in the tabulations, because of the possibility that the response of the other was a subset of the one tabulated.
6. The genetic counselor informed the mother that, on the basis of this evidence, he was unable to make any specific prediction about the state of the fetus. The mother elected to undergo an abortion, but she did not inform the counselor of this decision until after the procedure, when the abortus had been fixed in formalin. Thus further chromosome studies could not be done. Detailed pathologic examination of the abortus at another institution revealed no evidence for any congenital defect (J. Q. Miller, personal communication).
7. No reply was received from the center at which the association was first reported. It appears likely that extensive work was performed here because of the suspected toxicity of spray adhesives (*1–3*).
8. Out of a total of 27 active independent genetic counseling centers in New York State who replied, 18 reported receiving inquiries concerning spray adhesives and 9 reported receiving none. In a further investigation 16 of these 18 and 8 of the 9 were able to estimate the number of clients per year they counseled. The mean ± standard deviation (and median) were 204.8 ± 166.1 (175) and 136.3 ± 103.2 (150), respectively, somewhat higher in the group receiving inquiries concerning the adhesives, albeit not significant at the 5 percent level ($P \sim .3$).
9. We thank those who responded to the questionnaires and M. Hoff for advice on statistical matters.

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Carotid Body in the Sudden Infant Death Syndrome

Abstract. *Sixty-three percent of victims of the sudden infant death syndrome had a subnormal volume and 23 percent an enlarged volume of glomic cells in their carotid bodies. Evidences of antecedent chronic alveolar hypoxia and hypoxemia were found in both groups but were more severe in the victims with enlarged glomic tissue.*

Prolonged apneic periods during sleep have been described in several sudden infant death syndrome (SIDS) victims prior to death (*1, 2*). Such apneic episodes may be a common final pathway of death in SIDS. In several adult disorders such episodes of sleep apnea are associated with chronic alveolar hypoventilation (*3*). Many SIDS victims show characteristic consequences of such chronic hypoventilation,