

Asperger's syndrome: a clinical account

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SYNOPSIS The clinical features, course, aetiology, epidemiology, differential diagnosis and management of Asperger's syndrome are described. Classification is discussed and reasons are given for including the syndrome, together with early childhood autism, in a wider group of conditions which have, in common, impairment of development of social interaction, communication and imagination.

INTRODUCTION

The many patterns of abnormal behaviour that cause diagnostic confusion include one originally described by the Austrian psychiatrist, Hans Asperger (1944, 1968, 1979). The name he chose for this pattern was *autistic psychopathy*, using the latter word in the technical sense of an abnormality of personality. This has led to misunderstanding because of the popular tendency to equate psychopathy with sociopathic behaviour. For this reason, the neutral term *Asperger's syndrome* is to be preferred and will be used here.

Not long before Asperger's original paper on this subject appeared in 1944, Kanner (1943) published his first account of the syndrome he called early infantile autism. The two conditions are, in many ways, similar, and the argument still continues as to whether they are varieties of the same underlying abnormality or are separate entities.

Whereas Kanner's work is widely known internationally, Asperger's contribution is considerably less familiar outside the German literature. The only published discussions of the subject in English known to the present author are by Van Krevelen (1971), Isaev & Kagan (1974), Mnukhin & Isaev (1975) (translation from Russian), Wing (1976), Chick *et al.* (1979), Wolff & Barlow (1979) and Wolff & Chick (1980). In addition, a book by Bosch in which autism and Asperger's syndrome are compared, originally appearing in German in 1962, has been translated into English (Bosch, 1962). A

paper given by Asperger in Switzerland in 1977 has appeared in an English version (Asperger, 1979). Robinson & Vitale (1954) and Adams (1973) gave clinical descriptions of children with behaviour resembling Asperger's syndrome, but without referring to this diagnosis.

In the present paper the syndrome will be described, illustrated with case histories, and the differential diagnosis and classification discussed. The account is based on Asperger's descriptions and on 34 cases, ranging in age from 5 to 35 years, personally examined and diagnosed by the author. Of these, 19 had the history and clinical picture of the syndrome in more or less typical form and 15 showed many of the features at the time they were seen, though they did not all have the characteristic early history (see below). Six of those in the series were identified as a result of an epidemiological study of early childhood psychoses in the Camberwell area of south-east London (Wing & Gould, 1979). The rest were referred to the author for diagnosis - 11 by their parents, through the family doctor, 2 by head teachers and 15 by other psychiatrists.

The following general description includes all the most typical features. But, as with any psychiatric syndrome identifiable only from a pattern of observable behaviour, there are difficulties in determining which are essential for diagnosis. Variations occur from person to person and it is rare to find, in any one case, all the details listed below.

THE CLINICAL PICTURE

Illustrative case histories based on those of children and adults seen by the present author

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are to be found in the Appendix. Throughout the paper, the numbers in parentheses refer to these histories.

Asperger's description of the syndrome

Asperger noted that the syndrome was very much more common in boys than in girls. He believed that it was never recognized in infancy and usually not before the third year of life or later. The following description is based on Asperger's accounts.

Speech

The child usually begins to speak at the age expected in normal children, whereas walking may be delayed. A full command of grammar is sooner or later acquired, but there may be difficulty in using pronouns correctly, with the substitution of the second or third for the first person forms (No. 1). The content of speech is abnormal, tending to be pedantic and often consisting of lengthy disquisitions on favourite subjects (No. 2). Sometimes a word or phrase is repeated over and over again in a stereotyped fashion. The child or adult may invent some words. Subtle verbal jokes are not understood, though simple verbal humour may be appreciated.

Non-verbal communication

Non-verbal aspects of communication are also affected. There may be little facial expression except with strong emotions such as anger or misery. Vocal intonation tends to be monotonous and droning, or exaggerated. Gestures are limited, or else large and clumsy and inappropriate for the accompanying speech (No. 2). Comprehension of other people's expressions and gestures is poor and the person with Asperger's syndrome may misinterpret or ignore such non-verbal signs. At times he may earnestly gaze into another person's face, searching for the meaning that eludes him.

Social interaction

Perhaps the most obvious characteristic is impairment of two-way social interaction. This is not due primarily to a desire to withdraw from social contact. The problem arises from a lack of ability to understand and use the rules governing social behaviour. These rules are unwritten and unstated, complex, constantly

changing, and affect speech, gesture, posture, movement, eye contact, choice of clothing, proximity to others, and many other aspects of behaviour. The degree of skill in this area varies among normal people, but those with Asperger's syndrome are outside the normal range. Their social behaviour is naïve and peculiar. They may be aware of their difficulties and even strive to overcome them, but in inappropriate ways and with signal lack of success. They do not have the intuitive knowledge of how to adapt their approaches and responses to fit in with the needs and personalities of others. Some are oversensitive to criticism and suspicious of other people. A small minority have a history of rather bizarre antisocial acts, perhaps because of their lack of empathy. This was true of 4 of the present series, one of whom injured another boy in the course of his experiments on the properties of chemicals.

Relations with the opposite sex provide a good example of the more general social ineptitude. A young man with Asperger's syndrome observes that most of his contemporaries have girl friends and eventually marry and have children. He wishes to be normal in this respect, but has no idea how to indicate his interest and attract a partner in a socially acceptable fashion. He may ask other people for a list of rules for talking to girls, or try to find the secret in books (No. 1). If he has a strong sex drive he may approach and touch or kiss a stranger, or someone much older or younger than himself, and, as a consequence, find himself in trouble with the police; or he may solve the problem by becoming solitary and withdrawn.

Repetitive activities and resistance to change

Children with this syndrome often enjoy spinning objects and watching them until the movement ceases, to a far greater extent than normal. They tend to become intensely attached to particular possessions and are very unhappy when away from familiar places.

Motor coordination

Gross motor movements are clumsy and ill-coordinated. Posture and gait appear odd (No. 1). Most people with this syndrome (90 % of the 34 cases mentioned above) are poor at games involving motor skills, and sometimes the executive problems affect the ability to write or

to draw. Stereotyped movements of the body and limbs are also mentioned by Asperger.

Skills and interest

Those with the syndrome in most typical form have certain skills as well as impairments. They have excellent rote memories and become intensely interested in one or two subjects, such as astronomy, geology, the history of the steam train, the genealogy of royalty, bus time-tables, prehistoric monsters, or the characters in a television serial, to the exclusion of all else. They absorb every available fact concerning their chosen field and talk about it at length, whether or not the listener is interested, but have little grasp of the meaning of the facts they learn. They may also excel at board games needing a good rote memory, such as chess (No. 2), and some have musical ability. Seventy-six per cent of the present author's series had special interests of this kind. However, some have specific learning problems, affecting arithmetical skills, reading, or, as mentioned above, writing.

Experiences at school

This combination of social and communication impairments and certain special skills gives an impression of marked eccentricity. The children may be mercilessly bullied at school, becoming, in consequence, anxious and afraid (Nos. 1 and 2). Those who are more fortunate in the schools they attend may be accepted as eccentric 'professors', and respected for their unusual abilities (No. 4). Asperger describes them as unsatisfactory students because they follow their own interests regardless of the teacher's instructions and the activities of the rest of the class (Nos. 3 and 4). Many eventually become aware that they are different from other people, especially as they approach adolescence, and, in consequence, become over-sensitive to criticism. They give the impression of fragile vulnerability and a pathetic childishness, which some find infinitely touching and others merely exasperating.

Modifications of Asperger's account

The present author has noted a number of additional items in the developmental history, not recorded by Asperger, which can sometimes be elicited by appropriate questioning of the parents. During the first year of life there may have been a lack of the normal interest and pleasure

in human company that should be present from birth. Babbling may have been limited in quantity and quality. The child may not have drawn attention to things going on around him in order to share the interest with other people. He may not have brought his toys to show to his parents or visitors when he began to walk. In general, there is a lack of the intense urge to communicate in babble, gesture, movement, smiles, laughter and eventually speech that characterizes the normal baby and toddler (No. 3).

Imaginative pretend play does not occur at all in some of those with the syndrome, and in those who do have pretend play it is confined to one or two themes, enacted without variation, over and over again. These may be quite elaborate, but are pursued repetitively and do not involve other children unless the latter are willing to follow exactly the same pattern. It sometimes happens that the themes seen in this pseudo-pretend play continue as preoccupations in adult life, and form the main focus of an imaginary world (see the case history of Richard L. in Bosch, 1962).

There are also two points on which the present author would disagree with Asperger's observations. First, he states that speech develops before walking, and refers to 'an especially intimate relationship with language' and 'highly sophisticated linguistic skills'. Van Krevelen (1971) emphasized this as a point of differentiation from Kanner's early childhood autism, in which, usually, walking develops normally, or even earlier than average, whereas the onset of speech is markedly delayed or never occurs. However, slightly less than half of the present author's more typical cases of Asperger's syndrome were walking at the usual age, but were slow to talk. Half talked normally but were slow to walk, and one both walked and talked at the expected times. Despite the eventual good use of grammar and a large vocabulary, careful observation over a long enough period of time discloses that the content of speech is impoverished and much of it is copied inappropriately from other people or books (No. 3). The language used gives the impression of being learned by rote. The meanings of long and obscure words may be known, but not those of words used every day (No. 5). The peculiarities of non-verbal aspects of speech have already been mentioned.

Secondly, Asperger described people with his syndrome as capable of originality and creativity in their chosen field. It would be more true to say that their thought processes are confined to a narrow, pedantic, literal, but logical, chain of reasoning. The unusual quality of their approach arises from the tendency to select, as the starting point for the logical chain, some aspect of a subject that would be unlikely to occur to a normal person who has absorbed the attitudes current in his culture. Usually the result is inappropriate, but once in a while it gives new insight into a problem. Asperger also believed that people with his syndrome were of high intelligence, but he did not quote the results of standardized intellectual tests to support this. As will be seen from the case histories in the Appendix, the special abilities are based mainly on rote memory, while comprehension of the underlying meaning is poor. Those with the syndrome are conspicuously lacking in common sense.

It must be pointed out that the people described by the present author all had problems of adjustment or superimposed psychiatric illnesses severe enough to necessitate referral to a psychiatric clinic. Nine had left school or further education. Of these, 3 were employed, 3 had lost their jobs, and 3 had not obtained work. The author is also acquainted, through their parents who are members of the National Society for Autistic Children, with a few young adults reported to have some or all of the features of Asperger's syndrome, and who are using their special skills successfully in open employment. It would be inappropriate to give precise numbers or to include these in the series, because the author does not have access to case histories or assessment. For this reason, the series described here is probably biased towards those with more severe handicaps.

COURSE AND PROGNOSIS

The published clinical descriptions are of children and young adults. No studies of the course and prognosis in later life are available.

Asperger emphasized the stability of the clinical picture throughout childhood, adolescence and at least into early adult life, apart from the increase in skills brought about by maturation. The major characteristics appear to

be impervious to the effects of environment or education. He considered the social prognosis to be generally good, meaning that most developed far enough to be able to use their special skills to obtain employment. He also observed that some who had especially high levels of ability in the area of their special interests were able to follow careers in, for example, science and mathematics.

As Bosch (1962) pointed out, it is possible to find people with all the features characteristic of Asperger's syndrome other than normal or high intelligence. This applied to 20% of the series described here. If these are accepted as belonging to the same diagnostic category, then Asperger's rather hopeful view of the prognosis has to be modified to take such cases into account (see the case history of J.G., Appendix No. 5).

The prognosis is also affected by the occurrence of superimposed psychiatric illnesses. Clinically diagnosable anxiety and varying degrees of depression may be found, especially in late adolescence or early adult life, which seem to be related to a painful awareness of handicap and difference from other people (Nos. 2 and 3). Wolff & Chick (1980), in a follow-up study of 22 people with Asperger's syndrome, reported one who appeared to have a typical schizophrenic illness and another in whom this diagnosis was made, but less convincingly. Five of the 22 had attempted suicide by the time of early adult life.

The present author's series included 18 who were aged 16 and over at the time they were seen. Of these, 4 had an affective illness; 4 had become increasingly odd and withdrawn, probably with underlying depression; 1 had a psychosis with delusions and hallucinations that could not be classified; 1 had had an episode of catatonic stupor; 1 had bizarre behaviour and an unconfirmed diagnosis of schizophrenia; and 2 had bizarre behaviour, but no diagnosable psychiatric illness. Two of the foregoing had attempted suicide and 1 had talked of doing so. The rest were referred because of their problems in coping with the demands of adult life.

Though it appears that the risk of psychiatric illness in Asperger's syndrome is high, it is difficult to draw firm conclusions because of the nature of the samples that were studied. The 13 people mentioned above, before they were seen

by the present author, had been referred to adult services because of superimposed psychiatric conditions, so the series was highly biased. Wolff's cases were somewhat less selective since they were referred as children and followed up into adult life, but, even so, they were clinic and not population based. Asperger (1944) noted that only 1 of his 200 cases developed schizophrenia. The true prevalence of psychiatric illnesses can be calculated only from an epidemiological study, including people with the syndrome not referred to psychiatric services.

Even in the absence of recognizable psychiatric disorder, adolescence may be a difficult time. The development of partial insight and increasing sexual awareness can cause much unhappiness (No. 1) and may lead to socially unacceptable behaviour. Peculiarities which may be ignored in a small child become very obvious in a young adult.

The degree of adjustment eventually achieved appears to be related to the level and variety of skills available and also to the temperament of the individual concerned. Good self-care, a special ability that can be used in paid employment, and a placid nature are needed if a person with Asperger's syndrome is to become socially independent.

AETIOLOGY AND PATHOLOGY

Asperger (1944) considered his syndrome to be genetically transmitted. He reported that the characteristics tended to occur in the families, especially the fathers of those with the syndrome. Van Krevelen (1971) stated that, in many cases, the antecedents for generations back had been highly intellectual. In the present author's series, 55% had fathers who were in professional or managerial occupations, but the personalities of the parents were not studied systematically. In many cases, the mother alone was seen. The purpose of the interview was to discuss the problems of the child, not to investigate the parents. Including only those concerning whom some tentative conclusions could be drawn (from clinical impressions or evidence from other sources), it appeared that 5 out of 16 fathers and 2 out of 24 mothers had, to a marked degree, behaviour resembling that found in Asperger's syndrome. No features of the clinical picture appeared to be associated with higher or

lower social class, level of education of the parents, or their personalities.

It is difficult to interpret the findings on social class, since the cases referred to clinics having a special interest in such problems are a selected group, with a strong bias towards higher social class and intellectual occupations in the parents. Schopler *et al.* (1979) and Wing (1980) noted a similar bias in the fathers of classically autistic children referred to clinics, which was not reflected in less selected groups with the same diagnosis. The findings concerning the parents' personalities have to be treated with caution because of the way they were obtained and the lack of any comparison group.

The syndrome can be found in children and adults with a history of pre-, peri- or post-natal conditions, such as anoxia at birth, that might have caused cerebral damage. This was true of nearly half of those seen by the present author (Nos. 3 and 4). Mnukhin & Isaev (1975) considered that the behaviour pattern was due to organic deficiency of brain function.

Emotional causes or abnormal child-rearing methods have been suggested, especially where the parents or siblings show similar peculiarities to the patient, but there is no evidence to support such theories.

Detailed epidemiological studies, based on total populations, are needed in order to establish which, if any, of these aetiological factors are relevant.

No specific organic pathology has been identified. No particular abnormalities of face or body have been reported. In childhood the physical appearance is usually, but by no means always, normal. In adolescence and adult life, the inappropriate gait, posture and facial expression produce an impression of oddness.

In general, on psychological assessment, tests requiring good rote memory are performed well, but deficits are shown with those depending on abstract concepts, or sequencing in time. Visuo-spatial abilities vary and the scores on testing may be markedly lower than those for expressive speech (No. 4). The results of psychological testing will be described in more detail elsewhere.

EPIDEMIOLOGY

As already mentioned, no detailed, large-scale epidemiological studies have been carried out, so

that the exact prevalence of Asperger's syndrome is unknown. A major difficulty in designing such a study would be the establishment of criteria for distinguishing the syndrome from other similar conditions, as will be discussed later.

Wing & Gould (1979) carried out a study in which all the mentally and physically handicapped children aged under 15 in one area of London were screened in order to identify cases of early childhood psychosis and severe mental retardation. In this study, 2 children (0.6 per 10000 aged under 15) showed most of the characteristics of Asperger's syndrome, though they were in the mildly retarded range on intelligence tests, and 4 (1.1 per 10000) could have been diagnosed as autistic in early life, but came to resemble Asperger's syndrome later. There was a total of 35000 children aged under 15 in the area.

Wing & Gould did not use methods designed to identify mild cases of Asperger's syndrome, so that any children who were attending normal school and had not come to the attention of the educational, social or medical services would not have been discovered. The prevalence rate for the typical syndrome given above is almost certainly an under-estimate.

The syndrome appears to be considerably more common in boys than in girls. Asperger originally believed it to be confined to males, though he modified this view later (personal communication). Wolff & Barlow (1979) mentioned that the clinical picture could be seen in girls. In their series the male : female ratio was 9 : 1. In the present author's series there were 15 boys and 4 girls with the syndrome in fairly typical form, and 13 boys and 2 girls who had many of the features. The girls tended to appear superficially more sociable than the boys, but closer observation showed that they had the same problems of two-way social interaction.

DIFFERENTIAL DIAGNOSIS

As with any condition identifiable only from a pattern of abnormal behaviour, each element of which can occur in varying degrees of severity, it is possible to find people on the borderlines of Asperger's syndrome in whom diagnosis is particularly difficult. Whereas the typical case can be recognized with ease by those with experi-

ence in the field, in practice it is found that the syndrome shades into eccentric normality, and into certain other clinical pictures. Until more is known of the underlying pathology, it must be accepted that no precise cut-off points can be defined. The diagnosis has to be based on the full developmental history and presenting clinical picture, and not on the presence or absence of any individual item.

Normal variant of personality

All the features that characterize Asperger's syndrome can be found in varying degrees in the normal population. People differ in their levels of skill in social interaction and in their ability to read non-verbal social cues. There is an equally wide distribution in motor skills. Many who are capable and independent as adults have special interests that they pursue with marked enthusiasm. Collecting objects such as stamps, old glass bottles, or railway engine numbers are socially accepted hobbies. Asperger (1979) pointed out that the capacity to withdraw into an inner world of one's own special interests is available in a greater or lesser measure to all human beings. He emphasized that this ability has to be present to a marked extent in those who are creative artists or scientists. The difference between someone with Asperger's syndrome and the normal person who has a complex inner world is that the latter does take part appropriately in two-way social interaction at times, while the former does not. Also, the normal person, however elaborate his inner world, is influenced by his social experiences, whereas the person with Asperger's syndrome seems cut off from the effects of outside contacts.

A number of normal adults have outstandingly good rote memories and even retain eidetic imagery into adult life. Pedantic speech and a tendency to take things literally can also be found in normal people.

It is possible that some people could be classified as suffering from Asperger's syndrome because they are at the extreme end of the normal continuum on all these features. In others, one particular aspect may be so marked that it affects the whole of their functioning. The man described by Luria (1965), whose visual memories of objects and events were so vivid and so permanent that they interfered with his comprehension of their significance, seemed to have behaved not unlike

someone with Asperger's syndrome. Unfortunately, Luria did not give enough details to allow a diagnosis to be made.

Even though Asperger's syndrome does appear to merge into the normal continuum, there are many cases in whom the problems are so marked that the suggestion of a distinct pathology seems a more plausible explanation than a variant of normality.

Schizoid personality

The lack of empathy, single-mindedness, odd communication, social isolation and oversensitivity of people with Asperger's syndrome are features that are also included in the definitions of schizoid personality (see review by Wolff & Chick, 1980). Kretschmer (1925) outlined some case histories of so-called schizoid adults, one or two of which were strongly reminiscent of this condition, although he did not provide sufficient detail to ensure the diagnosis. For example, one young man had no friends at school, was odd and awkward in social interaction, always had difficulty with speech, never took part in rough games, was oversensitive, and very unhappy when away from home. He thought out fantastic technical inventions and, together with his sister, invented a detailed imaginary world.

There is no question that Asperger's syndrome *can* be regarded as a form of schizoid personality. The question is whether this grouping is of any value. This will be discussed below in the section on classification.

Schizophrenia

Adults with Asperger's syndrome may be diagnosed as suffering from schizophrenia. The differential diagnosis of schizophrenia has been discussed elsewhere (J. K. Wing, 1978). The main difficulty arises from the fact that schizophrenia has been defined loosely by some and strictly by other workers.

If a loose definition of schizophrenia is accepted, based only on characteristics such as social withdrawal and speech disorder, then a case could perhaps be made for including Asperger's syndrome in this group. As with schizoid personality, the question is whether doing so has any advantages. Poverty of social interaction and abnormalities of speech can

have many different causes, so the diagnosis of chronic or simple schizophrenia tends to cover a variety of conditions having little in common with each other.

Careful observation of speech in Asperger's syndrome discloses differences from thought blocking and the 'knight's move' in thought described by Bleuler (1911). In Asperger's syndrome, speech may be slow, and there may be irrelevant or tangential replies to questions, but these problems are due partly to poor comprehension and partly to a tendency to become stuck in well-worn conversational grooves rather than to produce new ideas. Utterances are always logical, even if they are unrelated to the question, or originate from an unusual point of view. Thus one young man, when asked a general knowledge question about organized charities, said 'They do things for unfortunate people. They provide wheel-chairs, stilts and round shoes for people with no feet'. There is a marked contrast between the vague woolliness of schizophrenic thought and the concrete, pedantic approach found in Asperger's syndrome.

The term schizophrenia can be used more strictly. It can be confined to those who have, currently or in the past, shown the florid first-rank symptoms described by Schneider (1971). In this case, the differentiation of Asperger's syndrome rests on accurate definition of the clinical phenomena. Unless they have a superimposed schizophrenic illness, people with Asperger's syndrome do not experience thought echo, thought substitution or insertion, thought broadcast, voices commenting on their actions, voices talking to each other, or feelings that external forces are exerting control over their will, emotions or behaviour. The young man, L.P. (Appendix No. 2), when asked if he had such experiences, gave the matter long and careful thought and then said 'I believe such things to be impossible'.

During clinical examination it is necessary to be aware that comprehension of abstract or unfamiliar concepts is impaired in Asperger's syndrome. Those with the more severe form of the handicap may have a habit of answering 'yes' to any question they do not understand, this being the quickest way to cut short the conversation. Some may also pick up and repeat phrases used by other people, including other

patients in a hospital ward, making diagnosis even more difficult.

Other psychotic syndromes

The tendency found in people with Asperger's syndrome to sensitivity and over-generalization of the fact that they are criticized and made fun of may, if present in marked form, be mistaken for a paranoid psychosis. Those who are pre-occupied with abstract theories or their own imaginary world may be said to have delusions or hallucinations. One boy, for example, was convinced that Batman would arrive one day and take him away as his assistant. No rational argument could persuade him otherwise. This type of belief could be called a delusion, but is probably better termed an 'over-valued idea'. It does not have any specific diagnostic significance, since such intensely held ideas can be found in different psychiatric states.

Severe social withdrawal, echopraxia and odd postures may be noted. These may become more marked at times, and then they could be regarded as catatonic phenomena. Such catatonic symptoms can be associated with various conditions (including encephalitis) and, on their own, should not be considered as indicative of schizophrenia.

Obsessional neurosis

Repetitive interests and activities are part of Asperger's syndrome, but the awareness of their illogicality and the resistance to their performance characteristic of the classic case of obsessional neurosis are not found in the former. It would be of interest to investigate the relationship between Asperger's syndrome, obsessional personality, obsessional illness, and post-encephalitic obsessional conditions.

Affective conditions

The quietness, social withdrawal, and lack of facial expression in Asperger's syndrome might suggest a depressive illness. Shyness and distress when away from familiar surroundings could make an anxiety state a possible diagnosis, or excited talking about a rather fantastic grandiose, imaginary world might bring to mind hypomania. However, the full clinical picture and the early developmental history should clarify the diagnosis.

More difficult problems occur when affective

illnesses are superimposed on Asperger's syndrome. Then a double diagnosis has to be made on the history and present state.

Early childhood autism

Asperger acknowledged that there were many similarities between his syndrome and Kanner's early infantile autism. Nevertheless, he considered they were different because he regarded autism as a psychotic process, and his own syndrome as a stable personality trait. Since neither psychotic process nor personality trait has been defined empirically, little more can be said about whether they can be distinguished from each other.

Van Krevelen (1971) and Wolff & Barlow (1979) agreed with Asperger that his syndrome should be differentiated from autism. They differ in their accounts of the distinguishing features and the impression gained from their papers is that, although there are some differences, the syndromes are more alike than unlike. The variations could be explained on the basis of the severity of the impairments, though the authors quoted above would not agree with this hypothesis. Thus the autistic child, at least when young, is aloof and indifferent to others, whereas the child with Asperger's syndrome is passive or makes inappropriate one-sided approaches. The former is mute or has delayed and abnormal speech, whereas the latter learns to speak with good grammar and vocabulary (though he may, when young, reverse pronouns), but the content of his speech is inappropriate for the social context and he has problems with understanding complex meanings. Non-verbal communication is severely impaired in both conditions. In autism, in the early years, there may be no use of gesture to communicate. In Asperger's syndrome there tends to be inappropriate use of gesture to accompany speech. In both conditions, monotonous or peculiar vocal intonation is characteristic. The autistic child develops stereotyped, repetitive routines involving objects or people (for example, arranging toys and household objects in specific abstract patterns, or insisting that everyone in a room should cross the right leg over the left), whereas the person with Asperger's syndrome becomes immersed in mathematical abstractions, or amassing facts on his special interests. Abnormal responses to sensory input –

including indifference, distress and fascination – are characteristic of early childhood autism and form the basis of the theories of perceptual inconstancy put forward by Ornitz & Ritvo (1968) and of over-selectivity of attention suggested by Lovaas *et al.* (1971). These features are associated with greater severity of handicap, and lower mental age. They are not described as typical of Asperger's syndrome, and they are rarely seen in older autistic people with intelligence quotients in the normal range.

The one area in which this type of comparison does not seem to apply is in motor development. Typically, autistic children tend to be good at climbing and balancing when young. Those with Asperger's syndrome, on the other hand, are notably ill-coordinated in posture, gait and gestures. Even this may not be a particularly useful point of differentiation, since children who have typical autism when young tend to become clumsy in movement and much less attractive and graceful in appearance by the time of adolescence (see DeMyer, 1976, 1979 for a discussion of motor skills in autism and autistic-like conditions).

Bosch (1962) considered that Asperger's syndrome and autism were variants of the same condition. This author pointed out that, although Asperger and Van Krevelen (1971) listed features in the early history which they thought distinguished the 2 conditions, in practice these did not cluster into 2 groups often enough to justify the differentiation. The child in Appendix No. 6 illustrates this problem (see also Everard, 1980).

CLASSIFICATION

Asperger regarded the syndrome he described as a disorder of personality that could be distinguished from other types of personality abnormalities, although he recognized the similarities to early childhood autism. Wolff & Barlow (1979) argued that it should be classified under the heading of schizoid personality. In support of this view, Wolff & Chick (1980) reviewed the literature in which schizoid characteristics are described. As discussed above, the syndrome *can* be placed in this group, and further work in this field would be of interest, but, at the moment, classification under this heading has no useful practical implications. Although Wolff & Chick have listed 5 features,

operationally defined, that they regard as core characteristics of schizoid personality, this term, as generally used, is so vague and ill-defined a concept that it covers a wide range of clinical pictures in addition to Asperger's syndrome. The aim should be not to enlarge, but to separate sub-groups from the broad category and thus to increase diagnostic precision. Furthermore, the word schizoid was originally chosen to underline the relationship of the abnormal personality to schizophrenia. The latter can occur in a person with Asperger's syndrome, but, as already discussed, there is no firm evidence of a special link between this syndrome and schizophrenia, strictly defined. To incorporate such an untested assumption into the name of the condition must give rise to confusion.

The reasons for personality variations are so obscure that classifying Asperger's syndrome under this heading does not lead to any testable hypotheses concerning cause, clinical phenomena, pathology or management. A more limited, but more productive, view of the problem is to consider it as a consequence of impairment of certain aspects of cognitive and social development.

As mentioned above, Wing & Gould (1979) carried out an epidemiological study of all mentally or physically handicapped children in one area of London, in an attempt to identify all those with autism or autistic-like conditions, whatever their level of intelligence. The results confirmed the following hypothesis. Certain problems affecting early child development tend to cluster together: namely, absence or impairment of two-way social interaction; absence or impairment of comprehension and use of language, non-verbal as well as verbal; and absence or impairment of true, flexible imaginative activities, with the substitution of a narrow range of repetitive, stereotyped pursuits. Each aspect of this triad can occur in varying degrees of severity, and in association with any level of intelligence as measured on standardized tests.

When all children with this cluster of impairments were examined, it was found that a very few resembled the description given by Asperger and some had typical Kanner's autism. A number could, tentatively, be classified as having syndromes described by authors such as De Sanctis (1906, 1908), Earl (1934), Heller (see Hulse, 1954) and Mahler (1952), although the

definitions given by these writers were not precise enough for easy identification. The remainder had features of more than one of these so-called syndromes and could not be assigned to any single category. They could all be grouped under the general, but unsatisfactory, heading of early childhood psychosis. The justification for regarding them as related is that all the conditions in which the triad of language and social impairments occurs, whatever the level of severity, are accompanied by similar problems affecting social and intellectual skills. Furthermore, individuals with the triad of symptoms all require the same kind of structured, organized educational approach, although the aims and achievements of education will vary from minimal self-care up to a university degree, depending on the skills available to the person concerned.

This hypothesis does not suggest that there is a common gross aetiology. This is certainly not the case, since many different genetic or pre-, peri- or post-natal causes can lead to the same overt clinical picture (Wing & Gould, 1979). It is more likely that all the conditions in which the triad occurs have in common impairment of certain aspects of brain function that are presumably necessary for adequate social interaction, verbal and non-verbal communication and imaginative development. It is possible that these are all facets of one underlying in-built capacity – that is, the ability actively to seek out and make sense of experience (Ricks & Wing, 1975). Included in this would be the innate ability to recognize other human beings as distinct from the rest of the environment and of special importance. If this basic skill were diminished or absent, the effects on development would be profound, as is the case in all early childhood psychoses.

The full range of clinical material can be subdivided in many different ways, depending on the purpose of the exercise, but no aetiological classification is possible as yet. Sub-grouping on factors such as level of intelligence (Bartak & Rutter, 1976) or on degree of impairment of social interaction (DeMyer, 1976; Wing & Gould, 1979) has more useful practical implications for education and management than any based on the eponymous syndromes mentioned above.

In the light of this finding, is there any justification for identifying Asperger's syndrome as a

separate entity? Until the aetiologies of such conditions are known, the term is helpful when explaining the problems of children and adults who have autistic features, but who talk grammatically and who are not socially aloof. Such people are perplexing to parents, teachers and work supervisors, who often cannot believe in a diagnosis of autism, which they equate with muteness and total social withdrawal. The use of a diagnostic term and reference to Asperger's clinical descriptions help to convince the people concerned that there is a real problem involving subtle, but important, intellectual impairments, and needing careful management and education.

Finally, the relationship to schizophrenia of Asperger's syndrome, autism and similar impairments can be reconsidered. Although they are dissimilar in family history, childhood development and clinical pictures, both groups of conditions affect language, social interaction and imaginative activities. The time of onset and the nature of the disturbances are different, but there are similarities in the eventual chronic defect states that either may produce. It is not surprising that autism and schizophrenia have, in the past, been confused. Progress has been made in separating them and it is important to continue to improve precision in diagnosis, despite the many difficulties met in clinical practice.

MANAGEMENT AND EDUCATION

There is no known treatment that has any effect on the basic impairments underlying Asperger's syndrome, but handicaps can be diminished by appropriate management and education.

Both children and adults with this syndrome, like all those with the triad of language and social impairments, respond best when there is a regular, organized routine. It is important for parents and teachers to recognize the subtle difficulties in comprehension of abstract language, so that they can communicate with the child in ways he can understand. The repetitive speech and motor habits cannot be extinguished, but, with time and patience, they can be modified to make them more useful and socially acceptable. Techniques of behaviour modification as used with autistic children can possibly be helpful if applied with sensitivity. However, Asperger (1979) expressed considerable reservations about

using these methods with children with his syndrome who are bright enough to be aware of and, as Asperger put it, 'to value their freedom'.

Education is of particular importance because it may help to develop special interests and general competence sufficiently to allow independence in adult life. The teacher has to find a compromise between, on the one hand, letting the child follow his own bent completely, and, on the other, insisting that he conform. She also has to ensure that he is not teased and bullied by the rest of the class. There is no type of school that is particularly suitable for those with Asperger's syndrome. Some have performed well in schools for normal children, while others have managed better in schools for various kinds of handicaps. Educational progress depends on the severity of the child's impairments, but also on the understanding and skill of the teacher.

Most people with Asperger's syndrome who settle in open employment have jobs with a regular routine. They also have sympathetic employers and workmates who are willing to tolerate eccentricities. In many instances, work has been found by parents who persevere in approaching employers, despite all the difficulties.

Finding appropriate living accommodation also presents problems. Living with parents is the easiest solution, but cannot last for ever. Hostels or lodgings with a helpful landlady are the most usual answer. Tactful supervision may be needed to ensure that rooms are kept clean and tidy and clothes are changed regularly.

Superimposed psychiatric illnesses, if they occur, should be treated appropriately. Emotional distress in adolescents and young adults due to partial insight may be reduced to some extent by counselling from someone who has a full understanding of the syndrome. Such counselling consists mainly of explanation, reassurance and discussion of fears and worries. The counsellor has to adopt a simple and concrete approach in order to stay within the limits of the client's understanding. Psychoanalysis, which depends upon the interpretation of complex symbolic associations, is not useful in this condition.

Parents, in their child's early years, are usually confused and distressed by his strange behaviour. They need a detailed explanation of the nature of his problems if they are to understand and accept that he is handicapped.

APPENDIX

Case histories

As mentioned above, the following case histories are those of people who have been referred to psychiatric services. The high achievers mentioned by Asperger (1944) are not represented.

Case 1

This is a typical example of the syndrome.

Mr K.N. first presented as a psychiatric outpatient when he was aged 28, complaining of nervousness and shyness.

As a baby he was always placid and smiling and rarely cried. He used to lie in his pram for hours, laughing at the leaves on the trees. His mother remembered he did not point things out for her to look at, in contrast to his sister. He continued to be quiet and contented as a toddler. If other children took his toys he did not protest. Walking was somewhat delayed and he was slow in acquiring self-care skills, though not enough for his parents to worry.

He began to talk around 1 year of age. He had several words at this time, but, after seeing and hearing a car crash which startled him, he stopped talking and did not begin again until he was 3 years old. His parents thought his understanding of speech was normal. *K.* developed good grammar, though he referred to himself in the third person till 4-5 years old. He has never been communicative. Even as an adult he gives information only if questioned and then replies as briefly as possible. His facial expression and gestures are limited, and his voice is monotonous.

As a child he was attached to his mother, he never made any friends, and he was much teased at school. He remains a shy and socially isolated person though he would like to be able to make social contacts.

K. had no stereotyped movements, but has always been ill-coordinated and very poor at games. He does not swing his arms when he walks. He attended a private school and did well in subjects needing a good rote memory, such as history and Latin, but fell behind at the stage when comprehension of abstract ideas became necessary. He was in the army for a short time, but was not allowed to take part in marches and parades because of his clumsiness and inability to do the right thing at the right time. He was discharged because of these peculiarities.

K. did not object to changes imposed by others, but he was, and still is, orderly in his own daily routines and in arranging his own possessions.

From early in his life he liked toy buses, cars and trains. He amassed a large collection and would notice at once if a single item were missing. He would also make models with constructional kits. He played

with such toys, on his own, for as long as he was allowed to continue. He had no other pretend play and never joined in with other children. The interest in means of transport has remained with him. In his spare time he reads factual books on the subject, watches cars and trains and goes on trips to see trains with fellow train-enthusiasts. He has no interest in fiction or any other type of non-fiction.

K. has been employed for many years in routine clerical work. He enjoys his job and his hobby, but is very sad and anxious because he is aware of his own social ineptness and would like to have friends and to marry. He writes many letters to advice columns in magazines, hoping for help with these problems. His concern over what he terms his 'shyness' finally made him ask for help from a psychiatrist.

The WAIS gave K. an IQ in the dull normal range, with similar verbal and non-verbal scores. He was particularly poor at sub-tests needing comprehension of a sequence of events.

Case 2

The second case history is also typical, but complicated by severe depression with onset in early adult life.

Mr L.P. was admitted to a psychiatric hospital at age 24 because of a suicidal attempt. He was born 4 weeks premature and had feeding problems in the first week or two. He was an easy, placid, rather unresponsive baby who rarely cried. He acquired motor and self-care skills, but his parents later realized that he passed these milestones more slowly than his sister, though they did not worry at the time. His father had a vague premonition that there was something odd about L. but not enough to seek advice.

He did not begin to speak until he was 3 years old, but this was attributed to the fact that the family was bilingual. However, by the time he went to school he was speaking in long, involved, pedantic sentences that sounded as if they had come from books. He tended to interpret words in odd ways. For example, when hearing someone described as 'independent' he thought this meant they always jumped in at the deep end of the swimming pool. He still takes jokes very seriously. He used to ask the same questions over and over again, regardless of the answers he was given. He did not initiate or join in conversations except by repetitive questioning.

L. remained placid and obedient throughout his childhood. He rarely initiated any activity, but waited to be told what to do. As a small child he used to rock himself when unoccupied. He had no imaginative play. He went to normal school, but did not join in with the other children and had no friends until he was about 14 years old. Then he did begin to

mention one or two companions and referred to them as friends, but has lost touch since. He was bullied at school and remembers it as an unhappy time.

L. has always been concerned that his possessions should be orderly and that the daily routine should be followed exactly.

He is poor at games needing gross motor skills and at tasks requiring hand-eye coordination. His posture and gait are markedly odd. His face has a faintly bewildered expression that rarely changes. He uses large, jerky, inappropriate gestures to accompany speech. The odd impression he conveys is exacerbated by his old-fashioned choice of clothing.

L.'s memory is excellent and this enabled him to pass exams in subjects that can be learnt by rote. He is a very good chess player and enjoys taking part in matches. He can read well and enjoys books on physics and chemistry, concerning which he has memorized a large number of facts. He is particularly interested in time. He wears 2 watches, one set at Greenwich Mean Time and one at local time, even when these are the same.

His major problem is his social ineptitude. He will, for example, go on talking about his special subjects despite the most obvious signs of boredom in his audience. He makes inappropriate, often quite irrelevant, remarks in company and appears gauche and childish. He is painfully aware of his deficiencies, but is unable to acquire the skills necessary for social interaction. Nevertheless, he is kind and gentle and, if he realizes someone is ill or unhappy, he will be most sympathetic and do his best to help.

Since leaving school he has been employed as a filing clerk, and lives in a hostel.

L.'s parents did not seek psychiatric help when he was a child, but he has been in contact with psychiatric services since reaching adolescence. On the first occasion he had become agitated because of worries about sex. On the second, he was anxious and losing sleep because of a minor change in his routine at work. On the third he was admitted as an in-patient following attempted suicide, once again precipitated by the possibility of reorganization in the office where he works. He tried to drown himself, but failed because he is a good swimmer. He then tried to strangle himself, without success. Commenting on this he said 'The trouble is I am not a very practical person'. At admission he was dishevelled in appearance, deeply distressed and sad. His speech was painfully slow with long pauses between phrases. Its content was coherent, although, in his replies to questions, L. tended to add information that was correct, and related to the subject in hand, but not relevant in the context. For example, when asked about relations with his father L. said 'My father and I get on well. He is a man who likes gardening'.

L. blamed himself for all his problems, describing

himself as an unpleasant person, whom no one could like and who could not manage his own life. He said he had heard people saying things about him such as 'L. is stupid', 'L. is a bad person', 'L. is a chemistry fanatic'. Careful questioning and subsequent observation showed that these were misinterpretation of overheard conversations and never occurred when L. was alone. For the first two admissions, the referring agency diagnosed an anxiety state, and, for the third, schizophrenia. The final diagnosis was Asperger's syndrome complicated by anxiety and depression (not schizophrenia).

L. scored in the average range on the WAIS, his verbal being rather higher than his performance score, mainly because of his large vocabulary.

Case 3

The third case history is that of a boy where abnormality was recognized from infancy.

B.H. is aged 10. He was delivered by forceps and had difficulty with breathing and cyanosis after birth, remaining in special care for 2 weeks. He was a large, placid baby, who would lie without moving for long periods. He was not eager to use gestures, to clap or to wave good-bye. His mother was worried about him from the beginning, partly because of the difficult birth and partly because of his behaviour.

His parents were certain that he replied 'Yes' appropriately to questions at 11 months. At around 14 months he began to speak in a fluent, but incomprehensible 'language' of his own.

He made no effort to crawl, but one day, aged 17 months, he stood up and walked. He learnt to crawl after this.

He retained his own language until aged 3 years, when he started to copy clearly words he heard, and then went on to develop understandable speech. His comprehension of language has always lagged behind his expression. By the age of 4 he could read. His parents said they did not teach him – he presumably learnt from the television. At the age of 5 he had a reading age of 9 years, but his comprehension was poor.

In his early years, *B.* remained quiet and passive, showing little emotion of any kind. He seemed to prefer a regular routine, but did not react at all to changes. He was not demanding and gave no trouble.

B. did not develop imaginative pretend play at the usual age. At the age of about 6 years he became fascinated with means of transport, read all about them and learnt all the technical terms. He enacts actions involving cars, aeroplanes and so on, but never with other children.

He appears clumsy and ill-coordinated, has problems with buttons and laces, and is afraid of climbing.

B. attends a special school. When first admitted he ignored the other children and carried on with his usual preoccupations. He appeared astounded when the teacher indicated that he should obey her instructions and follow the rest of the class. Gradually he began to fit in and to make active social approaches, though in a naïve and inappropriate fashion. He has difficulty in following the rules of any game.

He speaks in a pedantic style, in an accent quite unlike that of his local environment. For example, he referred to a hole in his sock as 'a temporary loss of knitting'. Many of his phrases are, like this one, inappropriately adapted quotations from television or books.

B. is now aware of and sensitive to other people's criticism, but appears unable to learn the rules of social interaction.

When tested at age 7 years he had a word recognition age of 12 years, scored at his age level on performance tasks, but was well below this on tests needing recall and comprehension of language.

Case 4

In the following example of the syndrome, the diagnosis is complicated by a history of illness and psychological stress in early life, and by visual impairment.

Miss F.G. is aged 26. Pregnancy and delivery were normal, but *F.* had a series of illnesses and operations, including a subdural haemorrhage of unknown aetiology and correction of strabismus before the age of 3 years. She has poor eyesight and has to peer very closely to see, but can read, write and type.

F. talked fluently at an early age, and had a large vocabulary. Her parents thought she was developing normally until the operation on her eyes at 2½ years. Following this she was socially withdrawn for several months. No detailed description could be obtained, but her mother was quite certain that there was a marked change in behaviour. Despite the problems of social interaction, *F.*'s speech remained clear, with good vocabulary and grammar. She always had a remarkable memory for anything she had heard or read, including any statistical information. *F.* gradually became more friendly and, by about 3 years of age, she was making social approaches to her parents and others in the family. However, she did not interact much with other children. She copied her mother's activities a little, but did not develop normal pretend play or social play.

Her main interests as a young child were drawing and, later on, reading. She also collected costume dolls, which she arranged in rows that must not be disturbed.

F. went to a normal comprehensive school. She

loved history and geography, and would memorize facts in these subjects with ease, but her teacher reported that she would do no work in any subject that did not interest her, such as mathematics.

She was accepted at school but recognized as odd. Her conversation contained many long quotations from books and she also often made irrelevant remarks.

F. was never good at practical tasks. Her parents tended to do things for her. They found that, if they asked her to do some task, she would begin, but soon stop and turn to her own preferred activity – usually reading a book.

After leaving school she obtained work as a typist. She proved an excellent copy typist and was outstandingly accurate at spelling. She made no friends with the other members of staff. After 4 years the pressure of work increased. F. became distressed and unable to cope. She left work and has been unemployed for 3 years. During this time she has been anxious and agitated and unable to do anything on her own. She spends her time reading and amassing facts. She tends to have childish temper tantrums if thwarted in any way.

The WAIS showed that F. had a verbal score in the average normal range, but performance was very much lower, being in the mildly retarded range. The verbal skills depended on her good vocabulary. She did poorly on any task where the elements have to be organized into a coherent whole.

Case 5

This is the history of a young man who showed the features of Asperger's syndrome, but who was mentally retarded and did not achieve independence as an adult.

Mr J.G. is aged 24 and attends a training centre for mentally retarded adults. J. was a quiet, unresponsive baby. He began to say a few words at the age of 2, but did not walk well until 2½ years old. At first he echoed, used phrases repetitively and had poor pronunciation. He learnt to read at the age of 5½ and always did well on reading tests, though his comprehension was poor. He knew many unusual or technical words, such as 'aeronautical' and 'pterodactyl' but would be puzzled by familiar ones such as 'yesterday'.

He was not aloof, but gentle and passive, tending to stand and watch other children, wanting to join in but not knowing how. He was very affectionate towards his own family. At age 24 he is still unable to interact socially, though is happy to be a passive member of a group.

He is clumsy in gait and posture and slow on tests of manual dexterity. J.'s special interests are music and cars. He can recognize any make of car, even if shown only a small part of the whole vehicle.

He attended a special school for mentally retarded children. He was described by his teacher as 'showing no initiative'. He was eventually placed in an adult training centre near his home, where he is happily settled.

His WAIS score at the age of 17 was on the borderline between mild and severe retardation, with the verbal level being very slightly better than the performance. His reading age was still well in advance of all other skills.

Case 6

The following case history is of a boy who at first was classically autistic and later developed the characteristics of Asperger's syndrome.

C.B. is aged 13. His mother dates C.'s problems from the age of 6 months when his head was accidentally bruised. From this time he became socially aloof and isolated, and spent most of his time gazing at his hands which he moved in complicated patterns in front of his face. At 1 year old he began to watch the passing traffic, but still ignored people. He continued to be remote, with poor eye contact, until 5 years of age. He passed his motor milestones at the usual ages and, as soon as he was physically able, he spent hours running in circles with an object in his hand, and would scream if attempts were made to stop him. At the age of 3 he began to be able to recognize letters of the alphabet and rapidly acquired skill at drawing. He then drew the salt and pepper pots, correctly copying the names written on them, over and over again. For a time this was his sole activity. Following this he became fascinated with pylons and tall buildings and would stare at them from all angles and draw them.

He did not speak till the age of 4, then for a long time used single words. After this, he acquired repetitive phrases and reversed pronouns. C. had many stereotyped movements as a young child, including jumping, flapping his arms and moving his hands in circles.

After the age of 5, C.'s speech and social contact markedly improved. He attended a special school until aged 11, where they tolerated a range of bizarre, repetitive routines. At one point, for example, he insisted that all his class and the teacher should wear watches that he had made from plasticine before lessons could begin. Despite all the problems, he proved to have excellent rote memory, absorbed all that he was taught, and could reproduce facts *verbatim* when asked. C. was transferred to a normal comprehensive school at the age of 11. He has good grammar and a large vocabulary, though his speech is naïve and immature and mainly concerned with his own special interests. He has learnt not to make embarrassing remarks about other people's appear-

ances, but still tends to ask repetitive questions. He is not socially withdrawn, but he prefers the company of adults to that of children of his own age, finding it difficult to understand the unwritten rules of social interaction. He said of himself 'I am afraid I suffer from bad sportsmanship'. He enjoys simple jokes but cannot understand more subtle humour. He is often teased by his classmates.

His main interest is in maps and road signs. He has a prodigious memory for routes and can draw them rapidly and accurately. He also makes large, complicated abstract shapes out of any material that comes to hand, and shows much ingenuity in ensuring that they hold together. He has never had pretend play but is deeply attached to his toy panda to which he talks as if it were an adult when he needs comfort.

His finger dexterity is good, but he is clumsy and ill-coordinated in large movements and therefore is never chosen by the other children for sports and games teams.

C. is of average intelligence on the WISC, with better verbal than performance skills. He does well on tasks needing rote learning, but his teachers are deeply puzzled and concerned about his poor comprehension of abstract ideas and his social naïvety. They find him appealing but sadly vulnerable to the hazards of everyday life.

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