twin pregnancy had previously had single fetuses found by ultrasound at 39 weeks and at both 16 and 37 weeks. Therefore, of the 94 patients who delivered twins, 83 had had at least one ultrasonic examination and, of these, 17 had been diagnosed as having a single fetus on at least one occasion, a false-negative incidence of almost 21%.

Nine patients, however, were diagnosed as having a twin pregnancy when ultrasonic examination was performed (range 18-36 weeks) without this having been suspected clinically.

Discussion

A series of 94 consecutive twin deliveries is presented in which almost 31% and 94.6% were delivered by the end of the 36th and 39th weeks of pregnancy respectively. Nine sets of twins (10%) were undiagnosed before the second stage of labour, five being diagnosed only after ergometrine maleate (Syntometrine) had been given intramuscularly. This compares favourably with previously reported incidences of 29%,¹ 18%,⁷ 20%,⁸ and 12%,⁹ although Robertson⁵ reported a remarkable series in which only 8% were undiagnosed before labour, and he did not have the benefit of ultrasound. The importance of the early diagnosis of a multiple pregnancy has been emphasised, especially so that measures can be taken to reduce the incidence of preterm labour and so that the second twin can be spared the hazard of being delivered as an emergency in an unprepared labour ward.^{2 8 9}

Although ultrasonic examinations of the uterus confirmed the diagnosis of twins in 80 of our cases, a second ultrasonic examination should be performed if a multiple pregnancy is suspected clinically but the ultrasonogram shows only a singleton. Probably our apparently high incidence of false-negative examinations would have been reduced had all the scans been performed by a single operator, preferably trained both obstetrically and

radiologically. The practical considerations of this point are likely to become more important if screening with serum α -fetoprotein estimations (which are raised in the presence of a multiple pregnancy) becomes more widespread, or unnecessary amniocentesis may be performed. As an ultrasonic examination may diagnose a multiple pregnancy when this is not clinically suspected (10% of our cases) an argument may be advanced for performing two ultrasonic examinations in all pregnancies, perhaps at the 16th and 30th weeks, although this may not be feasible in many centres. Diagnostic ultrasound would seem to have decreased the incidence of twins remaining undiagnosed before the onset of labour, but two ultrasonic examinations may be necessary to confirm the clinical suspicion.

I am grateful for Mr D R Millar's advice during the preparation of this paper.

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(Accepted 11 July 1979)

Introduction to Marital Pathology

Choice of partner

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British Medical Journal, 1979, **2**, 594-596

Common sense suggests that marital conflict and breakdown are more likely in couples with little affinity for each other. The process of selection, courtship, and engagement makes it likely that a couple will share roughly similar attitudes, values, and opinions, and that they will sustain their common interests and avoid excessive conflict. The theory of like marrying like, homogamy, is well established, and evidence exists that if social barriers are crossed marital conflict increases.

Physical factors

Measurements for similarity of physical attributes between spouses began at the turn of the century; they showed a positive but low correlation for stature, maximum span of the arms, and length of the left forearm.¹ Since then the whole body has been subjected to detailed measurements and a low positive correlation has been found repeatedly for stature, maximum span of arms, length of left forearm, head length, and colour of skin and hair.²⁻⁴ The similarity of colour of skin is a reminder that race is a major factor determining selection of partner. In 1970 fewer than 10% of all marriages in the United States were inter-racial.⁵

Do spouses choose one another on the basis of a similarity to the opposite parent? Few studies of this exist, but one study established among 373 engaged couples or recently married persons a resemblance between the couple and parents, which was more than could be expected by chance.⁶ The similarity in physical appearance was considerable, but more important was the similarity of opinions, personality, and temperament. But the influential parent was not necessarily that of the opposite sex. An important factor was the presence of strong affective ties between child and either parent.

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Social factors

Although physical appearance is important, the social and psychological factors matter more. In one major study of 1000 engaged couples, similarity was found in 47 characteristics, including religious affiliation, family background, courtship behaviour, mutual friends, and attitudes to work, sexuality, and children.⁷ Common values make satisfying marriage more likely. A recent cross-cultural study related common values and marital satisfaction in both American and Japanese couples.⁸

PROPINQUITY

Two studies in the United States have shown that about half of the couples who met, dated, and married, lived within 13 blocks of each other.⁹ Geographical propinquity seems to be less important among higher-class groups.^{10 11}

SOCIAL CLASS

Considerable social class correlation exists between spouses, particularly at the higher end of the social scale.¹² Occasionally social class barriers are crossed and the marriage remains stable and successful. Clinically, however, it can be observed that a person with a high social status who lacks self-esteem may marry someone culturally and socially inferior as a way of compensating for lack of self-confidence. These marriages tend to be vulnerable because of disparity of social values.

RELIGION

Similarity of religious beliefs between spouses is also well established.¹² Work in the United States has indicated that religiously mixed marriages are more likely to breakdown.^{13 14}

AGE

Reference has already been made to the increased vulnerability of young marriages. This vulnerability is compounded by the fact that a person in their early 20s is likely to marry someone equally young.

EDUCATION

Social class similarity includes educational similarity, but for education alone a high similarity exists, which is most notable in the upper and lower socioeconomic groups.¹² A detailed analysis of the relationship between age, social class, and education suggests that age at marriage is almost completely independent of social class and education, but that the latter two are related. Furthermore, similarity of education without similarity of social class is a more decisive determinant of marital choice than is similarity of class without similarity of education.¹²

Psychological factors

Because it was so well known that people tended to select partners from a similar social background researchers assumed that the same applied to psychological factors, and the results of the earliest studies seemed to confirm this. Several studies of mental illness in couples concluded that mentally sick couples occur in the general population with a frequency significantly higher than to be expected by chance.¹⁵⁻²⁰ The crucial question is how this excess of mental illness among couples arises? Is it based on assortative mating—that is, unstable, neurotic people choosing each other—or is some other explanation possible? An exhaustive study in the United States adopted the view that neurotics marry neurotics.²¹ This has been both confirmed²² and challenged. Opponents of the view have proposed that mental illness arises from interaction after marriage. They propose that a couple do not start equally disturbed, but if the

husband is neurotic then, at a later stage the wife is likely to become more neurotic.^{23 24}

It appears to be the husband's neurotic behaviour rather than his symptoms which contribute to the wife's illness. Such behaviour includes self-interest, dependency, emotional irresponsibility, and domination, and leads to marital conflict particularly over child-rearing and leisure.^{25 26} A more detailed Swedish study, confirming the British findings, showed that the longer a couple were married the more likely they were both to suffer from mental illness, and that wives are more susceptible than husbands to illness in their partner.²⁷

INTELLIGENCE

Similarity of IQ has been found in all couples to a small degree, but is more important in social classes I and II than III, IV, and V.¹¹ Assortative mating among people of low IQ begs the question of the stability of these marriages. One study of 242 certified mental defectives who had married found that the rate of divorce and permanent separation was 20% compared with a national figure at the time of 14%. The crucial factor was the size of the family, and marital conflict increased with the size of the family. So an unintelligent but emotionally stable mother, who is not overtaxed with a large family, may expect a stable marriage.²⁸

COMPLEMENTARITY

The usual view is that similarity, at least in social background, is most important in selecting a partner. Winch stood out against this theory and suggested that, although eligible candidates were selected for their similarity, the final choice was made on the basis of complementarity, in which opposites attract, and the needs of one spouse are matched by opposite and complementary needs in the other.²⁹ Considerable research has failed to give much support to this interesting theory, but clinically it is important because any change in the delicate balance between the complementary needs may cause a serious disturbance in the relationship.

DYNAMIC FACTORS

Whereas the research of Kreitman and others has strongly suggested that spouses do not select each other on a neurotic basis initially, other workers think that, in fact, couples do choose each other occasionally for neurotic reasons.^{30 31} Perhaps one explanation for these divergent views is the use of the word neurotic. In one sense it describes conditions with considerable anxiety and tension, and in another, psychoanalytic sense, describes personality defects arising from development. Psychoanalysts postulate that beyond social and conscious psychological factors a spouse may be selected on unconscious factors.

Psychiatrists meet repeatedly emotionally dependent men and women who marry spouses who appear emotionally strong and reliable. These relationships may work for a time until it is discovered that the dependence is ambivalent: one partner is furious with or despises the person on whom they rely, or the apparently strong partner is an extravert who is underneath emotionally weak and needs as much emotional support as their partner. A person with poor self-esteem, who feels that he or she does not deserve attention or even love, marries a partner who cannot express loving feelings. After a while the deprived spouse becomes desperate for attention and discovers that the spouse, who was once acceptable because he made little fuss, is now intolerable. A man who has a poor image of himself may choose an over-critical, abrasive wife because he feels that being criticised is not only appropriate but the way to overcome his limitations. Gradually the absence of any recognition or approval becomes intolerable and the wife chosen for her sharpness is experienced as an uncaring critic.

Submissive-dominant, self-rejecting—critical, deprived—undemonstrative, insecure—controlling, secure—unreliable partnerships carry all the ingredients of dynamic conflict, as partners who are fixated, incompletely developed, or disturbed marry spouses with similar or complementary defects. For a time they collude: an unconscious arrangement whereby neither partner touches the damaged part of the self. But with change, development, and the need for greater intimacy, the unconscious bypassing of difficulties cannot be sustained and confrontation ensues.

Choice and pathology

Thus conflict may exist at a cultural and social level, and at a psychological level with conscious and unconscious factors of deprivation, dependence, and lack of self-esteem. Conflict on these different levels leads to the psychopathology, which in one sense is unique for every couple and yet at the same time contains factors applicable to most marriages. Stresses and strains occur in successive phases of the marriage as different elements of the personality are engaged.

This is the fourth in a series of eleven papers and no reprints will be available from the author.

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ZANY LESSONS FOR ACADEMICS

How to create a data base

Inasmuch as I have achieved a certain international notoriety in umbilical research, I will use my own example to show how serendipity and a little imagination can lead one to great discovery and intellectual progress through the steps of analysis, perturbing the system, and correlation and generalisation.

One day I was sitting on a veranda overlooking a southern California beach and accidentally spilt my coffee. The coffee was quite warm and some of it landed directly in the navel of a rather obese bikini'd lady sunning herself on the sand below. She sat up and abruptly assaulted me with a few choice words, but calmed down when I assured her of the unintentional nature of the mishap. That evening, I reflected on the event and noted serendipitously that, even from the distance of my observation, the coffee did not go straight to the bottom of the navel but was partly restrained by the swirls and folds. Great scientific discoveries are regarded by many as accidents that are observed by the prepared mind; consequently, I conceived of the great untapped area of umbilical science, based on my brief experience at the beach.

I next set out to see what would happen if I repeated the experiment intentionally and observed the large variety of umbilical fluid retention patterns for which I am now accorded scientific recognition. I used only coffee at first, but dropped tea, Coca Cola, Seven-Up, and a variety of fruit juices into the navels of various bathers under different weather conditions.

Nevertheless, recognising the limitations of such simple observations, it was then that I decided to take the project to the laboratory to begin a real analytical phase of umbilical research. This began with simple things like measuring the diameter, depth, and clockwise or counter-clockwise swirling of volunteers' navels. By this time, I had a grant to pursue animal studies, and we began to look at rat and dog navels. Umbilical proteins were extracted; at first we used polyacrilinide gel electrophoresis and isoelectric focusing to find out what was there. We then did our now famous separation of the proteins, pulse labelled with tritiated glycine, by curved gradient ultracentrifugation and sephadex columns. We analysed the components with spectrography, electron spin resonance, nuclear magnetic resonance, amino-acid analysis, gas-liquid chromatography, and circular dichroism. In fact, this is how we got our first 250 publications, as each of these tests warranted an article or two.

Initially, there seemed to be a striking difference between dog and rat umbilical proteins; it was at that point that Peter Flurd, my

research fellow, came up with the notion that the results might be the result of contamination by navel lint. We developed the now widely used procedure to measure differences in navel-lint precursor pool size, and eventually we were able to show that this accounted for the difference in dog and rat proteins. Later, we repeated all these experiments on human navels.

By this time we were up to 500 publications, and felt we had definitively analysed the normal navel. It now remained to see what happened if we *perturbed* the navel. Again using volunteers, we "tickled" our system with coffee to determine the importance of my original observation. We were now prepared to use all the aforementioned techniques. One of my technicians was relaxing with his shirt off and having a beer; he poured some beer into his navel and we analysed his navel protein, and proceeded to perturb our system with hot chocolate, Tiger Balm, and a variety of fine oriental teas.

With the production of 200 more publications, we then got our grant to look at umbilical proteins in cancer patients and found several unique proteins which we feel are induced by various forms of environmental carcinogens and may well cause carcinomas in man. This is still under study.

The next step, of course, is *correlation*—we compared things such as navel depth versus umbilical protein dichroism, normal dog navel lint with human cancer navel lint, and so on. This brought us up to 1000 papers and we felt it was time to see whether our techniques could be applied to other investigations. Our navel lint extraction procedure proved valuable in extracting protein from horses with hangnail, rhesus monkeys with acne, and lymphocyte cultures. Having written 2000 publications, we are now meeting our responsibilities as scientists to the general community and are actively publishing work about the relevance of our results to scientific intellectual progress, peer review, the two-party system, and the urban poor.

I was humbly thankful for the recent award of the Nobel Prize, which implies that we have found the definitive truth about navels and that there is no further need for anyone to think about them again—after all, if progress stops, we must have found final truth.

In summary, the young investigator need only follow my example with the basic principles of careful observation, analysis, perturbation, correlation, and generalisation and he also will become famous and stop progress in science by getting everyone to agree that he has found the ultimate truth.—BERRIL YUSHOMERSKI YANKELOWITZ.