Current Research on Multiple Births

ANNUAL BIBLIOGRAPHY — 1989

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Subject Sections *

Title, authors, and journal source, alphabetized by journal:

- Behavior and Physiology
- Genetic Traits and Methods
- Obstetrics and Pediatrics
- General

Author Section

Authors, titles, journal source, and abstract (if available), alphabetized and cross-indexed by all authors.

(*) The first three subject sections include other topics related to these headings. Classification is performed automatically on the basis of keywords. Some articles may appear in two or three of the specific subject sections.

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† Thanatophoric dysplasia in identical twins. Young ID, et al. **J Med Genet** 1989 Apr;26(4):276–9

† Serum selenium concentration, glutathione peroxidase activity and lipid peroxides in a co-twin control study on multiple sclerosis. Korpela H, et al. **J Neurol Sci** 1989 Jun; 91(1–2):79–84

† Use of magnetic resonance imaging in planning the separation of omphalopagus conjoined twins. Richardson RJ, et al. **J Pediatr Surg** 1989 Jul; 24(7):683–4; discussion 684–5

† Fetus in fetu or not? Ouimet A, et al. **J Pediatr Surg** 1989 Sep;24(9):926–7

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† Successful separation of a conjoined biliary tract in a set of omphalopagus twins. Lobe TE, et al. **J Pediatr Surg** 1989 Sep;24(9):930–2

† Discordant Hirschsprung's disease in monozygotic twins: a clue to pathogenesis? Hannon RJ, et al. **J Pediatr Surg** 1988 Nov;23(11):1034–5

Neonatal fistula from the appendix to the umbilicus. Kadzombe E, et al. **J Pediatr Surg** 1988 Nov;23(11):1059–60

† Paratesticular malignant mesothelioma associated with abdominoscrotal hydrocele. Velasco AL, et al. **J Pediatr Surg** 1988 Nov;23(11):1065–7 (10 ref.)

† Documentation of paradoxical umbilical blood supply of an acardiac twin in the antepartum state. Kirkinen P, et al. **J Perinat Med** 1989; 17(1):63–5

† Assessment and management of conjoined twins. Jakobowski DS, et al. **J Perinat Neonatal Nurs** 1989 Jul;3(1):66–82

† Antenatal diagnosis of cephalothoracopagus twins in a triplet pregnancy. A case report. Sakala EP, et al. **J Reprod Med** 1989 May;34(5):365–8 (22 ref.)

† The Yoruba contribution to our understanding of the twinning process. Creinin M, et al. **J Reprod Med** 1989 Jun;34(6):379–87 (34 ref.)

† Sonography of nonconjoined monoamniotic twin pregnancies. Townsend RR, et al. **J Ultrasound Med** 1988 Dec;7(12):665–70

Prenatal diagnosis of fetal liver calcifications. Richards DS, et al. **J Ultrasound Med** 1988 Dec; 7(12):691–4

Doppler demonstration of reversed umbilical blood flow in an acardiac twin. Benson CB, et al. **JCU** 1989 May;17(4):291–5

† A twin study of febrile convulsions in the general population. Sunami K, et al. **Jpn J Psychiatry Neurol** 1988 Sep;42(3):549–51

Congenital hypothyroidism and monoamniotic twins [letter] de Zegher F, et al. **Lancet** 1989 Jul 15;2(8655):169–70

† The morphology of the nasal septum in identical twins. Grymer LF, et al. **Laryngoscope** 1989 Jun; 99(6 Pt 1):642–6

Conjoined twins: a multidisciplinary approach. Ramp JB, et al. **Neonatal Netw** 1989 Aug; 8(1):29–39

MS in twins [letter] James WH. **Neurology** 1989 Apr;39(4):612

† Survival of twins after acute fetal hemorrhage from ruptured vasa previa. Duenhoelter JH. **Obstet Gynecol** 1989 May;73(5 Pt 2):866–7 (6 ref.)

Immunologic assessment of neonatal herpes simplex virus infection in one dizygotic twin. Plaeger-Marshall S, et al. **Pediatr Infect Dis J** 1989 Mar;8(3):171–5

† Parasitic conjoined twins with omphalocele and tetralogy of Fallot. Husain AN, et al. **Pediatr Pathol** 1989;9(3):321–8

† The breathing patterns of identical twins. Shea SA, et al. **Respir Physiol** 1989 Feb;75(2):211–23

† Concurrent anaplastic bronchial cancer in identical twin brothers. Nores JM, et al. **Respiration** 1989;55(1):56–9

Acephalus acardius cervico-thorachophagus conjoined twin--a case report. Thavarasah AS, et al. **Singapore Med J** 1988 Oct;29(5):528–9

† Neonatal lupus in twins. Lawrence N, et al. **South Med J** 1989 May;82(5):657–60

† On correcting for misclassification in twin studies and other matched-pair studies. Greenland S. **Stat Med** 1989 Jul;8(7):825–9

† Craniopagus parasiticus. Everard Home's Two-Headed Boy of Bengal and some other cases. Bondeson J, et al. **Surg Neurol** 1989 Jun; 31(6):426–34

† Concordance and discordance of congenital hydrocephalus in 107 twin pairs in Japan. Imaizumi Y. **Teratology** 1989 Aug;40(2):101–3 (26 ref.)

† Use of the correlation of liability in twins and siblings in the study of birth defects. Newman TB, et al. **Teratology** 1988 Oct;38(4):303–11

Comments on Schwaibold's "Sirenomelia and Anencephaly in One of Dizygotic Twins" [letter] Pfeiffer RA, et al. **Teratology** 1988 Nov; 38(5):497–8

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A

A'Hern R see **Olmos P**
Ahn MO see **Strong TH Jr**
Airaksinen J see **Kirkinen P**
Aker JS see **Rosner J**
Alcalay J see **Goldberg LH**
Allen E see **Bondeson J**
Allen G: Frequency of triplets and triplet zygosity types among U.S. births, 1964.
Acta Genet Med Gemellol (Roma) 1988; 37(3-4):299-306
The frequency of triplets in the U.S. white population may have reached an all-time low around 1964, at 78 sets per million deliveries. One-fourth of those were monozygotic as estimated by the difference method, or 18% by Bulmer's theoretical model. By 1983 the frequency of triplets had nearly doubled, the increase presumably occurring in dizygotic and trizygotic types. In Belgium most triplet pregnancies now result from artificial induction of ovulation, which is expected to occur mainly in older mothers. In the U.S., however, triplets have increased as much in young mothers as in older mothers, proportionally. This age distribution of the increase may be partly explained by a decrease in parity in older mothers since 1964.
Allen G: U.S. regional changes in twinning rates.
Acta Genet Med Gemellol (Roma) 1988; 37(3-4):307-11
The rise in twinning rates previously reported for U.S. between 1964 and 1987 after adjustment for maternal age and birth order occurred in each of the nine conventional geographic divisions except the Pacific States. Differences and consistencies in rank order among the divisions with respect to crude and adjusted twinning rates and other demographic parameters may hold clues to yet unidentified influences in twinning.
Andersson L see **Steffenburg S**
Antonelli D, Avni G, Antonelli J, Rosenfeld T: Cardiovascular malformations in lecanosomatopagus conjoined twins: a cardiologic curiosity.
Cardiology 1989;76(1):67-70
Female conjoined twins were delivered after 42 weeks' gestation, but they died within a few minutes of birth. They were dicephalus, dibrachius and dipus conjoined twins with two separate spines and fusion of the trunk and the pelvis. The pericardial sac was common, and the heart was a single structure. The atrial complex was a common chamber with an attempt at division into two parts by a circular ridge of tissue; the ventricular complex was formed by three chambers which were all communicating between each other in the superior margin of their muscular interventricular septum.
Antonelli J see **Antonelli D**
Applebaum H see **Richardson RJ**
Armstrong B see **Sherer DM**
Arora V see **Sakala EP**
Ash KM see **Lange IR**
Austin CR: The surrogate triplets of Perth, Western Australia. Hum Reprod 1989 Apr;4(3):346
Avni G see ***Antonelli D***

B

Barlow JK, Sims KB, Kolodny EH: Early cerebellar degeneration in twins with infantile neuroaxonal dystrophy. Ann Neurol 1989 Apr;25(4):413-5
Dizygotic twin girls with typical infantile neuroaxonal dystrophy (INAD) were studied at age 19 months with computed tomography and magnetic resonance imaging (MRI). Both methods showed distinct atrophy confined to the cerebellum and MRI revealed diffuse signal abnormality of the cerebellar parenchyma. This neuro-imaging evidence for selective early involvement of the cerebellum is consistent with both the typical presenting symptoms and the gross pathological findings in the disorder. Neuroimaging may aid in differentiation of INAD from other neurodegenerative disorders with onset in late infancy, providing impetus for diagnostic biopsy and early genetic counseling.
Bártová A see **Lenhart K**
Bass M: The fallacy of the simultaneous sudden infant death syndrome in twins.
Am J Forensic Med Pathol 1989 Sep;10(3):200-5
The likelihood of twin infants dying suddenly and simultaneously of SIDS, a natural disorder, defies credibility. However, injuries associated with environmental hazards provide possible mechanisms of sudden death. A search for hazards in the homes of 13 pairs of healthy twins who died together of no apparent cause formed the basis of this study. Ten of the 13 sets were certified by medical examiners as simultaneous twin SIDS. The findings in this study suggest that all 13 sets died from injuries, either unintentional or otherwise, and that these deaths could have been prevented.
Becker V see **Pfeiffer RA**
Benchetrit G see **Shea SA**
Benda JA see **Streit JA**
Benson CB, Bieber FR, Genest DR, Doubilet PM: Doppler demonstration of reversed umbilical blood flow in an acardiac twin. JCU 1989 May;17(4):291-5
Bertranpetit J, Marin A: Demographic parameters and twinning: a study in Catalonia, Spain.
Acta Genet Med Gemellol (Roma) 1988; 37(2):127-35
Twinning rates for the years 1975-79 in Catalonia (Spain) are presented. Crude rates are very low: 7.62 per 1,000 maternities, the DZTR and the MZTR being 3.74 and 3.88 respectively. Standardized rates remain very low. Sex ratio among twin couples is also very low (0.49 male vs 0.51 female births). A multiple linear stepwise regression on the twinning rates shows MZ rates to be influenced by birth order and father's age, and the DZ rates by mother's age and birth order.
Bieber FR see **Benson CB**
Bishop DT see **Meikle AW**
Bittles AH, Devi AR, Rao NA: Consanguinity, twinning and secondary sex ratio in the population of Karnataka, south India. Ann Hum Biol 1988 Nov-Dec;15(6):455-60
Consanguineous marriages are strongly favoured in the state of Karnataka. Of 65,492 marriages studied 33.07% were consanguineous, equivalent to a coefficient of inbreeding (F) of 0.0298. The twinning rate was low, 6.9 per thousand, whereas the secondary sex ratio, 0.5221, was higher than in comparable major human populations. Consanguinity exerted no significant effect on either parameter. The results also indicate that consanguinity is not associated with excess antenatal losses and suggest the possibility of enhanced selection against mutations at X chromosome loci.
Blajchman MA see **Singal DP**
Blickstein I, Friedman A, Caspi B, Lancet M: Ultrasonic prediction of growth discordancy by intertwin difference in abdominal circumference.
Int J Gynaecol Obstet 1989 Jun;29(2):121-4
Intertwin abdominal circumference (AC) and femur length (FL) differences were studied in 24

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growth-discordant (greater than or equal to 15% birth weight difference) and in 32-growth concordant twin pairs delivered within 2 weeks of the last ultrasonic examination. Both groups were of similar gestational age but differed significantly in the mean twin birth weight and intertwin AC difference ($P = 0.01$ and $P = 0.00009$, respectively). A cutoff value (greater than or equal to 18 mm) for AC difference was found to discriminate significantly (P less than 0.0009) between concordant and discordant pairs with sensitivity, specificity, positive predictive value and negative predictive value of 66.7%, 78%, 69.5% and 75.7%, respectively. These data may suggest that an intertwin difference of 18 mm or more in AC effectively screens for the diagnosis of 15% or more birth weight difference in twin pregnancies.

Bligard CA see **Lawrence N**

Bohman M see **Steffenburg S**

Bondeson J, Allen E: Craniopagus parasiticus. Everard Home's Two-Headed Boy of Bengal and some other cases. Surg Neurol 1989 Jun;31(6):426-34

Craniopagus parasiticus, or épicome, is a rare teratological type, of which only six cases have been recorded in the medical literature. It differs from craniopagus conjoined twins in that the body and limbs of the parasitic twin are underdeveloped, leaving in some cases only a parasitic head, inserted on the crown of the autositic twin. The first case of this malformation was Everard Home's famous Twin-Headed Boy of Bengal, whose skull is preserved at the Hunterian Museum. In this historical review, Home's case is presented in some detail, and the later cases are used to explain further some of its particulars.

Bongso TA see **Wong PC**

Bønnelykke B: Menstrual characteristics of mothers of twins. J Biosoc Sci 1989 Jul;21(3):329-34

The menarcheal age and frequency of menstrual disorders in mothers of dizygotic (DZ) and monozygotic (MZ) twins born in Denmark in 1984 or 1985 were compared with a control sample of mothers of singleton infants born in the same period. Compared to control mothers, mothers of DZ twins had a lower menarcheal age and a lower frequency of menstrual irregularities--menstrual cycles exceeding 5 weeks duration, varying length of menstrual cycles and episodes of menostasia. Mothers of MZ twins had a higher frequency of intermenstrual bleeding compared to mothers of singletons. All results were adjusted for maternal age and parity. The findings are relevant to the interpretation of aetiological factors leading to twin births and support the hypothesis of differences in sex hormone activity of the mothers of DZ twins in comparison with other women.

Boomsma DI, van den Bree MB, Orlebeke JF, Molenaar PC: Resemblances of parents and twins in sports participation and heart rate. Behav Genet 1989 Jan;19(1):123-41

A model to analyze resemblances of twins and parents using LISREL is outlined and applied to sports participation and heart-rate data. Sports participation and heart rate were measured in 44 monozygotic and 46 dizygotic adolescent twin pairs and in their parents. Genetic factors influence variation in both sports behavior and heart rate, while there is no evidence for transmission from parental environment to offspring environment. For sports participation the data support a model in which there is a high positive correlation between environments of spouses and between environments of female twins. This correlation is absent for male twins and negative for opposite sex twins. For heart rate, a positive correlation between environmental influences was observed for all twins; there is no evidence for assortative mating. The proposed model can also handle data sets where parents and twins have been measured on more than one variable. This is illustrated by an application to the observed association of sports participation and heart rate.

Boomsma DI, Martin NG, Molenaar PC: Factor and simplex models for repeated measures: application to two psychomotor measures of alcohol sensitivity in twins. Behav Genet 1989 Jan;19(1):79-96

As part of a larger study, data on arithmetic computation and motor coordination were obtained from 206 twin pairs. The twins were measured once before and three times after ingesting a standard dose of alcohol. Previous analyses ignored the time-series structure of these data. Here we illustrate the application of simplex models for the genetic analysis of covariance structures in a repeated-measures design and compare the results with factor models for the two psychomotor measures. We then present a bivariate analysis incorporating simplex processes common and specific to the two measures. Our analyses confirm the notion that there is genetic variation affecting psychomotor performance which is "switched on" in the presence of alcohol. We compare the merits of analysis of mean products versus covariance matrices and confront some practical problems that may arise in situations where the number of subjects is relatively small and where the causal structure among the latent variables places a heavy demand on the data.

Boomsma DI see **Dolan CV**

Boomsma DI see **Martin NG**

Boston VE see **Hannon RJ**

Bottazzo GF see **Johnston C**

Botting B see **Murphy M**

Bottoms S see **Bronsteen R**

Bowden JB, Hebert AA, Rapini RP: Dermal hematopoiesis in neonates: report of five cases. J Am Acad Dermatol 1989 Jun;20(6):1104-10

We report five cases of dermal hematopoiesis in newborn infants. Dermal hematopoiesis, manifested clinically as a blueberry muffin eruption, has been associated with both intrauterine viral infections and congenital hematologic dyscrasias. Of our five patients, four of whom were boys, the cutaneous findings could be attributed to congenital infections in two instances. The infectious agents were cytomegalovirus and coxsackie virus B-2. Two infants had hematologic abnormalities, including twin transfusion syndrome and ABO blood group incompatibility. In our fifth patient a cause was not identified.

Bozynski ME, Sedman AB, Naglie RA, Wright EJ: Serial plasma and urinary aluminum levels and tissue loading in preterm twins. JPEN J Parenter Enteral Nutr 1989 Jul-Aug; 13(4):428-31

Serial plasma, urinary, and postmortem tissue aluminum levels were determined in 32-week, appropriate-for-gestational-age twins from 45 to 151 days postnatal age. Estimated total aluminum absorptions were 56.7 mg, and 28 mg, twin A and twin B, respectively. At autopsy, Twin A had a hypoplastic right kidney while Twin B had normal kidneys. Mean plasma aluminum levels (twin A, 34.2 micrograms/liter and twin B, 32.3 micrograms/liter) and urinary aluminum levels expressed as aluminum creatinine ratios (twin A, 11.3 and twin B, 8.5) were similar. These levels were elevated compared to normal plasma aluminum levels of 5.1 +/- 3.6 (1

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SD) and urinary aluminum creatinine ratios of 0.64 +/- 0.75 (1 SD). Twin A had higher tissue aluminum levels than twin B in all tissues except for brain. Bone and liver aluminum contents for both twins were increased as compared to infants receiving short-term or no parenteral nutrition. We conclude; (1) tissue aluminum loading occurs in infants receiving aluminum-containing solutions, (2) plasma and urinary aluminum levels are poor predictors of tissue aluminum content, (3) enteral solutions may add significant aluminum exposure.

Brand RJ see **Cohn BA**
Brar HS see **Strong TH Jr**
Bray GA see **Kumar D**
Brennom WS see **Velasco AL**
Bronsteen R, Goyert G, Bottoms S: Classification of twins and neonatal morbidity. Obstet Gynecol 1989 Jul;74(1):98-101
Prematurity is the most significant determinant of neonatal morbidity among twins, but the relative importance of other factors is unclear. We compared the prognostic value of intrauterine growth retardation, discordancy, and other classifications in 131 consecutive sets of surviving twins. A four-factor model for neonatal morbidity was developed from 161 potential outcome measures. Individual evaluation of each twin for intrauterine growth retardation using singleton growth curves was more effective than discordancy and other classifications in predicting neonatal morbidity. Our findings suggest that evaluation of twin growth should concentrate on individual twin growth rather than discordancy. These results also speak against interpreting growth curves based on twins in the same way as growth curves based on singletons; it is apparent that the frequency of growth retardation with associated neonatal morbidity is increased among twins.
Browner WS see **Newman TB**
Bryan EM see **Lewis E**
Bryson YJ see **Plaeger-Marshall S**
Buchanan WW see **Singal DP**

C

Carey G see **Coon H**
Carlson SE: Narcoleptic twins [letter; comment] Neurology 1989 Jul;39(7):1005-6
Carmelli D see **Fabsitz RR**
Carson JA see **Hitch DC**
Caspi B see **Blickstein I**
Castilla EE, Lopez-Camelo JS, Orioli IM, Sánchez O, Paz JE: The epidemiology of conjoined twins in Latin America.
Acta Genet Med Gemellol (Roma) 1988;37(2):111-8
Twenty-three cases of symmetrical conjoined twins were registered by the Latin-American Collaborative Study of Congenital Malformations (ECLAMC) in 1,714,952 births, which were observed during the 1967-1986 period in 95 maternity hospitals distributed in eleven Latin-American countries. This results in a birth prevalence rate of about 1/75,000 births. The secular and geographic distribution of this material do not depart from random in spite of one hospital with three cases, and two hospitals with two cases each, within a short time period. These 23 cases include one diprosopus, 3 dicephalus, one ischiopagus, 5 pygopagus, none dipygus, 3 syncephalus, none craniopagus, 9 thoracopagus, one omphalopagus, and one rachipagus. Sex distribution is even, with 12 male and 11 female cases.

Chan CL see **Wong PC**
Chawls WJ, Lally KP, Mahour GH: Neonatal surgical casebook. Meconium ileus in premature twins. J Perinatol 1988 Winter;8(1):62-4
Chebat J see **Nores JM**
Chen CJ see **Lin LL**
Chen CJ see **Lin TM**
Chen JS see **Lin TM**
Chen WJ see **Eng HL**
Christensen CM see **Malamud D**
Christian JC see **Fabsitz RR**
Christian JC see **Ramos-Arroyo MA**
Chuang JH see **Eng HL**
Chwals WJ see **Richardson RJ**
Ciriaco M see **Fiorillo A**
Clark C, Klonoff H, Tyhurst JS, Li D, Martin W, Pate BD: Regional cerebral glucose metabolism in three sets of identical twins with psychotic symptoms. Can J Psychiatry 1989 May;34(4):263-70
Three sets of young identical twins where at least one had a psychotic episode were assessed in terms of psychiatric and psychological status and integrity of cerebral structure and metabolism. The psychiatric diagnoses for each set were normal/schizophrenia, prodromal/schizophrenia and schizoaffective/schizoaffective. The latter two sets were re-examined two years after the initial assessment. The data are considered from a case study perspective. Reduced cerebral metabolism was found for at least one region on eight of nine scans of patients with a psychotic history. On seven of the nine scans, glucose metabolism in the orbital frontal cortex was reduced. These findings are discussed with respect to previous studies of glucose metabolism in patients with schizophrenia, metabolic similarities found in normal identical twins and the known functional specialization of the orbital frontal cortex.
Cohn BA, Brand RJ, Hulley SB: Correlates of high density lipoprotein cholesterol in women studied by the method of co-twin control. Am J Epidemiol 1989 May;129(5):988-99
This study examines the relation between each of the following risk variables and high density lipoprotein (HDL) cholesterol: cigarette smoking, alcohol use, leisure exercise, postmenopausal estrogen use, and body mass, before and after adjustment for genetic and nongenetic variables shared by monozygous and dizygous co-twins. Subjects were 179 dizygous and 255 monozygous twin pairs from the Kaiser Permanente Twin Registry who participated in a special examination in 1978-1979 in Oakland, California. A multivariate co-twin analysis made it possible to adjust for measured covariables and also to adjust for unmeasured familial variables shared by co-twins. After adjustment for measured covariables, further adjustment for the unmeasured familial variables shared by monozygous co-twins reduced a positive association between alcohol and HDL cholesterol and eliminated a positive association between exercise and HDL cholesterol. On the other hand, adjustment for unmeasured familial variables shared by monozygous co-twins had little effect on significant associations between smoking and HDL cholesterol, postmenopausal estrogen use and HDL cholesterol, and body mass and HDL cholesterol. Although an important role for random error was not ruled out in the sample size available, findings are consistent with the following interpretations: 1) alcohol consumption and leisure exercise may have smaller effects on HDL cholesterol than predicted by studies unadjusted for familial factors because

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effects of these variables are confounded by familial factors; and 2) smoking, postmenopausal estrogen, and body mass have effects predicted by studies unadjusted for familial factors and may therefore be good targets for interventions to raise HDL cholesterol.

Coon H, Carey G: Genetic and environmental determinants of musical ability in twins.
Behav Genet 1989 Mar;19(2):183–93
Analyses of musical ability data from the Loehlin and Nichols National Merit Scholarship study are presented. Musical ability is indexed by four measures: interest in a profession in music, performance in school, performance outside of school, and receiving honors in music. These variables pose a challenge for behavior genetic analysis since they do not conform to the assumptions of traditional linear models. For example, there is a dependent relationship between the honors and the performance variables; one cannot obtain honors without performance. Several methods were employed to deal with these relationships, and the following conclusions appeared regardless of the method used. First, twin correlations were always high, ranging from 0.44 to 0.90 in monozygotic (MZ) twins and from 0.34 to 0.83 in dizygotic (DZ) twins. Second, although there was evidence for heritable variation, the effects of common environment were almost always larger than the effects of heredity. Third, marital assortment was not of sufficient magnitude to account for these common environment effects. In the young adults in this sample, musical ability is influenced more by shared family environment than by shared genes.

Courregé ML see **Lawrence N**

Creinin M, Keith LC: The Yoruba contribution to our understanding of the twinning process.
J Reprod Med 1989 Jun;34(6):379–87 (34 ref.)
The Yoruba people of Nigeria possess a twinning rate more than fourfold that of Caucasian populations. As such, they provide extraordinary possibilities for the study of multiple birth. Percy Nylander clarified many of the factors that contribute to this high incidence of twinning. His analyses of Nigerian placentation and zygosity have shown the increased rate of multiple pregnancy to be a result of higher proportions of dizygotic twins and trizygotic triplets as compared to Caucasian populations. Whereas a well-established genetic influence upon dizygotic twinning exists throughout the rest of the world, there may be an environmental factor in Nigeria responsible for the increased incidence of multiple births. Nylander's study of the Yoruba also has provided important contributions to the studies of perinatal mortality in multiple gestation. In totality, much of Nylander's work can be applied to further the understanding of ethnic and racial differences in human twin placentation and zygosity.

Crisi G see **Torlai F**

Cruz AC see **Richards DS**

Currie AB see **Kadzombe E**

D

Dado D see **Husain AN**

D'Agostino N see **Fiorillo A**

Dalayeun J see **Nores JM**

D'Alton ME, Dudley DK: The ultrasonographic prediction of chorionicity in twin gestation.
Am J Obstet Gynecol 1989 Mar;160(3):557–61
In a prospective study of 69 consecutive twin gestations, chorionicity was assessed ultrasonographically, by the new technique of counting the number of layers visualized in the dividing membrane. For purposes of the study the antenatal categorization of chorionic type was based only on the number of layers observed. The pregnancy was classified as monochorionic when only two layers were identified and as dichorionic if three or four layers were seen. Confirmation of chorionic type was obtained after delivery by histopathologic examination of the placenta. The ultrasonographic technique used correctly determined chorionicity in 68 of 69 twin pregnancies. The predictive accuracy was 100% for 51 pregnancies designated by ultrasonography as dichorionic and 94.4% for 18 pregnancies considered to be monochorionic. These results suggest that counting the number of layers seen in fetal membranes by ultrasonography examination is an accurate way of determining chorionicity in twin gestation.

Davis C see **Hudson JW**

Davis C see **Malamud D**

Deapen D see **Kumar D**

Debbia A see **Torlai F**

DeFaire U see **Pedersen NL**

DeFries JC, Fulker DW: Multiple regression analysis of twin data: etiology of deviant scores versus individual differences.
Acta Genet Med Gemellol (Roma) 1988; 37(3–4):205–16
The multiple regression analysis of twin data in which a cotwin's score is predicted from a proband's score and the coefficient of relationship (the basic model) provides a statistically powerful test of genetic etiology. When an augmented model that also contains an interaction term is fitted to the same data set, direct estimates of heritability (h2) and the proportion of variance due to shared environmental influences (c2) are obtained. A simple transformation of selected twin data prior to regression analysis facilitates direct estimates of h2g (an index of the extent to which the difference between the mean of probands and that of the unselected population is heritable) and a test of the hypothesis that the etiology of deviant scores differs from that of variation within the normal range.

Degani S, Paltiely J, Lewinsky R, Shapiro I, Sharf M: Fetal internal carotid artery flow velocity time waveforms in twin pregnancies. J Perinat Med 1988; 16(5–6):405–9
The fetal internal carotid artery and umbilical artery flow velocity time waveforms were studied in 17 consecutive twin pregnancies. The pulsatility index was calculated for each fetus in each artery as an index of vascular resistance. All studies were done within 14 days before delivery. In 8 pregnancies both fetuses were of birthweight appropriate for gestational age; whereas, in 9 patients one or both of the infants were small for gestational age (SGA). From ultrasound criteria and Doppler studies of the umbilical and fetal internal carotid arteries, decreased fetal internal carotid artery pulsatility index (cut off value less than or equal to 1.2) was found to be the best predictor of SGA (sensitivity 83%, specificity 95%, positive predictive value 91%, negative predictive value 91%).

DeMarco P: Eyelid myoclonia with absences (EMA) in two monovular twins. Clin Electroencephalogr 1989 Jul;20(3):193–5
EMA (eyelid myoclonia with absences) consists of brief seizures triggered by eyelid closure and

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characterized by absence and palpebral myoclonia. The EEG shows brief discharges with 3 per second spike and wave complexes. The present report describes the cases of 2 monovular twins who started to have this form of epilepsy at the age of 4 1/2 years. Their seizures, after 2 years of follow-up, are greatly reduced with combined therapy of valproic acid and benzodiazepines (Clobazam).

Dent J see ***Thompson C***

Derom C see **Vlietinck R**

Derom R see **Vlietinck R**

Deter RL see **Stefos T**

Devi AR see **Bittles AH**

de Zegher F, Vanderschueren-Lodeweyckx M: Congenital hypothyroidism and monoamniotic twins [letter] Lancet 1989 Jul 15;2(8655):169-70

Dietrich R see **Richardson RJ**

Dieudonne P see **Nores JM**

DiMaio S see ***Fiorillo A***

Divon MY, Girz BA, Sklar A, Guidetti DA, Langer O: Discordant twins--a prospective study of the diagnostic value of real-time ultrasonography combined with umbilical artery velocimetry.
Am J Obstet Gynecol 1989 Sep;161(3):757-60
This study was undertaken to evaluate the role of Doppler velocimetry combined with intertwin differences in ultrasonographically derived estimated fetal weight, biparietal diameter, abdominal circumference, and femur length as a comprehensive test for the prediction of discordancy. The following cutoff values were used to indicate abnormal test results: delta biparietal diameter greater than 6 mm, delta abdominal circumference greater than 20 mm, delta femur length greater than 5 mm, delta estimated fetal weight greater than 15%, and delta systolic/diastolic ratio greater than 15%. Discordancy was identified when the birth weight difference exceeded 15%. The study population consisted of 58 consecutively evaluated third-trimester twin gestations. Eighteen sets of twins were discordant. None of these tests was uniformally successful in identifying twin discordancy; in three instances, all test results were normal. The diagnostic accuracy provided by ultrasonography was not significantly different from that provided by Doppler velocimetry. Overall the best predictor appeared to be the presence of either delta systolic/diastolic ratio greater than 15% or delta estimated fetal weights greater than 15%, which correctly identified 14 of the 18 discordant twins and misclassified only five of the 40 concordant pairs. This combination also had the highest positive and negative predictive values (73% and 90%, respectively).

Doherty JD: Perinatal mortality in twins, Australia, 1973-1980: I. Acta Genet Med Gemellol (Roma) 1988;37(3-4):313-9
The perinatal outcome of twin births in Australia is described from 1973 to 1980. Over that period, the perinatal mortality rate declined more slowly in twins than singletons. The stillbirth rate actually increased in twins due to a rise in antepartum deaths. An increasing proportion of monozygotic twins may have contributed to this trend. The overall perinatal mortality rate was 82.85/1,000 for twins and 16.49/1,000 for singletons, giving a relative risk of 5.0.

Doherty JD: Perinatal mortality in twins, Australia, 1973-1980: II. Maternal age, lethal congenital malformations and sex.
Acta Genet Med Gemellol (Roma) 1988; 37(3-4):321-9
The influence of maternal age and congenital malformations on perinatal mortality in twins in Australia from 1973 to 1980, is described. Stillbirths and neonatal deaths in twins fell with advancing maternal age. For teenage mothers, the twin perinatal mortality rate was 127.15/1,000. The sex ratio in twins is closer to unity than in singletons. Perinatal mortality due to malformation fell as maternal age increased up to 35 years. The role of zygosity and the distribution of birth weight with maternal age are discussed.

Doherty JD: Fertility, fecundity and twinning: a comparison of the trends in births and twinning in Australia from 1854 to 1982.
Acta Genet Med Gemellol (Roma) 1988; 37(2):119-25
The trends in births and in twinning in Australia are compared from 1854 to 1982. Until about 1930 the twinning rate increased as births fell. The two rates then became concordant. The relationship of fecundity to twinning is discussed. Comparison with other countries is made. The period embraces the demographic transition when changing contraceptive practices would have had a variable effect on twinning.

Dolan CV, Molenaar PC, Boomsma DI: LISREL analysis of twin data with structured means.
Behav Genet 1989 Jan;19(1):51-62
A method is introduced to test the hypothesis that both the phenotypic means and the phenotypic covariances can be modeled with the same common genetic and environmental factors. LISREL can be used to implement the method. An illustration is given with simulated twin data.

Dorcester W see **Gocke SE**

Doubilet PM see **Benson CB**

Dowdy KA see **Richards DS**

D'Souza M see **Singal DP**

Dudley DK see **D'Alton ME**

Duenhoelter JH: Survival of twins after acute fetal hemorrhage from ruptured vasa previa.
Obstet Gynecol 1989 May;73(5 Pt 2):866-7 (6 ref.)
Vasa previa was suspected when sudden bleeding occurred in a twin pregnancy during an attempt to attach a scalp electrode. Shortly thereafter, we observed sustained fetal bradycardia using a portable ultrasound. Delivery was accomplished immediately with cesarean section, and an exsanguinated twin A and a normal twin B were delivered. After appropriate resuscitation and transfusion, twin A recovered, and both neonates appear normal at the age of 6 months. According to our review of the literature, this is the first reported case in which both twins survived vasa previa complicated by ruptured membranes.

Dutrillaux B see **Massaad L**

Dworkin RH see **Lenzenweger MF**

E

Eaves LJ, Fulker DW, Heath AC: The effects of social homogamy and cultural inheritance on the covariances of twins and their parents: a LISREL model. Behav Genet 1989 Jan;19(1):113-22
In general, models involving parent-offspring transmission are not possible to specify in LISREL due to the complex constraints implied by assortative mating and genotype-environmental correlation. In this short note we describe one simple model of resemblance among twins and their parents which can be accommodated in the LISREL specification due to the strong assumption of social homogamy. The specification is described fully and checked for

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identification, and its power to resolve different parameters is briefly examined.

Eaves LJ see **Heath AC**

Eaves LJ see **Neale MC**

Eisen S, Neuman R, Goldberg J, Rice J, True W: Determining zygosity in the Vietnam Era Twin Registry: an approach using questionnaires. Clin Genet 1989 Jun;35(6):423–32

The Vietnam Era Twin Registry (VETR) is a registry of 7375 American male veteran twin pairs born between 1939 and 1955 who served in the armed forces of the United States between 1964 and 1975. Optimal use of registry data requires the determination of zygosity. Two approaches are available: analysis of blood genetic marker systems and responses of twins to questions about sibling similarity. Zygosity for the VETR was determined using the questionnaire technique supplemented with blood group typing data abstracted from military records. After comparing four alternative zygosity assignment methods, a logistic regression technique which uses discriminating variables based on race was selected. The approach is similar to that described by Magnus et al. (1983) in their study of Norwegian twins, suggesting that questionnaire responses are independent of nationality and reinforcing the reliability of the questionnaire method for zygosity ascertainment.

Elias S see **Tharapel AT**

Emerson DS see **Tharapel AT**

Endo M see **Hori A**

Endo S see **Sunami K**

Eng HL, Chuang JH, Lee TY, Chen WJ: Fetus in fetu: a case report and review of the literature. J Pediatr Surg 1989 Mar;24(3):296–9

A cystic tumor was first found in the abdomen of a Taiwanese girl at the age of 9 months. The tumor gradually increased in size and caused no symptoms until the girl was 7 years of age, when surgical removal was carried out. Pathological examination disclosed two "fetuses" within the fibrous sac. The pathogenesis of fetus in fetu and its differentiation from retroperitoneal teratoma are still controversial issues. Further work needs to be done to elucidate whether it is a natural progression of the twinning process to teratoma or the inclusion of a monozygotic diamniotic twin within the bearer.

F

Fabsitz RR, Kalousdian S, Carmelli D, Robinette D, Christian JC: Characteristics of participants and nonparticipants in the NHLBI Twin Study. Acta Genet Med Gemellol (Roma) 1988; 37(3–4):217–28

The NHLBI Twin Study is a longitudinal study of cardiovascular disease risk factors in 514 pairs of white, middle aged, male, veteran twins. The initial examination took place between 1969–1973. Ten years later, 81% of the living cohort returned for a second examination. Data collected up to 30 years prior to recruitment for the initial examination were used to characterize participants and nonparticipants; data from the initial examination were used to characterize returnees and nonreturnees to the second examination. Participants had significantly lower diastolic blood pressure and higher socioeconomic status than nonparticipants as measured thirty years earlier. Between the first and second examinations, the mortality of participants was less than 50% of the mortality of nonparticipants. Returnees to the second examination had a better health profile at the initial examination than nonreturnees, with significantly lower levels of cigarette smoking, glucose intolerance, hypertension, and diabetes and higher levels of pulmonary function. However, returnees were more obese than nonreturnees. Thus, this study of cardiovascular disease risk factors in twins appears to be affected by response bias in a way similar to studies of individuals. Additional analyses of biases that may affect the genetic component of the study indicated that factors related to classical twin analyses were relatively unaffected by selection.

Fabsitz RR see **Selby JV**

Faherty T see **Malmstrom PE**

Farina V see **Fiorillo A**

Feldman E see **Shalev E**

Fellman J: Comments on the paper "The Monozygotic Twinning Rate: Is it Really Constant?" [letter] Acta Genet Med Gemellol (Roma) 1988;37(2):201–4

Filly RA see **Townsend RR**

Fiorillo A, Farina V, DiMaio S, Ciriaco M, Nunziata L, Scippa L, D'Agostino N: Myocardial dysfunction in two hypothyroid twins with thalassaemia major. Acta Paediatr Scand 1989 May;78(3):455–7

Fischer A see **Massaad L**

Ford MH see **Meikle AW**

Friedman A see **Blickstein I**

Fulker DW see **DeFries JC**

Fulker DW see **Eaves LJ**

Fulker DW see **Heath AC**

Fulker DW see **Neale MC**

G

Galassi G see **Torlai F**

Garett RA see **Thomalla JV**

Garite T see **Gocke SE**

Gatz M see **Pedersen NL**

Gaud C see **Massaad L**

Gazzaniga MS see **Oppenheim JS**

Gemayel NS see **Kumar D**

Genest DR see **Benson CB**

Geola F, Hershman JM: Isolated hypogonadotropic hypogonadism in male identical twins. West J Med 1989 Jan;150(1):84–7

Giles KA see **Gorczyca DP**

Gill SK see **Kumar D**

Gillberg C see **Steffenburg S**

Gillberg C see **Wahlström J**

Gillberg IC see **Steffenburg S**

Girz BA see **Divon MY**

Gocke SE, Nageotte MP, Garite T, Towers CV, Dorcester W: Management of the nonvertex second twin: primary cesarean section, external version, or primary breech extraction. Am J Obstet Gynecol 1989 Jul;161(1):111–4

Six hundred eighty-two consecutive twin deliveries were reviewed. Included in the study were 136 sets of vertex–nonvertex twins with birth weights greater than 1500 gm. A primary attempt at delivery of the second twin by external version was performed on 41 twins, 55 twins underwent attempted breech extraction, and 40 patients had a primary cesarean section solely because of physician preference. There were no differences in the incidence of neonatal morbidity or mortality among the modes of delivery. External version was associated with a higher failure rate than primary breech extraction (p less than 0.01). External version was associated with complications (fetal distress, cord prolapse, and compound presentation) that were not seen in the other two groups. Primary breech extraction of the second

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nonvertex twin weighing greater than 1500 gm appears to be a reasonable alternative to either cesarean section or external version.

Goldberg J see **Eisen S**

Goldberg LH, Hsu SH, Alcalay J: Effectiveness of isotretinoin in preventing the appearance of basal cell carcinomas in basal cell nevus syndrome. J Am Acad Dermatol 1989 Jul;21(1):144–5

Gorczyca DP, Lindfors KK, Giles KA, McGahan JP, Hanson FW, Tennant FP: Prenatally diagnosed gastroschisis in monozygotic twins. JCU 1989 Mar–Apr;17(3):216–8

Gottesman II see **Markow TA**

Goyert G see **Bronsteen R**

Greenbaum SS, Krull EA, Rubin MG, Lee R: Localized acquired cutis laxa in one of identical twins. Int J Dermatol 1989 Jul–Aug;28(6):402–6

Greenland S: *On correcting for misclassification in* twin studies and other matched-pair studies. Stat Med 1989 Jul;8(7):825–9

In twin studies (and other matched-pair studies) of the effect of a K-level risk factor on disease risk, one must estimate the proportion of pairs in each of K2 possible pair categories, of which K(K-1) categories represent discordant pairs. In particular, for a binary factor, one must estimate proportions within two discordant-pair categories and the variances of functions of these estimates. This paper shows how to do so when misclassification is present and stable estimates of the classification rates are available. Unlike methods that estimate only the discordance ratio, one can use the methods presented here to improve estimates of epidemiologic effects.

Grymer LF, Melsen B: The morphology of the nasal septum in identical twins. Laryngoscope 1989 Jun; 99(6 Pt 1):642–6

A comparison was made of the nasal septums of 41 pairs of identical twins to assess the impact of genetic and environmental factors on the formation of deformities of the nasal septum. Deformities of the anterior nasal septum (cartilaginous septum) were present in 22% of all the individuals studied, and *in the posterior nasal septum (bony septum),* some deformity was present in 74% of the persons studied. The distribution of deformities within pairs suggests that anterior deformities might be of external origin (e.g., traumatic), and posterior deformities may be considered to be part of a normal developmental process of the maxillary complex, where both genetic and epigenetic factors may play a role.

Guidetti DA see **Divon MY**

Guz A see **Shea SA**

H

Haapanen A, Koskenvuo M, Kaprio J, Kesäniemi YA, Heikkilä K: Carotid arteriosclerosis in identical twins discordant for cigarette smoking. Circulation 1989 Jul;80(1):10–6

From a nationwide twin panel, identical twin pairs with highest discordance in cigarette smoking were selected for a study of arteriosclerosis (49 pairs with a mean age of 52 years). Smoking history was obtained in 1975, 1981, and 1986. The mean life-long smoking dose of the smoking cotwins was 20 package-years. The smoking and nonsmoking cotwins had similar systolic and diastolic blood pressures, total plasma cholesterol level, body mass index, and some psychosocial factors; the only difference was found in use of alcohol, which was greater among smoking cotwins. Duplex sonography of carotid arteries was performed. Carotid artery stenoses (narrowing of area of the lumen with 15–60%) were found in nine pairs: in nine smoking twins and in two of their nonsmoking cotwins ($p = 0.036$). The total area of carotid plaques was 3.2 times larger in smoking cotwins (p less than 0.001). The thickness of the inner layer of carotid arteries was more marked in smoking cotwins (p less than 0.001). The size of plaques and the degree of inner layer thickening correlated with the dose of smoking (NS). The association of smoking with carotid arteriosclerosis was highly significant even after the adjustment for age, total plasma cholesterol level, diastolic blood pressure, and body mass index in multiple logistic regression analyses.

Hamer C see **Newman RB**

Hamilton MP see **Wong PC**

Hamilton RD see **Shea SA**

Hannon RJ, Boston VE: *Discordant Hirschsprung's* disease in monozygotic twins: a clue to pathogenesis? J Pediatr Surg 1988 Nov;23(11):1034–5

Presented is a case of discordant aganglionosis in monozygous twins that supports the "post migration" destruction mechanism in Hirschsprung's disease.

Hansen T see **Watsky KL**

Hanson FW see **Gorczyca DP**

Harman CR see **Lange IR**

Hayashi N see **Sunami K**

Heath AC, Jardine R, Martin NG: Interactive effects of genotype and social environment on alcohol consumption in female twins. J Stud Alcohol 1989 Jan;50(1):38–48

Information about drinking practices has been obtained by questionnaire from 1,984 monozygotic and dizygotic adult female twin pairs from the Australian twin register, including 1,690 pairs where both twins have used alcohol. Statistical analyses of these data show that marital status is an important modifier of genetic effects on drinking habits. In young twins, aged 30 years or less, genetic differences between individuals account for only 31% of the variance in alcohol consumption of married respondents, but for 60% of the variance of unmarried respondents. In twin pairs, aged 31 years or more, genetic differences account for 46–59% of the variance in married twins, but for 76% of the variance in unmarried twins. In our young sample (average age 35 years) there is no evidence that individuals genetically predisposed to heavy drinking are any less likely to be married than the rest of the population. Some alternative explanations of these findings are also rejected.

Heath AC, Neale MC, Hewitt JK, Eaves LJ, Fulker DW: Testing structural equation models for twin data using LISREL. Behav Genet 1989 Jan; 19(1):9–35

Simple genetic models can be fitted to twin data using software packages such as LISREL (Jöreskog and Sörbom, 1986a). After discussion of data preparation and routine checks on possible violation of assumptions of the twin method, we illustrate univariate, bivariate, and multivariate genetic models which can be tested in cross-sectional twin data using LISREL. These include models for cohort or cohabitation effects, genotype x sex interaction, and certain types of genotype x environment interaction and genotype-environment correlation.

Heath AC see **Eaves LJ**

Heath AC see **Neale MC**

Heaton DA see **Olmos P**

Hebert AA see **Bowden JB**

Heikkilä K see **Haapanen A**

Heiner DC see **Schoettler JJ**

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Hellgren L see **Steffenburg S**
Hellgren L see **Wahlström J**
Hershman JM see **Geola F**
Herva R see **Kirkinen P**
Hewitt JK see **Heath AC**
Hewitt JK see **Neale MC**
Hickok DE see **Pederson AL**
Hill RM see **Stefos T**
Hisano K, Nakamura K, Okada M, Iwai S: Separation of conjoined twins using chest wall prosthesis. J Pediatr Surg 1989 Sep;24(9):928–9
Hitch DC, Carson JA, Smith EI, Sarale DC, Rennert OM: Familial congenital diaphragmatic hernia is an autosomal recessive variant. J Pediatr Surg 1989 Sep; 24(9):860–4 (42 ref.)
Forty families that have had more than one sibling with a congenital diaphragmatic hernia have been identified. The 85 children among the 40 families describe a subset of congenital diaphragmatic hernia displaying an autosomal recessive inheritance mode. The chance of a diaphragmatic hernia among siblings within this subset is 25%.
Hogge WA see **Schnatterly PT**
(Home E), Bondeson J, Allen E: Craniopagus parasiticus. Everard Home's Two-Headed Boy of Bengal and some other cases. Surg Neurol 1989 Jun; 31(6):426–34
Craniopagus parasiticus, or épicome, is a rare teratological type, of which only six cases have been recorded in the medical literature. It differs from craniopagus conjoined twins in that the body and limbs of the parasitic twin are underdeveloped, leaving in some cases only a parasitic head, inserted on the crown of the autositic twin. The first case of this malformation was Everard Home's famous Twin-Headed Boy of Bengal, whose skull is preserved at the Hunterian Museum. In this historical review, Home's case is presented in some detail, and the later cases are used to explain further some of its particulars.
Hori A, Kazukawa S, Endo M, Kurachi M: Sleep spindles in twins. Clin Electroencephalogr 1989 Apr; 20(2):121–7
Sleep spindle characteristics and spindle power periodicity were studied in 4 identical and 3 fraternal twin pairs (mean age, 16 years). There were no significant genetic effects such as concordance between the identical twins and discordance between the fraternal twins for mean duration, mean amplitude and mean frequency of spindles. Spindle periodicity, which is correspondent to the sleep cycle, was visually more similar between the identical twins than between the fraternal twins. These observations suggest that the sleep cycle which is expressed by periodic appearance of spindle powers is genetically determined. On the other hand, some spindle characteristics and some physical measures had significant relationships. These relationships may suggest that some spindle characteristics are influenced by the individual development rather than by a genetic trait.
Hoskins P see **Johnston C**
Hsu LC see **Lin TM**
Hsu SH see **Goldberg LH**
Hsu ST see **Lin TM**
Hudson JW, Jaffrey BJ, Davis C, Witkowski CE: The psychological and behavioral considerations of orthognathic surgery on identical (monozygotic) twins. Oral Surg Oral Med Oral Pathol 1989 Sep; 68(3):259–63
The psychologic and behavioral changes that may occur with the impact of orthognathic surgery on the physical appearance of an identical twin set have been addressed. This unique situation has not been discussed in the literature with respect to reconstructive or cosmetic facial surgery. A report on elective orthognathic surgery performed on identical twins and the subsequent impact on the *twin relationship due to alterations of* "self-image phenomenon" is given. Such an impact was a consideration in this case. Further collective study in this area is needed but is difficult to obtain because of the rarity of occurrence of this type of case.
Hulley SB see **Cohn BA**
Hurlbert BJ see **Mawk JR**
Hurwitz SR see **Nageotte MP**
Husain AN, Muraskas J, Lambert G, Dado D, Lynch J: Parasitic conjoined twins with omphalocele and tetralogy of Fallot. Pediatr Pathol 1989;9(3):321–8
Human parasitic twins are very rare. Here we report a unique case of a partial twin attached to the host in the midline at the forehead, chin, chest, and epigastrium. The parasite lacked thoracic organs and major neural tube derivatives. However, it had small peripheral nerves and ganglia within perirenal and pericolonic connective tissue. Also present were a well-developed small intestine, colon, and appendix with normal submucosal and myenteric plexuses. These findings may represent either the initial presence of a neural tube that later regressed or migration of autosite neural crest cells. The parasite had a mature, functioning kidney with its ureter opening to skin and complete absence of urinary bladder or genital organs. This raises questions about the embryological development of the ureteric bud, which is an outgrowth of the mesonephric duct. The host had tetralogy of Fallot and omphalocele containing the parasitic kidney and bowel. Parasitic twinning occurs at 3 weeks of gestation, tetralogy of Fallot at 3–7 weeks, and omphalocele at 6–10 weeks. A single noxa acting at 3 weeks could have caused sequential malformations that initially seem unrelated.

I

Ikäheimo M see **Kirkinen P**
Imaizumi Y: Concordance and discordance of congenital hydrocephalus in 107 twin pairs in Japan. Teratology 1989 Aug;40(2):101–3 (26 ref.)
During the period from 1969 to 1985, 107 pairs of twins, of which at least one in each pair had congenital hydrocephalus, were ascertained in Japan. The rate of concordance for hydrocephalus among these twins was 15%, with a slightly higher rate in like-sex male twins (28%) than in like-sex female twins (14%). The rates were 21% in like-sex and 0% in unlike-sex pairs. Two twin pairs had one anencephalic twin and one hydrocephalic twin.
Imaizumi Y: Conjoined twins in Japan, 1979–1985. Acta Genet Med Gemellol (Roma) 1988; 37(3–4):339–45
Nation-wide data in Japan on the 112 sets of conjoined twins from fetal deaths and from postnatal deaths during 1979–1985 were analysed. Female conjoined twins accounted for 60% of cases. The incidence rate of conjoined twins remained constant except in 1985. Overall incidence rate was 10 per million births. Maternal age effect was found in mothers over the age of 40, where the highest incidence rate was obtained. The incidence rate of conjoined twins increased with birth order. There was no seasonal variation in the time of conception.
Ionasescu R see **Ionasescu VV**
Ionasescu VV, Searby CC, Ionasescu R, Patil S:

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Duchenne muscular dystrophy in monozygotic twins: deletion of 5' fragments of the gene. Am J Med Genet 1989 May;33(1):113–6
A recombinant DNA study for deletion evaluation was performed in a 4 generation family with Duchenne muscular dystrophy (DMD) in twins. The patients were 6 years old, had a history of progressive difficulty in walking since age 4, and showed weak gluteals, iliopsoas, latissimus dorsi, rhomboids, lower trapezius, sternocleidomastoids, pseudohypertrophic calves, and tight heelcords. Both patients had high serum creatine kinase of 19,000 and 11,000 IU, respectively, and the muscle biopsy of the left vastus lateralis showed dystrophic alterations. Both twins had the same red cell types for ABO, Rh, CDE, MNSs, Kelly, Lewis, Duffy, and Kidd. HLA typing also detected the same antigens in both twins: A2, B44, DR4, and DR5. Cytogenetic studies were consistent with 46, XY male individuals with normal banding pattern. By cDNA probes the entire DMD gene was surveyed for missing or abnormal-sized restriction fragments. Both twin boys showed absence of 8.5, 8.0, 4.6, 4.2, and 3.1 kb fragments on Hind III blots and absence of 13.5, 3.7, 2.9, and 1.4 kb fragments on Bgl II blots both hybridized with cDNA 1-2a corresponding to most 5' region of the DMD gene. The mother and other relatives of the patient did not show deletion. These findings strongly suggest that the deletion in the DMD monozygotic twins represents a new mutation.

Issacov D see **Shalev E**
Iwai S see **Hisano K**

J

Jadhav MA see **Rajadurai VS**
Jaffrey BJ see **Hudson JW**
Jakobsson G see **Steffenburg S**
James WH: MS in twins [letter] Neurology 1989 Apr; 39(4):612
Jardine R see **Heath AC**
Jayakumar CR see **Thavarasah AS**
Johnston C, Millward BA, Hoskins P, Leslie RD, Bottazzo GF, Pyke DA: Islet-cell antibodies as predictors of the later development of type 1 (insulin-dependent) diabetes. A study in identical twins. Diabetologia 1989 Jun;32(6):382–6
To determine the value of islet-cell antibodies, both complement-fixing and non-complement-fixing, in predicting the later development of Type 1 (insulin-dependent) diabetes, we studied different groups of identical twins. Twelve twins have developed diabetes and 11 of these had non-complement-fixing islet-cell antibodies before diagnosis, and eight out of nine tested had complement-fixing islet-cell antibodies. Of the twins who have remained non-diabetic for many years and are now unlikely to develop diabetes, twelve have had non-complement-fixing islet-cell antibodies at some stage but only four have ever had complement-fixing antibodies. In 29 non-diabetic co-twins tested within 5 years of the diagnosis of diabetes in the affected twin the presence of islet-cell antibodies, especially complement-fixing, predicted the progression to frank diabetes with a high specificity (100%), sensitivity (88%) and predictive value (100%). In pairs remaining discordant the antibodies were found more frequently in the diabetic than the non-diabetic twin. We conclude that the presence of islet-cell antibodies is not genetically determined and can occur without progression to diabetes. However, the presence of islet-cell antibodies, especially complement-fixing, in non-diabetic twins tested soon after the diagnosis of their co-twin, indicates a high risk for the development of diabetes.

Josse D see **Robin M**
Journel H, Le Marec B: Dizygotic twinning in mothers of spina bifida [letter] Am J Med Genet 1989 Feb; 32(2):257–9
Juntunen J see **Korpela H**

K

Kadzombe E, Currie AB: Neonatal fistula from the appendix to the umbilicus. J Pediatr Surg 1988 Nov; 23(11):1059–60
Kalousdian S see **Fabsitz RR**
Kaprio J see **Haapanen A**
Kassam Y see **Singal DP**
Kataki A, Kouvatsi A: Twinning in Greece. Acta Genet Med Gemellol (Roma) 1988; 37(2):147–50
Mean MZ and DZ twinning rates in seven big Greek cities were 3.2 and 4.75 per 1,000 maternities, respectively, during the 1980–1985 period. The seasonal variations in twinning frequencies are not significant. The total twinning rate in Greece shows a decreasing trend from 1956 to 1985.
Kaupke CJ see **Nageotte MP**
Kazukawa S see **Hori A**
Keith LG see **Creinin M**
Kendler KS: Limitations of the ratio of concordance rates in monozygotic and dizygotic twins [letter] Arch Gen Psychiatry 1989 May;46(5):477–8
Kesäniemi YA see **Haapanen A**
Kilpatrick GS see **McConnochie K**
King MC see **Selby JV**
Kingsland CR, Smith SJ, Mason BA: Consecutive triplet pregnancies following in-vitro fertilization and embryo transfer. Two case reports. Hum Reprod 1989 May;4(4):473–4
The number of multiple pregnancies has been increasing as a result of the relatively widespread use of drugs for induction of ovulation and assisted conception techniques. This paper details the first reported cases of triplet pregnancies occurring in consecutive IVF cycles in two patients.
Kinnunen E see **Korpela H**
Kirkinen P, Herva R, Räsänen J, Airaksinen J, Ikäheimo M: Documentation of paradoxical umbilical blood supply of an acardiac twin in the antepartum state. J Perinat Med 1989;17(1):63–5
In a case with one acardiac twin, color Doppler examination revealed retrograde umbilical circulation to this fetus. This pulsatile flow in the umbilical vessel of the acardiac fetus was supported by the cardiac function of the co-existing healthy twin.
Klonoff H see **Clark C**
Koizumi J see **Mizukami K**
Kolodny EH see **Barlow JK**
Korpela H, Kinnunen E, Juntunen J, Kumpulainen J, Koskenvuo M: Serum selenium concentration, glutathione peroxidase activity and lipid peroxides in a co-twin control study on multiple sclerosis. J Neurol Sci 1989 Jun;91(1-2):79–84
Serum selenium concentration, glutathione peroxidase activity and lipid peroxides were determined in patients with multiple sclerosis (MS). The series consisted of 13 same-sexed twin pairs derived from the Finnish Twin Cohort of 15,815 pairs. Fourteen subjects had a definite and 1 a

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probable MS, and their 11 co-twins showed no evidence of central nervous system disease. No statistical differences were observed, but the 3 patients with active progressive MS had a higher mean level of lipid peroxides than the rest of the patients. We suggest that serum lipid peroxidation may be involved in the activity of MS.

Koskenvuo M see **Haapanen A**

Koskenvuo M see **Korpela H**

Kouvatsi A see **Kataki A**

Kraut JR, Shah B: Simultaneous transient hyperphosphatasemia in a set of twins [letter] Am J Dis Child 1989 Aug;143(8):881-2

Kroneld R: Human twinning rate in Iniö in the south-west of Finland.
Acta Genet Med Gemellol (Roma) 1988;37(2):143-6
A secular demographic study on the Iniö Island in SW Finland shows an even stronger decline of twinning rates than in the Aland Islands and the rest of the archipelago. Twinning rates in Iniö declined, in fact from about 30%, to less than 10%.

Krull EA see **Greenbaum SS**

Kumar D, Gemayel NS, Gill SK, Bray GA, Roy-Burman P, Deapen D, Mack TM: Type-specific concordance in young diabetic monozygotic twins. Adv Exp Med Biol 1988;246:259-67

Kumpulainen J see **Korpela H**

Kurachi M see **Hori A**

Kwang TY see **Lin TM**

L

Lally KP see **Chawls WJ**

Lambert G see **Husain AN**

Lamont AC see **Young ID**

Lancet M see **Blickstein I**

Lange IR, Harman CR, Ash KM, Manning FA, Menticoglou S: Twin with hydramnios: treating premature labor at source. Am J Obstet Gynecol 1989 Mar;160(3):552-7
Six twin pregnancies complicated by hydramnios and premature labor were prospectively studied to determine whether indomethacin reduces amniotic fluid. Requirements for study entry included a gestational age less than 32 completed weeks and an amniotic fluid greater than 10 cm in one or both sacs. The amniotic fluid was measured using real-time ultrasonography before, during, and after treatment. Indomethacin treatment was initiated as a 100 mg rectal suppository and maintained thereafter by 50 mg orally every 6 hours. Treatment was discontinued after 32 completed weeks' gestation, if the patient was asymptomatic and the amniotic fluid was "normal" (less than 8 cm) or after the onset of oligohydramnios in one or both sacs (less than 2 cm). The interval from initiation of treatment to delivery ranged from 12 to 101 days. A coincidental reduction in amniotic fluid was observed in all seven treatment cycles. The time interval to obtain "normal" fluid ranged from 4 to 20 days (mean, 12.5 days). There were no perinatal complications attributable to indomethacin treatment. These data suggest that in selected pregnancies complicated by hydramnios, indomethacin may be of value not only in prolonging gestation but also in amniotic fluid reduction.

Langer O see **Divon MY**

Lassila R: The platelet alpha 2-adrenoceptor and prostacyclin sensitivity are not altered by cigarette smoking--a study of monozygotic twin pairs discordant for smoking. Thromb Res 1989 May 15; 54(4):339-48
A study with ten identical twin pairs discordant for cigarette smoking for over 20 years was undertaken to evaluate the effect of smoking on platelet alpha 2-adrenoceptor binding ([3H]-yohimbine) and prostacyclin (IloprostR) sensitivity. Since plasma catecholamines, adrenaline and noradrenaline were increased in smokers (3.95 +/- 0.7 vs 2.26 +/- 0.1 pmol/ml, p less than 0.05) at rest, the objective of an acute additional adrenergic discharge by physical exercise was to uncover possible tachyphylaxis. Aggregation of adrenaline-stimulated platelets was significantly reduced in smokers after exercise and the refractoriness appeared to be maintained for 15 and 30 min afterwards. However, the densities of binding sites for the radioligand were not markedly different between the study groups at rest or after exercise. The binding affinity decreased after exercise in both groups. Adrenaline-stimulated platelets responded to prostacyclin by inhibiting aggregation and activating cAMP production equally in smokers and nonsmokers implying a preserved sensitivity to prostacyclin. Although smoking introduces long-term sympathoadrenergic effects, it does not alter alpha 2-adrenoceptor binding in platelets. Thus, the present data support a theory that smoking mediates its effects by platelet to vessel wall interaction and vasoactivity, rather than directly changing the properties of adrenoceptor in platelet or the coupling to adenylate cyclase.

Lawrence N, Bligard CA, Storer J, Courregé ML: Neonatal lupus in twins. South Med J 1989 May; 82(5):657-60
Neonatal lupus erythematosus (NLE) is a syndrome characterized by one or all of the following elements: cutaneous LE lesions, systemic disease, and congenital heart block. SS-A/Ro and SS-B/La have been implicated in the etiology of NLE, but because NLE is not uniformly manifested in all offspring of SS-A and SS-B autoantibody positive mothers, and because of the wide range of clinical manifestations associated with NLE, other contributing etiologic factors are being explored. HLA studies have revealed that infants of SS-A/Ro and SS-B/La positive mothers bearing HLA-A1, B8, DR3, DQ2, and DR52 are at greater risk of having NLE. Haplotyping in our dizygous twins supports these material HLA associations.

Le Marec B see **Journel H**

Lee R see **Greenbaum SS**

Lee TY see **Eng HL**

Lenhart K, Luks A, Bártová A, Lenhartová E: Probability of paternity: deceased accused man or mother; twins.
Acta Univ Palacki Olomuc Fac Med 1988; 120:137-52

Lenhartová E see **Lenhart K**

Lenzenweger MF, Dworkin RH, Wethington E: Models of positive and negative symptoms in schizophrenia: an empirical evaluation of latent structures.
J Abnorm Psychol 1989 Feb;98(1):62-70
The present investigation empirically evaluated three competing models of the relations between positive and negative symptoms in schizophrenia, namely the severity-liability model (Gottesman, McGuffin, & Farmer, 1987), Andreasen's unidimensional bipolar model (Andreasen & Olsen, 1982), and Crow's independent dual-process model (Crow, 1980a, 1980b). Using positive and negative symptom ratings based on 220 schizophrenic subjects, the results of a LISREL VI (Joreskog & Sorbom, 1984) confirmatory factor analysis revealed that Crow's model of positive and negative symptoms provided

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the best fit to the observed data among the three models. The severity-liability model provided a modest fit to observed data, and Andreasen's model fit the data poorly. Results are interpreted as supporting the validity of the positive and negative symptom distinction in schizophrenia and as providing substantive empirical support for Crow's independent dual-process model. The methodological advantages of confirmatory factor analysis in the specification and evaluation of theoretical models in experimental and developmental psychopathology are discussed.

Leslie RD see **Johnston C**

Leslie RD see **Olmos P**

Lewinsky R see **Degani S**

Lewis E, Bryan EM: Management of perinatal loss of a twin [letter] BMJ 1989 Jan 21;298(6667):184

Lewis K see **Plaeger-Marshall S**

Li D see **Clark C**

Lichtenstein P see **Pedersen NL**

Lin CC see **Lin TM**

Lin LL, Chen CJ: A twin study on myopia in Chinese school children.
Acta Ophthalmol Suppl (Copenh) 1988;185:51-3

Lin SY see **Lin TM**

Lin TM, Chen CJ, Wu MM, Yang CS, Chen JS, Lin CC, Kwang TY, Hsu ST, Lin SY, Hsu LC: Hepatitis B virus markers in Chinese twins.
Anticancer Res 1989 May-Jun;9(3):737-41
Chinese same-sex twins were recruited in order to study the distribution of different markers of hepatitis B virus (HBV) infection, including HBV surface antigen (HBsAg), antibody to HBV core antigen (anti-HBc), antibody to HBsAg (anti-HBs), HBV e antigen (HBeAg) and antibody to HBeAg (Anti-HBe), as well as to compare the concordance of these markers in pair-wise fashion among monozygotic (MZ) and dizygotic (DZ) twins and singleton controls. A total of 289 pairs of MZ twins, 102 pairs of DZ twins and 375 pairs of age-sex-matched singleton controls were studied. More than 50 percent of the members of each group (64.71% of MZ twins, 51.96% of DZ twins and 62.13% of controls) were found to be infected with HBV. In general, the patterns of the response to HBV infection in the 3 groups were similarly distributed. 20.17% of the members of the 3 groups (21.45% of MZ twins, 14.22% of DZ twins, and 20.80% of controls) were HBsAg carriers. Among the HBsAg carriers, 49.19% (44.35% of MZ twins, 34.48% of DZ twins and 55.77% of controls) were HBcAg carriers. No significant difference in the concordance of HBV infection was observed in the MZ and DZ twins. However, highly significant differences were noted between MZ twins and controls, and between DZ twins and controls. Highly significant differences were also observed in the concordance of carrier status between MZ and DZ twins and between MZ twins and controls, but not between DZ and controls. As for the other HBV markers, no significant differences were observed. It is concluded that the genetic influence in response to HBV infection markers is not well-characterized and requires further study.

Lindfors KK see **Gorczyca DP**

Lobe TE, Oldham KT, Richardson CJ: Successful separation of a conjoined biliary tract in a set of omphalopagus twins. J Pediatr Surg 1989 Sep; 24(9):930-2
Omphalopagus twins were separated in the first 48 hours of life. Preoperative evaluation did not disclose either their conjoined intestines or their conjoined biliary tract; intraoperative evaluation, including an operative cholangiogram, was required to determine if separation was possible. The intestines were divided to give each infant an equal share, and an hepaticoenterostomy was constructed in each of the twins.

Loehlin JC see **Plomin R**

Lopez-Camelo JS see **Castilla EE**

Luks A see **Lenhart K**

Lynch J see **Husain AN**

M

McClearn GE see **Pedersen NL**

McConnochie K, Williams WR, Kilpatrick GS, Wiliams WJ: Chronic beryllium disease in identical twins. Br J Dis Chest 1988 Oct;82(4):431-5
Identical male twins born in 1959 have developed chronic beryllium disease. Twin 1 was exposed to beryllium for more than 3 years. The diagnosis was first suspected at the time of his post-employment chest radiograph. Twin 2 was exposed for 21 months and ceased employment at the same time as his brother. His post-employment examination was normal. Thirty months later he developed an unusual skin rash which biopsy showed to be granulomatous. Further investigations proved the diagnosis. Both men have reduced tear secretion measured with Schirmer's test, a feature not previously reported in this condition. Bronchoalveolar lavage and laser microprobe mass spectrometry (LAMMS) were used as aids to the diagnosis. Sarcoidosis has been reported in identical twins, suggesting genetic susceptibility, which may also be of importance in chronic beryllium disease.

McCrossin DB, Roberton NR: Congenital skin defects, twins and toxoplasmosis. J R Soc Med 1989 Feb; 82(2):108-9

McGahan JP see **Gorczyca DP**

Mack TM see **Kumar D**

Maes H see **Vlietinck R**

Mahour GH see **Chawls WJ**

Malamud D, Christensen CM, Navazesh M, Davis C: Bacterial agglutinin activity in the saliva of human identical and fraternal twins. Arch Oral Biol 1988; 33(11):801-5
The major factor in human saliva responsible for the specific aggregation of oral streptococci is a high molecular-weight glycoprotein (agglutinin). To determine if the level of this glycoprotein in whole and parotid saliva was genetically determined, agglutinin activity for Streptococcus sanguis and Streptococcus mutans in saliva obtained from identical and fraternal twins was compared. Evidence for the heritability of agglutinin activity and also parotid flow rate and total protein was obtained. There was no evidence for a significant genetic contribution to salivary sodium concentration.

Malmstrom PE, Faherty T, Wagner P: Essential nonmedical perinatal services for multiple birth families. Acta Genet Med Gemellol (Roma) 1988; 37(2):193-8
Parents of multiples suffer unique stresses which can severely impair family health and welfare. Access to information, counseling, and community resources increase parents' abilities to cope, and reduce the risk of child and spousal abuse. Twinline, a social service agency in California, provides a variety of free and low-cost nonmedical perinatal services to meet the needs of a heterogeneous population of over 1,000 multiple birth families and parents expecting multiples in the urban and rural counties of the San

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Francisco Bay Area.

Manning FA see **Lange IR**

Marin A see **Bertranpetit J**

Markow TA, Gottesman II: Fluctuating dermatoglyphic asymmetry in psychotic twins. Psychiatry Res 1989 Jul;29(1):37–43

Fluctuating asymmetry of bilateral morphological traits is the result of prenatal developmental instability and has been shown to be greater in organisms having more homozygous genotypes (aabb vs. AaBb, for example). This expected increase in fluctuating asymmetry has been found among individuals having a high degree of liability for schizophrenia, as this disorder appears to have a polygenic basis. We tested the additional prediction that the greater genetic liability for schizophrenia necessary for concordance between twins should be associated with greater fluctuating asymmetry in twin pairs in which both twins are mentally ill compared to twin pairs in which one individual is normal. Our analysis of asymmetry for finger ridge counts from fingerprints of concordant and discordant pairs of twins supports this prediction and provides additional indirect support for the roles of polygenic transmission and prenatal epigenetic vulnerability in schizophrenia.

Markow TA, Gottesman II: Dermatoglyphic fluctuating asymmetry in twins and singletons. Hereditas 1989;110(3):211–5

The influence of twinning on developmental stability was measured by comparing fluctuating asymmetry in dermatoglyphic traits in monozygotic twins, dizygotic twins, and singletons. Despite reports that twinning has been reported to influence development of traits such as birth weight and I.Q., no significant difference in fluctuating asymmetry was found between different zygotic categories.

Martin NG, Boomsma DI: Willingness to drive when drunk and personality: a twin study. Behav Genet 1989 Jan;19(1):97–111

In a laboratory study of psychomotor sensitivity to alcohol, twins were asked "Would you drive a car now?" at 1, 2, and 3 h after drinking a standard dose of ethanol (0.75 g/kg). Correlations among these binary items, the Eysenck personality scales, and age were investigated using PRELIS and LISREL. Willingness to drive and Extraversion correlate at all three times in both males and females. In males, willingness to drive also correlates with Psychoticism, and in females it correlates negatively with the Lie (or Social Desirability) scale. Most correlations between cotwins in willingness to drive were significant in both monozygotic (MZ) and dizygotic (DZ) male twins but correlations were lower in female twins. Factor and Markovian models were fitted. In males there seem to be both genetic and cultural influences on willingness to drive when drunk. About half the genetic variance seems to be the pleiotropic effects of genes influencing Extraversion. The correlations with Psychoticism, on the other hand, seem to be largely environmental in origin. The small sample size and lack of proper significance tests mean that these results must be interpreted with caution.

Martin NG see **Boomsma DI**

Martin NG see **Heath AC**

Martin NG see **Neale MC**

Martin W see **Clark C**

Martlew M: Observations on a child with cerebral palsy and her twin sister made in an integrated nursery and at home. Child Care Health Dev 1989 May–Jun;15(3):175–94

Observations were made on two twins attending the same integrated nursery. One of the children had cerebral palsy while her sister developed normally. Similar observations were also made in the twins' home while they played with their mother. Comparisons were made between the behaviour and experience of the two children in the nursery and also between the home and the nursery. The child with cerebral palsy was non-ambulant and her interactions in the nursery were limited in both quality and quantity compared with her sister and with opportunities presented at home. Despite this both children enjoyed attending the nursery. It is proposed that integration needs to have structured and monitored support for ensuring that children with special needs benefit from mainstream education.

Mason BA see **Kingsland CR**

Massaad L, Prieur M, Gaud C, Fischer A, Dutrillaux B: Unusual karyotypic evolution in subacute myelomonocytic leukemia in two monozygotic twins. Cancer Genet Cytogenet 1989 Apr; 38(2):205–13

A subacute myelomonocytic leukemia was diagnosed in 28-month-old cotwins. At this age, their spontaneously dividing cells had a normal karyotype. A few months later, after treatment with 6-mercaptopurine, the following karyotypes were observed: 50,XX, +X, +13, +19, +21 in one and 51,XX, +X, +X, +10, +19, +21 in the other. After bone marrow transplantation, both relapsed although they had received high doses of chemo- and radiotherapy. One developed a clone 46,XX,del(20q), which acquired other clonal rearrangements. The other child developed two different abnormal clones, both with unbalanced rearrangement of chromosome 13. Some of these clones may correspond to immature erythroblasts. The gain of chromosomes, especially for #13, which occurred independently in the cotwins by various mechanisms and at different periods during the disease, is very striking. It may indicate the existence of a strong selective advantage for trisomic 13 cells and may be related to the genetic constitution of the patients.

Matheny AP Jr: Children's behavioral inhibition over age and across situations: genetic similarity for a trait during change. J Pers 1989 Jun;57(2):215–35

Ratings of behaviors pertaining to inhibition were observed for 130 twins participating in a longitudinal study. Ratings were available for four ages (12, 18, 24, and 30 months) and from three sources at each age: direct observations obtained in a laboratory setting, direct observations obtained in conjunction with infant mental testing, and a temperament measure from a questionnaire completed by parents. For the individual twins, the age-to-age correlations were in the moderate range (.26 to .64). The situation-to-situation correlations were generally in the same range (.17 to .64). When the twins were recombined into twin pairs, within-pair (intraclass) correlations indicated that monozygotic (MZ) twins were more concordant than dizygotic (DZ) twins for each of the behaviors at each of the ages. Also, the MZ twins were more concordant for the direction and degree of behavioral change from age to age or from situation to situation. These data provide additional evidence for the biological influence on behavioral inhibition, a characteristic that has been studied in temperament and personality research. The results suggest that the trait of behavioral inhibition and a change in the trait are genetically conditioned. In addition, it is suggested that the concept of trait be expanded to include the

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person-centered biological regulation of change.

Matheus M see **Sala MA**

Matthai J see **Rajadurai VS**

Matthews KA see **Pedersen NL**

Mawk JR, Hurlbert BJ: Management of hydrocephalus in ilio-omphalopagus conjoined twins. Childs Nerv Syst 1988 Dec;4(6):367-9
One member of ilio-omphalopagus conjoined twins developed symptomatic hydrocephalus. Uneventful ventriculoperitoneal shunting improved the baby's condition. Technical aspects of the neurosurgical and anesthetic management in this case are discussed.

Maxey-Conley JE, Peters RK: Dermatoglyphics available for study at the Kloepfer Genetics Archives [letter]
Acta Genet Med Gemellol (Roma) 1988; 37(2):199-200

Meaney FJ see **Selby JV**

Meikle AW, Bishop DT, Stringham JD, Ford MH, West DW: Relationship between body mass index, cigarette smoking, and plasma sex steroids in normal male twins. Genet Epidemiol 1989;6(3):399-412
Smoking has been observed to affect plasma sex hormones and body mass index. The relationship between smoking, body mass index, and plasma concentration of sex hormones was studied in normal adult male twins. The analyses were performed for between 150 and 159 twin pairs for whom hormonal data were available on both twins. With bivariate analysis, neither body mass index nor smoking affected estrone, luteinizing hormone, follicle-stimulating hormone, ratio of testosterone to estradiol, or ratio of testosterone to dihydrotestosterone. Body mass index significantly (P less than 0.05) affected sex hormone binding globulin, whereas smoking had no effect. The plasma contents of testosterone and dihydrotestosterone and the luteinizing hormone/testosterone ratio were affected by both body mass index and smoking, although, after allowing for body mass, smoking was less significant (0.05 less than P less than 0.10). A path model was formulated to examine the relationship of body mass and sex steroid levels. Our results suggest that body mass index affects sex steroids, since common environmental factors do not account for the strength of the relationship. The bivariate analysis suggests that the smoking effect on sex hormones (except perhaps for dihydrotestosterone) is secondary to an effect on body mass index.

Melsen B see **Grymer LF**

Menticoglou S see **Lange IR**

Metlay LA see **Sherer DM**

Miller MC see **Newman RB**

Millward BA see **Johnston C**

Millward BA see **Olmos P**

Mitchell ME see **Thomalla JV**

Mizukami K, Shiraishi H, Koizumi J: A Graves' disease of identical twins with mental disorder.
Jpn J Psychiatry Neurol 1988 Dec;42(4):777-83 (25 ref.)
We present here the clinical cases of identical twins with Graves' disease associated with various mental disorders. They showed restlessness, hyperexcitability, emotional instability, anxiety, depressive state, obsessive-compulsive manifestations, and delusions of persecution and reference. In the case of twin A, the psychiatric symptoms and Graves' disease were in parallel with their clinical course, and his psychiatric symptoms disappeared after a subtotal thyroidectomy. In the case of twin B, however, the psychiatric symptoms had almost disappeared during the period of hypothyroidism for two months after a subtotal thyroidectomy, but the symptoms recurred in spite of the data of euthyroidism in blood examinations after that period of time. It was suggested that the psychiatric symptoms of twin B were due to the euthyroid Graves' disease. The close resemblance of the psychiatric symptoms in both twin A and B might be based on the same genetic disposition due to their being identical twins.

Molenaar PC see **Boomsma DI**

Molenaar PC see **Dolan CV**

Moore A see **Szajnberg NM**

Moss C: Genetic control of sebum excretion and acne--a twin study [letter] Br J Dermatol 1989 Jul; 121(1):144-5

Muraskas J see **Husain AN**

Murphy M, Botting B: Twinning rates and social class in Great Britain. Arch Dis Child 1989 Feb; 64(2):272-4
We examined like and unlike sex twinning rates in Great Britain by social class over the period 1974-85. Although twinning rates are believed to have changed over that period, we found no evidence of differential change by social class, suggesting that any factors affecting twinning are widespread in the population.

N

Nageotte MP, Hurwitz SR, Kaupke CJ, Vaziri ND, Pandian MR: Atriopeptin in the twin transfusion syndrome. Obstet Gynecol 1989 May;73(5 Pt 2):867-70
Atriopeptin, a peptide produced by mammalian atria that promotes diuresis, natriuresis, and vascular changes, was in much higher concentration in the recipient twin than in the donor in two cases of severe twin transfusion syndrome. This finding suggests a possible etiology for the changes seen in twin transfusion syndrome.

Nageotte MP see **Gocke SE**

Naglie RA see **Bozynski ME**

Nagoshi CT, Wilson JR: Long-term repeatability of human alcohol metabolism, sensitivity and acute tolerance. J Stud Alcohol 1989 Mar;50(2):162-9
Thirty-eight subjects in the Colorado Alcohol Research on Twins and Adoptees (CARTA) were brought back between 3 and 39 months after their initial testing to be retested on a shortened version of the standard CARTA procedures. As before, subjects were given a dose of ethanol (0.8 g/kg) calculated to bring their blood alcohol level (BAL) to near 100 mg/dl, but no topping doses were administered in the retests to maintain BALs near peak for 3 hours, as was done previously. Repeatability (test-retest correlation) for alcohol clearance rate was near zero, repeatability for time to peak BAL was 0.36 and that for peak BAL was 0.50. Repeatabilities of prealcohol baseline scores were generally high (median 0.55) for the shortened battery of physiological, motor coordination, perceptual speed and reaction time measures. Repeatabilities were near zero for sensitivity scores (median 0.02) and were low for acute tolerance scores (median 0.10) and perceived intoxication (median 0.27). These findings are highly consistent with an earlier report on repeatabilities of responses to alcohol over a 1-month time interval.

Nakamura K see **Hisano K**

Nance WE, Neale MC: Partitioned twin analysis: a power study. Behav Genet 1989 Jan;19(1):143-50
Individual differences in the human genome may

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now be measured with molecular genetic techniques. Therefore, dizygotic (DZ) twins may be classified as sharing two, one, or zero "genes" identical by descent for any measured polymorphism. As a result, we may partition genetic variation into two sources: (i) genotypes at and closely linked to particular marker loci identified with restriction fragment length polymorphisms (RFLPs) and (ii) other genetic variation. The power of the classical twin study to reject false models lacking either a marker effect or a residual genetic effect is explored. Additivity of genetic effects at or near the locus and of the residual genetic variation as well as random environmental variation are assumed. Results indicate that statistical rejection of models could be achieved with sample sizes which are within the range of several current twin registers. A design including monozygotic (MZ) twins is compared with one consisting of only DZ twins. MZ twins add considerable power for the detection of residual genetic variation but provide no information to resolve genetic marker effects.

Navazesh M see **Malamud D**

Neale MC, Stevenson J: Rater bias in the EASI temperament scales: a twin study [published erratum appears in J Pers Soc Psychol 1989 May;56(5):845] J Pers Soc Psychol 1989 Mar;56(3):446–55

Under trait theory, ratings may be modeled as a function of the temperament of the child and the bias of the rater. Two linear structural equation models are described, one for mutual self- and partner ratings, and one for multiple ratings of related individuals. Application of the first model to EASI temperament data collected from spouses rating each other shows moderate agreement between raters and little rating bias. Spouse pairs agree moderately when rating their twin children, but there is significantly rater bias, with greater bias for monozygotic than for dizygotic twins. MLE's of heritability are approximately .5 for all temperament scales with no common environmental variance. Results are discussed with reference to trait validity, the person-situation debate, halo effects, and stereotyping. Questionnaire development using ratings on family members permits increased rater agreement and reduced rater bias.

Neale MC, Martin NG: The effects of age, sex, and genotype on self-report drunkenness following a challenge dose of alcohol. Behav Genet 1989 Jan; 19(1):63–78

Age is a potential source of variation that contributes to differences between, but not within, twin pairs. In most genetic analyses of twin data, linear and other functions of age are usually removed prior to model fitting. This correction is typically applied only within twin groups of the same sex and zygosity, and no heterogeneity test of age regressions is performed. Here we include age as a variable in the model-fitting procedure and allow for tests of heterogeneity of age regressions across sex and zygosity groups. The LISREL formulation of the approach is illustrated with data collected from Australian twins on subjective impressions of drunkenness following alcohol consumption. The results indicate significant negative covariation of impressions of drunkenness with age. The data support a simple model of additive genetic and unique environmental variation. No evidence was found for sex differences in genetic or environmental components of variation.

Neale MC, Heath AC, Hewitt JK, Eaves LJ, Fulker DW: Fitting genetic models with LISREL: hypothesis testing. Behav Genet 1989 Jan; 19(1):37–49

A brief introduction to the mathematical theory involved in model fitting is provided. The properties of maximum-likelihood estimates are described, and their advantages in fitting structural models are given. Identification of models is considered. Standard errors of parameter estimates are compared with the use of likelihood-ratio (L-R) statistics. For structural modeling, L-R tests are invariant to parameter transformation and give robust tests of significance. Some guidelines for fitting models to data collected from twins are given, with discussion of the relative merits of parsimony and data description.

Neale MC see **Heath AC**

Neale MC see **Nance WE**

Neale MC see **Vlietinck R**

Nenna AD see **Nores JM**

Nesselroade JR see **Pedersen NL**

Neuman R see **Eisen S**

Newman B see **Selby JV**

Newman RB, Hamer C, Miller MC: Outpatient triplet management: a contemporary review. Am J Obstet Gynecol 1989 Sep;161(3):547–53; discussion 553–5

The antepartum management of 198 women who were delivered of triplets between 1985 and 1988 is reviewed. Women were managed with the assistance of ambulatory perinatal nursing to provide outpatient surveillance. Modified bed rest, prophylactic tocolysis, and betamethasone were liberally used and patients were hospitalized only when obstetrically indicated. The most common antepartum complication was preterm labor (66.2%) and the success of therapy with tocolytic agents is described. The mean gestational age and birth weight at delivery were 33.6 +/- 3 weeks (mean +/- SD) and 1871 +/- 555 gm, respectively. Comparison of the gestational age distribution at delivery with previous reviews demonstrates fewer deliveries less than 29 weeks' gestation and significantly more deliveries between 32 and 37 weeks' gestation. Cesarean delivery occurred in 94% of the triplets, which eliminated birth order as a factor that affects survival. The corrected perinatal survival rate was 95% in this contemporary review of outpatient triplet management and represents a major improvement in the expected outcome for triplets.

Newman TB, Browner WS: Use of the correlation of liability in twins and siblings in the study of birth defects. Teratology 1988 Oct;38(4):303–11

The epidemiologic approach to determining the etiology of disease involves identification of potential risk factors and then comparison of disease incidence among people with varying levels of exposure to the potential risk factors. This paper defines risk factors which correspond to different levels of genetic and environmental proximity to index cases of birth defects. Genetic proximity is estimated by the coefficient of relationship (R): 0.5 for siblings and dizygotic twins and 1.0 for monozygotic twins. Environmental proximity is measured by a combination of two variables: one variable for those potentially preventable risk factors common to siblings (S) and another for those common only to twins (T). Discordance in identical twins is attributed to a third type of environmental factors (U) that are unshared by twins and include random (stochastic) factors. The association between these risk factors and birth defects is estimated by using a linear model of the correlation of liability for different relatives. The coefficients derived from the model reflect the relative importance of genetic and

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different types of environmental risk factors as causes for the defects and can be used to identify birth defects most likely to be caused by measurable and possibly preventable risk factors. These defects could then be assigned high priority for future studies and preventive efforts.

Ng SC see **Wong PC**

Nielsen F: Transient neonatal diabetes mellitus in a pair of twins. Acta Paediatr Scand 1989 May; 78(3):469–72
The occurrence of transient neonatal diabetes mellitus in male twins with almost identical courses of illness is reported. A trial with chlorpropamide treatment of twin A had no obvious influence on the insulin consumption or on duration of treatment. Very low values of plasma C-peptide and serum proinsulin with no detectable insulin antibodies supports the theory of delayed maturation of the beta-cell.

Nores JM, Dalayeun J, Chebat J, Dieudonne P, Nenna AD: Concurrent anaplastic bronchial cancer in identical twin brothers. Respiration 1989;55(1):56–9
After having observed homozygotic identical twin brothers who simultaneously suffered from anaplastic bronchial cancer which rapidly led to death in both cases, the authors assess the frequency of such cases. Review of the available literature failed to produce identical observations, although 4 cases of twins suffering from bronchial cancer with differing histologies (3 epidermoidal and 1 bronchiolar-alveolar) were noted. Statistics show that in the area where the observed twins were living, anaplastic cancer occurs each year in 0.39 of 53-year-old men. The cases of these twins therefore support the notion of the role of genetic factors in the determination of bronchial cancer.

Nunziata L see **Fiorillo A**

O

Okada M see **Hisano K**

Oldham KT see **Lobe TE**

Olmos P, A'Hern R, Heaton DA, Millward BA, Risley D, Pyke DA, Leslie RD: The significance of the concordance rate for type 1 (insulin-dependent) diabetes in identical twins. Diabetologia 1988 Oct; 31(10):747–50
We studied prospectively 49 non-diabetic identical twins of recently-diagnosed Type 1 (insulin-dependent) diabetic patients for up to 24 years (median 9 years). During this time 15 developed Type 1 diabetes. Actuarial analysis indicates that by 12 years 34% of the twins will have developed Type 1 diabetes and that thereafter only another 2% will do so. Inevitable bias in ascertainment of the twins makes it likely that the true figure is less. We conclude that factors which are not genetically determined must be important in the pathogenesis of the disease. The rates of developing Type 1 diabetes in the co-twins declines sharply in the years after diagnosis of the index twin, which suggests that the initiation of the process leading to Type 1 diabetes occurs within a finite, and not a prolonged, period.

Ophoven J see **Velasco AL**

Oppenheim JS, Skerry JE, Tramo MJ, Gazzaniga MS: Magnetic resonance imaging morphology of the corpus callosum in monozygotic twins.
Ann Neurol 1989 Jul;26(1):100–4
Recent reports describe wide variations in the size and shape of the human corpus callosum. To investigate genetic influences on this variability, magnetic resonance images from 5 pairs of monozygotic twins and 10 unrelated control subjects were analyzed. Measurements of size and shape revealed greater similarity in twin pairs than in randomly paired controls. The results are consistent with the view that the anatomy of the corpus callosum, while clearly influenced by nongenetic factors, is under considerable genetic control.

Orioli IM see **Castilla EE**

Orlebeke JF see **Boomsma DI**

Ouimet A, Russo P: Fetus in fetu or not?
J Pediatr Surg 1989 Sep;24(9):926–7
A case of sacrococcygeal teratoma is presented with characteristics of fetus in fetu. The clinical implications of teratomatous tissue in an inguinal node are presented.

P

Paltiely J see **Degani S**

Pandian MR see **Nageotte MP**

Pate BD see **Clark C**

Patel I see **Young ID**

Patil S see **Ionasescu VV**

Paz JE see **Castilla EE**

Pearl W: Regression of endocardial fibroelastosis [letter] Am Heart J 1989 Jun;117(6):1401

Pedersen NL, Gatz M, Plomin R, Nesselroade JR, McClearn GE: Individual differences in locus of control during the second half of the life span for identical and fraternal twins reared apart and reared together. J Gerontol 1989 Jul;44(4):P100–5
The relative influences of genetic and environmental factors for components of locus of control (LOC) were examined in the Swedish Adoption/Twin Study of Aging. The sample consisted of 84 pairs of monozygotic twins separated at an early age and reared apart, 173 pairs of dizygotic twins reared apart, 129 monozygotic pairs reared together, and 168 dizygotic pairs reared together. At the time of data collection, 72% were over 50 years of age. Three LOC components were measured in a mailed questionnaire: sense of personal control or lack of control over the direction of one's own life (Life Direction), beliefs about how responsible people are for misfortunes in their lives (Responsibility), and beliefs concerning the role of luck in determining people's outcomes (Luck). Model-fitting results indicated that genetic influences were of importance for Life Direction and Responsibility, accounting for somewhat over 30% of the variance in each component, while environmental influences explained twin similarity for Luck.

Pedersen NL, Lichtenstein P, Plomin R, DeFaire U, McClearn GE, Matthews KA: Genetic and environmental influences for type A-like measures and related traits: a study of twins reared apart and twins reared together. Psychosom Med 1989 Jul-Aug;51(4):428–40
The relative influences of genetic and environmental factors for Type A-like behaviors and related traits were examined in the Swedish Adoption/Twin Study of Aging. The sample consisted of 99 pairs of monozygotic twins separated at an early age and reared apart, 229 pairs of dizygotic twins reared apart, 160 monozygotic pairs reared together, and 212 dizygotic pairs reared together. The average age of the Swedish Adoption/Twin Study of Aging twins at the time of data collection in 1984 was 58.6 (SD 13.6); 72% of the pairs were over 50 years of age and 60% were female. The Framingham Type A Scale, three descriptors of the Type A behavior

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pattern (pressure, hard-driving, and ambitious), and measures of hostility and lack of assertiveness were assessed in a mailout questionnaire. Heritability (the proportion of total variance due to genetic effects) was 27%, 28%, 43%, 37%, 20%, and 12%, respectively, for the six measures. The most conservative test of significance indicated significant genetic influence for all but the hostility and assertiveness scales. Sharing the same rearing environment was generally unimportant for twin similarity in the Type A behaviors later in life; however, 20% of the variation in the hostility and assertiveness measures could be attributed to shared family environment. Evidence for the effects of correlated post-rearing environments was found for hostility. Approximately 60% of the variation in each of the measures can be attributed to non-shared environmental experiences unique to the individual.

Pederson AL, Worthington-Roberts B, Hickok DE: Weight gain patterns during twin gestation. J Am Diet Assoc 1989 May;89(5):642-6
Few data are available about desirable weight gain during twin gestation. The present study addresses this issue through retrospective evaluation of 217 women pregnant with twins who delivered at Swedish Hospital Medical Center, Seattle, between 1982 and 1986. The purpose of the study was to identify an optimum total weight gain and an optimum weight gain pattern for normal twin gestation. A mean prenatal weight gain of 20 kg (44 lb) was associated with "optimum" outcome; optimum outcome was defined as a pregnancy lasting at least 37 weeks with the delivery of two living infants weighing greater than or equal to 2,500 gm each with 5-minute Apgar scores greater than or equal to 7. A weight gain curve for twin gestation was generated and compared with the standard curve for singleton pregnancy. While the weight gain curve during twin gestation was similar to the standard curve during the first half of pregnancy, increased weight gain began in the second trimester and continued to term. The weight gain pattern of twin gestations with less-than-optimum outcome paralleled that of the optimum outcome group until about 30 weeks' gestation, at which time weight gain slowed in women in the former group, whose mean total weight gain was 16.8 kg (37 lb).

Peduzzi M see **Torlai F**

Penick GD see **Streit JA**

Peters RK see **Maxey-Conley JE**

Pfeiffer RA, Becker V: Comments on Schwaibold's "Sirenomelia and Anencephaly in One of Dizygotic Twins" [letter] Teratology 1988 Nov;38(5):497-8

Pham Dinh T see **Shea SA**

Phelan JP see **Strong TH Jr**

Philippe P: Selection intensities in mothers of twins and in mothers of singletons. Soc Biol 1988 Fall-Winter;35(3-4):285-92

Plaeger-Marshall S, Lewis K, Sullivan-Bolyai J, Bryson YJ: Immunologic assessment of neonatal herpes simplex virus infection in one dizygotic twin. Pediatr Infect Dis J 1989 Mar;8(3):171-5

Plomin R, Loehlin JC: Direct and indirect IQ heritability estimates: a puzzle. Behav Genet 1989 May;19(3):331-42 (26 ref.)
Direct estimates of IQ heritability based on a single family relationship such as adopted-apart relatives are often 50% greater than indirect estimates that rely on differences in correlations such as the classical twin method or nonadoptive-adoptive comparisons. Factors such as nonadditive genetic variance, assortative mating, selective placement, measurement error, age differences, and genotype-environment correlation and interaction do not obviously explain the difference between direct and indirect IQ heritability estimates. Because direct estimates are derived from separated individuals and indirect estimates are derived from individuals reared together in families, some aspect of the within-family environment seems a likely candidate but its exact nature remains to be understood.

Plomin R see **Pedersen NL**

Priest JR see **Velasco AL**

Prieur M see **Massaad L**

Pyke DA: Development of diabetes in identical twins. Adv Exp Med Biol 1988;246:255-8

Pyke DA see **Johnston C**

Pyke DA see **Olmos P**

Q

Quesenberry CP Jr see **Selby JV**

R

Rajadurai VS, Matthai J, Jadhav MA: Omphalopagus twins and twin transfusion syndrome. Indian J Pediatr 1988 Sep-Oct;55(5):811-6

Ramos-Arroyo MA, Ulbright TM, Yu PL, Christian JC: Twin study: relationship between birth weight, zygosity, placentation, and pathologic placental changes. Acta Genet Med Gemellol (Roma) 1988; 37(3-4):229-38
We examined the placentas of 182 like-sexed live-born twins: 73 placentas (40.1%) were monochorionic and 109 (59.9%) were dichorionic. All twin pairs with monochorionic placentas were monozygotic (MZ), but 28.9% of pairs with dichorionic placentas were MZ. Analysis of birth weights demonstrated that dichorionic and dizygotic (DZ) twins were heaviest, and suggested that the chorion status is a more important determinant of birth weight than zygosity. Vascular anastomoses were identified only in monochorionic placentas and occurred in 79.5% of cases. All placentas with deep anastomoses had superficial anastomoses. A higher proportion of velamentous and marginal insertions of the umbilical cord in monochorionic placentas (27.4%) compared to dichorionic placentas (13.8%) supports the belief that lateral placental growth is greatest in twin gestations in which the embryos are initially most closely apposed--The theory of trophotropism.

Rao NA see **Bittles AH**

Rapini RP see **Bowden JB**

Räsänen J see **Kirkinen P**

Ratnam SS see **Wong PC**

Reid B see **Singal DP**

Rennert OM see **Hitch DC**

Rice J see **Eisen S**

Richards DS, Cruz AC, Dowdy KA: Prenatal diagnosis of fetal liver calcifications. J Ultrasound Med 1988 Dec;7(12):691-4

Richardson CJ see **Lobe TE**

Richardson RJ, Applebaum H, Taber P, Woolley MM, Chwals WJ, Warden MJ, Dietrich R: Use of magnetic resonance imaging in planning the separation of omphalopagus conjoined twins. J Pediatr Surg 1989 Jul;24(7):683-4; discussion 684-5
Magnetic resonance imaging (MRI) was used for the first time in the preoperative planning for separation of conjoined twins. In these omphalopagus infants, MRI showed normal biliary and cardiovascular structures and demonstrated, in detail, a relatively

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avascular plane through the liver bridge, which enabled safe separation with minimal blood loss at 3 1/2 months of age. A single MRI study supplied information superior to that obtained with multiple previously available imaging studies. MRI should be an essential part of the preoperative workup of all types of conjoined twins.

Riese ML: Temperament and neonatal risk in full-term and preterm combined vaginal/cesarean section twin pairs. Acta Genet Med Gemellol (Roma) 1988; 37(3-4):239-48
Ten pairs of full-term and 8 pairs of preterm twins from combined vaginal and Cesarean section deliveries were evaluated on measures of neonatal temperament, developmental status, and integrity to determine if the Cesarean-delivered infant was compromised relative to its vaginally-delivered twin. There were no significant differences, within groups, between the vaginal and Cesarean section infants on measures of risk and developmental status. Analyses of variance of paired comparisons performed on the temperament measures indicated that, for the full-term group, there were no significant differences in ratings between vaginally and Cesarean-delivered infants. In contrast, preterm infants delivered by Cesarean section were more active during sleep than their vaginally-delivered cotwins. This finding, together with previous findings demonstrating a relation between this measure and temperament at 9, 18, and 24 months of age, suggested that the preterm Cesarean-delivered infant may be at risk in this area when compared with its twin. In the main, however, the results demonstrated that infants born by Cesarean section following vaginal delivery of their twins were not more compromised than their twin siblings.

Risley D see **Olmos P**

Roberton NR see **McCrossin DB**

Robin M, Josse D, Tourrette C: Mother-twin interaction during early childhood.
Acta Genet Med Gemellol (Roma) 1988;37(2):151-9
The components of a research program focusing on early mother-twin interaction is described. Preliminary data obtained from a questionnaire at two months post term, cross-sectional observations at the age of one year, a follow-up study involving home observation and parental interviews from birth to the age of 3, point to the specificity of this triadic situation. During the first months of life, the burden of material tasks and the increase in baby care leave little time for starting a relationship based on pleasure or play. The impossibility of responding simultaneously to the needs of two babies and the difficulty of forming relationships on an individual basis foster early concerns for egalitarianism. The degree of physical resemblance between the babies creates the problem of differentiating them. To tell twins apart, mothers rapidly tend to rely on behavioral characteristics to which they attribute a genetic basis. In contrast, differences in development between the babies that introduce the eventuality of the dominance of one of the twins are often denied. In this highly specific situation, mothers arrive at personal solutions of adjustment over the first 3 years, manifest in a certain number of psychological and educational attitudes. Analysis of these maternal attitudes may help to shed light on some of the features of later psychoemotional development in twins.

Robinette D see **Fabsitz RR**

Rosenfeld T see **Antonelli D**

Rosner J, Aker JS, Rosner J: Similarities and differences in a set of 7-year-old triplets, two of whom are monozygotic.
Am J Optom Physiol Opt 1988 Nov;65(11):890-2
This paper describes three sisters, triplets, age 7 years, 2 months, two of whom derive from a single ovum, the third from a second ovum. As such, they provide an opportunity to examine the relative impact of heredity on certain of their physical, developed, and acquired abilities and characteristics. In addition to a comparison of such physical traits as height, weight, refractive status, axial length, and so on, certain (developed) sensory-motor and (acquired) cognitive and language measures are reported, such as binocular status, visual and auditory analysis skills, intelligence quotient, and (expressive and receptive) language abilities. Because all three children have lived in (more or less) the same pre- and post-natal environment, we assume that whatever concordance the monozygotic (MZ) pair displays that is not shared by their dizygotic (DZ) sister is attributable to heredity. (It does not necessarily follow, however, that any discordance between the two MZ sisters or any concordance between one of them and their DZ sister is attributable to environment.

Rosner J see **Rosner J**

Roy-Burman P see **Kumar D**

Rubin MG see **Greenbaum SS**

Russo P see **Ouimet A**

S

Sakala EP, Scott TM, Arora V: Antenatal diagnosis of cephalothoracopagus twins in a triplet pregnancy. A case report. J Reprod Med 1989 May;34(5):365-8 (22 ref.)
The occurrence of conjoined twins in a triplet pregnancy is rare. Cephalothoracopagus twins were diagnosed on ultrasonography at 17 weeks' gestation. This is the first case of conjoined twins in a triplet pregnancy diagnosed early enough antenatally to allow vaginal pregnancy termination.

Sala MA, Matheus M: Placental characteristics in twin transfusion syndrome. Arch Gynecol Obstet 1989; 246(1):51-6
The authors describe the histological features of the placenta in a typical case of twin-to-twin transfusion, with particular attention focused on the stereologic aspects. Villi from the anemic placental portion were slightly edematous, with small and inconspicuous vessels. The stereologic characteristics of this portion were nearer values of normal placentas. The plethoric region appears as a postmature organ, with a very thin trophoblast layer and numerous vasculo-syncytial membranes. The most dramatic alterations of this region were mainly related to the foetal capillary. According to the stereologic results, the consecutive circulatory alterations would facilitate the maternal-fetal exchanges in the plethoric placental territory, thus justifying the greater development of this twin.

Salzano FM see **Schmidt M**

Sánchez O see **Castilla EE**

Sandbank AC: The effect of twins on family relationships. Acta Genet Med Gemellol (Roma) 1988;37(2):161-71
The results of the Bene Anthony Family Relations Test on 53 pairs of twins and 30 older siblings, as well as an analysis of personality inventories from their parents, are presented. It is shown that weight and birth order can affect not only personality and the way in which twins interact with each other,

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but can also affect family interaction. Particular attention has been given to the effect on and of the preceding sibling.

Sarale DC see **Hitch DC**

Sarno AP Jr see **Strong TH Jr**

Sawers RS see **Tang L**

Saxby P see **Thompson C**

Schleissner LA see **Schoettler JJ**

Schmidt M, Salzano FM: New case of an EEC-like syndrome in twins.
Acta Genet Med Gemellol (Roma) 1988; 37(3-4):347-50
A patient wrongly referred as a possible victim of thalidomide showed the three classical cardinal features of the EEC syndrome, plus severe mental retardation, an unusual finding in this condition. His twin brother was similarly affected, and died at four months of age due to complications caused by the malformations. Their normal parents were first cousins. The concordance of the manifestation in the twins and the parents' consanguinity suggest that they had the recessive form of the EEC syndrome.

Schmidt-Gollwitzer K see **Wessel J**

Schnatterly PT, Hogge WA: Alpha fetoprotein and acetylcholinesterase levels in twins discordant for neural tube defects: dependence on type of fetal membranes [letter] Am J Med Genet 1989 Jan; 32(1):146-7

Schoettler JJ, Schleissner LA, Heiner DC: Familial IgE deficiency associated with sinopulmonary disease. Chest 1989 Sep;96(3):516-21
Three generations of relatives of 58-year-old nonidentical twins with chronic bronchitis and fibrotic lung disease were evaluated. Sera of 23 family members, 14 with a history of excessive sinopulmonary infections, were examined for deficiencies of immunoglobulin classes, IgG subclasses, and specific antibody to tetanus toxoid and Hemophilus influenzae type b. Of 14 symptomatic family members, 12 had serum IgE concentrations less than 5 IU/ml. Four had values less than 1 IU/ml. Serum IgE was greater than 10 IU/ml in all nine asymptomatic individuals. Inheritance of low IgE appeared to be autosomal dominant, with variable penetrance. IgA was low normal (70-90 mg/dl) in three individuals. Two of these were IgE deficient. One symptomatic child had unmeasurable IgG2 (less than 10 mg/dl) and IgE (less than 0.5 IU/ml). This kindred demonstrates that IgE deficiency can be familial, and associated with sinopulmonary disease.

Scippa L see **Fiorillo A**

Scott TM see **Sakala EP**

Searby CC see **Ionasescu VV**

Sedman AB see **Bozynski ME**

Seely L see **Tharapel AT**

Segal NL: Origins and implications of handedness and relative birth weight for IQ in monozygotic twin pairs. Neuropsychologia 1989;27(4):549-61
The implications of left-handedness for intellectual functioning in monozygotic (MZ) twinships remain unresolved. Two proposed explanations of hand-discordance in MZ twin pairs, elevated birth stress and delayed zygotic splitting, were used to generate hypotheses and predictions concerning IQ, both within and between twin pairs. A comparison of Full Scale IQ, Verbal IQ and Performance IQ scores for MZ twin children, from 67 twin pairs, organized according to concordance or discordance for handedness and relative birth weight, is presented. The results support the hypothesis that left-handedness in lower birth weight MZ co-twins may be associated with pre-natal pathological events, while left-handedness in higher birth weight left-handed MZ co-twins may be associated with delayed zygotic splitting and disrupted asymmetry determination. Birth weight status within MZ twin pairs may predict a lower IQ for the lower birth weight twin only when lower birth weight co-occurs with left-handedness. Pre-natal insult similarly reduced Verbal IQ, but not Performance IQ, within these particular twinships.

Selby JV, Newman B, Quesenberry CP Jr, Fabsitz RR, King MC, Meaney FJ: Evidence of genetic influence on central body fat in middle-aged twins.
Hum Biol 1989 Apr;61(2):179-94
The heritability of centrally and peripherally deposited subcutaneous body fat, as measured by thickness of subscapular and triceps skinfolds respectively, was examined in 173 monozygotic and 178 dizygotic pairs of white male twins, ages 54 to 65 years, who participated in the second examination of the National Heart, Lung, and Blood Institute's Twin Study. The heritability of two indices of body fat distribution (subscapular/triceps ratio and subscapular-triceps difference) and two indices of overall obesity (body mass index and sum of skinfolds) were also assessed. Evidence for a genetic influence on central deposition of body fat was suggested in that the classical estimate of heritability for subscapular skinfold thickness was 0.77 (p less than 0.0001). After adjusting subscapular skinfold for the overall level of obesity, heritability was reduced but remained highly significant (0.40, $p = 0.003$). Heritability estimates for triceps skinfold thickness and for the two fat distribution indices were substantially lower and were not statistically significant after adjustment for overall obesity. High classical estimates of heritability were also observed for both measures of overall obesity: 0.70 for BMI and 0.73 for sum of skinfolds. However, these two estimates were biased upward because of lower total variances among monozygotic compared to dizygotic twins in this sample. The more conservative and unbiased among-component estimates also suggested substantial heritability for each measure (0.35, $p = 0.08$ and 0.53, $p = 0.01$, respectively). The heritability of overall obesity emphasizes the importance of adjusting measures of fat distribution for overall obesity before assessing its heritability.

Shah B see **Kraut JR**

Shah YG see **Sherer DM**

Shalev E, Issacov D, Weiner E, Feldman E, Zuckerman H: Ultrasound-guided selective feticide of hydrocephalic fetus in triplet pregnancy. JCU 1988 Jan;16(1):41-3

Shapiro I see **Degani S**

Sharf M see **Degani S**

Shea SA, Benchetrit G, Pham Dinh T, Hamilton RD, Guz A: The breathing patterns of identical twins. Respir Physiol 1989 Feb;75(2):211-23
The resting breathing patterns of healthy adult identical twins were compared to see if there was any possible genetic component in the determination of this pattern. From breath-by-breath analysis of airflow, measured with a pneumotachometer (9 pairs of twins), the pattern of breathing was quantified in terms of individual respiratory variables; inspiratory time (TI), expiratory time (TE), total breath duration (TTOT), VT/TI, TI/TTOT, and by taking TI, TE and VT all together (TRIAD). Also, the airflow shape was quantified by harmonic analysis (ASTER). A second study was performed under more strictly defined conditions of rest and where the respiratory variables were estimated with

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respiratory inductance plethysmography to eliminate the possible effect of a facemask (5 pairs of twins). In each study, for each variable, the differences within twin-pairs were compared to the differences within random-pairs from the same subject population. In both studies, there were highly significant similarities within twin-pairs in the pattern of breathing, being best demonstrated when the entire 'shape' of the pneumotachogram (ASTER) or the spirogram (TRIAD) was considered.

Sherer DM, Armstrong B, Shah YG, Metlay LA, Woods JR Jr: Prenatal sonographic diagnosis, Doppler velocimetric umbilical cord studies, and subsequent management of an acardiac twin pregnancy. Obstet Gynecol 1989 Sep;74(3 Pt 2):472-5
Sonographic prenatal diagnosis and management of a twin pregnancy complicated by acardius anceps of one twin and acute polyhydramnios is presented. To our knowledge, this is the first case of an acardiac twin gestation in which Doppler umbilical arterial velocimetric studies were obtained. These studies, performed at 29 weeks' gestation, demonstrated markedly different umbilical artery systolic to end-diastolic (S/D) ratios in the twins. This difference is explained by the vascular resistance reflected in the umbilical artery S/D ratios obtained on each twin. The healthy twin's S/D ratio represented the vascular resistance of the placenta and the perfused acardiac twin. Because of the reversed direction of blood flow in the acardiac twin's umbilical artery, this S/D ratio represented the vascular resistance of the acardiac twin. Planned preterm delivery resulted in survival of the healthy normal twin.

Shiraishi H see **Mizukami K**

Shulman LP see **Tharapel AT**

Simon NV see **Stefos T**

Simpson JL see **Tharapel AT**

Sims KB see **Barlow JK**

Singal DP, D'Souza M, Reid B, Kassam Y, Buchanan WW, Blajchman MA: Molecular analysis of the HLA-D region and the T-cell antigen receptor beta-chain genes in monozygotic twins discordant for rheumatoid arthritis. Transplant Proc 1989 Feb; 21(1 Pt 1):632-4

Skerry JE see **Oppenheim JS**

Sklar A see **Divon MY**

Skrinjaric J see **Szajnberg NM**

Smith EI see **Hitch DC**

Smith SJ see **Kingsland CR**

Steffenburg S, Gillberg C, Hellgren L, Andersson L, Gillberg IC, Jakobsson G, Bohman M: A twin study of autism in Denmark, Finland, Iceland, Norway and Sweden. J Child Psychol Psychiatry 1989 May; 30(3):405-16
The Nordic countries were screened for the occurrence of cases of autism with a same-sexed twin under age 25 years. Twenty-one pairs (11 monozygotic and 10 dizygotic) of twins and one set of identical triplets were found and extensively examined. The concordance for autism by pair was 91% in the monoygotic and 0% in the dizygotic pairs. The corresponding concordances for cognitive disorder were 91% and 30%, respectively. In most of the pairs discordant for autism, the autistic twin had more perinatal stress. The results lend support for the notion that autism sometimes has a hereditary component and that perinatal stress is involved in some cases.

Steffenburg S see **Wahlström J**

Stefos T, Deter RL, Hill RM, Simon NV: Individual growth curve standards in twins: prediction of third-trimester growth and birth characteristics. Am J Obstet Gynecol 1989 Jul;161(1):179-83
The ability of Rossavik growth models, determined from measurements obtained before 24 weeks, to predict third-trimester growth and birth characteristics in normally growing twins has been investigated. Third-trimester values for head circumference, abdominal circumference, and femur diaphysis length were predicted with an accuracy of +/- 6% to 9% (95% to 98% of percent deviations). For thigh circumference and estimated weight, the comparable values were +/- 15% and +/- 16%, respectively. The head circumference at birth was predicted without bias; the random error was approximately +/- 5% (94% of percent differences). Weight, abdominal circumference, and thigh circumference were systematically overestimated (3.1%, 14.9%, and 11.3%, respectively) as a result of differences in prenatal and postnatal measurement procedures. After correction for systematic errors, these parameters could be predicted with random errors of -11.5% to 7.2% (weight), -12.8% to 5.4% (abdominal circumference), and -15.3% to 10.0% (thigh circumference). Growth Potential Realization Index values were found to have means of approximately 100% and ranges from 91% to 118%. These results are similar to those for singletons and indicate that individual assessment of growth in twins can be carried out with the same methods used for singletons.

Stevenson J see **Neale MC**

Storer J see **Lawrence N**

Streit JA, Penick GD, Williamson RA, Weiner CP, Benda JA: Prolonged elevation of alphafetoprotein and detectable acetylcholinesterase after death of an anomalous twin fetus. Prenat Diagn 1989 Jan; 9(1):1-6
Persistence of elevated alphafetoprotein (AFP) levels and the presence of an acetylcholinesterase (AChE) band in amniotic fluid have been reported to occur up to 11 weeks following intrauterine fetal demise (IUFD) of one twin (Bass et al., 1986). We now report a case where such prolongation of these findings was observed in a case of unrecognized monochorionic, monoamniotic twinning, in which case cord entanglement resulted in IUFD at an estimated 10-12 weeks and 25-26 weeks. The fetus suffering early demise (Fetus B) had multiple congenital anomalies, including a neural tube defect. The presence of this defect and/or fetal demise and bleeding into the amniotic sac is entertained as continuing sources of documented elevated AChE and AFP 9-11 weeks after the initial fetal death. We re-emphasize the possibility of unrecognized twinning as a cause of abnormal maternal serum and amniotic fluid study results in the face of one apparently normal fetus.

Stringham JD see **Meikle AW**

Strong TH Jr, Phelan JP, Ahn MO, Sarno AP Jr: Vaginal birth after cesarean delivery in the twin gestation. Am J Obstet Gynecol 1989 Jul; 161(1):29-32
The pregnancy outcomes of 56 women with a twin gestation and a prior cesarean birth were analyzed to determine whether a trial of labor was a reasonable consideration. Of these patients, 31 (55%) underwent an elective repeat cesarean delivery and 25 (45%) attempted vaginal delivery. Of those who attempted vaginal delivery, 18 (72%) were vaginally delivered of both infants. The dehiscence rate among women with twin pregnancies who attempted a trial of labor was 4% compared with 2% in women with singleton pregnancies. There were no significant

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differences in maternal or neonatal morbidity or mortality rates in trial of labor versus no trial of labor groups. We conclude in this limited population that a trial of labor in a twin gestation after a previous cesarean delivery appears to be a reasonable consideration. The usual safeguards for attempted vaginal delivery in the twin gestation should be followed.

Strong TH Jr, Brar HS: Placenta previa in twin gestations. J Reprod Med 1989 Jun;34(6):415–6
The incidence of placenta previa in twin gestations was compared to that found in singleton pregnancies over a ten-year period. During this period, eight placenta previas occurred in 1,464 twin pregnancies, for an incidence of 0.55%, which was significantly higher (P less than .05) than the incidence of 0.31% in singleton pregnancies (458 placenta previas in 148,197 singleton pregnancies). We conclude that a twin gestation confers an added risk of placenta previa.

Sullivan-Bolyai J see **Plaeger-Marshall S**

Sunami K, Hayashi N, Endo S: A twin study of febrile convulsions in the general population.
Jpn J Psychiatry Neurol 1988 Sep;42(3):549–51
Seven monozygotic (MZ) and six dizygotic (DZ) twin pairs with febrile convulsions (FC) in the general population were studied. The pairwise concordance rate for FC in MZ 85.7% (6/7) was higher than that in DZ 16.7% (1/6). In a discordant MZ pair, the unaffected co-twin was attacked by epileptic seizures later. Between the concordant DZ twins, the clinical symptoms and EEGs differed in quality. According to the ratio of concordance rate in MZ to that in DZ 5.1, a multifactorial mode of inheritance for FC was suspected.

Szajnberg NM, Skrinjaric J, Moore A: Affect attunement, attachment, temperament, and zygosity: a twin study.
J Am Acad Child Adolesc Psychiatry 1989 Mar; 28(2):249–53
A twin study examines the relationship of affect attunement to four factors of development: zygosity, temperament, attachment, and twin preference. Affect attunement occurs when an infant expresses affect and a mother responds cross-modally, matching duration, intensity, and rhythm. A sample of 16, same sex, healthy twins (8 MZ, 8 DZ) and their mothers were recruited at 10 to 12 months of age. Monozygous twins attuned at more similar rates than dizygous twins. There was no relationship between attunement, attachment, and temperament, nor between affect signal rate and attunement. Five of eight mothers expressed a twin preference. Eleven of the 16 infants were classified securely attached. Affect attunement is discussed as a measure of the complementarity between an infant's affect signaling rate and a mother's contingent responsiveness.

T

Taber P see **Richardson RJ**

Tang L, Sawers RS: Twin pregnancy in premature ovarian failure after estrogen treatment: a case report. Am J Obstet Gynecol 1989 Jul;161(1):172–3
Spontaneous or pharmacologically induced reactivation of follicular development in patients with premature ovarian failure may occasionally result in successful singleton pregnancy. We report the first case of a dizygotic twin pregnancy after cyclic estrogen-progestin treatment in this condition.

Tennant FP see **Gorczyca DP**

Tharapel AT, Elias S, Shulman LP, Seely L, Emerson DS, Simpson JL: Resorbed co-twin as an explanation for discrepant chorionic villus results: non-mosaic 47,XX,+16 in villi (direct and culture) with normal (46,XX) amniotic fluid and neonatal blood.
Prenat Diagn 1989 Jul;9(7):467–72
Non-mosaic trisomy 16 was observed in chorionic villus cytotrophoblasts (direct) as well as cultured mesenchymal core cells derived from the pregnancy of a 38-year-old woman. Chromosome preparations from amniotic fluid and neonatal cultures (cord blood) were 46,XX. Normal fetal growth as determined by serial ultrasound examinations occurred throughout the pregnancy, which resulted in a healthy 2724 g female. Multiple biopsies taken from the umbilical cord, placental cotyledons, and fetal membranes were 46,XX. However, a placental nodule and three of six cultures initiated from membranes (amnion and chorion) showed 46,XX/47,XX,+16 mosaicism. We propose that the trisomy 16 cells arose from residual villi derived from a trisomic co-twin that never developed. This case further demonstrates that normal fetal growth may presage normal outcome irrespective of cytogenetic findings in cytotrophoblasts (direct) and cultured mesenchymal core cells.

Thavarasah AS, Jayakumar CR: Acephalus acardius cervico-thorachophagus conjoined twin--a case report. Singapore Med J 1988 Oct;29(5):528–9

Thiery M see **Vlietinck R**

Thomalla JV, Mitchell ME, Garett RA: Posterior urethral valves in siblings. Urology 1989 Apr; 33(4):291–4 (14 ref.)
The etiology and incidence of posterior urethral valves is unknown. We report on a pair of non-twin siblings with identical pathology stemming from type I posterior urethral valves as well as discordance in a pair of monozygotic twins. Familial posterior urethral valves have been reported before in both twin and non-twin siblings. The occurrence of identical pathology in non-twin siblings suggests the possibility of an inherited trait as does its occurrence in identical twins. However, non-identical clinical manifestation is as common as is identical presentation in both groups. There are also instances of discordance in monozygotic twins suggesting the possibility of a random mutation. As such, we recommend urologic evaluation of the male siblings of affected patients with posterior urethral valves. Further prospective and retrospective analyses are needed to define the genetic etiology of valves.

Thompson C, Dent J, Saxby P: Effects of thallium poisoning on intellectual function.
Br J Psychiatry 1988 Sep;153:396–9
A student of chemistry was treated for thallium poisoning. Seven months after his ingestion of thallium, intelligence tests were performed on the patient and his non-identical twin brother, who was of similar educational background. These indicated severe deterioration in intellectual function of the patient, particularly in memory and performance abilities. Tests 13 months after ingestion showed little general improvement.

Torlai F, Galassi G, Debbia A, Crisi G, Peduzzi M: Familial pseudotumor cerebri in male heterozygous twins. Eur Neurol 1989;29(2):106–8
Papilledema due to raised intracranial pressure in absence of intracranial mass arose roughly at the same time in 2 male heterozygous twins. The diagnosis of benign intracranial hypertension (BIH) was confirmed by the finding of normal cerebrospinal fluid and high opening pressure. Neurologic examination was normal. In both cases choroidal folds were evident. The relationship

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between BIH and genetic factors is discussed.

Tourrette C see **Robin M**

Towers CV see **Gocke SE**

Townsend RR, Filly RA: Sonography of nonconjoined monoamniotic twin pregnancies.
J Ultrasound Med 1988 Dec;7(12):665–70
Five nonconjoined monoamniotic twin pregnancies were identified prenatally by sonography. In all cases the diagnosis was made when umbilical cords of the two fetuses were seen to be entangled. One monoamniotic twin pregnancy was not recognized prenatally because the cords were not seen to be entangled. Although monoamniotic twins frequently die related to cord knotting, sonographic visualization of cord entanglement does not imply impending demise. Visualization of cord entanglement appears to be specific for the diagnosis of monoamnionicity, but the sensitivity is not known. Prenatal diagnosis allows informed planning of obstetrical monitoring and mode of delivery.

Tramo MJ see **Oppenheim JS**

True W see **Eisen S**

Tyhurst JS see **Clark C**

U

Ulbright TM see **Ramos-Arroyo MA**

V

Van den Berghe H see **Vlietinck R**

van den Bree MB see **Boomsma DI**

Vanderschueren-Lodeweyckx M see **de Zegher F**

van Geldermalsen AA: Combined intrauterine and extrauterine pregnancy in a consistent twin producer. Trop Geogr Med 1989 Apr;41(2):167–8
A case is presented of a simultaneous intra- and extra-uterine pregnancy in a gravida five. The history of persistent twin deliveries assisted in establishing the correct diagnosis when the patient presented with signs of a septic incomplete abortion.

van Loon H see **Vlietinck R**

Vaziri ND see **Nageotte MP**

Velasco AL, Ophoven J, Priest JR, Brennom WS: Paratesticular malignant mesothelioma associated with abdominoscrotal hydrocele. J Pediatr Surg 1988 Nov;23(11):1065–7 (10 ref.)
This is the report of 14-year-old boy with a malignant mesothelioma of the tunica vaginalis contained in an abdominoscrotal hydrocele. A review of the literature shows that this aggressive tumor is very rare and has been reported only in adults.

Vesell ES: Pharmacogenetic perspectives gained from twin and family studies. Pharmacol Ther 1989; 41(3):535–52 (123 ref.)

Vlietinck R, Derom R, Neale MC, Maes H, van Loon H, Derom C, Thiery M: Genetic and environmental variation in the birth weight of twins.
Behav Genet 1989 Jan;19(1):151–61
Two novel approaches to the analysis of twin data are illustrated with data from birth weight in twins. First, two possible covariates of birth weight are fitted to the data simultaneously, allowing for linear effects of these variables, and their correlation. Second, information on chorionicity is used to estimate the effects of chorion type on birth weight. The data were collected from a large sample of twins born in East Flanders, Belgium. Variation and covariation in twins were considered as a function of sex, chorionicity, maternal age, gestational age, and genotype. No evidence for sex differences in causes of variation was found. As expected, the largest source of variation in bith weight was associated with gestational age. Other common environmental influences were non-significant. Heritability was significant, constituting approximately 40% of variation not associated with maternal and gestational age. A small but significant effect of chorionicity was found, such that dichorionic twins show a greater similarity than monochorionic.

Vlietinck R, Derom C, Derom R, Van den Berghe H, Thiery M: The validity of Weinberg's rule in the East Flanders Prospective Twin Survey (EFPTS). Acta Genet Med Gemellol (Roma) 1988; 37(2):137–41
Most population studies of twins estimate the number of monozygotic (MZ) and dizygotic (DZ) pairs by Weinberg's differential rule. This rule assumes that within the DZ twins the numbers of unlike-sexed (U) and like-sexed (L) twins are equal. The literature on the validity of Weinberg's rule is still controversial. In this prospective population-based study (EFPTS) of 2,589 twin pairs, of whom 2,577 were of known zygosity and placentation, the estimates of Weinberg's rule agree well with the results of direct zygosity determination.

W

Wagner P see **Malmstrom PE**

Wahlström J, Steffenburg S, Hellgren L, Gillberg C: Chromosome findings in twins with early-onset autistic disorder. Am J Med Genet 1989 Jan; 32(1):19–21
In a twin study of autistic disorder, chromosome analyses were carried out in nine pairs of monozygotic (MZ) twins, two pairs of dizygotic (DZ) twins, one set of MZ triplets, one single twin from a MZ pair, and seven single twins from DZ pairs. All but one of the MZ sets were concordant for autistic disorder; all DZ pairs were discordant. Fragile X(q)(27.3) was found in one pair of MZ twins and in MZ triplets, i.e., in 9% of the population with autistic disorder. A marker chromosome of unknown origin was detected in a male twin with autistic disorder from a discordant DZ pair.

Warden MJ see **Richardson RJ**

Watsky KL, Hansen T: Annular erythema in identical twins. Cutis 1989 Aug;44(2):139–40
A case of superficial gyrate erythema that was indistinguishable from erythema annulare centrifugum occurred in identical twins. We propose to include a familial cause among the known causes of erythema annulare centrifugum rather than considering this a separate entity, "familial annular erythema."

Weiner CP see **Streit JA**

Weiner E see **Shalev E**

Wessel J, Schmidt-Gollwitzer K: Intrauterine death of a single fetus in twin pregnancies. J Perinat Med 1988;16(5–6):467–76
The paper reports on nine twin pregnancies in the years 1982–1987 with the intrauterine death of a single fetus. The incidence of 0.10% is consistent with that reported in other comparable studies. Evaluation of the causes of death shows a preponderance of asphyxia. A fetofetal transfusion syndrome occurred in 4 cases. Eight of the pregnancies were terminated by caesarean section. One of the surviving children died in the neonatal period. The course of the neonatal period in the other babies was determined mainly by the state of

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maturity. No increased maternal morbidity was observed. On the basis of this and other experience described in the literature, some general guidelines are proposed for the management of the further pregnancy and delivery in such high-risk cases.

West DW see **Meikle AW**

Wethington E see **Lenzenweger MF**

Wierzbicki M: Twins' responses to pleasant, unpleasant, and life events. J Genet Psychol 1989 Jun;150(2):135-45

Pairs of monozygotic (n = 41) and same-sex dizygotic (n = 29) twins were administered the Pleasant Events Schedule, the Unpleasant Events Schedule (Lewinsohn & Amenson, 1978), and the Life Experiences Survey (Sarason, Johnson, & Siegel, 1978). These provided indices of both the frequency of and the emotional response to mood-related events. Monozygotic twins resembled one another more than dizygotic twins on all subscales of these measures, and the greater similarity was statistically significant for most of the subscales. This suggests that there may be a genetic influence on affect, which is expressed through both the frequency of engagement in and the emotional response to mood-related events. The results are discussed in the context of studies of genetic influences on subclinical levels of depression and other emotions.

Wiliams WJ see **McConnochie K**

Williams WR see **McConnochie K**

Williamson RA see **Streit JA**

Wilson JR see **Nagoshi CT**

Witkowski CE see **Hudson JW**

Wong PC, Ng SC, Hamilton MP, Chan CL, Bongso TA, Ratnam SS: Birth from replacement of frozen-thawed embryos after failure of gamete intra-fallopian transfer: a successful pregnancy case. Asia Oceania J Obstet Gynaecol 1989 Mar; 15(1):7-10

The patient was 8 years subfertile and had failed other forms of treatment when she was enrolled in the GIFT program. Of the total of 16 oocytes recovered 4 were transferred and the remaining 12 inseminated with her husband's sperm. Four resulting embryos were frozen. When she did not conceive, the 4 embryos were thawed 3 months later and replaced into her. She conceived and recently delivered a pair of twins. The protocol will be discussed in detail. Cryopreservation of embryos therefore may increase the patient's chance of pregnancy in a GIFT program.

Woods JR Jr see **Sherer DM**

Woodward J: The bereaved twin.

Acta Genet Med Gemellol (Roma) 1988; 37(2):173-80

This three-year study was based on individual interviews of over 200 bereaved MZ and DZ adult twins. Its purpose was to record the lone twins' response to the loss of their twin and to investigate factors that correlated with either the severity or amelioration of the loss.

Woolley MM see **Richardson RJ**

Worthington-Roberts B see **Pederson AL**

Wright EJ see **Bozynski ME**

Wu MM see **Lin TM**

Y

Yang CS see **Lin TM**

Young ID, Patel I, Lamont AC: Thanatophoric dysplasia in identical twins. J Med Genet 1989 Apr; 26(4):276-9

Female twins concordant for thanatophoric dysplasia are presented. Monozygosity was confirmed using minisatellite DNA genetic fingerprinting. The evidence supporting new dominant mutations as the likely cause of thanatophoric dysplasia is reviewed.

Yu PL see **Ramos-Arroyo MA**

Z

Zuckerman H see **Shalev E**