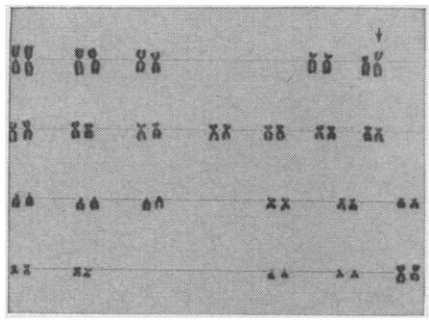

Fig. 1. B/? translocation. In view of the large size of this translocation, it is unlikely that there is an undetected reciprocal translocation although the phenotype of this infant was also normal. The father's autosomal complement was identical.

cent) weighed more than 140 lb (1 kg = 2.2 lb) compared to 27 percent of the total sample of mothers, and the most frequent weight class in the total sample (120 to 139 lb) was the least common in mothers of the chromosomally abnormal children. Since only two of these eight mothers were over 34, the relationship is probably independent of age. Two of the 11 mothers of infants with sex chromosome variants, as well as one mother of an infant with Down's Syndrome, had significant thyroid disease (two hyperthyroid and one hypothyroid) in contrast to 3.7 percent of the overall sample of mothers. The highest risk was found within the group of mothers with thyroid disease, and two of 50 mothers giving a history of hyperthyroidism had chromosomally abnormal children, a risk of 4 percent. Neither of the latter relationships should be regarded as more than possible clues, however, in view of the small sample size. Several negative findings are of equal interest. For mothers in the total sample and for those with chromosomally abnormal infants, the proportion that had taken oral contraceptives was identical (30 percent). Fourteen parents admitted to ingesting LSD prior to conception. None of their 14 children were chromosomally abnormal.

At least 0.5 percent of newborns possess major chromosome abnormalities which are likely to impair their effectiveness as individuals in various degrees. All autosomal trisomies are associated with significant mental retardation. Although the survival rate of children with autosomal trisomies is greatly decreased, the cost of hospitalization is frequently extremely high. The primary risk for the newborns with translocations lies in the increased probability of subsequent abnormal offspring. The level of risk for mental retardation or behavioral abnormality in the infants with sex chromosome aneuploidies is currently unclear, and adequate population surveys are urgently needed to provide answers. The large majority of these infants, except for those with autosomal trisomy, appear to survive into adult life, and all have survived to age 2 in the present study. It can be calculated that each year in the United States about 20,000 infants are born with a chromosome abnormality. The impact on their families and society as a whole is not trivial.

Three methods are available for reducing this population load. The first is to identify and remove factors which increase the rate of chromosome abnormalities. Public discussion and wider knowledge of the effect of maternal age (Table 3), for example, might prove partially effective. Second, these and other high risk groups, if identified, can already be offered amniocentesis and therapeutic abortion in many states. The only foreseeable totally effective means, however, is determination of the chromosome constitution of each fetus. More surveys of the type reported here are required before these possibilities can be intelligently implemented.

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Contraceptives and Dysplasia: Higher Rate for Pill Choosers

Abstract. *Among women choosing the pill in preference to other contraceptive methods there is a higher rate of the cancer precursor, dysplasia of the cervix, before any possible effect of the pill.*

Prospective studies on carcinogenic potential of the contraceptive pill depend on the observation of differential development over time. For cancer, a chronic disease of relatively low incidence, it is usually necessary to follow large numbers of women free of the disease and to compare incidence rates in those exposed and not exposed to the agent. For example, in the case of cancer of the cervix, with an annual rate of 3.1 per 10,000, it has been estimated that it may be necessary to follow a sample of 60,000 women exposed to the contraceptive pill and an equal number of controls for 1 year to detect a twofold difference in incidence. Over a 10-year follow-up, the numbers in each group could be reduced to 35,000 (*1*).

An alternative approach is possible in the case of cancer of the cervix, because women with the precursor, dysplasia, are at high risk for cancer of the cervix, the annual incidence being approximately 12 percent in women under 45 years old (*2*). The size of the population to be followed can therefore be considerably reduced by studying the carcinogenic potential of the pill in women who already have the precursor, dysplasia of the cervix (*1*). Follow-up of a relatively small population can be expected to yield valid results. Furthermore, the intrauterine device (IUD) has been reported not to affect the rate of progression from dysplasia to cancer, thus making it an ideal control for the pill (*3*).

Rates for cervical cancer and for dysplasia vary inversely with socioeconomic status, and within the low-income group there is no significant racial difference in prevalence of cervical cancer (*4*). A high yield of patients with dysplasia could therefore be expected by locating the study in a low-income area.

Participants in the study are those enrolled in the family planning program of the County Health Department: they attend clinics in a low-income, inner-

Table 1. Association of dysplasia and contraceptive choice prior to use. For the pill and IUD only, $\chi^2 = 7.31$, $P < .01$. For the pill, IUD, and other methods, $\chi^2 = 9.16$, $P < .005$.

Dysplasia	Contraceptive		
	Pill	IUD	Diaphragm and other
Present	122	39	5
Absent	1354	731	135

city area. The main criteria for eligibility are that the women are new to the family planning program and that they have previously not used the contraceptive pill. There is free choice of contraceptive methods and, in this population, the pill and the IUD are by far the most popular. Ideally, the agent to be tested is assigned at random. This is not practicable in contraceptive studies, since women express strong preferences and will not continue a method on an assigned basis if they prefer another one.

As a first step in dealing with possible differences related to selection of birth control methods, we investigated some characteristics of pill choosers and their controls at the time of entry into the study. The results are based on information from history, physical examination, and Papanicolaou smear test obtained at the first visit. Other investigators have related choice of contraceptive to demographic characteristics (*5*). In the current study, women choosing the pill differed from those choosing IUD's in having a higher income and lower body weight, but no further differences were found over a wide range of demographic and biomedical characteristics, including religion, ethnic group, age, age at first intercourse, age at first pregnancy, and number of children.

A significant association of dysplasia was found with choice of the contraceptive pill compared to choice of the IUD, or of the IUD and other methods (Table 1). The higher prevalence of dysplasia in women choosing the pill is apparently not attributable to demographic characteristics since those with dysplasia were comparable in age, race, and income to a sample of women without dysplasia.

In a recent study, a higher prevalence of cervical cancer was reported for women using the pill as opposed to the diaphragm (*6*). Implicit in the study was the assumption that differences in susceptibility to cervical cancer prior to use of a contraceptive method are random and therefore not factors in the carcinogenic process. Our results indicate that such an assumption may not be entirely warranted. The higher prevalence of dysplasia in women choosing the pill suggests that prior differences in susceptibility to cervical cancer may explain the correlation between use of the pill and cervical cancer reported in the Melamed study.

The implications of this study are several. First, among a relatively homogeneous population selecting alternative methods of birth control, there were significant differences prior to use between women choosing the pill and those choosing the IUD. Second, the differences in prevalence of dysplasia are not fortuitous although it is difficult to connect them with the decision-making process involved in the choice of a contraceptive method. Finally, the decision-making process among the women in this population has recently been profoundly affected by the Senate hearings on the alleged harmful consequences of the pill (*7*). Women who would have chosen the pill are now opting for the IUD or diaphragm.

The results in this study were obtained prior to the hearings, but the emotional heat generated by them is already producing a bias in the study's continuing phases. Thus, if there was a self-selection mechanism operating which was associated with a higher prevalence of dysplasia among pill choosers, it is now possible that another selective mechanism, fear, will prevent researchers from discovering whether the pill was really to blame after all.

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Conditioned Vocalizations as a Technique for Determining Visual Acuity Thresholds in Sea Lions

Abstract. *Aerial visual acuity and underwater visual acuity were measured in two sea lions* (Zalophus californianus) *by training them to emit click bursts if they saw a striped target or to remain silent if they saw a gray target. The closest grating spacings that could be resolved both in air and under water subtended a visual angle of 5.5 minutes of arc at a distance of 5.5 meters.*

Sea lions (*Zalophus californianus*) are capable of learning to emit underwater click vocalizations in the presence of visual cues (*1*). Aerial as well as underwater barking by *Zalophus* males can be suppressed, with the degree of suppression dependent upon the social context (*2*). Thus, exteroceptive cues to the visual or auditory channel can exert strong control over the emission of these sounds by *Zalophus*. How subtle can these cues be and still maintain control over the sound production? Can a wide variety of stimulus configurations be used to acquire control over underwater sound production? Can discriminative control of vocal behavior be used to determine the absolute or differential sensitivity of *Zalophus* to certain aspects of its environment?

This paper describes several experiments in which a sexually mature male (Sam) and a sexually mature female (Bibi) *Zalophus* were trained to emit a burst of short-duration sound pulses or clicks when viewing targets consisting of black and white stripes, and to remain silent when viewing a target that appeared flat gray. To our knowledge, this is the first report of a threshold determination for a nonhuman animal by means of a conditioned vocalization technique where shock was not