A PARTIAL SURVEY OF A CLEFT LIP AND OR CLEFT PALATE POPULATION IN THE STATE OF OREGON: A REPORT ON MICRO-FORMS AND ASSOCIATED ANOMALIES

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ABSTRACT

A study of the population of the State of Oregon affected with cleft lip and/or palate is reported. Genetic pedigrees for each of fifty families were constructed. Microforms and associated anomalies observed in probands and first and second degree relatives were recorded. Data on the site of the clefting, sibling rank, sex, parental age and seasonal incidence were correlated and then compared to findings in the literature. Findings of other investigations concerning microforms and associated anomalies were compared with the Oregon sample. The various modes of genetic transmission of cleft lip and/or palate are illustrated to stress the importance of obtaining a documented family history for purposes of counseling.

This study concluded that more males were affected than females with cleft lip with or without cleft palate; that more females were affected than males by cleft palate alone. More children with clefting were born to younger parents than to older parents. The months of April and May showed a greater incidence of clefting. Different modes of genetic transmission were observed. Heredity seemed to be an important factor in the incidence of clefting, but not the most important one.

INTRODUCTION

Children of the State of Oregon with cleft palate have received extensive professional care for their congenital abnormalities over the past twenty years. Their families, however, have received little attention. Such families, particularly where there is a multiple occurrence of clefting defects, offer a ready source of information concerning inheritance of this and other associated anomalies.

The purpose of this paper was to: 1) construct a pedigree for selected families; 2) identify microforms of clefting and associated anomalies in probands, siblings and parents; 3) report findings or associated physical variants occurring in members of the families; and 4) correlate data concerning clefting sites, sibling rank, sex, parental age, and seasonal incidence.

REVIEW OF THE LITERATURE

Interest in factors associated with the developmental abnormalities of cleft lip and cleft palate has a long history. Such interest holds the hope of understanding predisposing elements and causative mechanisms.

Reports on the incidence of clefting of the lip and/or palate are variable. Early incidence rates were very low compared to recent studies. Davis (15) in 1928, reported an incidence of about one per 1,500 in the United States. In more recent years, Fogh-Andersen (26) reports one per 665 live births in Denmark and Rank and Thomson (70) one per 600 in Australia. Birth records over a ten year period in Montana were compiled by Bardanouve (6) to show an incidence of one cleft defect in 465 births. She contrasted this higher incidence with the rate of one per 700 live births for the other states (6). Millard and McNeill (60) reported an incidence of one in 1,887 births in Jamaica, a rate similar to that reported for the Israel population (3).

Kraus (49), in a review, made note of the lack of studies on the incidence in populations and cultures other than Caucasian. He attributes this absence of reports as an explanation for the finding of more clefting in Caucasian groups. Millard and McNeill (60) suggests that the low incidence in Negro populations may be due to infanticide and a higher mortality rate among affected infants. Another factor which is likely to increase the variances in incidence among cultural groups is the reproductive rate of affected adults (79).

Parental age has been given consideration as a predisposing element to cleft lip and/or palate. Fraser and Calnan (24) reported that advanced maternal age may predispose to cleft lip in the female and to cleft lip and cleft palate in the male where the child is the first born. They

(24) also suggested in this study of 454 births that new mutations may be enhanced by the paternal age. Others (6, 36, 84) have also reported an increased incidence of clefting among children of older mothers. Hay (36) found this association existed with children of older fathers. He proposed that cleft of the lip alone does not have a relationship to parental age, but other clefts do (36).

Peer et al (63) were unable to demonstrate a correlation between parental age and the incidence of clefting while studying the effect of vitamin and oxygen deficiencies in four hundred expectant mothers. Spreisterbach (77) also was unable to demonstrate a relationship between older aged parents and cleft palate births.

Azaz and Koyoumdjisky-Kaye (3) and Bakan (4) demonstrated trends where young parents had an increased tendency of bearing children with some type of facial cleft. Inconsistent results have been reported by a number of authors (26, 50, 52, 53, 54).

Prevalence of the different types of clefting in males and females has been examined with varying findings. Hixon (38) in 1951 reported a higher prevalence of cleft lip in males and cleft palate in females from a study of Canadian children. Peer et al (68) and Fraser and Calnan (24) supported Hixon's earlier findings and further specified that cleft of lip and cleft of lip and palate are more prevalent in males in contrast to a cleft of palate alone which is more predominant in females. These two reports (24, 68) support the hypothesis that cleft of the lip alone or with the palate are both related to the same genetic mechanism which is different than that related to single cleft palate. However, Azaz and associate (3) report a prevalence of cleft lip among females and of cleft palate among males and Bethman (9) found no differences in pre-

valence of the types of clefting as related to sex.

Hay and Wehrung (37) reported recently, 1970, on a study of twins with clefting. They found (37) that cleft of the lip with or without the palate was more frequent in males, whether the birth was single or multiple. Bardanouve (6) showed the prevalence of clefting variants in females in Montana over a ten year period to be 57.8 percent of those with clefts of the palate only; 38.6 percent of those with clefts of the lip only; and 39.6 percent of those with clefts of lip or lip and palate.

Fogh-Andersen (26), Rank and Thomson (70), and Fraser and Calnan (24) have reported a prevalence of cleft lip on the left side. They found left side involvement in 51.6 percent of those patients with a cleft of the lip only, 29.0 percent involved the right side and 19.4 percent were bilateral. Patients with cleft of the lip and palate were found to have a predominance of the left side involvement, 53.3 percent. Bilateral clefting occurred in 25.7 percent of those having this anomaly.

Many investigators (3, 9, 24, 84) publishing over the past ten years on birth rank in relation to the anomaly have been unsuccessful in identifying relationships. An exception is Bakan (4) who reported that more children with clefts are first born in order more often than other birth positions.

The literature presents paradoxical views as to the seasonal incidence of clefting. Fraser and Calnan (24) and Woolf (84) found no seasonal relationship to cleft lip and/or cleft palate, although Woolf did find a higher incidence in July and the winter months. Others have not found any association regarding seasonal incidence (21, 52).

Cervenka et al (12) reported an incidence lower in January and November and higher in March and April. When the anomaly was subdivided into types of clefts, a higher incidence of cleft lip with cleft palate in the month of October was found.

Bardanouve (6) illustrates a higher incidence only in the spring months.

Kraus (44) concluded in his review that there is no evidence to indicate seasonal influences as a factor related to clefting of the lip and/or palate.

Cleft lip and/or cleft palate may be accompanied by other congenital defects. Different investigators have suggested a wide variety of disorders to have an association with clefting. The incidence of associated anomalies have been estimated from 10 to 25 percent (7, 18, 39, 40, 43, 68, 82) in contrast to the general population where the incidence is approximately three percent (18).

Drillien, Ingram and Wilkinson (20) divided their sample according to type of cleft defects and familial disposition in considering associated anomalies. The following categories were used to group these associates: 1) no other defect; 2) additional craniofacial defects as hypertelorism and hypomandibulosis; 3) other congenital defects. They reported 75.0 percent of the subjects with cleft lip and/or palate had no other anomalies; 4.3 percent had craniofacial anomalies; 19.6 percent had other anomalies and/or craniofacial anomalies; and 1.1 percent had multiple congenital anomalies.

These findings of Drillien and associates (20) are in agreement with other reports (24, 59, 77, 82) of a higher incidence of associated

anomalies among the patients with cleft palate as compared to patients with cleft lip or cleft lip and palate.

Some associated anomalies that appear consistently in patients with clefting are thought to be indicative of a tendency for cleft formation in nonclefted individuals. These anomalies could be minor manifestations of clefting and not associated anomalies and as such are called "cleft microforms" (27, 55, 85). The most common microforms studied have been bifid uvula, congenital lip pits, commissural lip pits, ocular hypertelorism, deformities of the hands and dental abnormalities (5, 20, 27, 30, 56, 57, 58, 80).

Bifid uvula has been considered a microform of clefting (2, 27, 56, 57, 58). It also has been reported as an associated anomaly in a wide variety of syndromes (30). The prevalence of bifid uvula in the population reported by Berans (8) in a sample of three thousand was found to be 1.82 percent. Berans report in the late XIXth century closely approximated more recent estimates. Meskin and associates (56) reported, in 1964, a prevalence of 1.34 percent in their controls and 1.47 percent in a population with clefting. These investigators also reported a prevalence of 0.20 percent in other groups where clefting was not present.

There is no evidence of preference of bifid uvula in either sex. Meskin and co-workers report varied results in their studies (56, 57, 58) and other workers have found no difference as to prevalence in the sexes.

Reports on prevalence of bifid uvula in different racial groups vary. Green and Combie (32) found a high prevalence among Chinese.

Feiglova (23) reports a very low incidence among Negroes. These findings are in agreement with other reports in the literature (30, 34, 42).

Meskin, Gorlin, and Isaacson (56) report 19.0 percent of the parents and 18.6 percent of the siblings of probands with bifid uvula. In a control group of 49 families they found only four with bifid uvula, each from a different family. As to the mode of genetic transmission of bifid uvula, Meskin and associates (56, 57, 58) suggest an autosomal dominant pattern with limited penetrance, similar to that of isolated cleft palate as suggested by Fogh-Andersen (26) and Fraser and Calnan (24).

Two variants of the lip pits, commissural lip pits and congenital lip pits, may have an association with clefting. These anomalies have different locations, involve different structures of the lips and possibly different patterns of genetic expression.

Commissural lip pits have been given several descriptions varying from dimples to heavy folds (23). These are differentiated from normal depressions occurring at the corners of the mouth.

Everett and Wescott (22) suggested that commissural lip pits have a dominant mode of transmission and have a frequent association with other congenital defects. Reports on the frequency of this variant range from 0.20 percent (22) to 11.94 percent (5). Baker (5) found a much higher incidence in Negroes than in Caucasians. Feiglova's report (23) of high incidence in Negroes, 21.1 percent in a sample of 956, supports the hypothesis that lip pits are not microforms.

Congenital lip pits have been described as small pits in the vermillion border of the lip to large snout like structures in the midline (80). They are more common on the lower lip. Some of the

different names given this anomaly are accessory salivary glands, supernumerary labial cysts, labial fistula, mucuous glands or cysts, mucoceles, and dermoid cysts (80).

Drillien and co-workers (20) state that congenital lip pits, cleft lip and cleft palate are genetically associated conditions. Previous data suggest that the malformation is due to a single dominant gene whose effects may vary from the full triad of cleft lip, cleft palate and labial fistulae, to no detectable departure from the normal (80). The real causal agent is unknown, but still, stress is layed on hereditary as the main etiological factor (81).

Van der Woude (80) reviewed case reports from the literature demonstrating a familial tendency. She reported that 80 percent of affected subjects had an associated cleft lip and palate, and that 75 percent had an apparent dominant type of inheritance. As to the incidence in the sexes, Van der Woude reported no difference and Watanabe a higher incidence in females (80, 81).

Ocular hypertelorism was described initially as an excessive distance between the eyes (34). Gunther (35) in 1933 reviewed norms for normal values intercanthal distances, outer canthal distances, interpupillary distances and head circumference. He suggested normal values for the canthal index and a circumference interorbital index for the German population. His review of other studies established variances between different people and races for these same indices. He suggested the term ocular hypertelorism for the more extreme values of the indices and euryopia for intermediate values between the upper limit of normality and the extremes.

Normal Values for Canthal Index and Circumference-Interorbital Index*

Condition	Canthal index	Circumference-interorbital index
Upper limit of normality	38	6.8
Euryopia	38-42	6.8-8
Hypertelorism	42	8

*Source: Gorlin and Pindborg (30)

These conditions of canthal distance and cranial circumference along with other anomalies of the face and mouth have been described by Gorlin and Pindborg (30) as Ocular Hypertelorism of Grieg. Ocular Hypertelorism has not been described as a microform of clefting, although clefting has been described as being present in cases of this anomaly (30).

In 1963 Mustarde (64) used the term "telecanthus" to describe any condition in which the distance between the medial canthi is increased. Christian et al (13) restrict the term ocular hypertelorism to increased separation of the bony orbits and stated that telecanthus can be accompanied with hypertelorism and/or other associated anomalies.

Due to the various methods used, e.g. skull and radiographic measurements and clinical examinations, and varied types of population, different values for intercanthal distances have been suggested (13, 14, 16, 34, 35, 63, 64).

Aduss, Pruzansky and Miller (1) studied orbital hypertelorism in patients with clefting of the lip and palate in order to define this craniofacial deformity and determine if abnormal widening of the head is related to inhibition of normal fusion of the palatal shelves.

Using the method of Morin et al (63) with frontal cephalometric radiographs, they were unable to demonstrate a consistent pattern of hypertelorism.

Pryor (70) described a method of measurement of interpupillary distance and recommended establishment of norms for different races using their criteria.

Christian (13) observed that the mode of transmission of telecanthus is as a dominant trait with a high penetrance and no male to male transmission.

Juberg and Hirsch (44) using an increased separation of the medial canthi without abnormal divergence of the orbits as criteria for primary telecanthus, also observed high penetrance of this single dominant gene. Expressivity of associated anomalies studied in the family varied from only widely spaced medial canthi to instances of several dental anomalies, possible mental retardation and bilateral cleft lip and palate.

The incidence of congenital tooth absence varies from 1.5 to 6.0 percent in different populations (40, 65). The teeth most frequently missing are lower second premolars, maxillary lateral incisors and maxillary second premolars, disregarding third molars.

Olin (65) reported on 175 patients with cleft lip and palate, 101 males and 74 females. Twenty four percent of the sample had missing premolars of which seventy five percent were in the maxillary arch. He also reported twenty five percent to have missing maxillary lateral incisors. All of the subjects had some anomalous condition of one or more maxillary anterior teeth in the site of the cleft lip whether with or without cleft palate.

Woolf and coauthors (85) concluded that congenitally absent lateral incisors is an entity itself and not a microform of cleft lip.

Jordan et al (42) in a study of dental abnormalities which have a high frequency in patients with clefting supported previous workers (45, 46) in emphasizing the nongenetic association of widely diffuse abnormalities in populations with cleft lip and cleft palate. Jordan et al (43) also concluded that viral or bacterial infection on or before the 47th day of pregnancy may be more important to associated anomalies than genetic tendencies. They found the fifteen abnormalities observed in cleft patients were also seen in the control group, but in a lesser frequency.

It has been concluded that the occurrence of multiple abnormalities of teeth, external body structures and visceral organs in a single individual is far more common in subjects with clefting abnormalities than in those without. Development of the dentition, other organs and structures of the body all may be affected by the same etiological factor or factors that are responsible for the cleft lip and/or cleft palate (42, 45, 48).

Some investegators (17, 46, 62, 68, 75) have made reference to hearing loss in patients with cleft lip and/or cleft palate. Tangen emphasized the frequent changes that occur in hearing and the occurrence of middle ear findings on repeated examinations of children with cleft palate (19).

Peer et al (68) found that sixty percent of his sample of children with cleft palate had signigicant hearing loss which was usually due to middle ear changes. They report that in general population, signigicant hearing reduction in children is about six percent (68).

Donaldson (19) reported 14.0 percent of 702 subjects with cleft palate had middle ear pathology that required miringotomies. Of the group requiring miringotomies, 86 percent were eight years of age and younger. His findings suggest that younger children are more prone to have middle ear fluid which requires treatment than older children.

Pannbacker (67) reported a loss of fifteen decibels or more in about 66 percent of a group with cleft lip and/or cleft palate with no significant hearing loss in patients with only cleft lip. She also reported that the number with hearing losses of medical significance exceeded those with functional losses.

The results of other studies relating the type of cleft to hearing loss support the finding that younger children have more ear problems than older children (17, 20, 62, 77). Definition of "significant hearing loss" has added to the confusion in this area and is in need of elucidation (20, 67).

The mode of genetic transmission of cleft lip and/or cleft palate is somewhat unclear. Different studies have presented familial incidence rates that vary from six to twenty six percent (49, 76, 78), and family histories of cleft lip with and without cleft palate and of cleft palate alone also vary (4, 6, 68, 77). Increases in incidence within families have been reported recently (49, 83). Also, a higher incidence of relatives affected in patients with cleft lip with or without cleft palate than in patients with cleft palate alone have been reported (20, 26, 49, 84). Numerous sporadic occurrences have also been reported (49, 76, 78).

Studies have been done on the mode of transmission and the etiological factors involved in the birth of children with facial

clefting (6, 37, 68). Peer and co-workers (68) reported three pairs of identical twins with only one of each pair having a cleft. His observations were duplicated by Bardanouve (6) and later by Hay and Wehrung (37). All concluded that facial clefts are not entirely attributable to genetic factors.

Discrepancies in studies on the transmission and occurrence of cleft lip and/or cleft palate have resulted in varying opinions and hypotheses. Fraser and Calnan (24) suggested that new mutations are a reason for the increased incidence and that these can be due to paternal age. Drillien et al (20) suggested the involvement of multi-factorial systems. Other authors (14, 20, 57, 83) analyzing pedigrees reported modes of transmission as sex-linked recessive, autosomal dominant with reduced penetrance and autosomal recessive.

Kraus (49) and other authors (20, 79) concluded that the genetic mechanism of cleft lip and/or cleft palate is not properly explained in the literature. Furthermore, they suggested that other factors, viruses, antibodies, and other unknowns, in addition to the genetic factors might be important etiological considerations in the occurrence of facial clefts.

METHODS AND MATERIALS

One hundred thirty families with at least two relatives affected were selected from the records of the Crippled Children's Division of the University of Oregon Medical School and the Special Services Clinic of the University of Oregon Dental School. Fifty families consented to cooperate in the study. Two hundred and seventy nine individuals were examined. These represented probands, first degree relatives of the probands and second degree relatives. Examinations were limited in most cases to only first degree relatives.

The patients were examined clinically and pedigrees constructed using standard techniques. Oral examinations were done in a dental chair with a light and a tongue blade. Anterior occlusal radiographs were taken of the proband, siblings and any first degree relatives affected. In twelve percent of the cases, examinations were done at the home of the family with a tongue blade and flashlight. No radiographs were available for these families.

The findings were charted on an examination sheet which was made for each individual (Table 1). The data were recorded on unisort analysis cards for correlation.

The following orofacial variations were investigated and recorded: type of cleft, bifid uvula, submucous cleft, congenital malformations of the ears and hearing loss, strabismus, blindness, unusually high arched palate, nose defects, ocular hypertelorism, supernumerary teeth, congenitally missing teeth, geminated teeth, and enamel hypoplasia. In addition to these, congenital malformations of the heart from an interrogative point of view were recorded. The selection of these variations were based on previously reported association with the clefting process

TABLE 1

CLEFT PALATE DENTAL CLINIC

UNIVERSITY OF OREGON DENTAL SCHOOL

I. Chart No. _____ Sex _____

Patient _____ Birthdate _____ Age _____
Last First Middle

Address _____ Telephone _____
Street City

Parent _____

Mother's Maiden Name _____

Race: Caucasian _____ Negro _____ Asiatic _____ Indian _____ Other _____

Referred by _____ Admission Date _____

Family Dentist _____

	Right	Left	Bilat.	Hard	Soft
Cleft lip					
Cleft pal.					
CL / CP					

II. Other Conditions Present in the proband, his family, or relatives.

	Prob.	Fam.	
1)	_____	_____	Bifid uvula
2)	_____	_____	Submucous cleft
3)	_____	_____	Cong. lip pits
4)	_____	_____	Commissural lip pits
5)	_____	_____	Hands
6)	_____	_____	Ears (cong. malformations)
7)	_____	_____	Strabismus
8)	_____	_____	Blindness
9)	_____	_____	All other diseases of eye
10)	_____	_____	Cong. malformations of the heart
11)	_____	_____	Neonatal disorders arising from certain diseases of the mother during pregnancy

Prob. Fam.

12) _____ _____ Organic speech defects

13) _____ _____ Non-organic speech disorders

14) _____ _____ Palatal insufficiency/nasal speech

15) _____ _____ Unusually high arched palate

16) _____ _____ Nose defects

17) _____ _____ Hypertelorism

18) _____ _____ Other anomalies

III. Dental

1) _____ _____ Supernumerary

2) _____ _____ Cong. missing

3) _____ _____ Geminated teeth

4) _____ _____ Size (anomalies)

5) _____ _____ Hypoplasia

6) _____ _____ Occlusion

a) Molar relationship -- I _____ II _____ III _____

b) Anterior -- _____ _____ Crossbite

_____ _____ Rotation

_____ _____ Impactions (retarded eruption)

c) Posterior -- _____ _____ Crossbite

_____ _____ Rotations

_____ _____ Impactions (retarded eruption)

d) Orthodontic referral _____

IV. Recommendations and comments

_____

_____

_____

_____

and reported microforms (14, 22, 26, 27, 40, 57, 72, 74, 80).

Digital anomalies were grouped together including syndactyly (webbing), clinodactyly (incurved fingers), camptodactyly (down curved fingers), polydactyly (supernumerary fingers) and brachydactyly (short fingers). Congenital malformations of the ears and hearing loss were combined. This was completed by visual, subjective evaluation. No audiometric tests were made. Ocular hypertelorism was determined by the following measurements using a sliding caliper and a metric tape: intercanthal distance, outer canthal distance and occipitofrontal circumference. The canthal index and the circumference interorbital index were used to indicate ocular hypertelorism (30, 35). Congenital malformations of the heart included any heart condition reported by the parents and/or any medical chart available. Unusually high arched palate was evaluated subjectively.

RESULTS

The distribution of the population examined according to sex, probands and relatives is shown in Table 2. Sixty one percent of the probands were males and thirty nine percent females. However, 55.1 percent of the relatives examined were females and 44.9 percent were males. This resulted in a total of 52.3 percent females and 47.1 percent males examined.

TABLE 2

TOTAL POPULATION OF EXAMINED INDIVIDUALS

	MALES	FEMALES	TOTAL
Probands	29	18	47
Relatives	104	128	232
Total	133	146	279

Parental Age: Data regarding parental age at the birth of the child are shown in Table 3 for the 47 probands. The data shows that a number of children with clefts were born to mothers between 25 and 30 years of age. In regard to the father's age at the birth of a child, the largest number were between 30 to 35.

TABLE 3

PARENTAL AGE - TOTAL PROBANDS

AGE	FATHER		MOTHER	
	No.	%	No.	%
Under 19	2	4.25	3	6.38
20-24	7	14.89	14 (1)*	29.78
25-29	13 (1)*	27.63	20 (6)*	42.55
30-34	18 (6)*	38.29	8 (1)*	17.02
35-39	4 (1)*	8.50	1	2.12
40-44	-	-	1	2.12
45- --	2	4.25	-	-
No record available	2			
TOTAL	47		47	

* (CP alone)

Table #3: Parental age: at birth for the 47 probands. (*) Those probands with only cleft palate, they are included in the total numbers

Sibling rank: The combined group of cleft probands showed more of these patients in the third position (Table 4). The second and fourth born were next followed by the first and fifth born patients.

TABLE 4

SIBLING RANK

First born =	8	Fifth born =	4
Second born =	10	Sixth born =	1
Third born =	13	Seventh born =	1
Fourth born =	10		

Seasonal occurrence: Table 5 shows the distribution of the probands in regard to month of birth. The data indicated a high incidence of cleft births for April and May, while September, November, and December have lower incidence. The rest of the months of the year had similar occurrence rates.

TABLE 5

MONTHS OF BIRTH OF PROBANDS AND SEASONAL OCCURRENCE

Winter		Summer	
Month	No. of Births	Month	No. of Births
January	4	July	5
February	5	August	5
March	4	September	1
Spring		**Fall**	
Month	No. of Births	Month	No. of Births
April	7	October	1
May	8	November	2
June	4	December	1

Sex, type of cleft, and site of clefting: The distribution according to sex and type of cleft are shown in Table 6. The figures showed twice as many cleft lip with cleft palate patients in this group as cleft lip or cleft palate alone. Cleft lip alone and cleft palate alone showed similar percentages. Regarding the information as to the site of the cleft, the left side was affected almost three times as much as the right side and twice as often as the occurrence of bilateral clefts. As to the sex distribution, males predominated in the whole group. In the cleft lip group, 60 percent were males and 40 percent females. Cleft lip with cleft palate had a similar distribution with 64 percent males and 36 percent females affected. The cleft palate alone group showed a predominance in the female group with a percentage of 62.5 percent.

Microforms and Associated Anomalies: Table 7 summarizes the frequency of occurrence of the various microforms and associated anomalies observed in the probands and their relatives.

Table 8 shows the incidence of microforms and associated anomalies observed both in the probands and affected relatives. The data is grouped by sex and into the different cleft types. Small percentages were observed in regard to congenital lip pits, commissural lip pits, strabismus, blindness, unusually high arched palate, hypertelorism and geminated teeth. Larger percentages were noted in bifid uvula, submucuous clefts, digital anomalies, ear anomalies and hearing loss, congenital malformations of the heart, nose defects, supernumerary teeth, congenitally missing and/or pegged shaped upper lateral incisors and enamel hypoplasia.

TABLE 6

DISTRIBUTION OF PROBANDS AND AFFECTED RELATIVES BY SEX, TYPE AND SITE OF CLEFT

	Type of Cleft			
	Cleft lip	Cleft lip & palate	Cleft palate	Totals
RIGHT SIDE CLEFT				
Probands				
Male	1	4	-	
Female	-	5	-	
				10
Relatives				
Male	-	-	-	
Female	1	-	-	
				1
LEFT SIDE CLEFT				
Probands				
Male	3	8	-	
Female	2	6	-	
				19
Relatives				
Male	4	3	-	
Female	3	-	-	
				10
BILATERAL CLEFT				
Probands				
Male	-	9	3	
Female	-	1	5	
				18
Relatives				
Male	1	1	3	
Female	-	2	5	
				12
TOTAL	15	39	16	70
PERCENT	21.42	55.73	22.85	100.00

TABLE 7

FREQUENCY OF OCCURRENCE OF MICROFORMS AND ASSOCIATED ANOMALIES IN THE TOTAL POPULATION EXAMINED

MICROFORMS AND ASSOCIATED ANOMALIES	Probands 47 29-18*	%** 100	Relatives 232 104-128*	%** 100	Total 279	% 100
Bifid Uvula	♂ 11 ♀ 7-4	23.40	♂ 28 ♀ 16.12	12.07	39	13.93
Submucous Cleft	3 2-1	6.38	2 -- 2	0.86	5	1.78
Cong. Lip Pits	---	---	2 -- 2	0.86	2	0.70
Comm. Lip Pits	7 3-4	14.89	35 21-14	15.08	42	15.05
Hands	12 7-5	25.53	49 20-29	21.12	60	21.50
Ears	19 12-7	40.42	34 22-12	14.65	53	18.99
Strabismus	3 2-1	6.38	5 2-3	2.15	8	2.86
Blindness	---	---	1 -- 1	0.43	1	0.35
Cong. Mal. of Ht.	8 5-3	17.02	21 5-16	9.05	29	10.39
U. High Pal.	---	---	4 4--	1.72	4	1.43
Nose Defects	15 10-5	31.91	15 9-6	6.47	30	10.75
Hypertelorism	5 3-2	10.63	16 7-9	6.89	21	7.52
Supernumerary Teeth	10 6-4	21.27	8 3-5	3.87	18	6.45
Cong. Miss./pegged	29 18-11	61.70	27 11-16	11.63	56	20.07
Geminated	1 1---	2.12	1 1---	0.43	2	0.75
Enamel Hypoplasia	19 11-8	40.42	33 16-17	14.22	51	18.27

* Correspondingly males and females
** Percentage for total population

TABLE 8

MICROFORMS AND ASSOCIATED ANOMALIES IN THE TOTAL CLEFT POPULATION EXAMINED

Microforms and associated anomalies	Cleft Lip				Cleft Palate				Cleft L/P				Total		Total	Percentage
	probds.*		relat.*		probds.		relat.		probds.		relat.					
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀		
	4	2	5	4	3	5	3	5	21	12	4	2	40	30	70	100%
Bifid uvula	1	–	4	–	–	3	–	4	6	1	1	–	12	8	20	28.57
Submucous cleft	–	–	–	1	–	–	–	1	1	1	–	–	1	3	4	5.70
Congentl. lip pits	–	–	–	–	–	–	–	1	–	–	–	–	–	1	1	1.42
Commisural lip pits	–	1	2	–	–	1	1	1	3	2	1	–	7	5	12	17.14
Digital anomalies	–	–	2	1	1	2	–	2	6	3	1	–	10	8	18	25.71
Ears	3	–	1	–	1	2	2	1	7	5	1	1	15	9	24	34.28
Strabismus	–	–	–	–	1	1	–	–	–	–	–	1	1	2	3	4.28
Blindness	–	–	–	1	–	–	–	–	–	–	–	–	–	1	1	1.43
Other dis. of eye	1	–	2	1	–	4	–	2	4	6	–	2	7	15	22	31.43
Cong. Malf. Heart	–	–	1	1	2	1	–	–	3	2	1	1	7	5	12	17.14
Un. High Arch Pal.	–	–	1	–	–	–	–	–	–	1	–	–	1	1	2	2.85
Nose defects	1	1	1	1	–	–	–	–	7	4	2	1	11	7	18	25.71
Hypertelorism	–	–	1	–	–	1	–	–	2	1	–	–	3	2	5	7.14
Supernum. Teeth	1	–	–	2	–	–	1	–	5	4	–	1	7	7	14	20.00
Cong.miss./pegged	2	1	4	–	1	2	–	3	14	8	3	2	24	16	40	57.14
Geminated teeth	–	–	–	–	–	–	–	–	1	–	–	–	1	–	1	1.43
Enamel hypoplasia	–	1	1	–	1	2	–	–	8	5	1	–	11	8	19	27.14
Subtotal	9	4	20	8	7	19	4	15	67	43	11	9	118	98		
TOTAL	13		28		26		19		110		20		216			

*Probands Relatives

Bifid Uvula: A total of 39 individuals had a bifid uvula. Table 9 shows the distribution of this group by sex and indicates the number of clefts, microforms and associated anomalies observed in this sub-group of related people. Twenty four families showed an incidence of bifid uvula. Of these, twelve families had only one member affected (eight males and four females). Ten families had two members affected and there was an incidence of three and four members in the two other families. Of the twelve families with a multiple incidence of bifid uvula, six were present in the same generation and six were present in two generations.

The male probands in this group had a range of one to six associated anomalies, the female probands two to six anomalies.

TABLE 9

BIFID UVULA

	PROBANDS		RELATIVES		SUBTOTAL		TOTAL
	♂	♀	♂	♀	♂	♀	
Microforms and associated anomalies	7	4	16	12	23	16	39
Clefts	7	4	5	4	12	8	20
Submucous cleft	2	–	–	1	2	1	3
Cong. lip pits	–	–	–	–	–	–	–
Comm. lip pits	1	1	2	–	3	1	4
Digital anomalies	1	1	2	2	2	2	6
Ears	4	2	4	2	8	4	12
Strabmismus	1	1	1	–	2	1	3
Blindness	–	–	–	–	–	–	–
Diseases of eye	1	4	3	4	4	8	12
Cong. Malf. heart	–	2	–	–	–	2	2
U. high arch palate	–	–	1	–	1	–	1
Nose deformation	3	1	3	–	6	1	7
Hypertelorism	–	–	2	1	2	1	3
Supernumerary teeth	1	–	–	1	1	1	2
Cong. missing teeth	4	2	5	2	9	4	13
Geminated teeth	–	–	–	–	–	–	–
Hypoplasia enamel	3	3	3	1	6	4	10
TOTAL	27	21	31	18	59	29	98

Submucous Cleft: Table 10 presents the distribution of these patients into probands and relatives by sex and indicates the number of clefts, microforms and associated anomalies observed. Five persons had a submucous cleft. There was a range from one to seven of other anomalies in these individuals. All five represented different families.

TABLE 10

SUBMUCOUS CLEFT

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	2	1	-	2	5
Clefts	2	1	-	2	5
Bifid uvula	2	-	-	-	2
Cong. lip pits	-	-	-	-	-
Comm. lip pits	1	1	-	-	2
Digital anomalies	-	1	-	1	2
Ears	2	1	-	1	4
Strabismus	1	-	-	-	1
Blindness	-	-	-	-	-
Diseases of eye	-	1	-	1	2
Cong. Malf. heart	-	-	-	-	-
U.high arch palate	-	1	-	-	1
Nose deformation	1	-	-	-	1
Hypertelorism	-	-	-	-	-
Supernumerary teeth	-	1	-	1	2
Cong. missing teeth	1	1	-	1	3
Geminated teeth	-	-	-	-	-
Hypoplasia enamel	2	1	-	-	3
TOTALS	12	9	-	7	28

Congenital Lip Pits: Only two individuals from different families presented this condition. One of them also had congenitally missing lateral incisors and the other one had clinodactyly and strabismus.

Commissural Lip Pits: Twenty five families had a total of forty two individuals with commissural lip pits. Their associated anomalies and microforms present are summarized in Table 11. Persons with commissural lip pits in this group had an average of 2.28 associated anomalies. Ten families had a multiple incidence of commissural lip pits; three of these families in the same generation; the other seven in two generations. Fifteen families had only one occurrence. Strabismus, blindness, congenital lip pits and geminated teeth were not associated with this anomaly.

TABLE 11

COMMISURAL LIP PITS

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	3	4	21	14	42
Clefts	3	4	4	1	12
Bifid uvula	1	1	2	2	6
Submucous cleft	1	1	-	-	2
Cong. lip pits	-	-	-	-	-
Digital anomalies	1	2	4	7	14
Ears	1	1	4	-	6
Strabismus	-	-	-	-	-
Blindness	-	-	-	-	-
Diseases of eye	2	3	9	6	20
Cong. Malf. heart	-	1	1	-	2
U. high arch palate	-	1	1	-	2
Nose deformation	1	2	4	-	7
Hypertelorism	-	-	1	1	2
Supernumerary teeth	1	2	-	-	3
Cong. missing teeth	2	4	3	1	10
Geminated teeth	-	-	-	-	-
Hypoplasia enamel	1	4	4	1	10
TOTALS	14	26	37	19	96

Digital Anomalies: Table 12 shows the distribution of the associated anomalies present in individuals with finger anomalies. The sixty patients in this group had an average of 2.4 anomalies each. Digital anomalies were present in twenty four families. Seven families had only one occurrence, six families had two and nine families had three or more. There was only one instance of three generation incidence. All the other families had a two generation occurrence with one exception of three members in the same generation. All associated anomalies and microforms observed were present in this group with the exception of geminated teeth.

TABLE 12

DIGITAL ANOMALIES

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	7	5	20	29	60
Clefts	7	5	3	3	18
Bifid uvula	1	1	2	2	6
Submucous cleft	-	1	-	1	2
Cong. lip pits	-	-	-	1	1
Comm. lip pits	1	2	3	7	13
Ears	3	3	3	2	11
Strabismus	1	-	1	1	3
Blindness	-	-	-	1	1
Diseases of eye	-	3	3	17	23
Cong. Malf. heart	1	2	2	3	8
U. high arch palate	-	1	-	-	1
Nose deformation	3	-	3	1	7
Hypertelorism	2	1	1	2	6
Supernumerary teeth	2	2	-	-	4
Cong. missing teeth	5	3	3	8	19
Geminated teeth	-	-	-	-	-
Hypoplasia enamel	3	5	6	5	19
TOTALS	29	29	30	54	142

Ear Anomalies and Hearing Loss: Table 13 summarizes the number and distribution of other anomalies present in these individuals. Thirty one families, sixty two percent of the total number of families examined, had members that were included in this group.

The congenital malformations of the ears noted included only striking abnormalities, such as extremely prominent ears, partial ear lobes, absence of external ear, folded external ear, and split lobes. Fifteen of these fifty three individuals belonged to different families. Twelve families had two members in the same generation and four families had more than two occurrences in two generations.

TABLE 13

EARS

	PROBANDS		RELATIVES		TOTALS
	♂	♀	♂	♀	
Microforms and associated anomalies	12	7	22	12	53
Clefts	12	7	5	2	26
Bifid uvula	4	2	4	2	12
Submucous cleft	2	1	-	1	4
Cong. lip pits	-	-	-	-	-
Comm. lip pits	1	1	4	-	6
Digital anomalies	3	2	3	2	10
Strabismus	1	-	-	1	2
Blindness	-	-	-	-	-
Diseases of eye	1	3	6	7	17
Cong. Malf. heart	2	1	4	2	9
U. high arch palate	1	1	1	-	3
Nose deformation	6	2	4	2	14
Hypertelorism	2	1	3	2	8
Supernumerary teeth	1	1	1	-	3
Cong. missing teeth	7	5	3	4	19
Geminated teeth	-	-	-	-	-
Hypoplasia enamel	4	4	1	4	13
TOTALS	47	31	39	29	146

Strabismus: Table 14 shows the distribution of strabismus which was observed in eight individuals in seven families. Only one of the families had two members of the same generation with this disorder. The other six families had one incidence each. One of these patients did not have any other disorder.

Blindness was observed in one female. She was blind in one eye, had cleft lip, clinodactyly and a heart murmur.

TABLE 14
STRABISMUS

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	2	1	2	3	8
Clefts	1	1	1	1	4
Bifid uvula	1	1	-	-	2
Submucous cleft	1	-	-	-	1
Cong. lip pits	-	-	-	1	1
Comm. lip pits	-	-	-	-	-
Digital anomalies	1	-	1	1	3
Ears	1	-	-	1	2
Blindness	-	-	-	-	-
Diseases of eye	-	1	-	3	4
Cong. Malf. heart	-	-	-	-	-
U. high arch palate	-	-	-	-	-
Nose deformation	1	-	-	-	1
Hypertelorism	-	-	-	-	-
Supernumerary teeth	-	-	-	-	-
Cong. missing teeth	1	-	-	1	2
Geminated teeth	-	-	-	-	-
Hypoplasia enamel	1	-	-	-	1
TOTALS	8	3	2	8	21

Unusually high arched palate: Four male relatives of four different families presented this condition.

Congenital Malformations of the Heart: Table 15 shows 29 individuals (thirty four percent of the families studied) with a history of heart defects. Females were affected almost three times as much as were the males. Female probands had from four to six other anomalies while the males had only one to three. Of the seventeen families represented in this group, fourteen had one incidence of a congenital heart defect, two with two incidences and one with three occurrences. All were manifested in the same generation with one exception.

TABLE 15

CONGENITAL MALFORMATIONS OF THE HEART

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	5	3	5	16	29
Clefts	5	3	2	2	12
Bifid uvula	-	2	-	-	2
Submucous cleft	-	-	-	-	-
Cong. lip pits	-	-	-	-	-
Comm. lip pits	-	1	1	-	2
Digital anomalies	1	2	2	3	8
Ears	2	1	4	2	9
Strabismus	-	-	-	-	-
Blindness	-	-	-	1	1
Diseases of eye	-	3	1	7	11
U. high arch palate	1	-	-	-	1
Nose deformation	1	1	2	3	7
Hypertelorism	-	-	1	1	2
Supernumerary teeth	2	1	-	1	4
Cong. missing teeth	3	1	3	4	11
Geminated teeth	1	-	-	-	1
Hypoplasia enamel	3	2	-	3	8
TOTALS	19	17	16	27	79

Nose Defects: Table 16 presents the distribution for thirty persons with this irregularity. Only external deformities were noted. These included a flattened nose or asymmetry of the alae. Nineteen families were represented in this group, eleven of which had single incidences. Three families with multiple occurrences had their affected members in the same generation, the other five families in two generations.

TABLE 16

NOSE DEFECTS

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	10	5	9	6	30
Clefts	10	5	4	2	21
Bifid uvula	4	1	3	-	8
Submucous cleft	1	-	-	-	1
Cong. lip pits	-	-	-	-	-
Comm. lip pits	1	2	4	-	7
Digital anomalies	3	-	3	1	7
Ears	6	2	4	2	14
Strabismus	1	-	-	-	1
Blindness	-	-	-	-	-
Diseases of eye	3	2	2	6	13
Cong. malf. heart	1	1	2	3	7
U. high arch palate	-	-	1	-	1
Hypertelorism	2	1	2	1	6
Supernumerary teeth	3	1	-	2	6
Cong. missing teeth	8	4	5	3	20
Geminated teeth	-	-	-	-	-
Hypoplasia enamel	4	3	2	1	10
TOTAL	47	22	32	21	122

Hypertelorism: Ten families had a total of twenty one members with widely spaced eyes. None of the people examined were hyperteloric according to the two indices described by Gorlin and Pindborg (30) with the exception of one male who had a canthal index of 42.2 and a circumference interorbital index of 7.1, thereby placing him in the category of hypertelorism for the first index and in that of euryopia for the second. The female proband in this family had a canthal index of 39 placing her in the euryopia group, too.

In one of the families, telecanthus was traced back five generations in seven members of the kindred.

In two other families, two members had indices that placed them in the euryopia group. A fifth family had telecanthus present in three generations. The other five families had only one member each with a canthal index between 38 and 42 placing them in the euryopia group.

Cleft lip, cleft lip with cleft palate, and cleft palate alone were all represented in the five probands of the group.

The following microforms were found in this group of increased separation of the medial canthi:

(1) Two persons had commissural lip pits.

(2) Six persons had digital anomalies.

(3) Eight persons had ear defects and/or hearing loss.

(4) Ten persons had diseases of the eye, excluding blindness and strabismus.

(5) Two persons had congenital malformations of the heart.

(6) Six persons had nose deformities.

(7) Six persons had congenitally missing teeth/or pegged form lateral incisors.

(8) Four persons had hypoplasia of the enamel.

(9) Eighteen of the twenty one individuals had between one and six microforms. Three persons did not have any.

Supernumerary Teeth: Table 17 illustrates distribution of associated anomalies and microforms observed in individuals with supernumerary teeth. Congenital lip pits, strabismus, blindness and widely spaced eyes were not observed in these patients. Sixteen families had a total of eighteen individuals affected. The male probands had from two to five other anomalies, and the female probands from one to seven.

TABLE 17

SUPERNUMERARY TEETH

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	6	4	3	5	18
Clefts	6	4	1	3	14
Bifid uvula	1	–	–	1	2
Submucous cleft	–	1	–	1	2
Cong. lip pits	–	–	–	–	–
Comm. lip pits	1	2	–	–	3
Digital anomalies	2	2	–	–	4
Ears	1	1	1	–	3
Strabismus	–	–	–	–	–
Blindness	–	–	–	–	–
Diseases of eye	3	3	1	3	10
Cong. Malf. heart	2	1	–	1	4
U. high arch palate	–	1	1	–	2
Nose deformation	3	1	–	2	6
Hypertelorism	–	–	–	–	–
Cong. missing teeth	5	3	–	1	9
Geminated teeth	1	–	–	–	1
Hypoplasia enamel	3	3	–	–	6
TOTAL	28	22	4	12	66

Geminated Teeth: These were observed only in one instance in a male with a congenital malformation of the heart, supernumerary teeth and enamel hypoplasia.

Congenitally missing and/or peg shapped lateral incisors: Seventy eight percent of the families fell within this category, with a total of fifty six individuals affected (Table 18). Twenty five of the thirty eight families that had members with congenitally missing teeth or peg shaped lateral incisors had only one occurrence with no sex differences. Nine families had two members affected and four had three or more members affected. Seven of the families were affected in two generations. The range of associated anomalies and microforms was from one to eight in the probands and from none to six in the relatives.

TABLE 18

CONGENITAL MISSING AND/OR PEG SHAPED TEETH

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	18	11	11	16	56
Clefts	18	11	7	5	41
Bifid uvula	4	2	5	2	13
Submucous cleft	1	1	-	1	3
Cong. lip pits	-	-	-	1	1
Comm. lip pits	2	4	3	1	10
Digital anomalies	5	3	3	8	19
Ears	7	5	3	4	19
Strabismus	1	-	-	1	2
Blindness	-	-	-	-	-
Diseases of eye	4	4	3	7	18
Cong. malf. heart	3	1	3	4	11
U. high arch palate	-	1	-	-	1
Nose deformation	8	4	5	3	20
Hypertelorism	2	1	2	1	6
Supernumerary teeth	4	3	-	1	8
Geminated teeth	-	-	-	-	-
Hypoplasia enamel	8	6	4	-	18
TOTALS	67	44	38	41	190

Enamel Hypoplasia: Table 19. This condition was present in forty eight percent of the families and 64.7 percent of the relatives of probands.

A single incidence was observed in fourteen families, two occurrences in ten families, and four families had more than two members affected. Enamel hypoplasia was observed in one family throughout three generations and in eight families was present in two generations.

TABLE 19

ENAMEL HYPOPLASIA

	PROBANDS		RELATIVES		TOTAL
	♂	♀	♂	♀	
Microforms and associated anomalies	11	8	16	17	51
Clefts	11	8	2	-	21
Bifid uvula	4	1	3	1	9
Submucous cleft	2	1	-	-	3
Cong. lip pits	-	-	-	-	-
Comm. lip pits	1	4	5	1	11
Digital anomalies	3	5	6	5	19
Ears	4	4	1	4	13
Strabismus	1	-	-	-	1
Blindness	-	-	-	-	-
Diseases of eye	-	4	5	13	22
Cong. Malf. heart	3	2	-	3	8
U. high arch palate	-	1	-	-	1
Nose defects	4	3	2	1	10
Hypertelorism	1	1	1	1	4
Supernumerary teeth	3	3	-	-	6
Cong. missing teeth	8	5	4	2	19
Geminated teeth	1	-	-	-	1
TOTALS	46	42	29	31	148

DISCUSSION

The knowledge of congenital malformations has advanced throughout time in a similar pathway as other fields in the biological sciences. Witchcraft, superstition, religion, common sense, natural and experimental sciences have all devoted time to the study of these afflictions of the human race. The etiology of cleft lip and/or cleft palate has been a puzzling problem for many generations. It has not been until this century that more specific efforts have been made to unravel different aspects of the causes of cleft lip and/or cleft palate. Some of the aspects studied have been the relationships between parental age, seasonal influence, sibling rank, sex, social and cultural background, and geographical influence. Among factors given more importance recently, heredity has played a leading part, especially after the studies of Fogh-Andersen in 1942 (26). A variety of modes of inheritance for the different clefting conditions have been proposed. Fukahara and Saito (27) were the first to attempt to demonstrate microforms or incomplete manifestations of cleft lip and/or cleft palate.

Evaluation in several of these aspects has not been done in the State of Oregon. A selected sample of families displaying more than a single occurrence of cleft lip and/or cleft palate was selected for this study, thereby increasing the probability of finding more persons with microforms.

Reports regarding parental age as a possible etiological factor of cleft lip and/or cleft palate have been inconsistent as shown in the first section of this paper. The data here suggests that more children with clefts are born to mothers between 25 and 30 years of age and to fathers between 30 and 34 years of age. These findings are not in

agreement with Woolf, Hay and Bardanouve (6, 36, 85) who have found an increased incidence among older mothers. They are in agreement with Azaz and his associate (3) and Bakan (4) who reported younger parents having more children with some type of cleft than do older parents. Some of the differences in the various reports are due undoubtedly to the type of analysis to which the data is subjected. Those reports that have found similar results as this study may well be reflecting that the major reproductive period is between 25 and 29 years for the females and 30 to 34 for the males.

A seasonal effect on the incidence of cleft lip and/or cleft palate is not known. However, there seems to be a higher incidence in certain months of the year. The results here suggest a higher tendency in the latter parts of spring (April and May) and a very low occurrence in the late summer and fall months. This is similar to the results obtained by Bardanouve (6), but does not agree with the other studies which have reported higher incidences in the winter months and in the month of July (85). More research in this area is needed as there might be a relationship as to geographical location, climate and the seasons.

The figures in this study suggest that more cleft patients are third born; Bakan (4) found more first born. Neither Bakan nor this survey evaluate multiple births, which is necessary to find some type of established relationship.

The differences in the literature on incidence, sex, type of clefting and site, although agreeing in some respects, can be accounted for by the varied numbers of people studied, the different variables of the population, genetically and enviornmentally, and the increase in the number of affected children who reach age of reproductibility. Two

recent studies on incidence report the results of clefting as one in every 1,880 births (3, 59). These studies were done in the period of 1960-1963. Could it be that these years produced less clefting than previous ones? More clefting has been reported in Caucasians, although no extensive studies have been done with other ethnic groups nor in many regions of the world.

Regarding sexual disparities concerning types of clefting syndromes, this survey agrees fully with previous ones (24, 38, 68). Females have a higher occurrence rate of cleft palate alone, while males are affected more by cleft lip with or without cleft palate. This has been interpreted in support of the hypothesis that cleft lip alone or with cleft palate form a different genetic pattern than does cleft palate alone (37, 68). Burdi (11) studying sexual differences in closure of the human palatal shelves suggests that the secondary palate is closed more rapidly in males than in females during the critical periods of palatal formations. Therefore, he stated that female embryos have a longer period of teratogen susceptibility. Kraus (49), however, believes that the type of cleft is related more to an interruption at the time of palatal closure due to an external insult than to a genetic pattern. He stresses the need for more studies in the field of viral and bacterial infections.

The literature agrees on the prevalence of site. The left side predominates with approximately fifty percent, the right side in second with about thirty percent and bilateral cleft lip has the lowest incidence with twenty percent. The probands in this group presented a similar tendency: the left side was forty percent; however, the bilateral cleft lip was thirty nine percent; twenty one percent on the right side. No explanation has been given at the present time for the preference of

clefting for the left side

The incidence (13.93 percent of 279 individuals) of bifid uvula in this group of probands and relatives is much higher than that reported for the general population. It has been reported previously (8, 56, 57, 58) between 1.34 percent and 1.82 percent. However, Blakely (10) found 5.25 percent in a group of Oregon school children. He reported a higher incidence in males (one in seventeen) than in females (one in twenty three) with a combined occurrence of one in nineteen. Sexually, in the present study there were approximately twice as many males affected as females.

The occurrence of congenital lip pits and commissural lip pits in this population is in agreement with previous studies (5, 14). Commissural lip pits was more prevalent in males. None of these reports are conclusive since they are all established on small samples, even though a familial tendency has been observed.

The combined digital anomalies showed an incidence of 21.50 percent of the population studied. A previous study on clinodactyly in Oregon school children produced a ratio of one in twelve (11).

The reported frequencies for commissural lip pits differ considerably from 0.20 percent to 11.94 percent (5, 22) for the general population. This population surveyed had a total incidence of 15.05 percent. The probands presented no difference when considered separately. Baker (5) found an incidence of nearly twenty percent in Negroes. His findings were supported later by Feiglova (23). None of the present data on commissural lip pits is conclusive as to supporting their presence as a microform of cleft lip and/or cleft palate.

Asymmetry of the nose has not been reported in the literature as

related to cleft lip and/or cleft palate. A high incidence among cleft probands is naturally related to their surgery. There was a 6.47 percent occurrence in relatives of these probands. Sixty percent of the relatives examined had some type of nose defect and no clefting present with one exception of a thirty year old female with a cleft of the left cheek, microtia, and failure of formation of the mandibular ramus and condyle, plus hypoplasia of the muscles on the affected side. Records were not available as to a differential diagnosis (possibly hemifacial microsomia?). Of the other patients in this group, six were single incidences, one of which had a congenital scar on the lip. In one family, mother and son had similar scars (44).

The incidence of strabismus, blindness, unusually high arched palate and geminated teeth in a population of cleft palate individuals and in their relatives has not been reported. Of these, only strabismus was present in a relatively high percentage, 6.38 percent in probands and 2.86 percent of the total. The remaining three groups had less than one percent with the exception of unusually high arched palate, which was 1.43 percent.

Hearing loss in the general population of children has been reported (47, 61, 68) to vary between six and twenty five percent. Hearing loss in cleft palate children is predominantly conductive; that is, a loss caused by some impairment of the sound conducting mechanism responsible for the transmission of sound waves to the inner ear (61). The results of this study were 40.42 percent of hearing loss and/or ear anomalies in the probands or 18.99 percent in the total number of individuals seen. This falls within the range of hearing loss reported in the literature for this type of population (20, 61, 67, 72).

The percentages found in this report on congenital malformations of the heart, which were recorded by the history only, were 17.02 percent for the probands, 9.05 percent for the relatives and 10.39 percent for the total population. These percentages are much higher than any reported elsewhere in patients who have survived infancy. Shah et al (75) found 66 percent of heart malformations in a small sample of survivors with 1.3 percent prevalence of major cardiac malformations in their clinic sample. The incidence of congenital heart diseases has been reported to be at least 0.65 percent of all live births (25). Schnitker (73) in his book on congenital anomalies of the heart gives an incidence of about two percent, with a range of 0.09 percent to 8.1 percent in all age groups. He states that this occurrence varies with the age group involved with the incidence being higher for infants. As for the differences found here, the lack of proper examination and diagnostic circumstances contributed to the error, but it is obvious that congenital heart anomalies occur increasingly in the cleft lip and/or cleft palate population. The results in this study do not agree with Shah regarding the sex and cleft type distribution. In the entire sample more males were affected and cleft lip with cleft palate patients had by far more congenital heart disease than cleft palate or cleft lip alone.

The condition of widely spaced eyes (hypertelorism) has been associated with different syndromes and has been studied mainly in connection with sporadic cases that present multiple anomalies. Gorlin and Pindborg (30) make reference to a number of instances where familial occurrences have been observed. Different names have been ascribed to

the increased distance between the medial canthi. However, Mustarde (64) used the term telecanthus, to include any increased distance between the medial canthi. Christian (13) fractionated the anomaly into primary telecanthus and secondary telecanthus. He emphasized that secondary telecanthus is true bony hypertelorism.

The question as to whether telecanthus is an anomaly associated with clefting, or clefting of lip and/or palate is an anomaly associated with the major defect of hypertelorism remains open for speculation. Of the twenty one individuals that presented telecanthus, five were sporadic; the other sixteen represented five families. If telecanthus and/or true hypertelorism is an associated anomaly of cleft lip and/or cleft palate, this was not elucidated in this evaluation. Aduss, Pruzansky and Miller (1) agree that orbital hypertelorism is not associated with clefts of the lip and/or palate. Over ten percent of the probands in this study had widely spaced eyes, and 7.52 percent of the total studied presented telecanthus. Gaard estimated the incidence as one in 100,000 births (28). The data here suggests that telecanthus and cleft lip and/or palate in specific cases are related.

The incidence of supernumerary teeth and congenitally missing lateral incisors in the general population is between 0.3 and two percent, 0.4 and six percent, respectively (31, 40, 51). Jordan et al (42) reported 4.4 percent supernumerary teeth, 25.7 precent missing laterals and 11.0 peg shaped laterals in his sample of cleft models. His data had a higher incidence of these traits compared to his control group of non-cleft models. The results of this survey show 21.27 percent supernumerary teeth, 61.70 percent missing and/or peg shaped lateral incisors which is much higher than their reported incidence for the general

population (42, 76).

The first sign of human tooth development is seen during the sixth week of embryonic life with the formation of dental lamina. Tooth buds are initiated simultaneously from it. A lack of initiation results in the absence of teeth. Abnormal initiation may result in the development of one or more supernumerary teeth (66). Thus the dental lamina is active from a very early stage throughout the embryonic stages, fetal life and fourth to fifth year of childhood when the third permanent molar starts its initiation. Any insult that also may cause clefting during embryonic stages may vary the number of the teeth depending at what stage of development they are in at the time of the insult.

To consider any of the traits studied as microforms of cleft lip and/or cleft palate is still somewhat premature. That they are associated anomalies is known, for they are associated with cleft lip, especially. In order to consider an anomaly as a microform of cleft lip and/or cleft palate, more data needs to be collected to substantiate the hypothesis. In some cases where there is a known hereditary pattern these can be considered as microforms, but when this is not shown specifically, it should be looked on cautiously. It has been shown here and in other studies mentioned throughout the survey that the incidence of these microforms increases in this type of population.

The genetic pattern of cleft lip and/or cleft palate is still debatable. Throughout the fifty families surveyed, different modes of transmission have been observed. A brief description of several of these families will follow in order to show this observation. The reader is referred to the appendix to see the pedigrees for all the families involved.

Family 1: In this family the clefting process was traced back five generations. By history, the proband's great great maternal grandmother had a cleft palate. There was no positive information on the second and third generation. The fourth generation had two siblings, one with a cleft lip and palate and one with only a cleft lip, both great grandchildren of the initial patient. A third great grandchild, a female, had syndactyly. This patient had a nephew by marriage with a cleft lip and cleft palate. The fifth generation is represented by the proband and his siblings. The proband has a cleft lip and cleft palate, syndactyly and some reported hearing loss of his right ear. Two of his male siblings also had syndactyly, a third male sibling had enamel hypoplasia and one of his sisters had an ear deformity and some hearing loss. The mode of transmission in this family could be an autosomal dominant with variable expressivity and lack of penetrance or multifactorial inheritance (because clefting occurs on both sides of the family).

Family 2: This family represents multiple consanguineous marriages in four consecutive generations. In the first generation there is a female with a cleft lip. She and her sister (who does not have any anomalies) marry first cousins. The female with the cleft lip has two daughters; one with a cleft lip and one without any reported anomalies. The second daughter marries her double first cousin and they have nine children in the third generation of this kindred. None of these nine siblings has any reported anomalies. The father of these nine children has a daughter by a second marriage without any anomalies. Thus, in the third generation no anomalies were reported. In the fourth generation there is a female

with hearing loss, one of her first cousins has a cleft palate; three other first cousins in a different branch are affected in the following way: a male with commissural lip pits and clinodactyly, another male with cleft lip and palate, and the third male with hearing loss. The first of these last three males is the father of the proband. In a third branch of first cousins, two males were affected with a cleft lip. The fifth generation included a female with disjointed hips; a hydrocephalic male; the proband, a female with cleft lip and palate, clinodactyly, a congenital heart condition, enamel hypoplasia and supernumerary teeth; and her deceased sister with reported similar anomalies. There is also in this generation a male with hearing loss and finally two siblings (again, the product of consanguineous marriage); one with epilepsy and one with multiple congenital anomalies. In summary, this family reports clefting in four out of five generations, the fourth and fifth generations being the more severely affected ones. The mode of genetic transmission in this family may be autosomal recessive since there has been extensive inbreeding. However, a multifactorial mode of inheritance must also be considered.

Family 4: This family demonstrated telecanthus in three generations; two generations with a clefting process; clinodactyly in four members of the third generation; and bifid uvula in two generations. Enamel hypoplasia, congenitally missing teeth and hearing loss was noted in three individuals. The proband was not examined, but his nephew in the third generation was examined and found affected with cleft lip and numerous microforms and associated anomalies. The family is considered to be representative of the autosomal dominant mode of transmission with variable expressivity.

A multifactorial inheritance pattern is also considered as a possible mode.

Family 11: Familial palatal clefting is presented in this sibship. The only clue suggesting a hereditary tendency is the unusually high arched palate of the father. Two out of the three sisters have a cleft palate, and the proband was noted to have strabismus. The sibship represents an autosomal dominant with a variable expressivity in the first generation or a multifactorial inheritance pattern.

Family 13: A dominant mode of inheritance appears to be present here. The parent in the second generation transmits the clefting process to her offspring. The proband of this family has cleft lip and palate, commissural lip pits, supernumerary teeth and a deformed nose (probably from surgery). A male sibling has cleft lip and palate, hearing loss, congenitally missing teeth and clinodactyly. A female sibling presents only clinodactyly and commissural lip pits. The mother had a cleft lip, clinodactyly, congenital heart problems and is blind in one eye. The father also has clinodactyly. The maternal grandfather is reportedly hard of hearing.

Family 14: Besides presenting two members with a cleft lip and palate, this family also presents with multiple systemic diseases. In the first generation, only the mother presents camptodactyly. In the second generation (by history) five females present a variety of pathology such as asthma, stomach cancer, glaucoma, heart condition, diabetes and encephalitis. The males of this family in the second generation had leukemia, diabetes, and glaucoma. The mother of the proband is a member of the

second generation. She has diabetes and camptodactyly. Her husband had cirrhosis. In the third generation a male maternal first cousin of the proband is mentally retarded. A sister of the proband has a bifid uvula; another sister has a bifid uvula and commissural lip pits. This female has a daughter who was born with a scar on the lip. The proband has a cleft lip and palate and congenitally missing teeth. A paternal first cousin also has cleft lip and palate. The mode of inheritance in this family could be dominant, also.

Family 27: This family presents an interesting combination. There is hearing loss in three consecutive generations represented by four individuals. Cleft lip and palate is present in two consecutive generations represented by father and son. Only one of the two cleft patients in this kindred had a hearing loss. Commissural lip pits are present in two generations; in the third generation they are present in the proband and a half brother; and in the fourth generation in three nephews of the proband. Two individuals in the third generation have enamel hypoplasia, two have congenitally missing or peg shapped lateral incisors and one has a congenital heart anomaly. If the initial hereditary transmission comes entirely from the male in the second generation, (G2-2), then G2-1 is a gene carrier lacking penetrance. An autosomal dominant pattern with variable expressivity in the third and fourth generation may be represented in this family. The multifactorial mode of inheritance may be possible here.

Family 40: The family presents a union of a father with clinodactyly and a mother with a slight hearing loss. Among their offspring is the proband with a cleft palate and clinodactyly, a female sibling with clinodactyly

and a third sibling without any known anomaly. The hearing loss was traced back to the proband's maternal grandfather and great grandfather. There is a maternal first cousin who also has a hearing loss, and a paternal first cousin with a cleft palate. No further history was obtainable. Polygenic factors seem to be the mode of transmission here. The hearing loss may be an independent factor with an autosomal mode of transmission all by itself.

Family 45: The proband has a cleft lip and cleft palate, clinodactyly, hearing loss, congenitally missing and/or peg shaped upper lateral incisors and enamel hypoplasia. A female sibling has a cleft palate and commissural lip pits. The other female sibling only has a bifid uvula. The two male siblings also have a bifid uvula. A paternal second cousin has a cleft lip and a maternal first cousin has some hearing loss. A maternal uncle has clinodactyly and a paternal cousin has hearing loss. Father and mother both have clinodactyly and the mother also has commissural lip pits. The mother of the paternal second cousin with the cleft lip is epileptic. As to mode of transmission the occurrence of the clefting process in the proband and sister are probably due to polygenetic factors preceeding from both parents.

As was demonstrated with the description of the preceding nine families the modes of inheritance, the expression and penetrance vary from family to family. The pedigrees show the liklihood multiple genetic factors were involved in transmission of clefting. As for the microforms involved, it is very likely that these are minor manifestations of clefting in the families involved, which has been described in the recent literature (14, 20, 27). This does not mean that every individual

SUGGESTIONS FOR FURTHER STUDY

1) Studies on parental age, seasonal incidence, sibling rank, and incidence should be done and analyzed statistically, realizing that in different parts of the world, the seasons occur in different months. If this is not done, research will continue to report a variety of results.

2) Studies should be undertaken in this same field in other places of the world. Most of the reports deal with populations from the "Western World." More than half of the world's population is in other parts of the earth. For example, there should be a reason as to why the American Negro population has such a low incidence of clefting. Could it be that when most of their ancestors came to America, they were selected as to the better specimens of their "race"? Could the opposite of the Caucasian population be true?

3) Further controlled research is needed to delineate what are true microforms.

4) The lack of proper genetic information available in many of the families involved in this study should make it mandatory that such information be acquired from every new family that receives services at the health institutions of the State. A complete genetic evaluation of the families studied might reveal some interesting factors for solving some of the previously mentioned problems.

5) The modes of transmission, the incidence and occurrence of cleft lip and/or cleft palate is so variable that etiology cannot be explained wholly from genetical studies. The time of palatal closure is known (11). Research should be initiated regarding the possible environmental insults that the embryo may receive. These could be

studies on viruses and antibodies as Kraus (49) suggests. Also, studies on new artificial foods, medicines, changes in the environment and emotional factors are indicated.

6) The high incidence of enamel hypoplasia in sibs and relatives of cleft lip and/or cleft palate patients has not been explained. Further research is needed.

CONCLUSIONS AND SUMMARY

More males than females were affected with cleft lip with or without cleft palate. More females were affected than males with cleft palate alone. Female probands had a tendency for more microforms and associated anomalies than male probands.

A larger number of children with clefting were born to mothers between twenty five and twenty nine years of age. A larger number of children with clefting had fathers between thirty five and thirty nine years of age at the time of birth.

No impression could be drawn from the data available as to sibling rank.

The months of April and May showed a greater incidence of clefting than any other months of the year.

Bifid uvula, commissural lip pits, digital anomalies, hearing problems and/or ear deformities, unusually high arched palate, strabismus, nose defects, hypertelorism, supernumerary teeth, congenitally missing teeth and/or peg shaped lateral incisors, enamel hypoplasia, and congenital malformations of the heart could be considered in this study as microforms. Congenital lip pits, blindness, and geminated teeth could not be considered microforms. However, without statistical analysis these must remain as impressions of the author.

The pedigrees indicated several possible modes of transmission including autosomal dominant inheritance (with variable expression and lack of penetrance) and multifactorial inheritance. Other factors besides genetics may play an important role in the clefting process.

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Genetic Key


Male


Female


Miscarriage


Cleft lip


Cleft palate


Bifid uvula


Comm. lip pits.


Ear anom/hearing loss


Digital anom.


Nose defects


Examined


Hypertelorism


Cong. miss./peg shaped lat.


Enamel hypoplasia


Diseases of eye


Cong, malf. of heart.


Supernumerary teeth


U. high arched palate.


Cong. lip pits.


Submucous clft


Proband

= M

= Female

= Sex Unknown

= Deceased female

= Patient (index case)

= 3 yr. old female

= 2 females

= Affected

= Adop

= Identical Twins

= Fraternal Twins

Marriage

Consanguineous marriage

Illegitimacy

No issue

Smaller symbols:

Lived l than one day

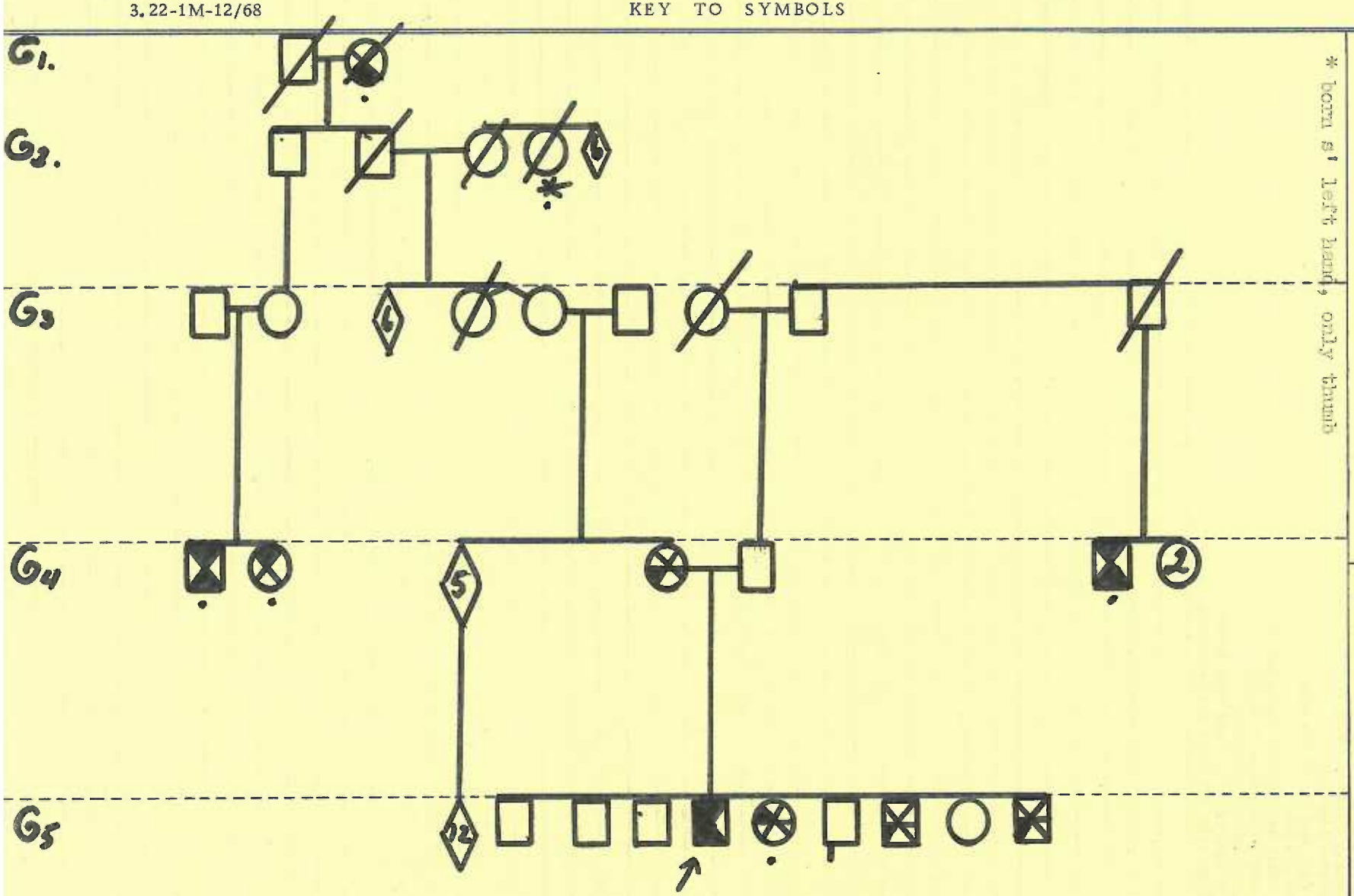
Pregnancy

Stillbirth

Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

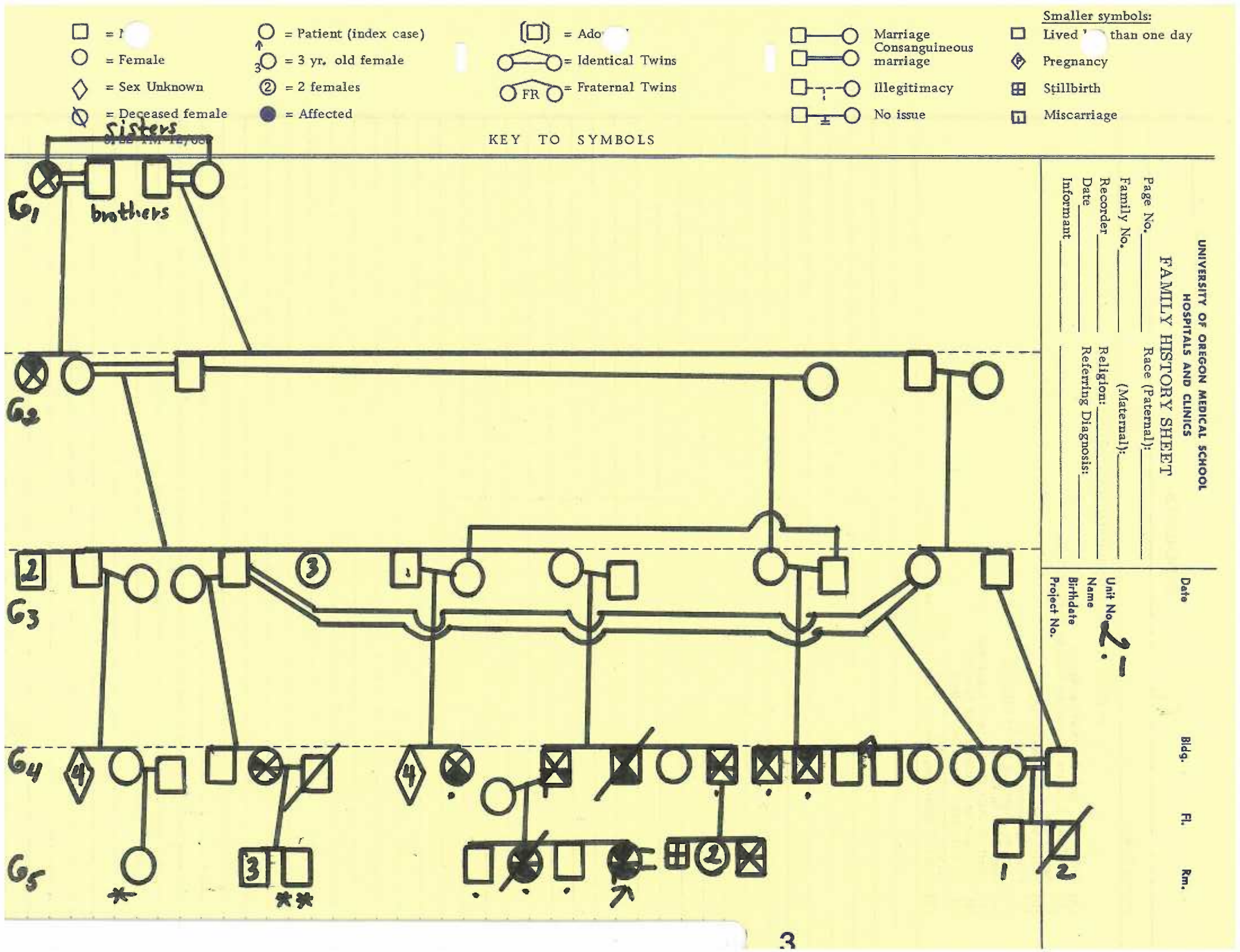
Unit No. _____

Name _____

Birthdate _____

Project No. _____

Date _____ Bldg. _____ Fl. _____ Rm. _____


= Male
= Female
= Sex Unknown
= Deceased female
= Patient (index case)
3 = 3 yr. old female
2 = 2 females
= Affected
= Identical Twins
FR = Fraternal Twins
Marriage
Consanguineous marriage
Illegitimacy
No issue
Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage
KEY TO SYMBOLS
sisters
brothers
G1
G2
G3
G4
G5
UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS
FAMILY HISTORY SHEET
Page No.
Family No.
Race (Paternal):
(Maternal):
Recorder
Religion:
Date
Referring Diagnosis:
Informant
Unit No.
Name
Birthdate
Project No.
Date
Bldg.
Fl.
Rm.

= I[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

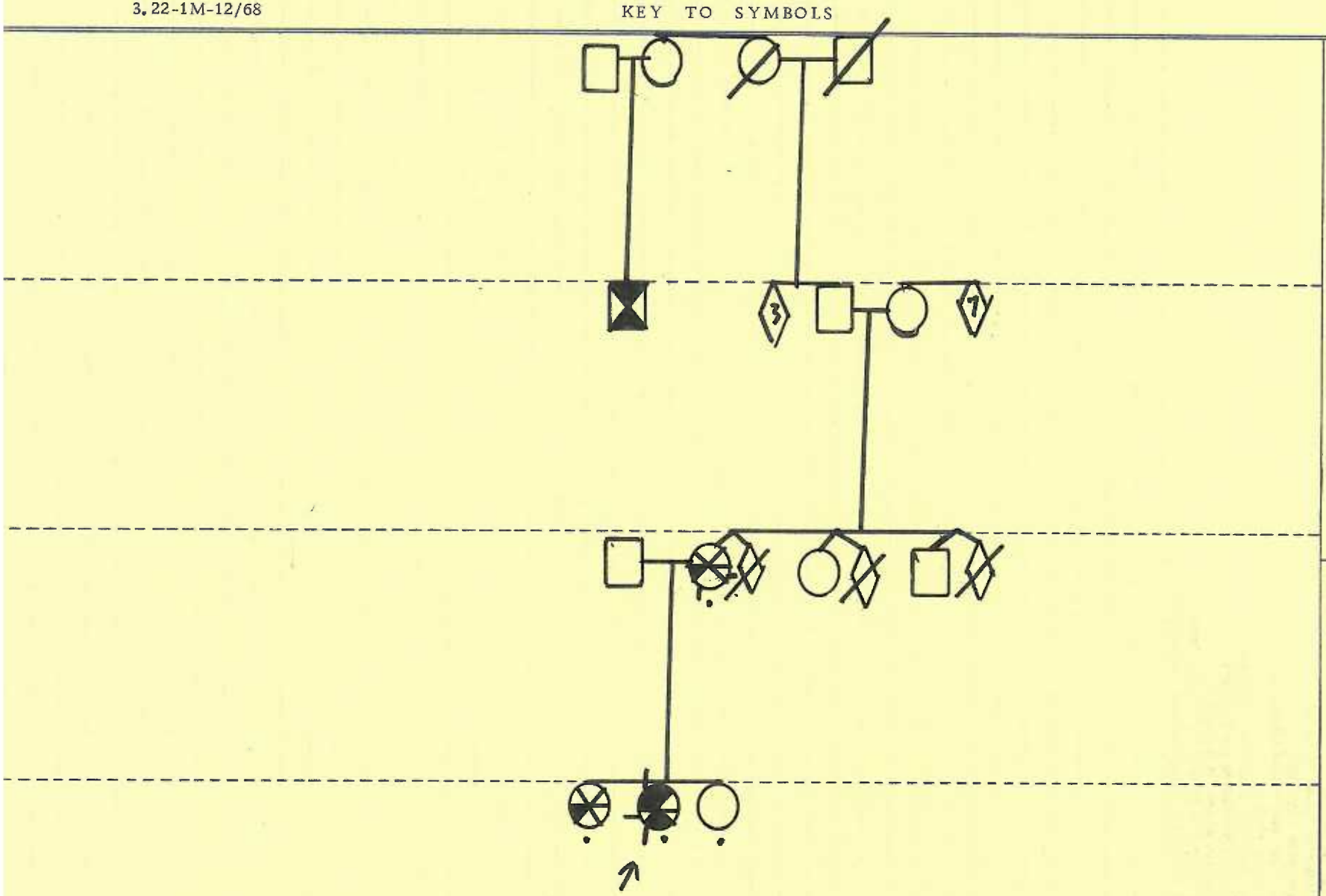
= Ado[illegible]
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3. 22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 3-1
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

3

= M

= Female

= Sex Unknown

= Deceased female

= Patient (index case)

= 3 yr. old female

= 2 females

= Affected

= Ado[illegible]

= Identical Twins

FR = Fraternal Twins

Marriage

Consanguineous marriage

Illegitimacy

No issue

Smaller symbols:

Lived [illegible] than one day

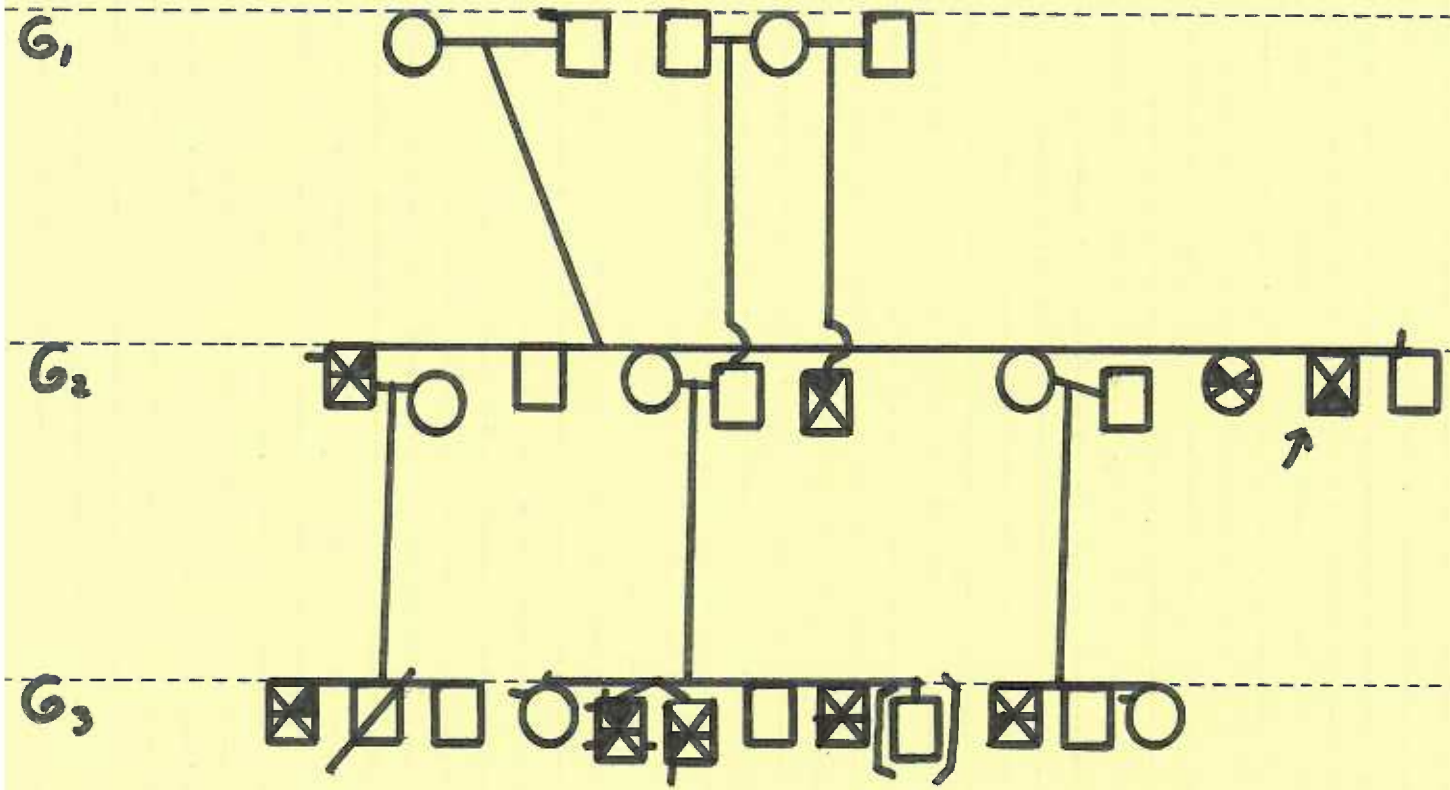
Pregnancy

Stillbirth

Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No._____ Race (Paternal):_____

Family No._____ (Maternal):_____

Recorder_____ Religion:_____

Date_____ Referring Diagnosis:_____

Informant_____

Date Bldg. Fl. Rm.

Unit No. 4

Name

Birthdate

Project No.

= M

= Female

= Sex Unknown

= Deceased female

3.22-1M-12/68

= Patient (index case)

= 3 yr. old female

= 2 females

= Affected

= Ado

= Identical Twins

FR = Fraternal Twins

KEY TO SYMBOLS

Marriage

Consanguineous marriage

Illegitimacy

No issue

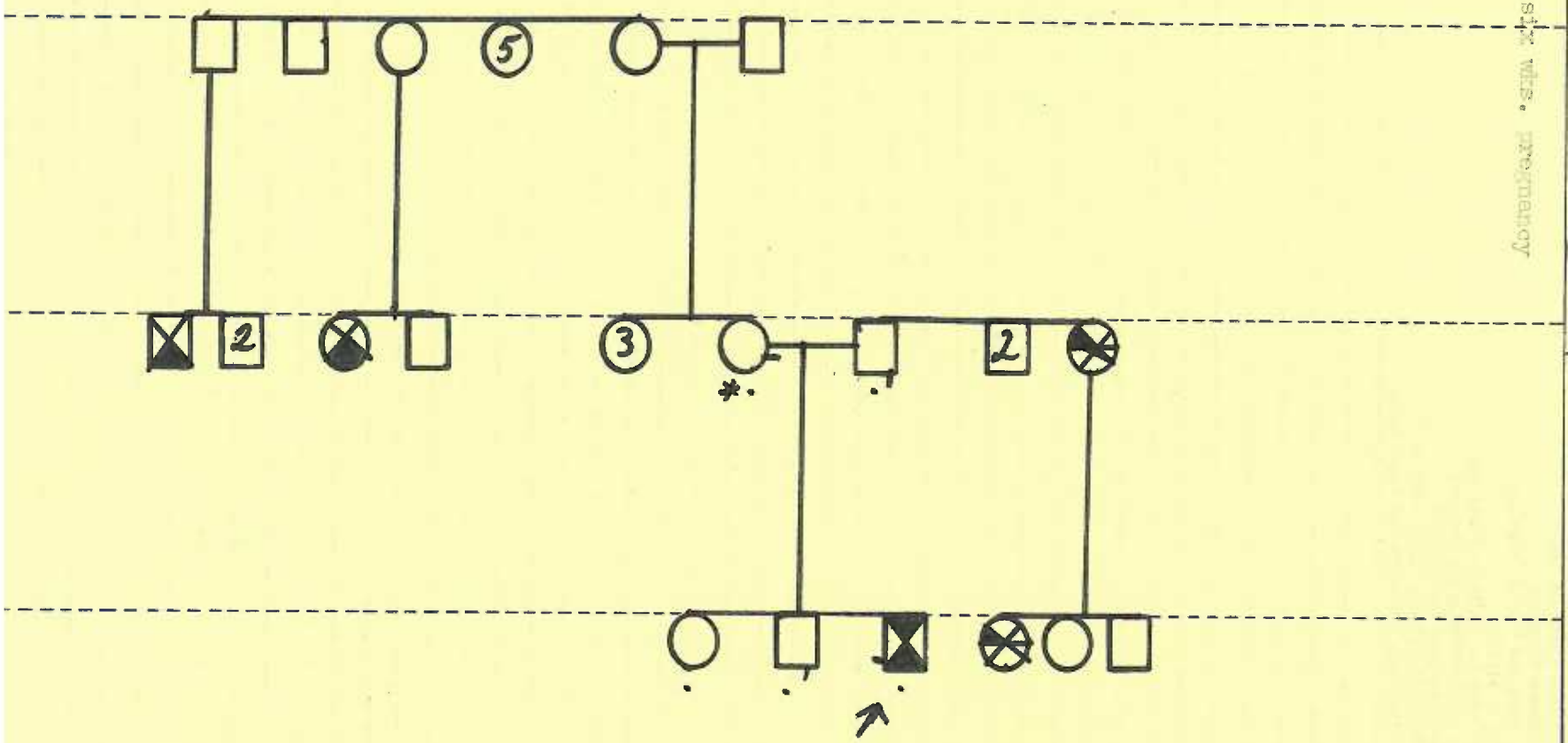
Smaller symbols:

Lived ... than one day

Pregnancy

Stillbirth

Miscarriage



* extreme flu at 5th wks. pregnancy

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No._____ Race (Paternal):_____

Family No._____ (Maternal):_____

Recorder_____ Religion:_____

Date_____ Referring Diagnosis:_____

Informant_____

Date Bldg. Fl. Rm.

Unit No. 5

Name

Birthdate

Project No.

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

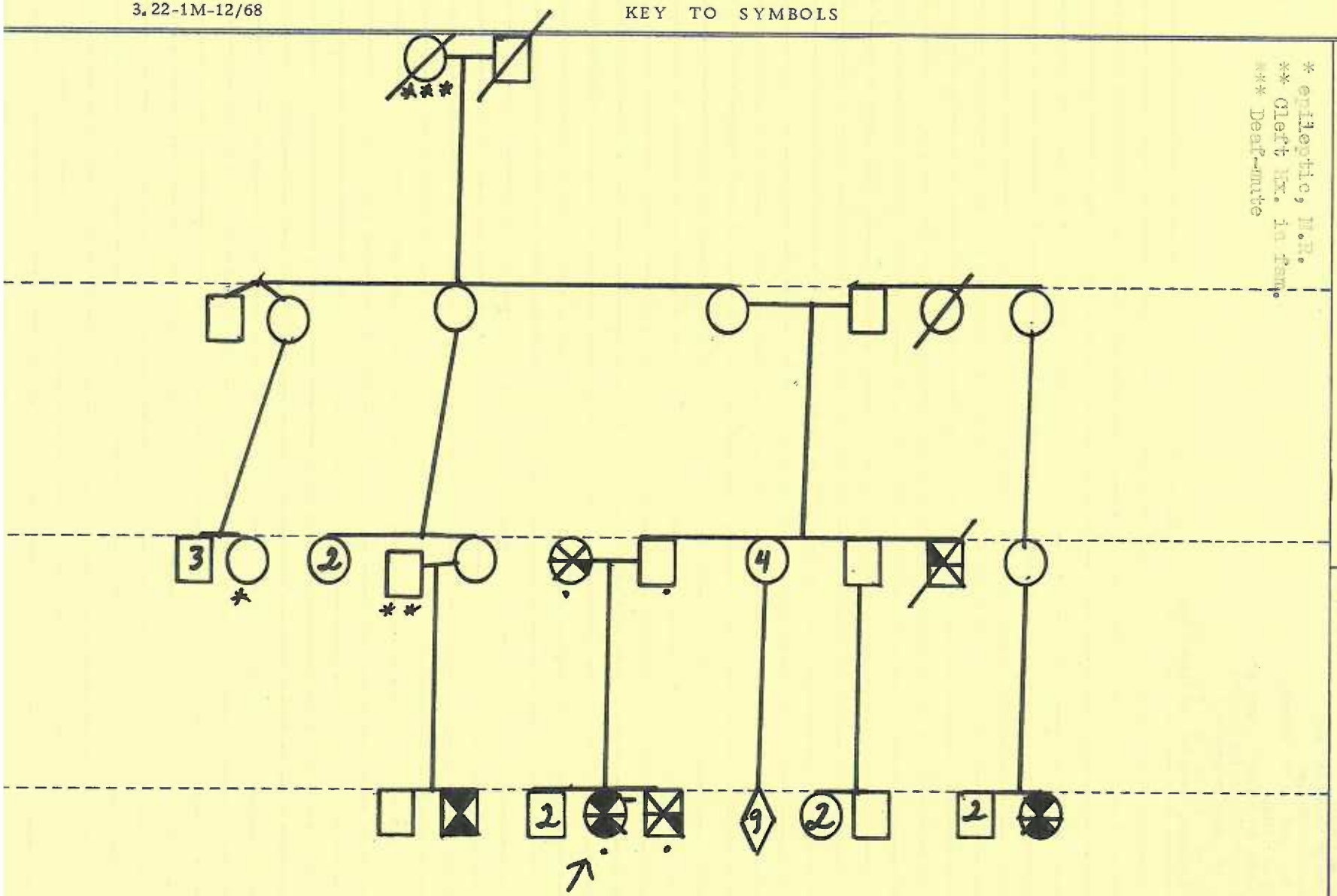
= Ador[illegible]
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 6.
Name
Birthdate
Project No.

Bldg. Fl. Rm.

3

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

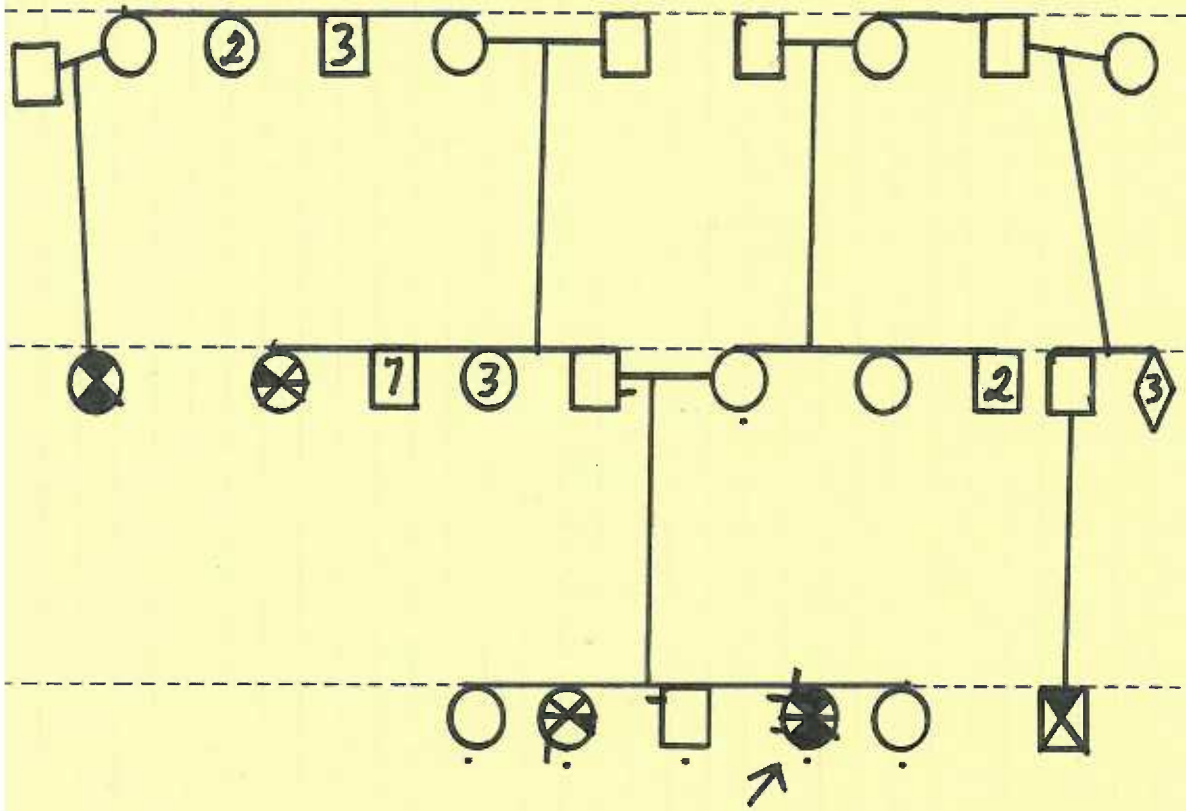
= Ador[illegible]
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Recorder
Date
Informant

Race (Paternal):
(Maternal):
Religion:
Referring Diagnosis:

Date
Unit No. 7
Name
Birthdate
Project No.

Bldg.
Fl.
Rm.

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

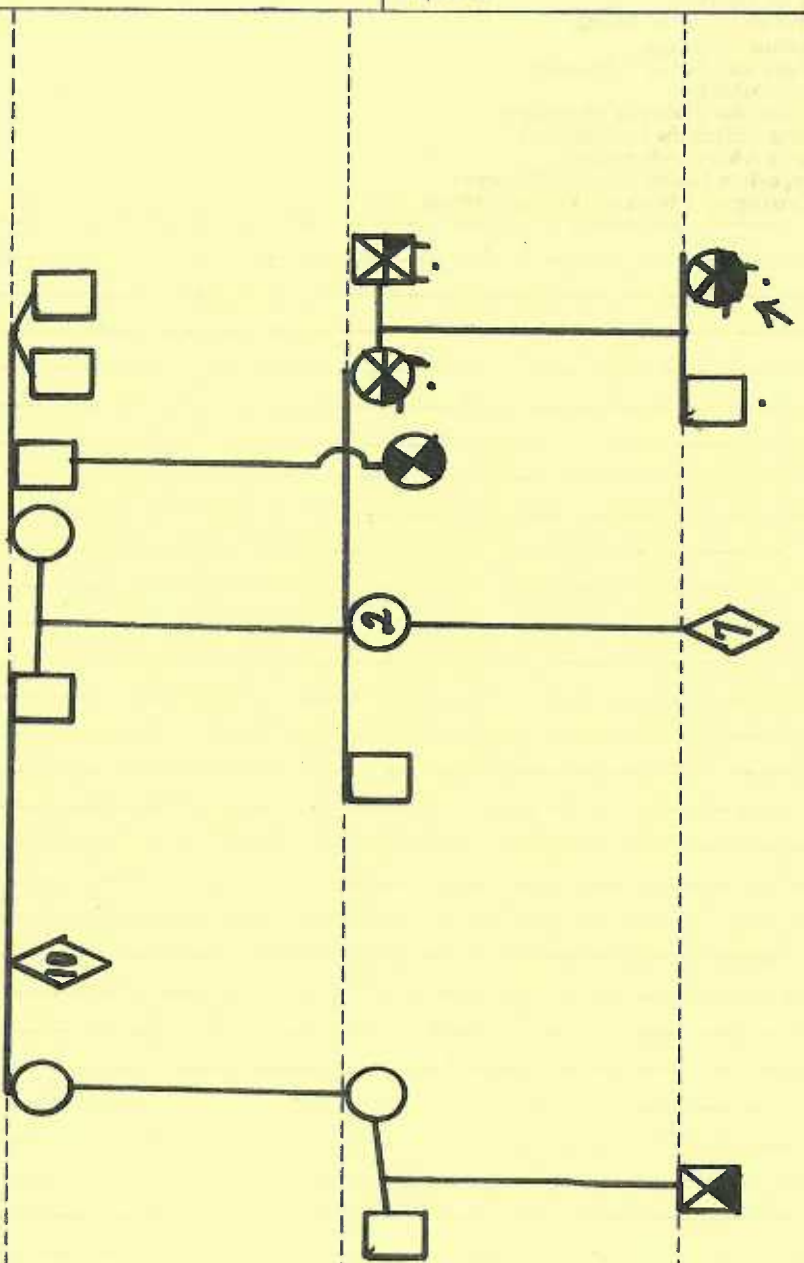
Date Bldg. Fl. Rm.

Unit No. 8

Name

Birthdate

Project No.



KEY TO SYMBOLS

Smaller symbols: Lived less than one day

Pregnancy

Stillbirth

Miscarriage

Marriage

Consanguineous marriage

Illegitimacy

No issue

= Adopted

= Identical Twins

FR = Fraternal Twins

= Patient (index case)

= 3 yr. old female

= 2 females

= Affected

= Male

= Female

= Sex Unknown

= Deceased female

3.22-1M-12/68

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

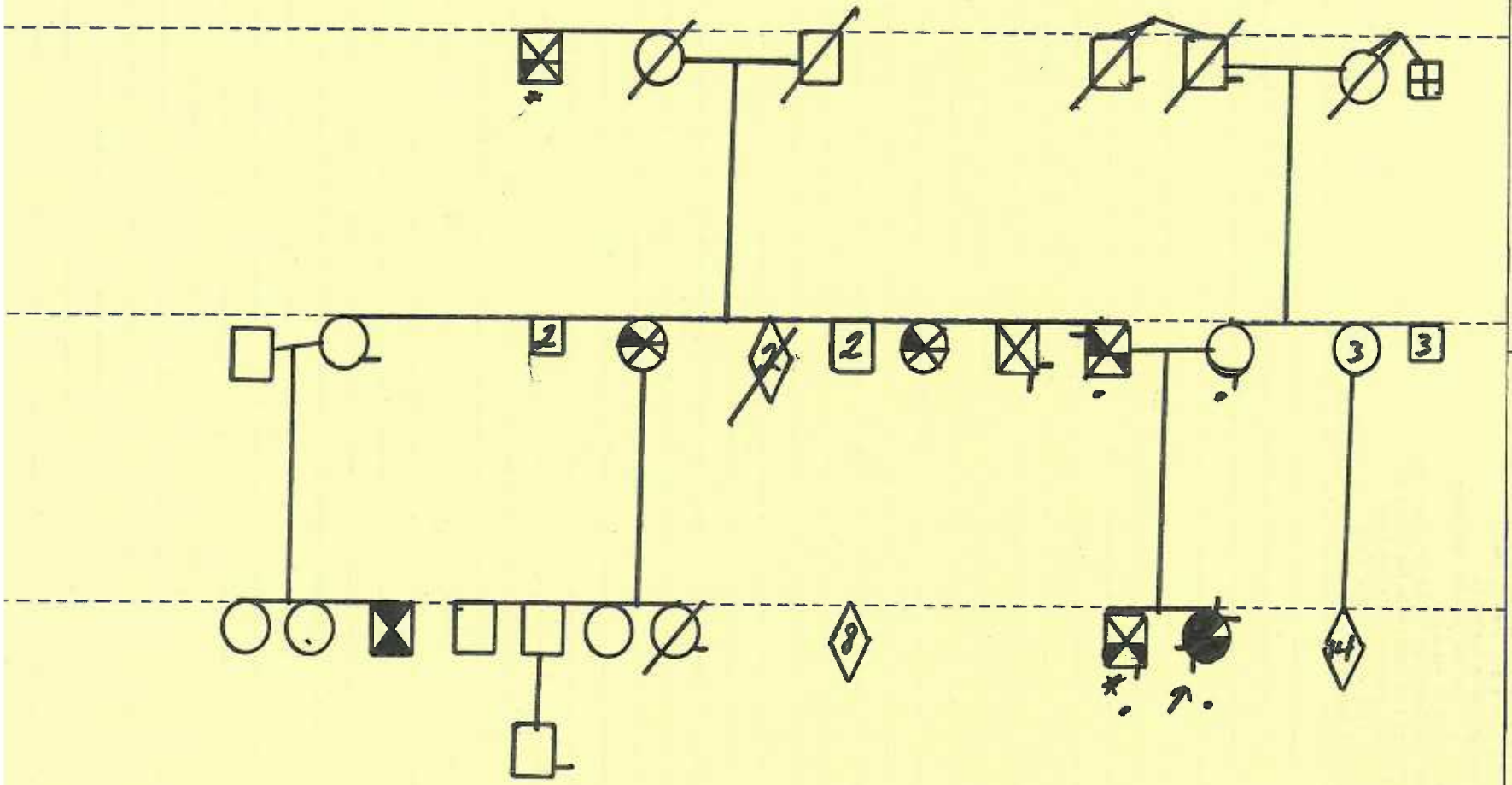
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 9.-
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

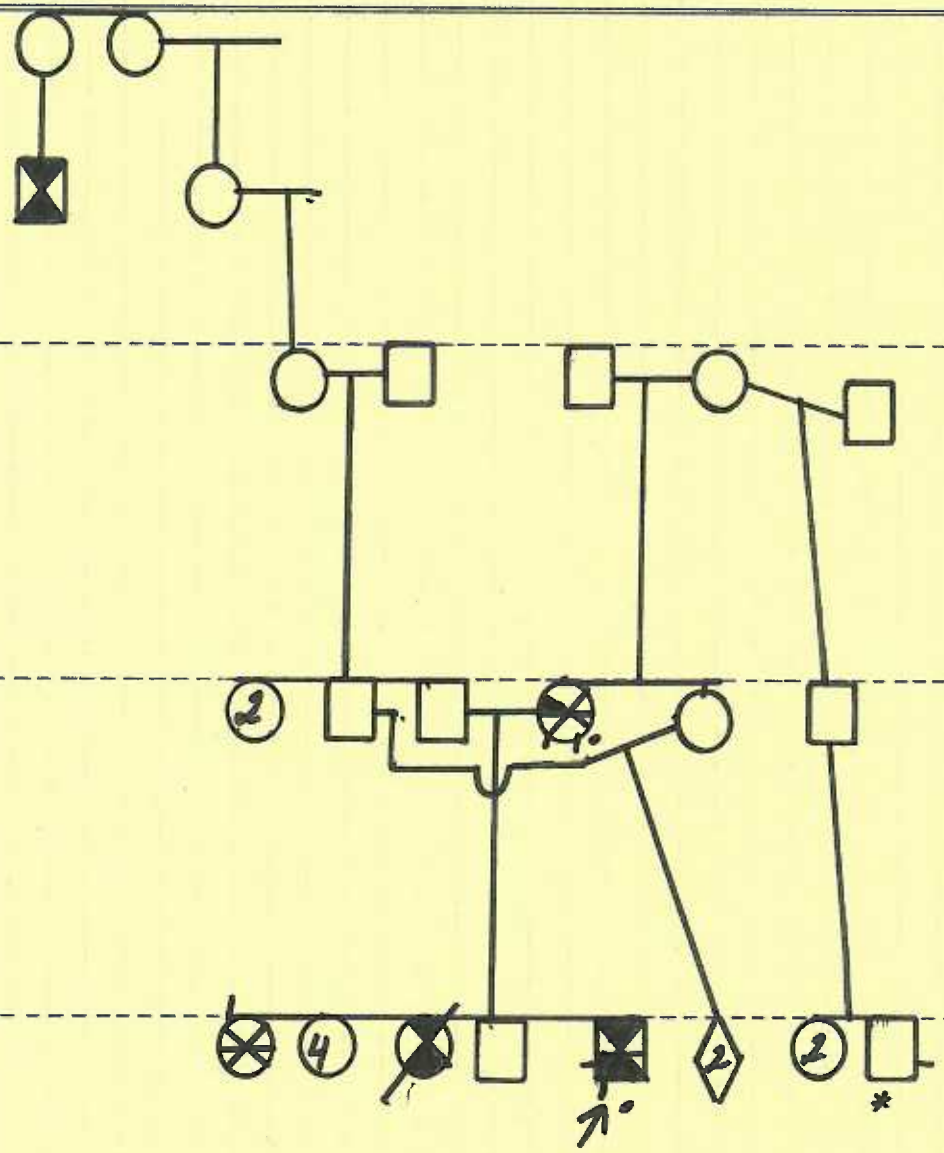
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 10-
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

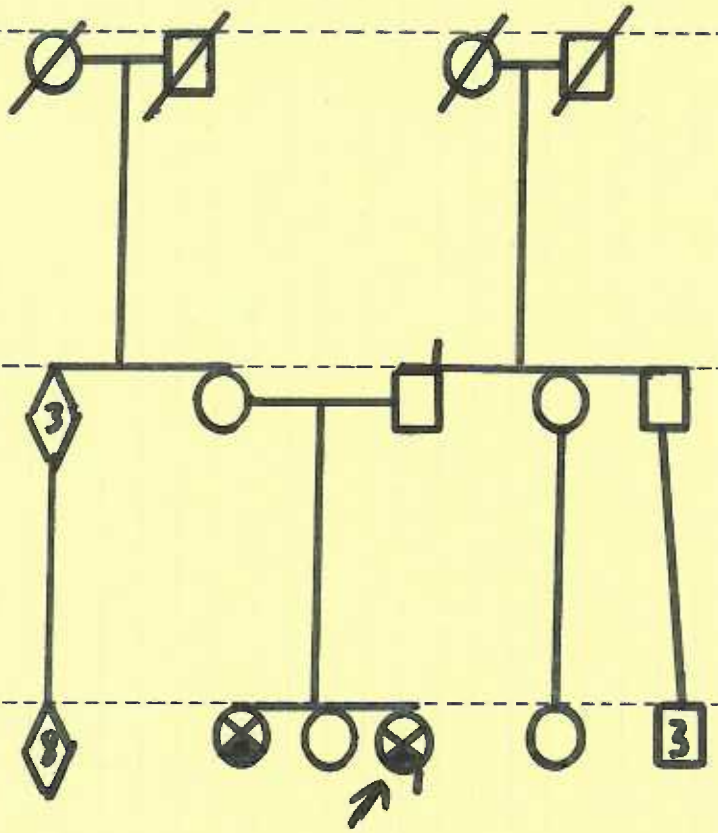
= Ador[illegible]
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 11.-
Name
Birthdate
Project No.

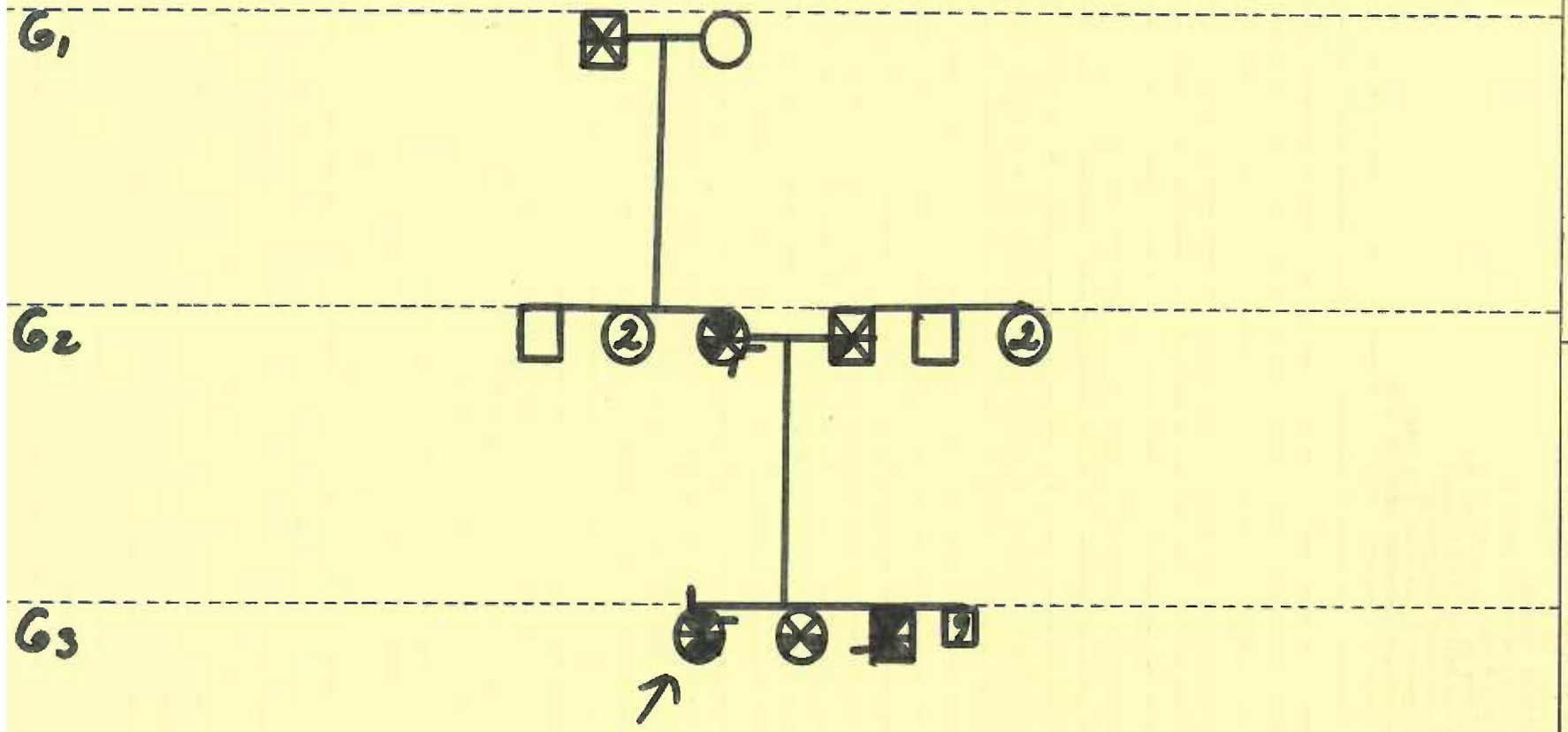
Bldg.
Fl.
Rm.

= Male
= Female
= Sex Unknown
= Deceased female
= Patient (index case)
= 3 yr. old female
= 2 females
= Affected
= Adopted
= Identical Twins
= Fraternal Twins
Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 13-
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

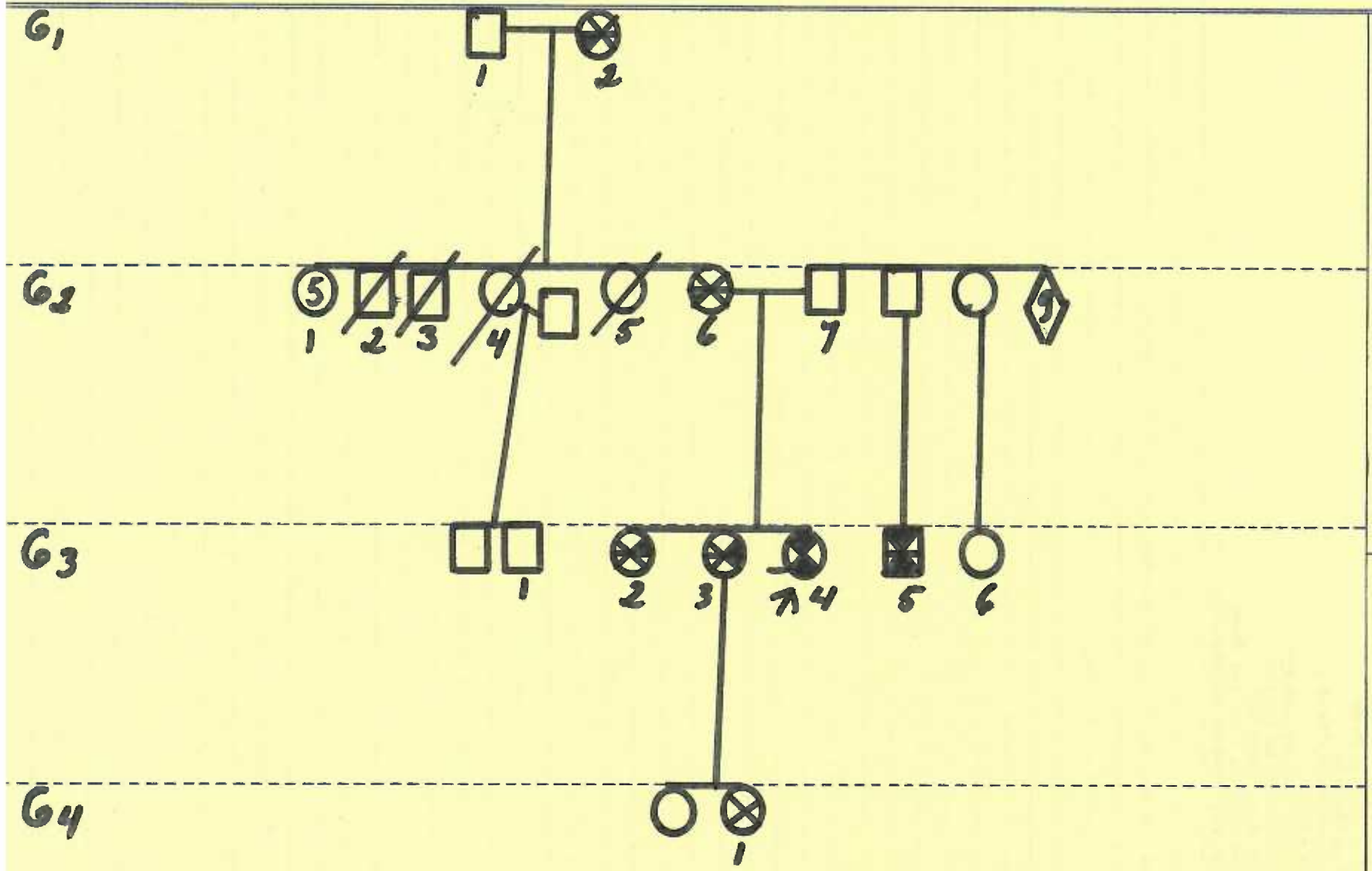
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Unit No. 14-
Name
Birthdate
Project No.

Date Bldg. Fl. Rm.

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

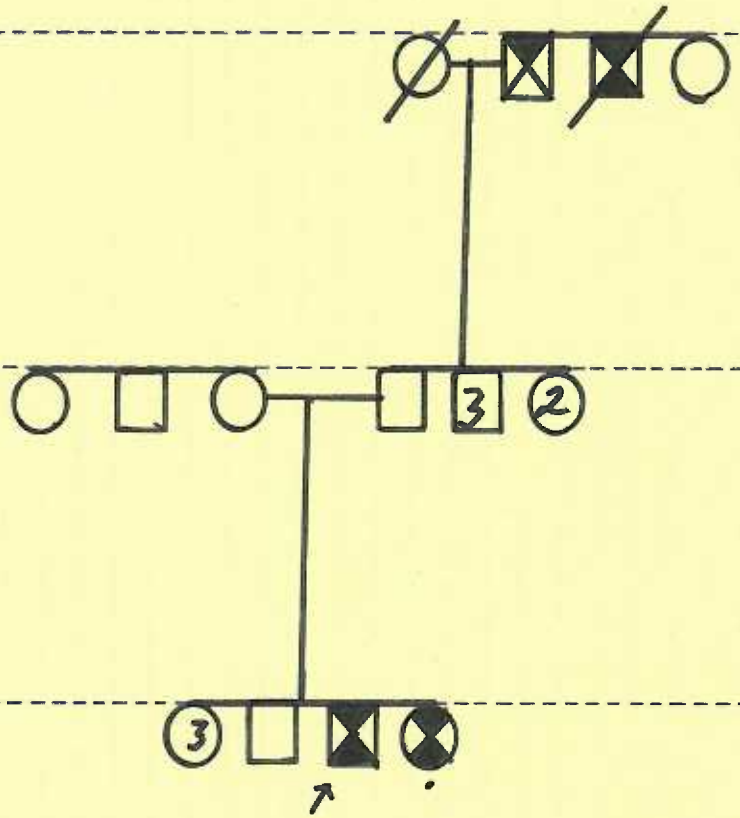
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

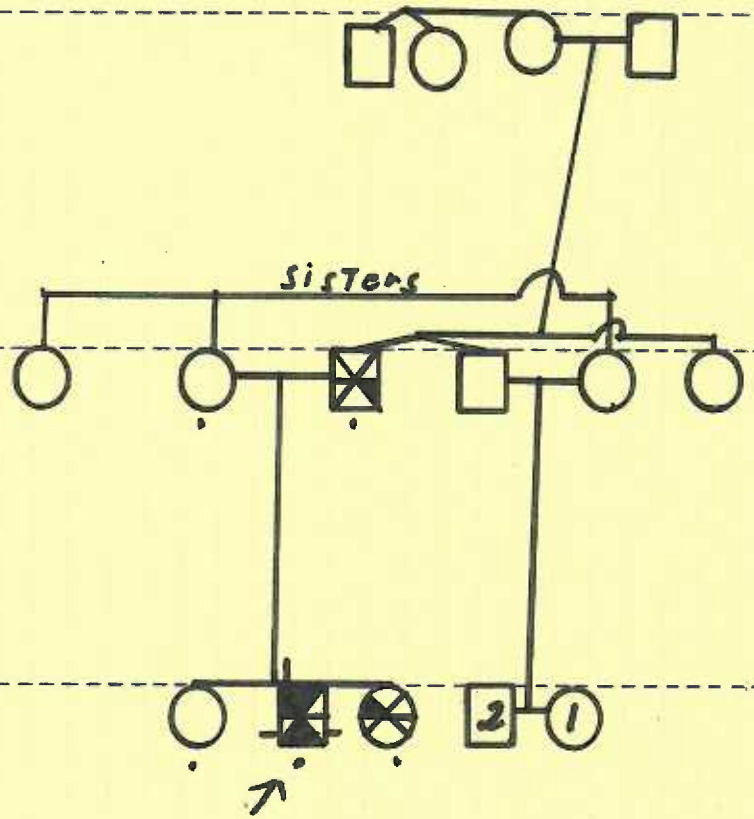
Date
Unit No. 15-
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= Male
= Female
= Sex Unknown
= Deceased female
= Patient (index case)
= 3 yr. old female
= 2 females
= Affected
= Adopted
= Identical Twins
FR = Fraternal Twins
Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Race (Paternal):
(Maternal):
Religion:
Recorder
Date
Referring Diagnosis:
Informant

Date
Unit No.
Name
Birthdate
Project No.
16.-
Bldg.
Fl.
Rm.

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

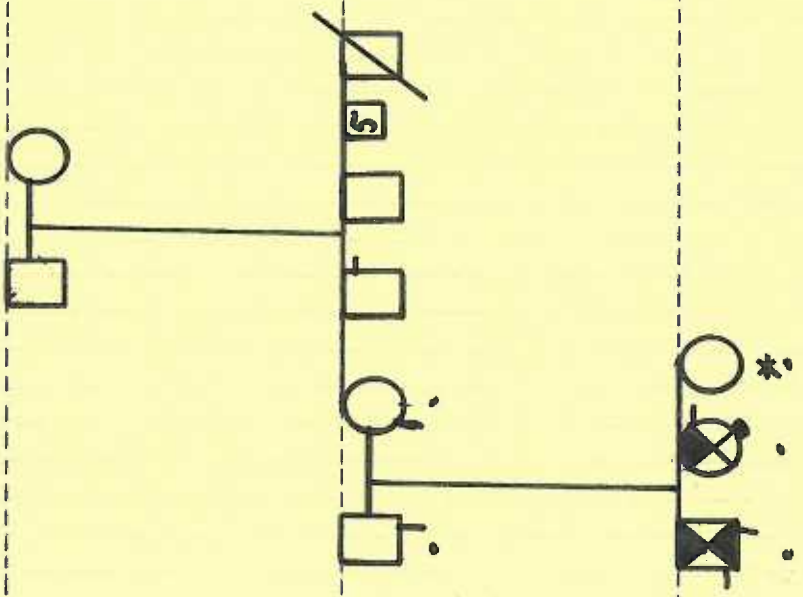
Unit No. 17-

Name

Birthdate

Project No.

* Congenital dislocation of hip



KEY TO SYMBOLS

Smaller symbols: Lived [illegible] than one day

Pregnancy

Stillbirth

Miscarriage

Marriage

Consanguineous marriage

Illegitimacy

No issue

[illegible] = Adopted

= Identical Twins

FR = Fraternal Twins

= Patient (index case)

3 = 3 yr. old female

② = 2 females

● = Affected

= [illegible]

= Female

= Sex Unknown

= Deceased female

3.22-1M-12/68

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

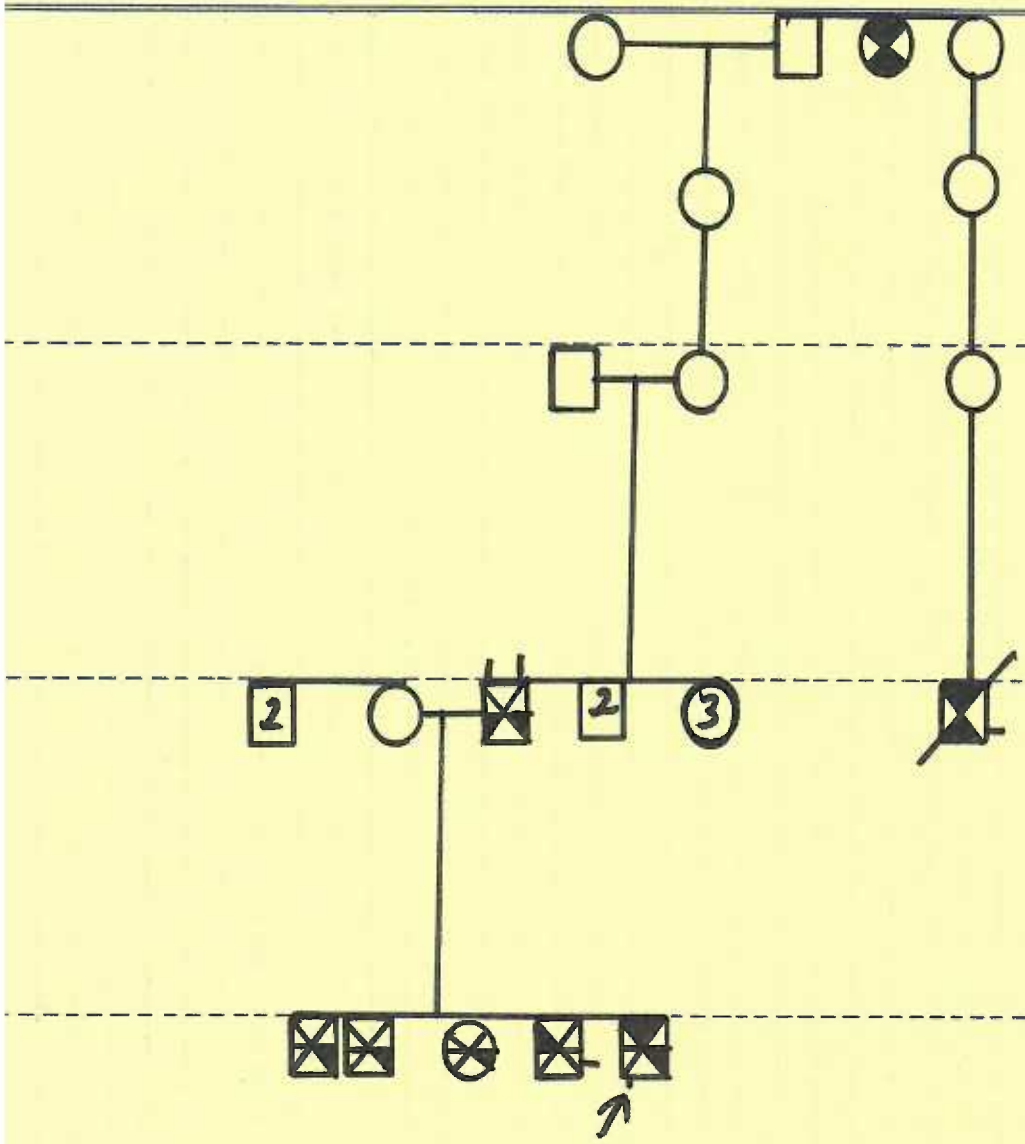
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Notes during last pregnancy

Date
Unit No. 18-
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

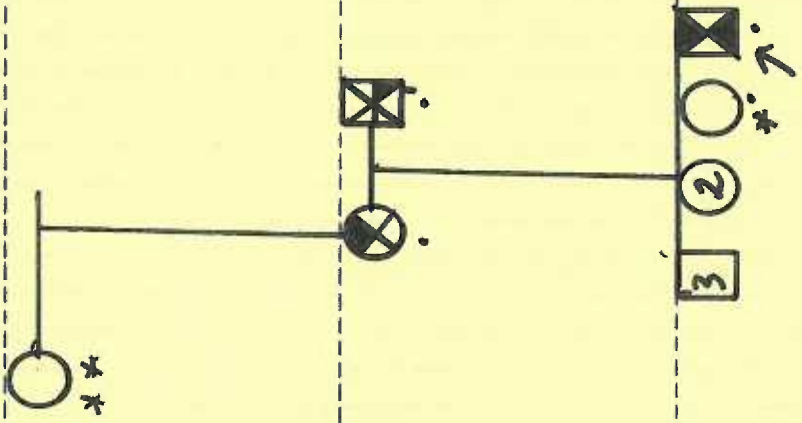
Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

Unit No. 19
Name
Birthdate
Project No.

* * epileptic
* Bleeder



KEY TO SYMBOLS

Smaller symbols: Lived [illegible] than one day

Pregnancy

Stillbirth

Miscarriage

Marriage

Consanguineous marriage

Illegitimacy

No issue

= Adopted

= Identical Twins

FR = Fraternal Twins

= Patient (index case)

3 = 3 yr. old female

② = 2 females

= Affected

= [illegible]

= Female

= Sex Unknown

= Deceased female

3.22-1M-12/68

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

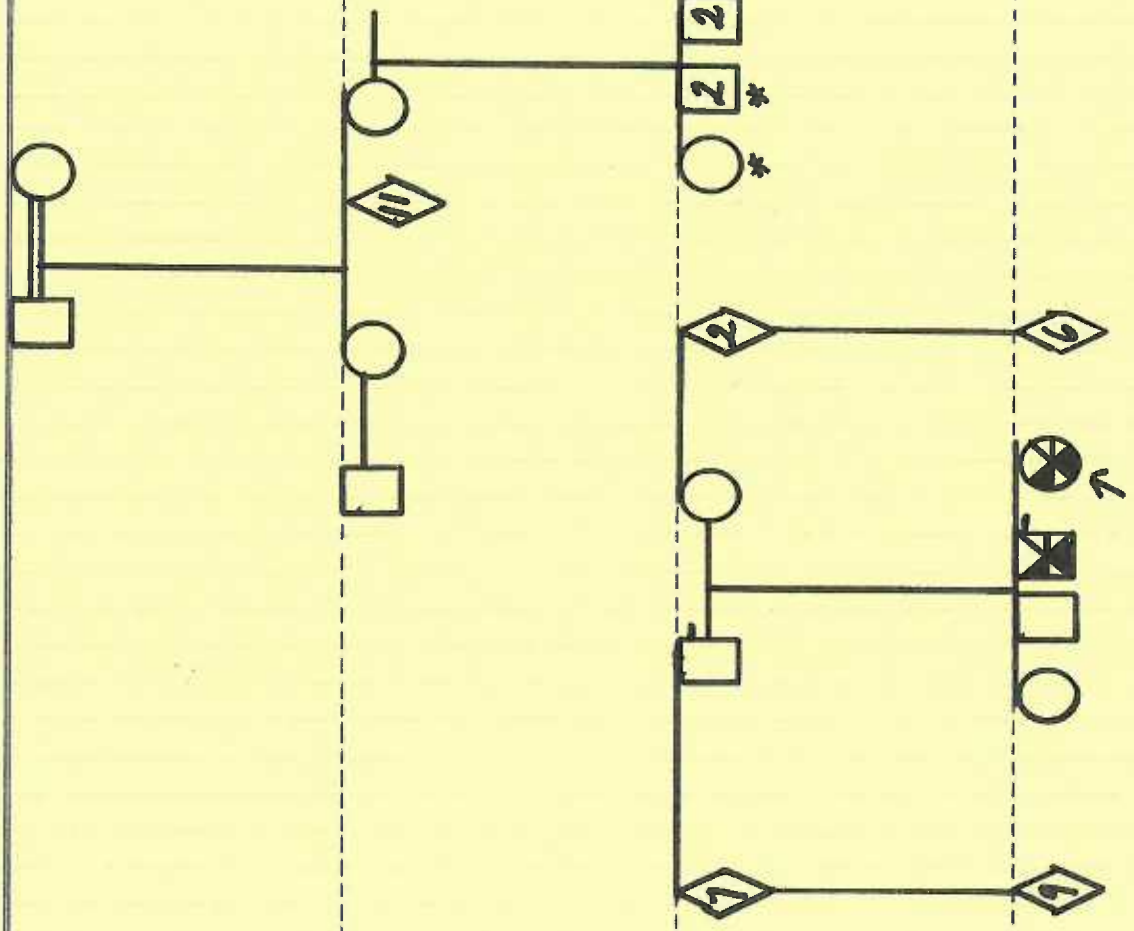
Unit No. 21.-

Name

Birthdate

Project No.

* Mild M.R.



KEY TO SYMBOLS

Smaller symbols: Lived [illegible] than one day

□ Pregnancy ◈ Stillbirth ⊞ Miscarriage

Marriage Consanguineous marriage Illegitimacy No issue

[□] = Ador[illegible]

= Identical Twins = Fraternal Twins FR

□ = [illegible] ○ = Female ◇ = Sex Unknown ⊘ = Deceased female

○← = Patient (index case) ○3 = 3 yr. old female ② = 2 females ● = Affected

3. 22-1M-12/68

3

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

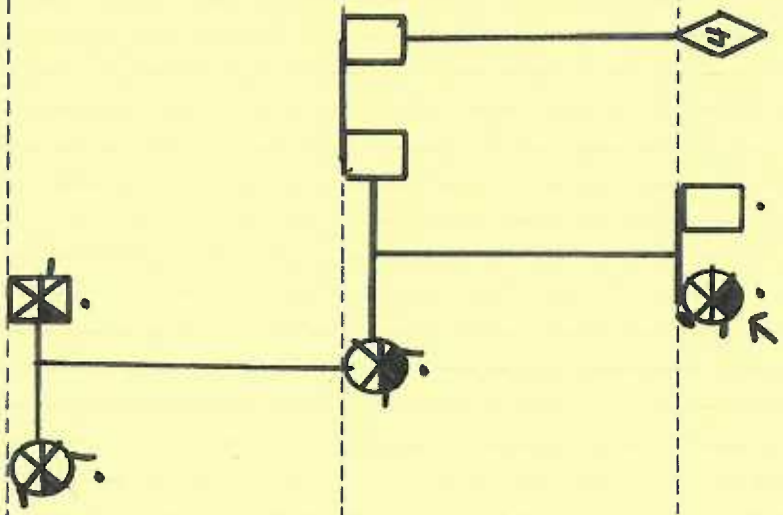
Date Bldg. Fl. Rm.

Unit No. 23.-

Name

Birthdate

Project No.



3

KEY TO SYMBOLS

Smaller symbols: Lived less than one day; Pregnancy; Stillbirth; Miscarriage

Marriage; Consanguineous marriage; Illegitimacy; No issue

= Adopted; = Identical Twins; = Fraternal Twins (FR)

= Patient (index case); = 3 yr. old female; = 2 females; = Affected

= Male; = Female; = Sex Unknown; = Deceased female

3.22-1M-12/68

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

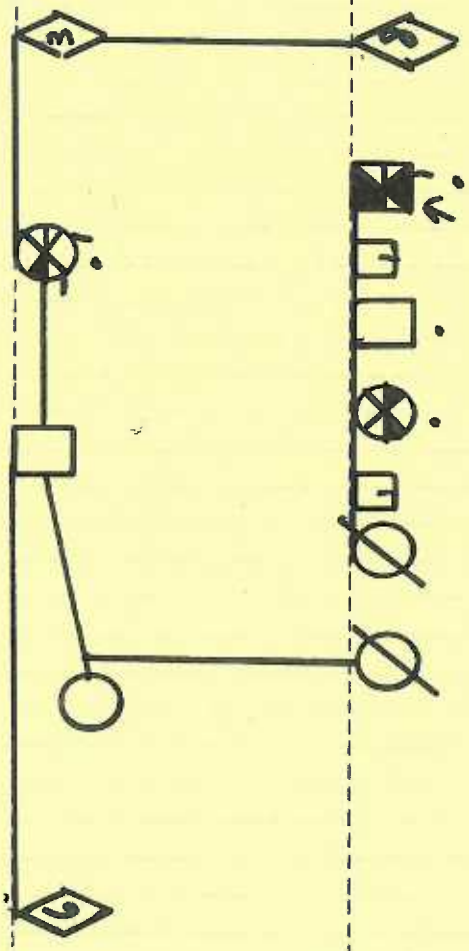
Date Bldg. Fl. Rm.

Unit No. 24-

Name

Birthdate

Project No.



KEY TO SYMBOLS

Smaller symbols: Lived less than one day

□ Pregnancy ◈ Stillbirth ⊞ Miscarriage

Marriage — Consanguineous marriage — Illegitimacy — No issue

= Adopted

= Identical Twins

FR = Fraternal Twins

= Patient (index case)

3 = 3 yr. old female

② = 2 females

= Affected

= Male

= Female

= Sex Unknown

= Deceased female

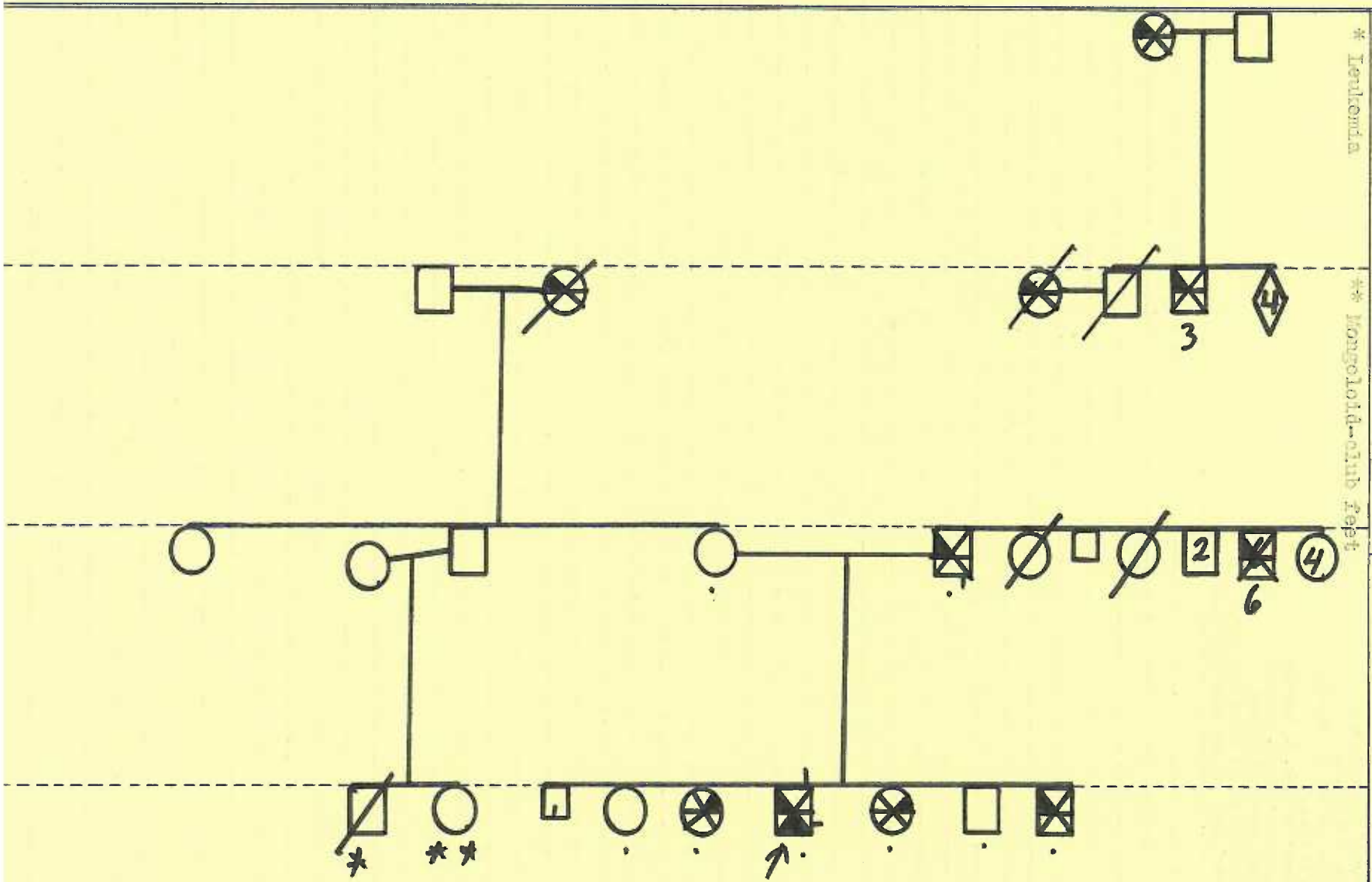
3.22-1M-12/68

= Male
= Female
= Sex Unknown
= Deceased female
= Patient (index case)
= 3 yr. old female
= 2 females
= Affected
= Adopted
= Identical Twins
FR = Fraternal Twins
Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



* Teratoma

** Mongoloid-club feet

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 25
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

Unit No. 26

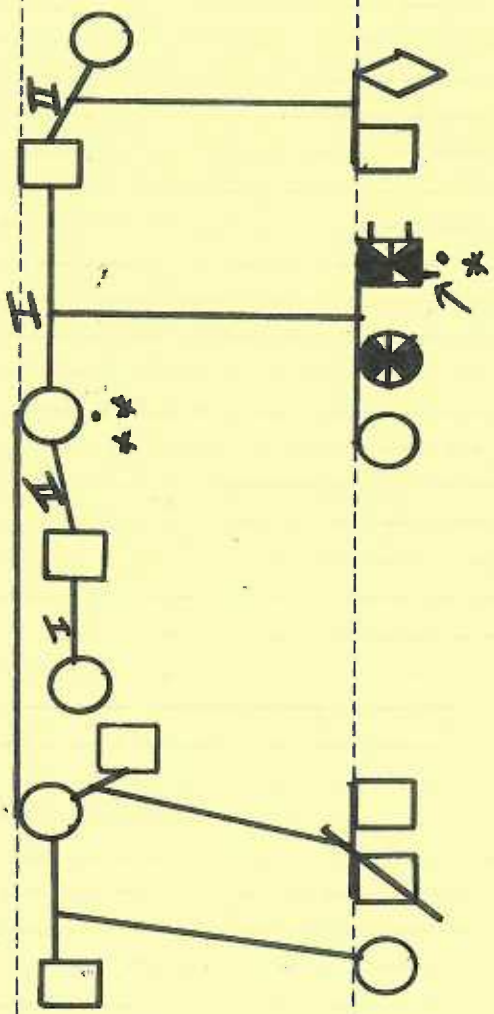
Name

Birthdate

Project No.

*Geminated teeth

** very sick 1st trimester of 2nd and 3d pregnancy.



KEY TO SYMBOLS

Smaller symbols: Lived more than one day

□ Pregnancy ◈ Stillbirth ⊞ Miscarriage ⊟

Marriage Consanguineous marriage Illegitimacy No issue

= Adopted = Identical Twins = Fraternal Twins FR

= Patient (index case) = 3 yr. old female = 2 females = Affected

= Male = Female = Sex Unknown = Deceased female

3.22-1M-12/68

3

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

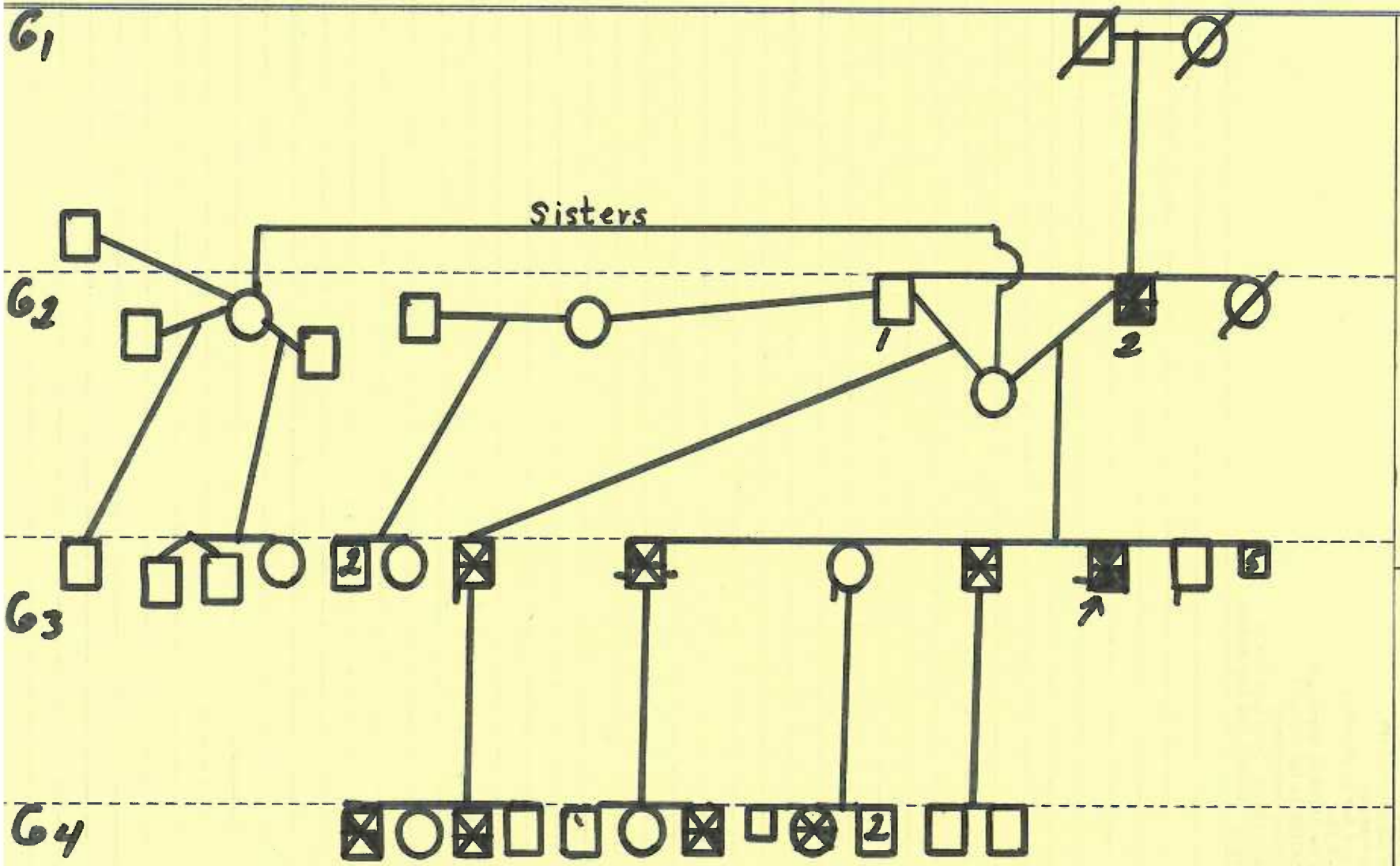
= Ador[illegible]
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Race (Paternal):
(Maternal):
Recorder
Religion:
Date
Referring Diagnosis:
Informant

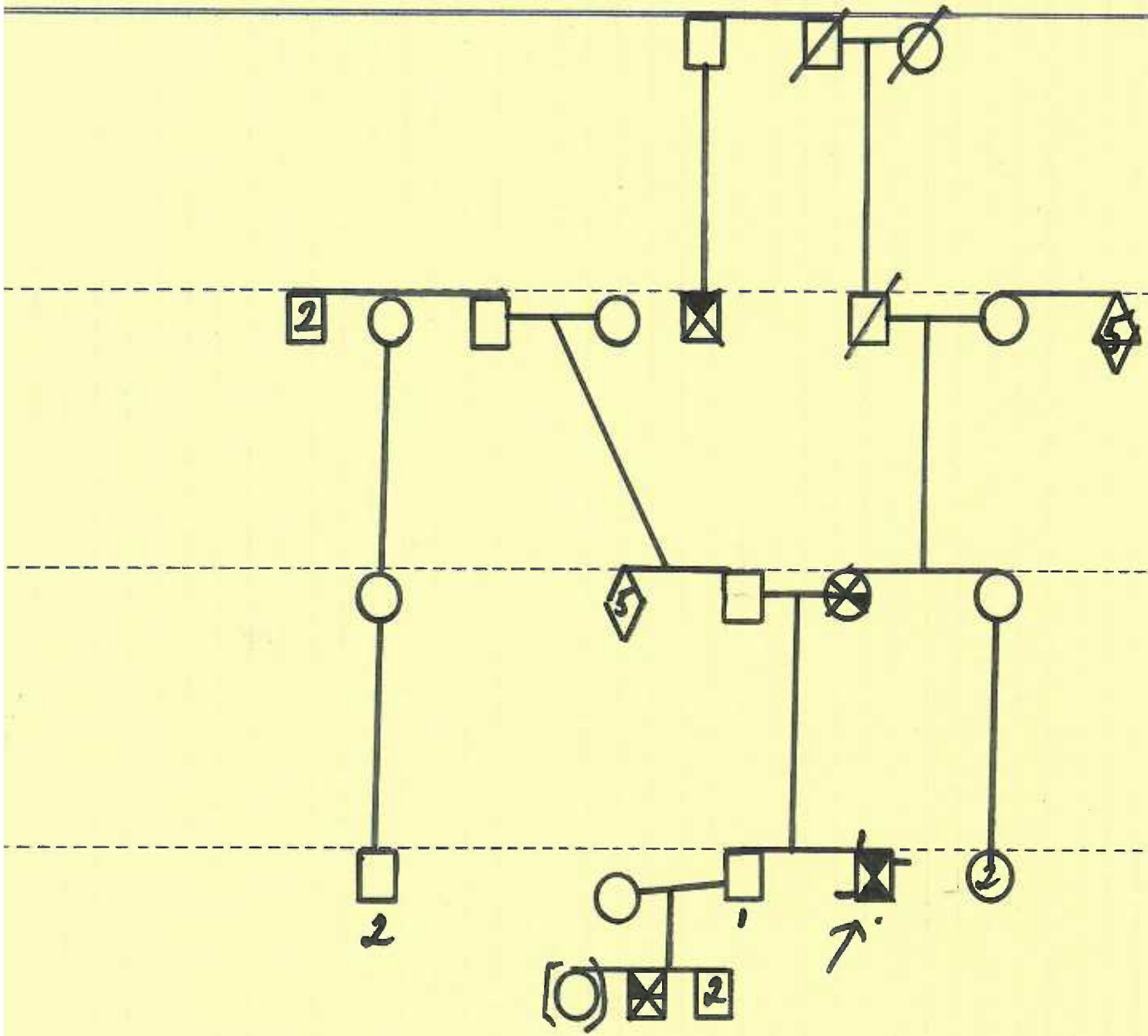
Date
Unit No. 27-
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= Male
= Female
= Sex Unknown
= Deceased female
= Patient (index case)
= 3 yr. old female
= 2 females
= Affected
= Adopted
= Identical Twins
= Fraternal Twins
Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



1. Kidney removed 2. Born at one foot only

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Unit No. 29
Name
Birthdate
Project No.

Date Bldg. Fl. Rm.

3

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

= Ado[illegible]d
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS

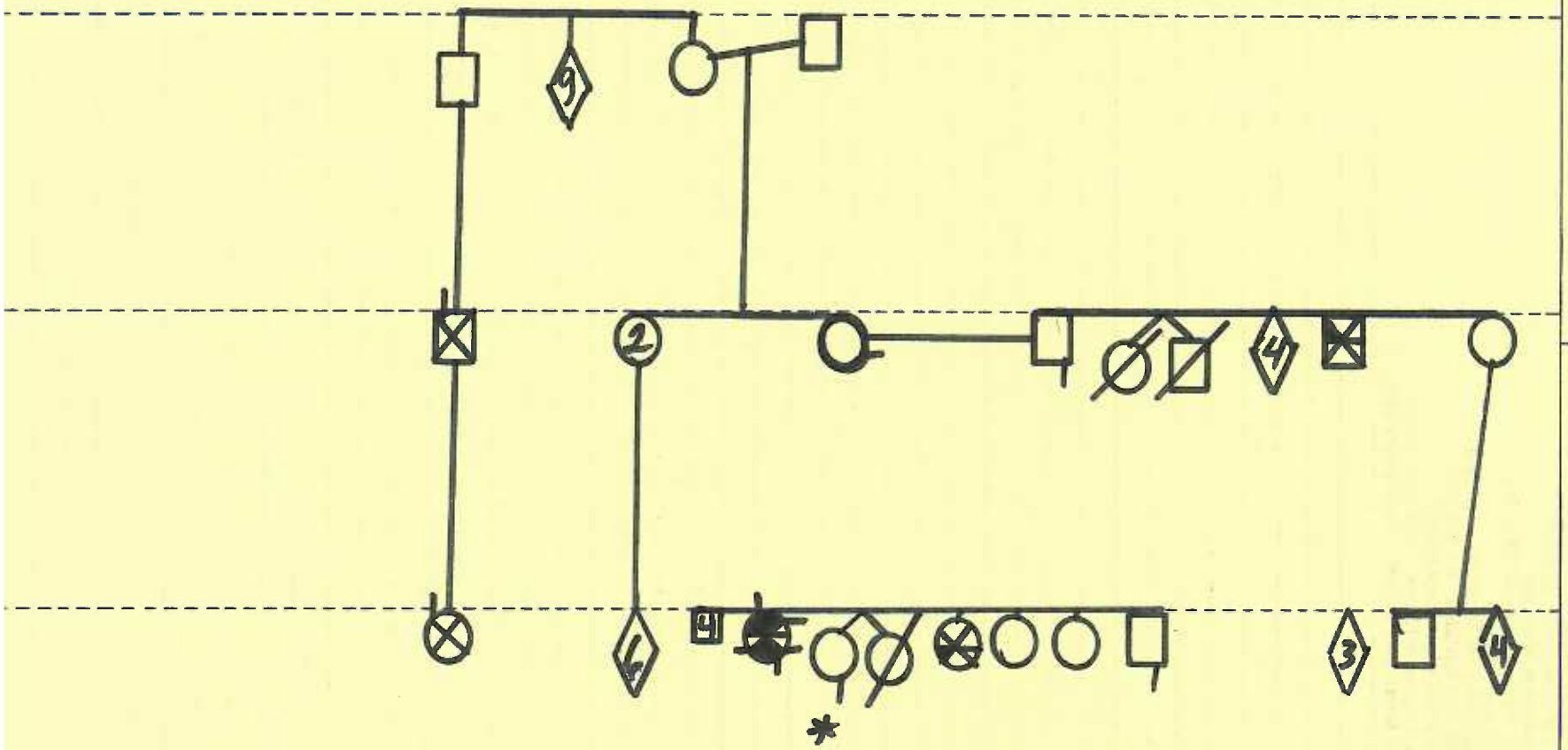
UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 30
Name
Birthdate
Project No.
Bldg. Fl. Rm.

* Cerebral palsy



= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

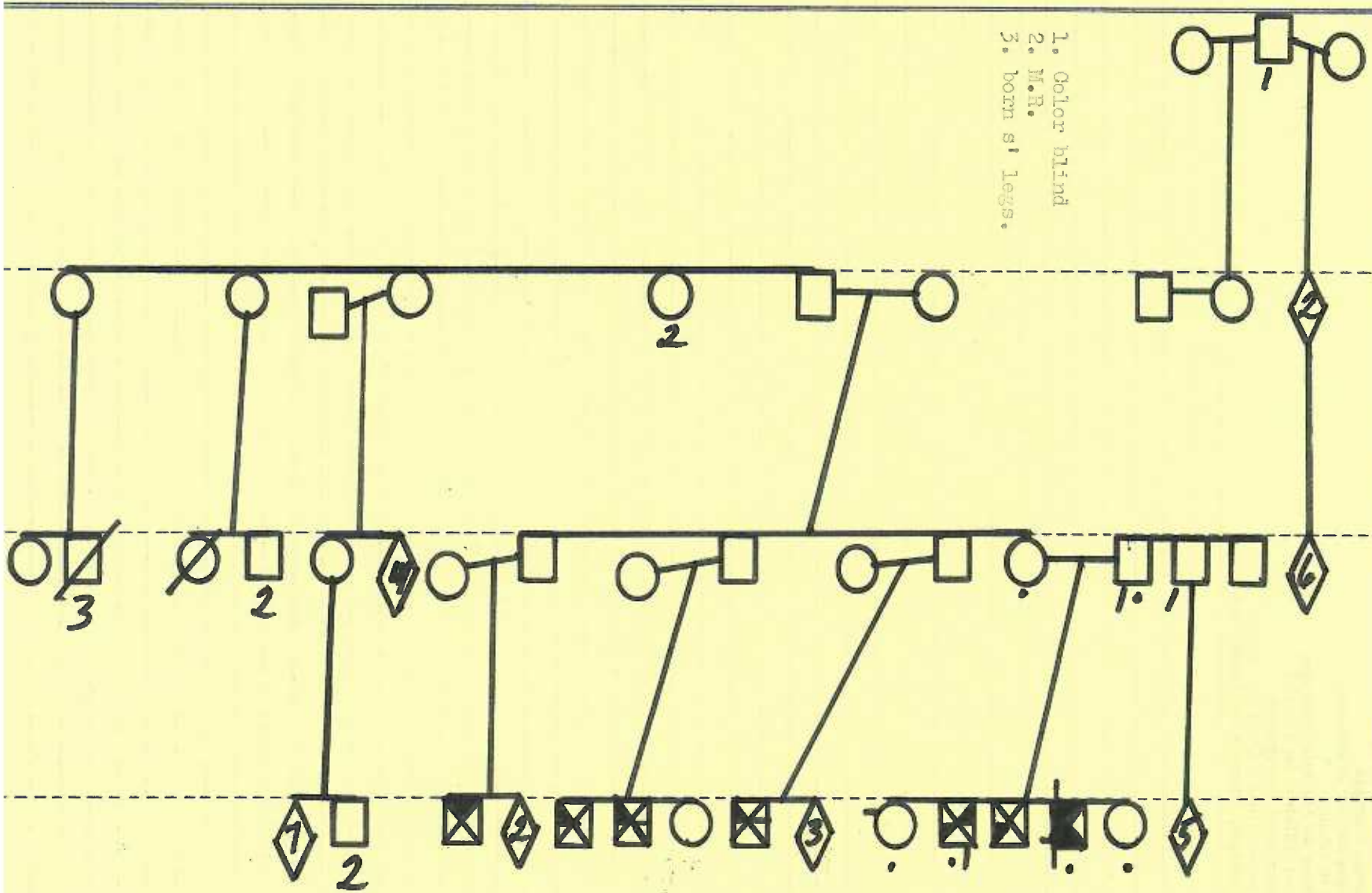
= Ador[illegible]d
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived l[illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 31
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

3

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

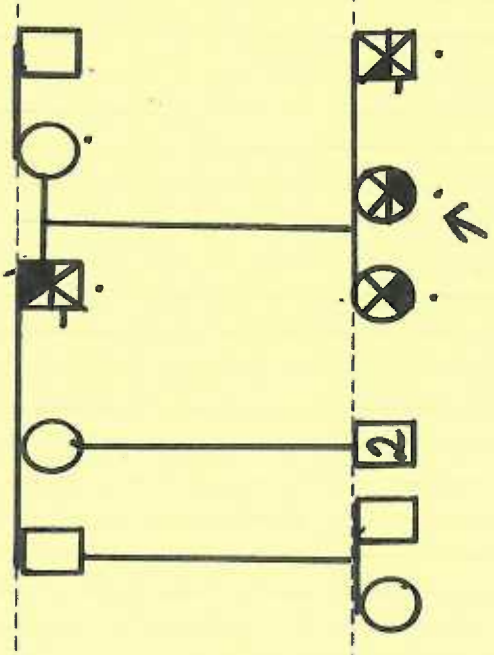
Unit No. 32

Name

Birthdate

Project No.

* mother threatened abortion c' the two daughters in 1st. trim. prg.



Smaller symbols:

Lived [illegible] than one day | Pregnancy | Stillbirth | Miscarriage

Marriage | Consanguineous marriage | Illegitimacy | No issue

= Adopted | = Identical Twins | FR = Fraternal Twins

= Patient (index case) | = 3 yr. old female | ② = 2 females | = Affected

= [illegible] | = Female | = Sex Unknown | = Deceased female

KEY TO SYMBOLS

3.22-1M-12/68

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

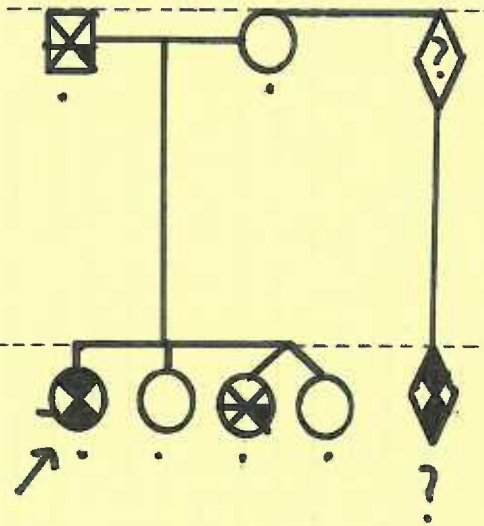
= Ador[illegible]
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No._____ Race (Paternal):_____
Family No._____ (Maternal):_____
Recorder_____ Religion:_____
Date_____ Referring Diagnosis:_____
Informant_____

Date
Unit No. 33
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

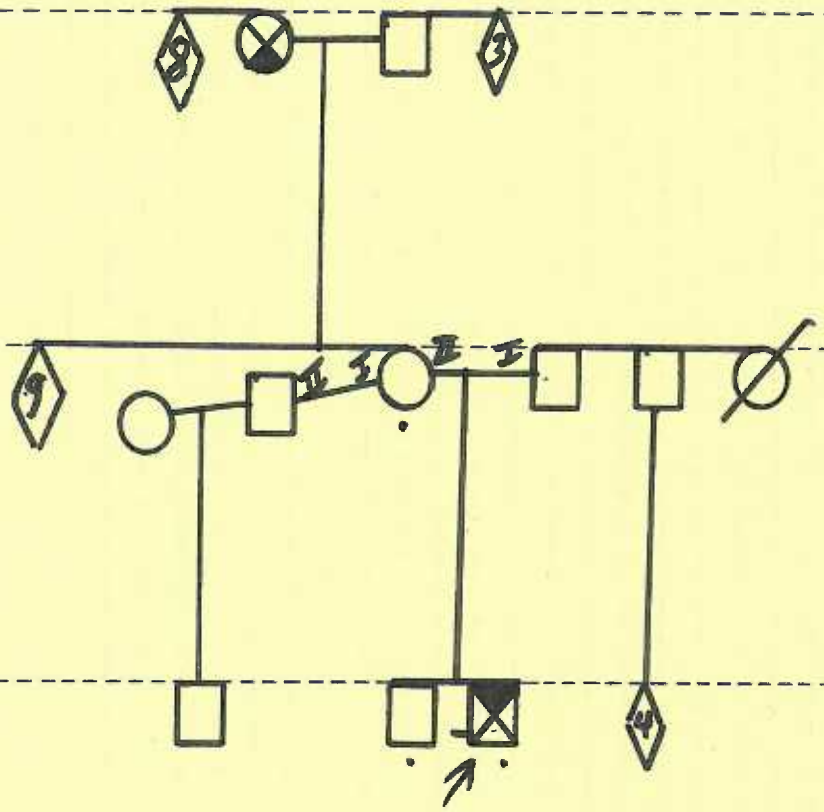
= Ador[illegible]d
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3. 22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Race (Paternal):
(Maternal):
Recorder
Religion:
Date
Referring Diagnosis:
Informant

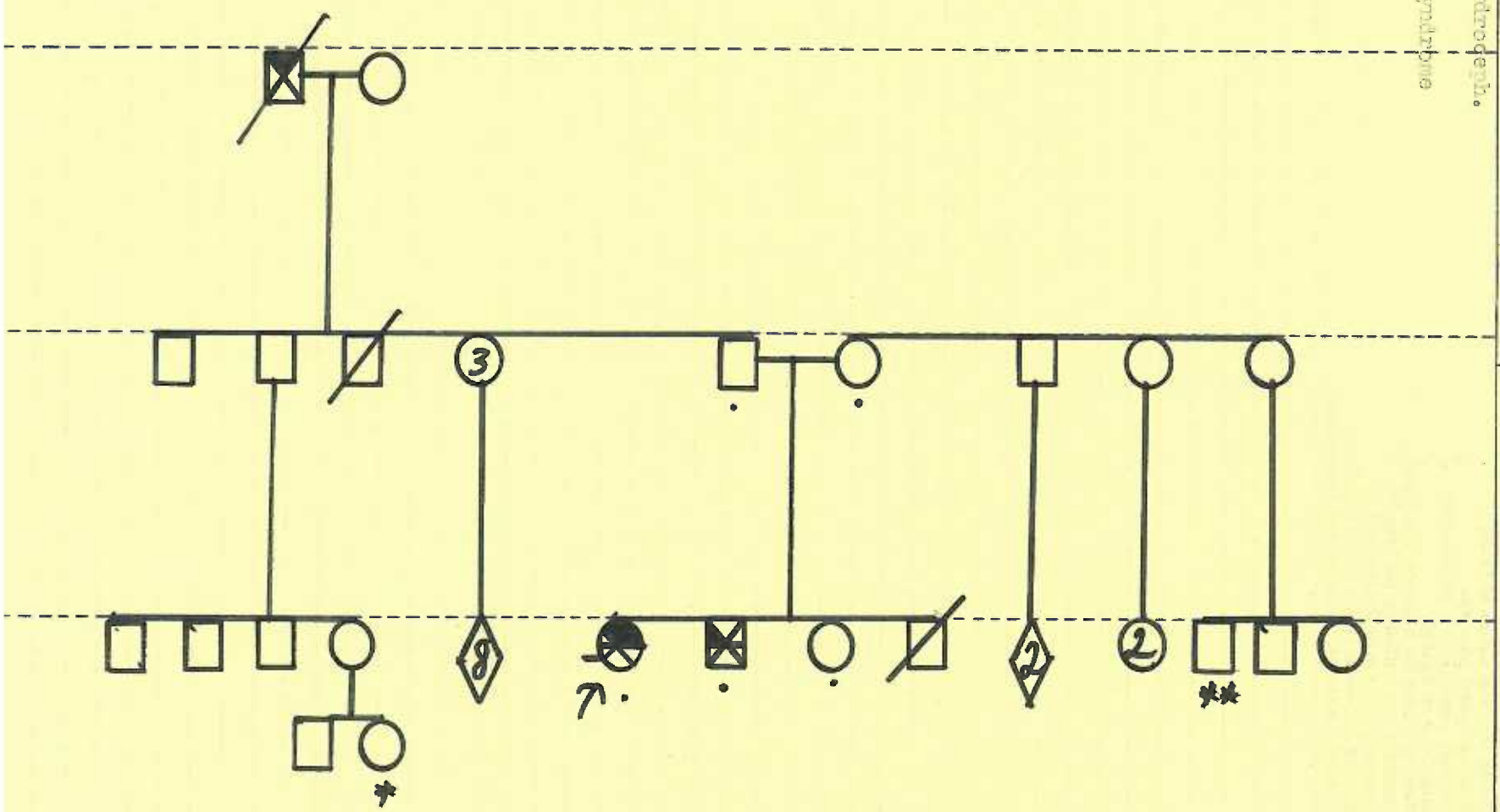
Date
Unit No. 34
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= Male
= Female
= Sex Unknown
= Deceased female
= Patient (index case)
= 3 yr. old female
= 2 females
= Affected
= Adopted
= Identical Twins
= Fraternal Twins
Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



* M.R. ** Hydrocele.
Pierre Robin Syndrome

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Race (Paternal):
(Maternal):
Recorder
Religion:
Date
Referring Diagnosis:
Informant

Unit No. 35
Name
Birthdate
Project No.

Date
Bldg.
Fl.
Rm.

3

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

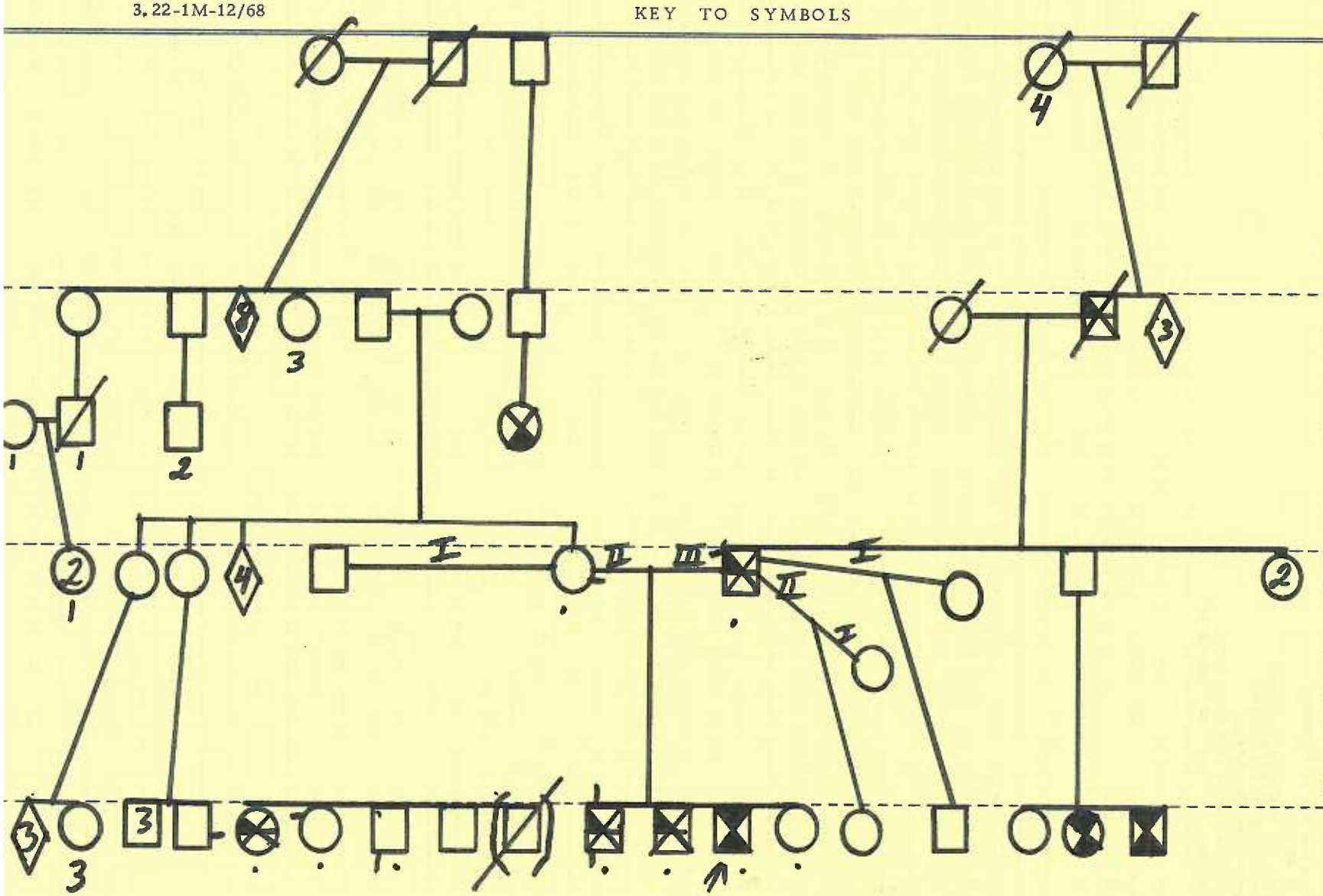
= Ado[illegible]d
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



1. Midgets 2. Deaf-blind-M.R. 3. M.R. 4. Hunch back

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Recorder
Date
Informant

Race (Paternal):
(Maternal):
Religion:
Referring Diagnosis:

Date
Unit No. 36
Name
Birthdate
Project No.

Bldg.
Fl.
Rm.

= M[illegible]
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

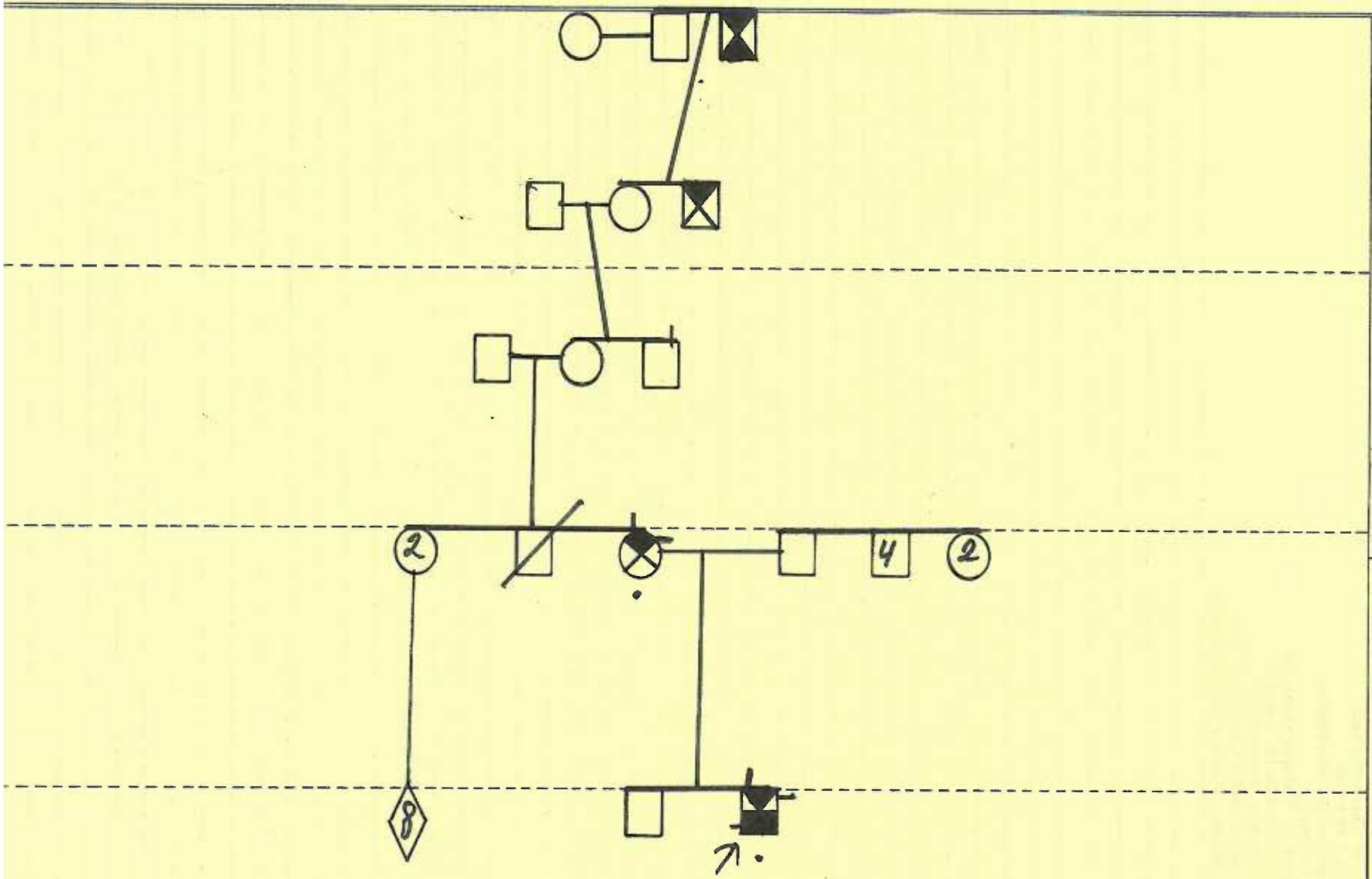
= Ado[illegible]d
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived [illegible] than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Race (Paternal):
(Maternal):
Recorder
Religion:
Date
Referring Diagnosis:
Informant

Unit No. 37
Name
Birthdate
Project No.

Date
Bldg.
Fl.
Rm.

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

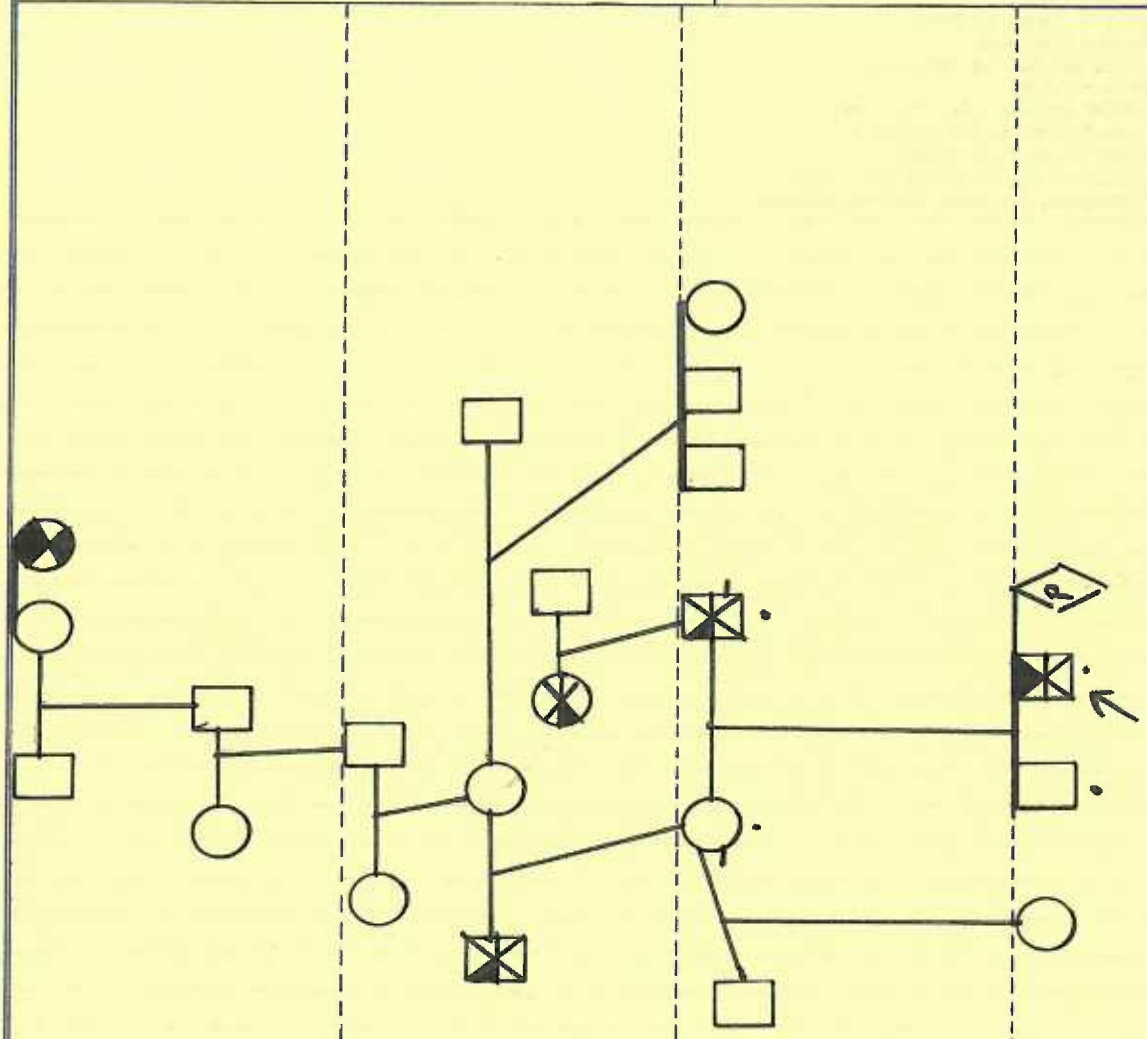
Date Bldg. Fl. Rm.

Unit No. 38

Name

Birthdate

Project No.



KEY TO SYMBOLS

Smaller symbols: Lived [illegible] than one day

Pregnancy

Stillbirth

Miscarriage

Marriage

Consanguineous marriage

Illegitimacy

No issue

[illegible] = Adopted

= Identical Twins

FR = Fraternal Twins

= Patient (index case)

3 = 3 yr. old female

② = 2 females

= Affected

= [illegible]

= Female

= Sex Unknown

= Deceased female

3. 22-1M-12/68

= Male

= Female

= Sex Unknown

= Deceased female

3. 22-1M-12/68

= Patient (index case)

= 3 yr. old female

= 2 females

= Affected

= Adopted

= Identical Twins

FR = Fraternal Twins

Marriage

Consanguineous marriage

Illegitimacy

No issue

Smaller symbols:

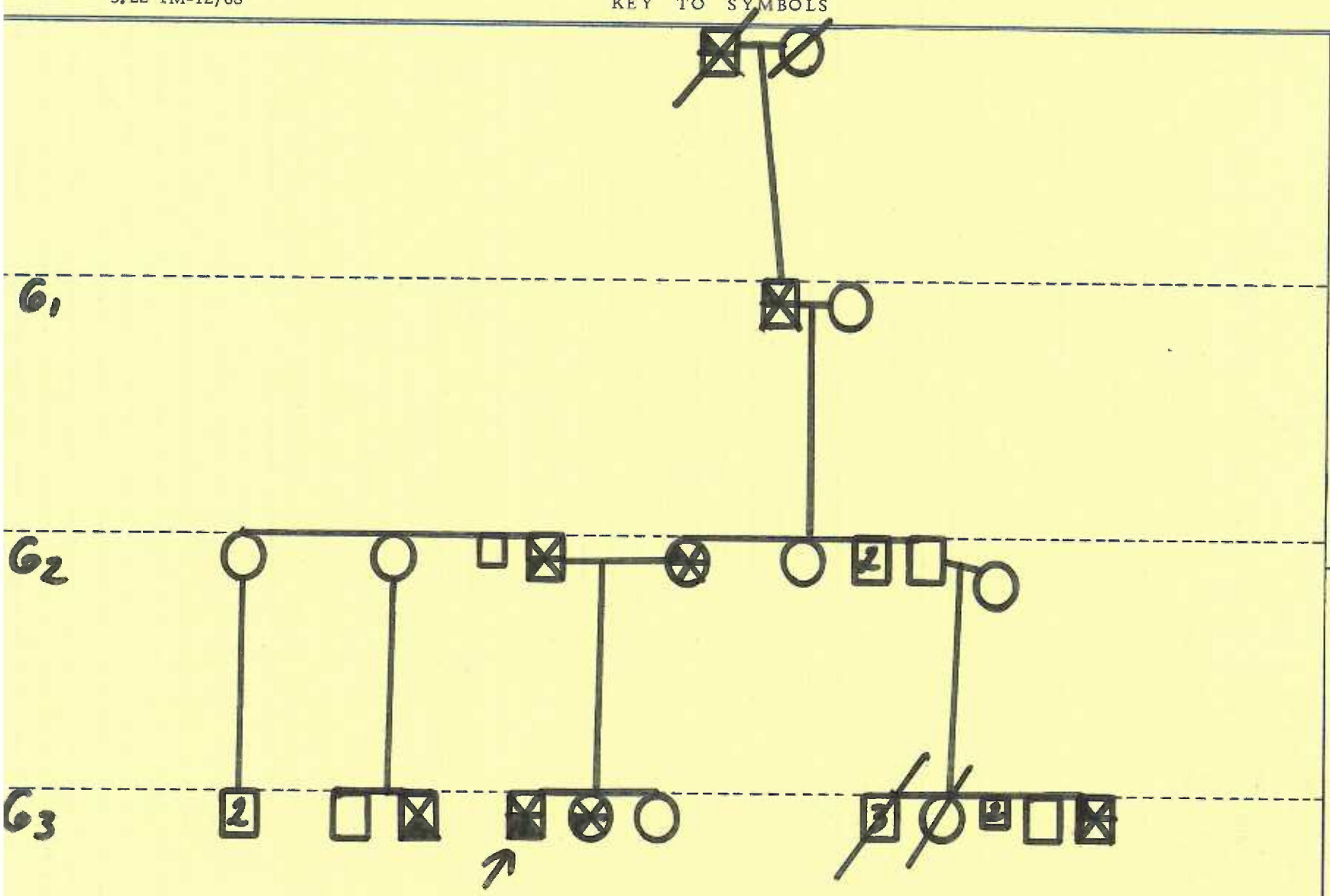
Lived less than one day

Pregnancy

Stillbirth

Miscarriage

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Date

Unit No. 40-

Name

Birthdate

Project No.

Bldg.

Fl.

Rm.

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

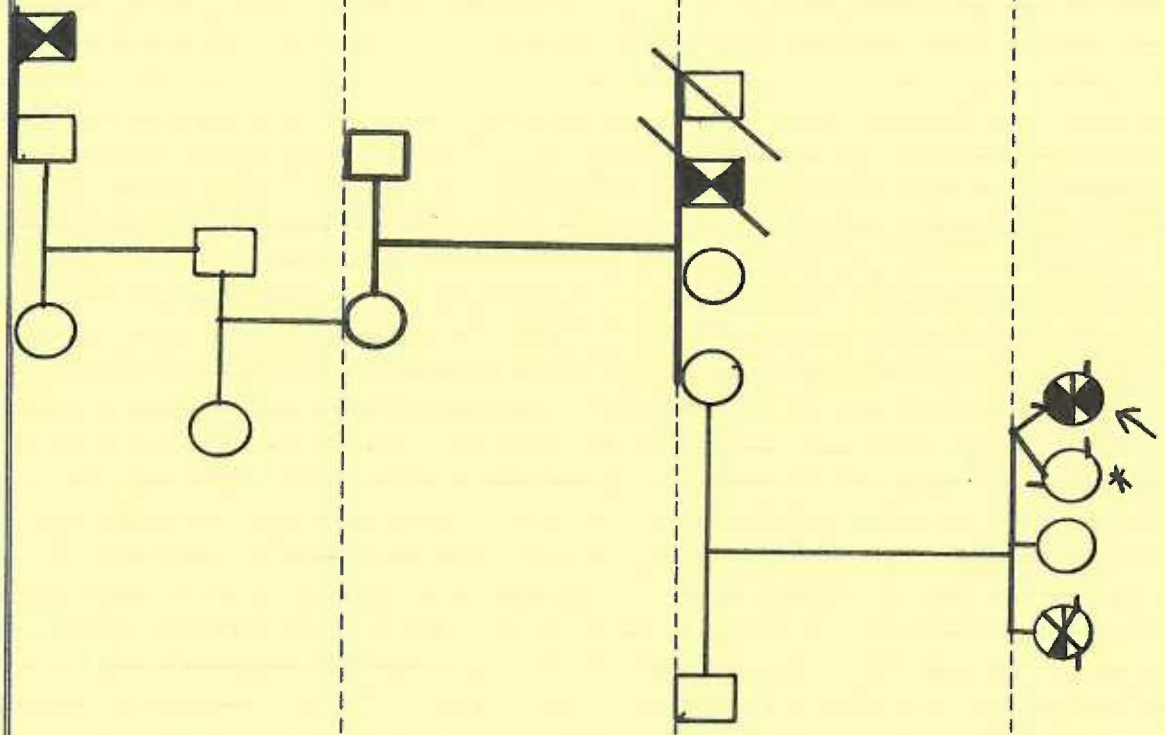
Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

Unit No. 42
Name
Birthdate
Project No.

* Scarv on lip



KEY TO SYMBOLS

Smaller symbols: Lived [illegible] than one day

Pregnancy

Stillbirth

Miscarriage

Marriage

Consanguineous marriage

Illegitimacy

No issue

= Ado[illegible]

= Identical Twins

FR = Fraternal Twins

= Patient (index case)

3 = 3 yr. old female

2 = 2 females

= Affected

= M[illegible]

= Female

= Sex Unknown

= Deceased female

3. 22-1M-12/68

3

= Male
= Female
= Sex Unknown
= Deceased female

3.22-1M-12/68

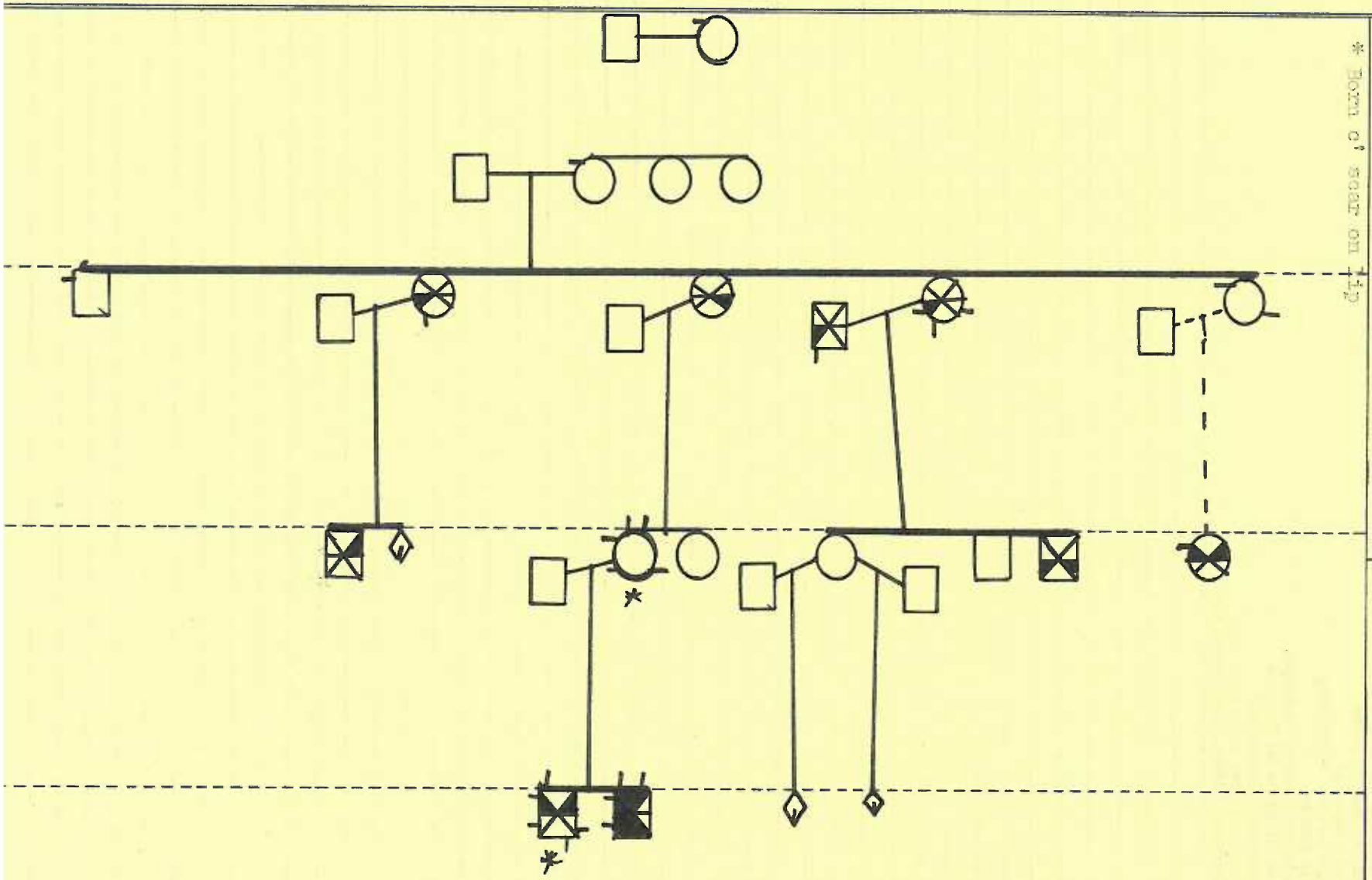
= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

= Adopted
= Identical Twins
= Fraternal Twins

KEY TO SYMBOLS

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 43
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

3

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

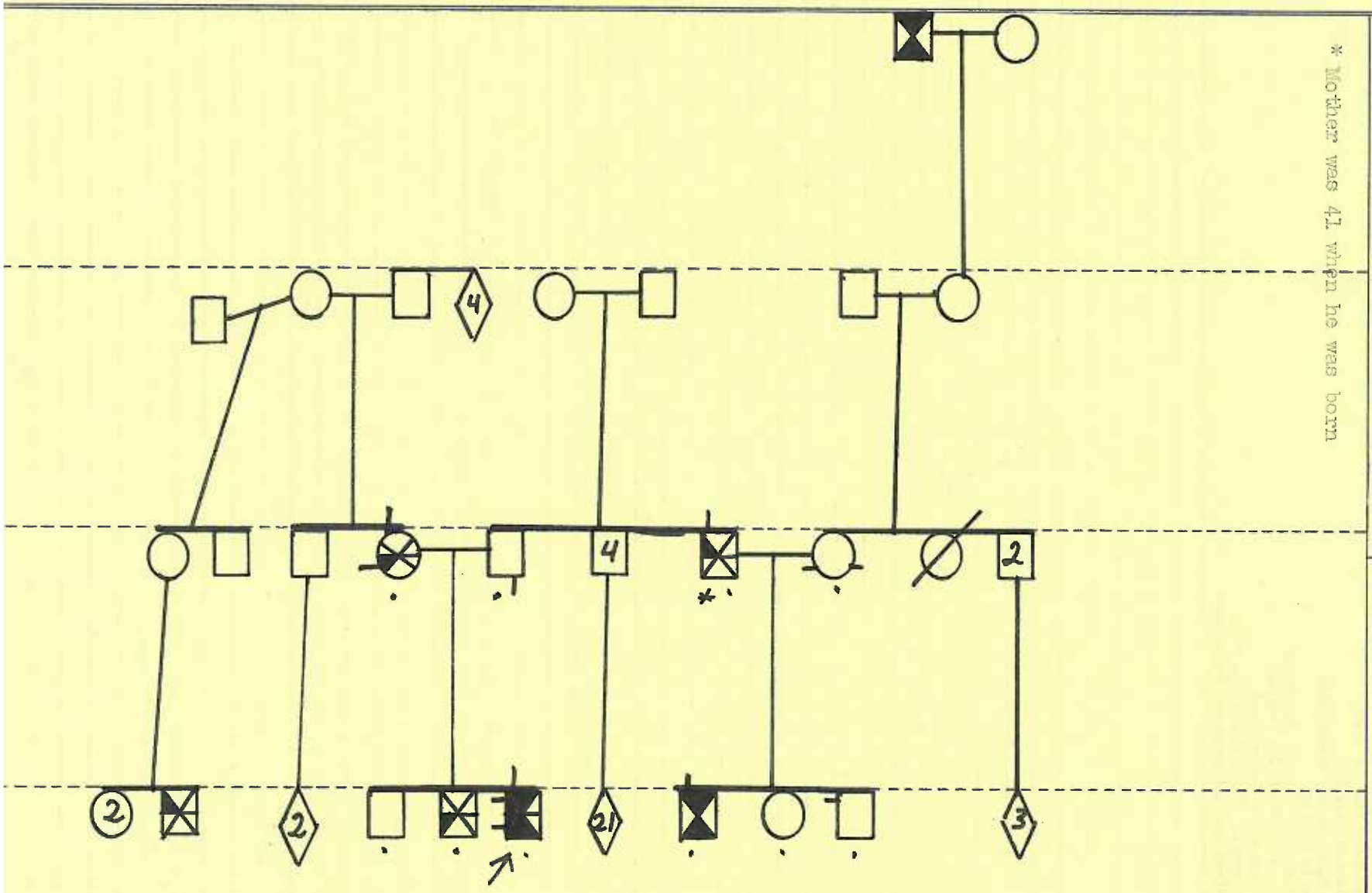
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



* Mother was 41 when he was born

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Unit No. 44
Name
Birthdate
Project No.

Date Bldg. Fl. Rm.

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

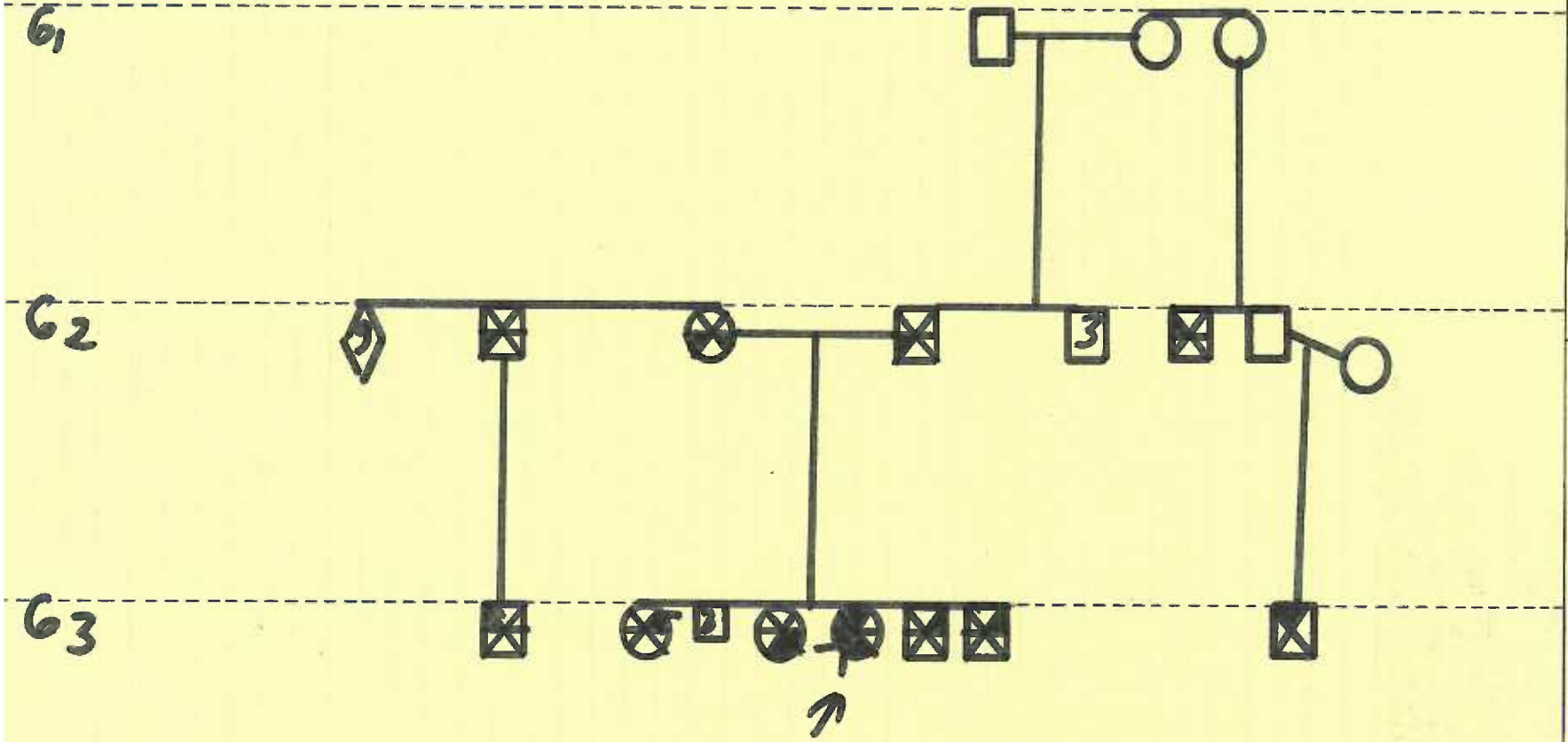
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 45-
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.

= Male
= Female
= Sex Unknown
= Deceased female

= Patient (index case)
= 3 yr. old female
= 2 females
= Affected

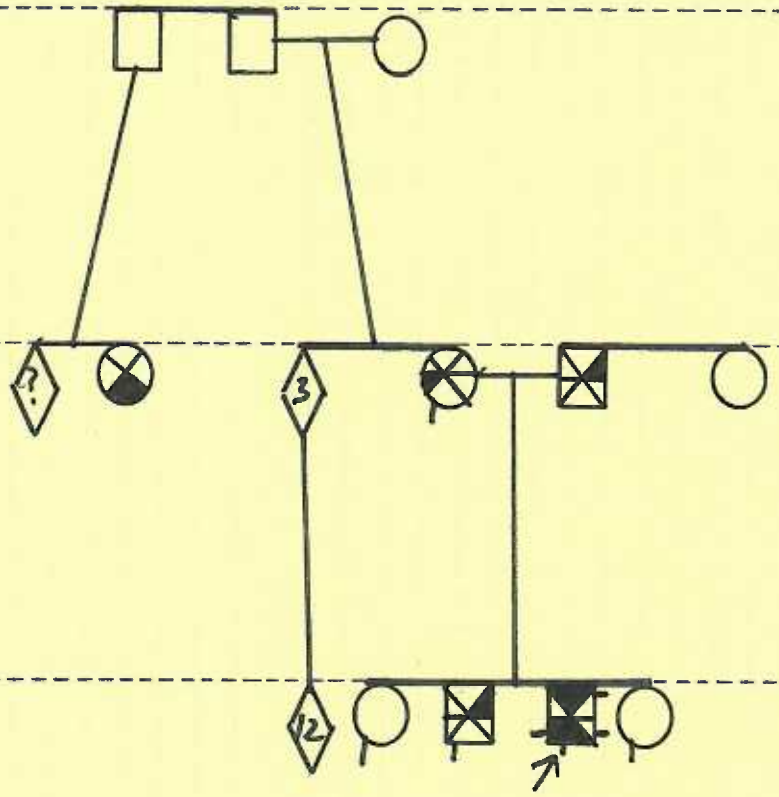
= Adopted
= Identical Twins
= Fraternal Twins

Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnancy
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No.
Family No.
Race (Paternal):
(Maternal):
Recorder
Religion:
Date
Referring Diagnosis:
Informant

Unit No. 46
Name
Birthdate
Project No.

Date Bldg. Fl. Rm.

= M

= Female

= Sex Unknown

= Deceased female

3.22-1M-12/68

= Patient (index case)

= 3 yr. old female

= 2 females

= Affected

= Adop

= Identical Twins

FR = Fraternal Twins

Marriage

Consanguineous marriage

Illegitimacy

No issue

Smaller symbols:

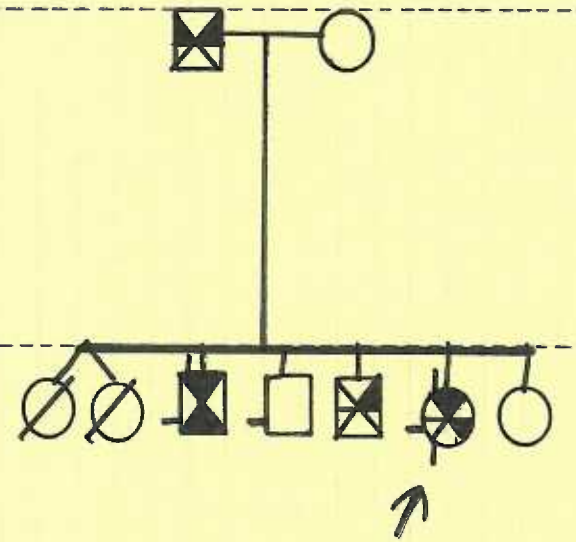
Lived l than one day

Pregnancy

Stillbirth

Miscarriage

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Unit No. 47

Name

Birthdate

Project No.

Date Bldg. Fl. Rm.

3

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

Unit No. 48

Name

Birthdate

Project No.

KEY TO SYMBOLS

= Male

= Female

= Sex Unknown

= Deceased female

= Affected

= Patient (index case)

= 3 yr. old female

= 2 females

= Adopt

= Identical Twins

= Fraternal Twins

Marriage

Consanguineous marriage

Illegitimacy

No issue

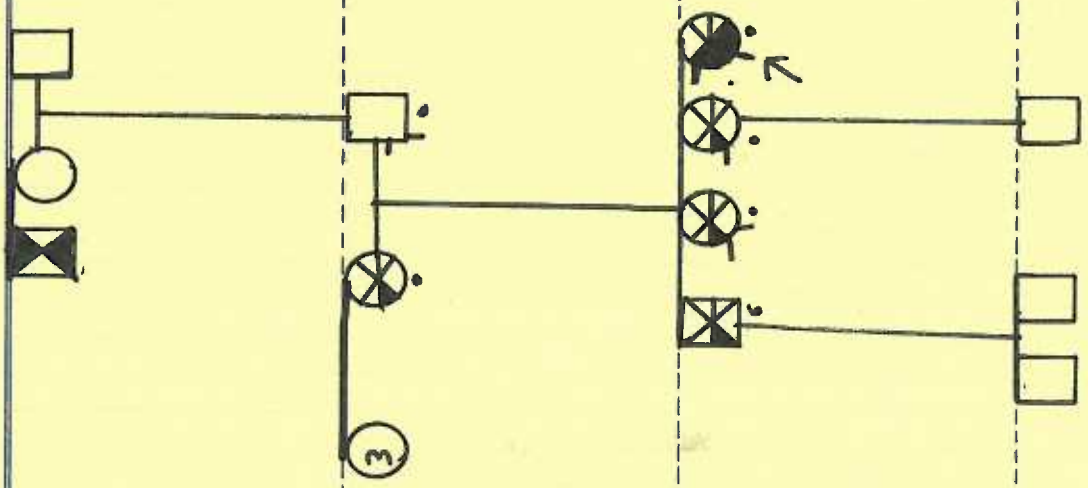
Smaller symbols:

Lived le han one day

Pregnancy

Stillbirth

Miscarriage



3.22-1M-12/68

UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____

Family No. _____ (Maternal): _____

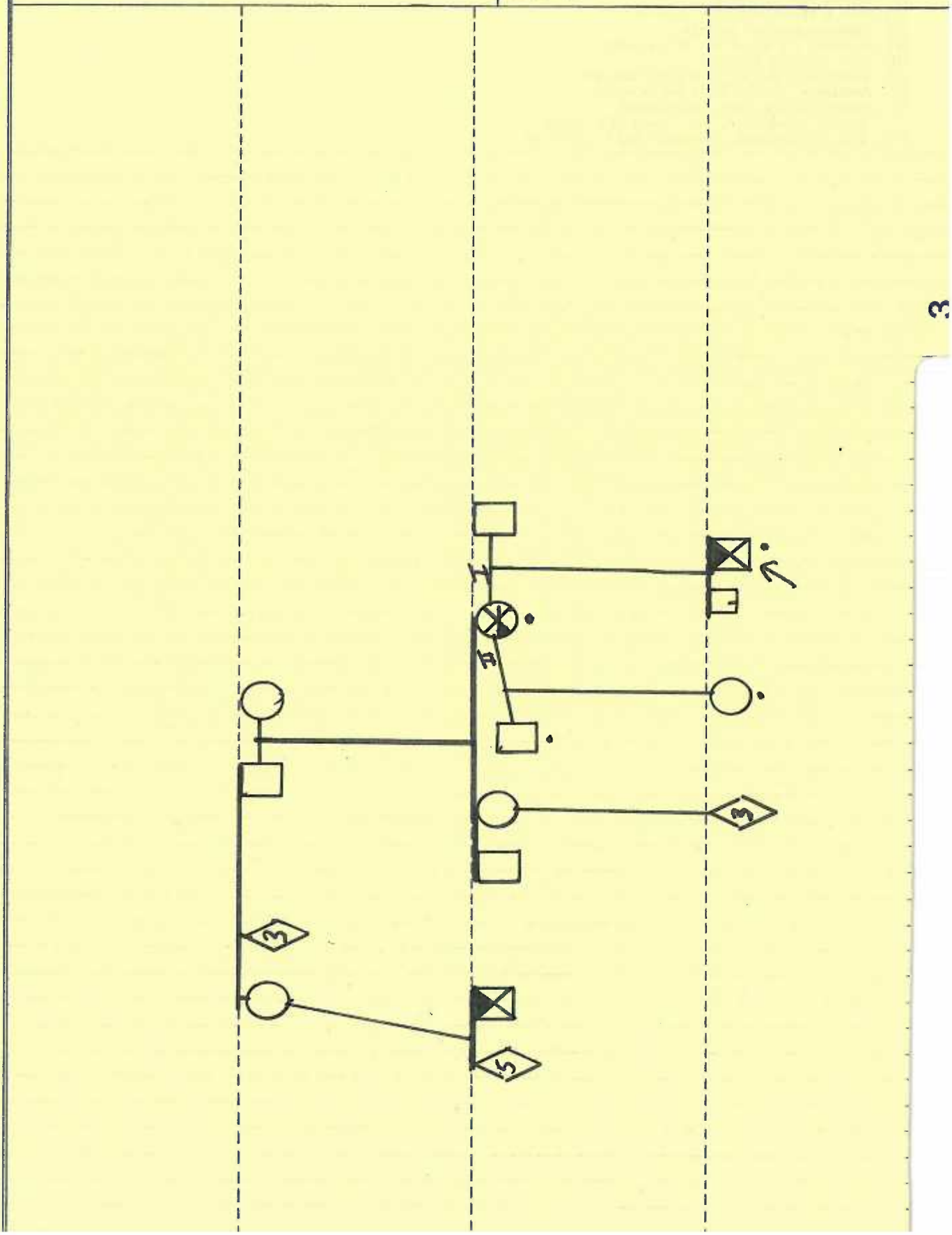
Recorder _____ Religion: _____

Date _____ Referring Diagnosis: _____

Informant _____

Date Bldg. Fl. Rm.

Unit No. 49
Name
Birthdate
Project No.



KEY TO SYMBOLS

Smaller symbols: Lived l than one day

Pregnancy

Stillbirth

Miscarriage

Marriage

Consanguineous marriage

Illegitimacy

No issue

= Adop

= Identical Twins

FR = Fraternal Twins

= Patient (index case)

3 = 3 yr. old female

2 = 2 females

= Affected

= M

= Female

= Sex Unknown

= Deceased female

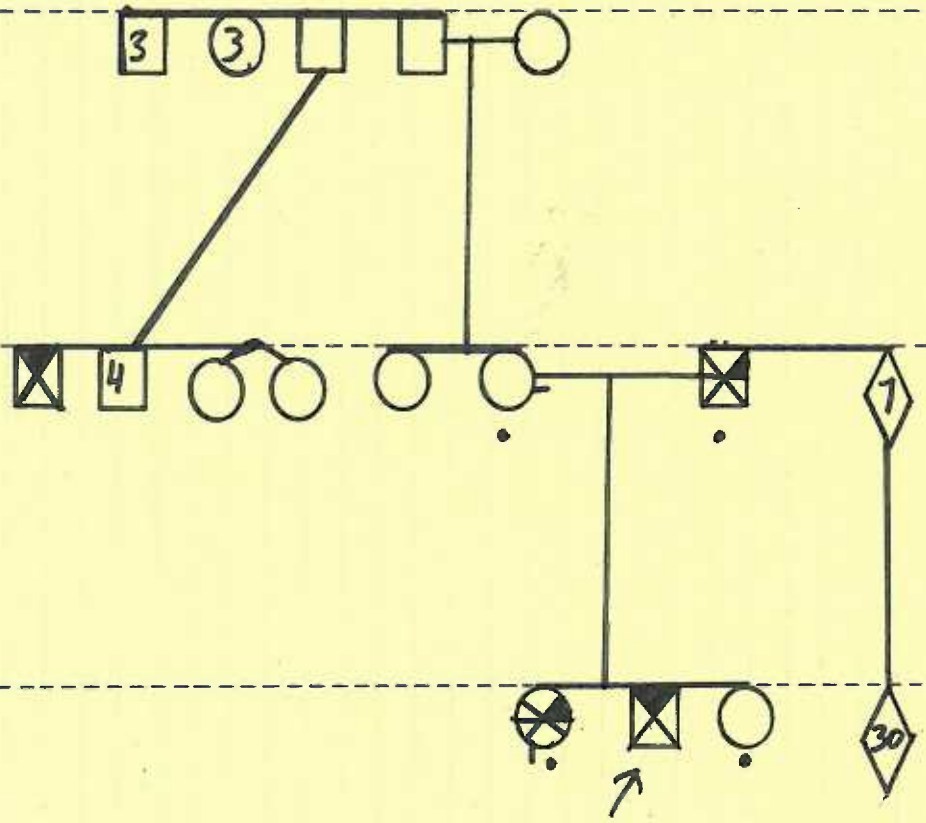
3. 22-1M-12/68

= Female
= Sex Unknown
= Deceased female
= Patient (index case)
= 3 yr. old female
= 2 females
= Affected
= Identical Twins
= Fraternal Twins
Marriage
Consanguineous marriage
Illegitimacy
No issue

Smaller symbols:
Lived less than one day
Pregnanc
Stillbirth
Miscarriage

3.22-1M-12/68

KEY TO SYMBOLS



UNIVERSITY OF OREGON MEDICAL SCHOOL
HOSPITALS AND CLINICS

FAMILY HISTORY SHEET

Page No. _____ Race (Paternal): _____
Family No. _____ (Maternal): _____
Recorder _____ Religion: _____
Date _____ Referring Diagnosis: _____
Informant _____

Date
Unit No. 50
Name
Birthdate
Project No.
Bldg.
Fl.
Rm.