

SCHIZOPHRENIA.

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and

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I. INTRODUCTION, DEFINITION, CLASSIFICATION, THEORY.

NEW methods of physical treatment introduced during the last decade have revived the general interest in schizophrenia, the "Cinderella of psychiatry" (Ellery, 1941). The fact that schizophrenic symptoms can be influenced by crude physical means such as convulsions, hypoglycaemia or operations on the brain has directed the attention to the bodily disturbances underlying the psychological symptoms. The need for accurate assessment of results of these treatments has also revived the interest in prognosis. Kraepelin, who, in 1896, "by a streak of genius" (Adolf Meyer) unified varied clinical pictures in what he called dementia praecox and considered it a disease entity, never doubted its causation by a brain process of organic nature. Nor did Bleuler, when he tentatively proposed the term "schizophrenias" for approximately the same group of cases in 1911 in which he found a common primary psychological disturbance. Those interested in the meanings of "splitting" as expressed by the term schizophrenia will find a discussion of possible misunderstandings in an article by Lewin (1939).

Kraepelin's and Bleuler's views are compared and contrasted with those of Adolf Meyer's on what he named parergasia in a paper by Katzenelbogen (1942). Meyer did not accept the organic aetiology, "for the reason that heretofore it has not been supported by adequate factual material." He waived the idea of disease entities even as an aim and introduced the schizophrenic reaction type; but it is worth recalling how much his psychodynamic interpretation is akin to Bleuler's. Both emphasized the prepsychotic handicaps of many schizophrenics which make their adjustment to the problems of reality difficult; both considered subconscious complexes the cause of conflicts preventing adjustment; and both included in the concept of schizophrenia schizoid personalities who remain so all their life without ever suffering from psychotic attack. Meyer added "habit deterioration" as an important element in the familiar picture. Katzenelbogen's summary of Bleuler's work is especially welcome because the latter's original monograph has never been translated into English, and the inadequate translation of his text-book gives no idea of his "elaborate, explicit and comprehensive" analysis based on a broad clinical material. Kraepelin's later views were influenced by

Bleuler ; he even admitted the idea of reaction types instead of disease entities ; but his clinical description has, according to Katzenelbogen, not been surpassed either by Bleuler or by Meyer. " It has stood the test of time and probably will remain a classical model."

It seems appropriate to mention that Bleuler's death falls in the period covered by this survey, as also Rosanoff's, whose *Manual of Psychiatry*, in its seventh edition (1938), is probably the only modern text-book which does not mention schizophrenia at all. The corresponding clinical descriptions are found under " chaotic sexuality."

As long as aetiology remains obscure the definition of schizophrenia seems elusive ; but, as Mapother and Lewis (1941) have pointed out, it is possible for two experts to disagree about what should properly be included, yet over the diagnosis of any particular patient they will attain a measure of agreement and certainty surprising to those who know the condition only from reading or limited experience.

Meanwhile the lively argument for clearer theoretical boundaries continues, kindled by dissatisfaction with the clinical polymorphism at present comprised under the concept, and by the search for a " nuclear " group of more homogeneous nature. Skottowe (1939) suggested " dys-symbole " as the name of a disturbance of conceptual thinking which he demonstrated in a group of cases with insidious onset and hopeless prognosis ; they did not yield either to convulsion or to insulin treatment. Darrah (1940) proposed to call a similar group " dementia praecox," and leave the term schizophrenia for acute cases with " milder symptoms " and better outlook. Osborne (1940) would like to give up both terms, dementia praecox and schizophrenia, and suggests " palaeophrenia " as a name for all cases in which impairment of abstract behaviour and conceptual thinking is found by tests like those of Vigotsky, Weigl, Goldstein and Shipley ; they show, according to Osborne, regression to a more primitive type of thinking, hence his new term. Osborne makes light of the difficulty of excluding patients with paranoid and paraphrenic symptoms—a problem rock on which more than a generation of psychiatrists have stranded. The regressive nature of schizophrenic symptoms is also one of the topics in a purely speculative paper by Hecker (1941). Criticism of the subdivisions of schizophrenia is made in a follow-up study by Macfie Campbell (1943) of nine cases of what he calls schizophrenic " surrender," in fact typical cases of the hebephrenic type. Campbell is loath to call them so : " The technical terms usually given to these cases are so shop-worn and contaminated that one hesitates to circulate further this degraded currency." Another attempt to restrict the diagnosis schizophrenia to a more uniform group by Langfeldt will be discussed under " Prognosis."

Against these attempts to differentiate diagnostically important smaller groups of cases, the idea of amalgamation of schizophrenia with affective psychoses has been revived by Stanley Cobb in his *Foundation of Neuropsychiatry* (1941). He first turns against the use of the term " functional " for schizophrenia and affective psychoses because of their hereditary origin. " Structure is inherited, not function." Although Cobb agrees that typical cases are different and easily separated nosologically, he maintains that they

are really nothing but the extremes of a continuous series of variables. The space between the extremes can, according to Cobb, be filled with a large number of mixtures which cannot be diagnosed as either. As mixtures are more common than typical cases, "one must logically admit that the two diseases are fundamentally one," the schizo-affective group. Thus schizophrenia, despite all theoretical and clinical work, has still to fight for its bare existence, even in one of the most up-to-date American introductions for practitioners and students.

2. AETIOLOGY.

Hereditary factors are discussed in Chapter 3 of this survey.

The prepsychotic personality of schizophrenics has gained fresh interest because of the necessity of excluding prospective schizophrenics from service in the armed forces. Thom (1941) has calculated that the average cost of a schizophrenic taken ill during the last war until his death was \$30,000, thus emphasizing the necessity of selective procedure. There are, however, no recent investigations dealing with predisposing factors in new material, only articles giving advice in general terms.

Bullard (1941) stresses the importance of minute signs of dissociation—Bleuler's *dereistic* thinking—in speech and behaviour, of the manner in which the examinee talks about himself, especially about his physical health, and of his lack of rapport with the examiner. There is a general agreement that a scientific weapon for sorting out prepsychotics does not exist, and that one has to rely on personal impressions and on the history.

Critics of Kretschmer's correlation between certain types of physique and schizophrenia have frequently pointed to the difficulty of ranging females within his types because their build is often indefinite. Elliot (1941) compared 100 female schizophrenics with 100 non-psychotic women of the same average age. The results were on the whole in favour of Kretschmer's view.

The rule that schizophrenia is equally frequent among all races is, according to Demerath (1942), still unproven for the case of primitives who have not been touched by civilization. Caravedo (1941), reporting on conditions in Peru, observed that most of the schizophrenics came from the mixed half-breed population, while the native Indian race seemed least affected; this, as well as the geographical distribution of the 2,500 hospital admissions on which the paper is based, was better explained by social conditions, prejudice against hospital treatment, etc., in the respective communities, than by racial differences.

Data on the social incidence of schizophrenia are the most interesting findings of research work carried out by Faris and Dunham (1939) in Chicago. The sociological structure of the different city districts was known from previous investigations. Faris and Dunham studied the pre-hospital residence in the city of all cases of mental disorder admitted to private and public hospitals within two years. The distribution showed a regular decrease from the centre, which had the greatest density of patients, to the periphery of the city. The pattern of distribution was similar to that of poverty, crime, unemployment,

infant mortality, and many other social abnormalities. This distribution was especially characteristic for schizophrenia, while manic-depressives had a random pattern of incidence not clearly referring to the social differences in the city areas. Among schizophrenics the paranoid type followed the characteristic pattern more closely than other types. The complex nature of the economic and racial conditions does not allow a clear-cut explanation of these findings; the authors take great care in suggesting theories. The material is admirably presented in tables, graphs and maps.

Endocrines, which played such an important role among the probable aetiological factors of schizophrenia at one time, have been much less in the foreground of discussion lately. Interest in the sex glands has dwindled, while the thyroid and its connection with metabolic disturbances have attracted greater attention (see "Pathology").

The question how far schizophrenia can be caused or precipitated by physical or psychological stress is of practical importance under war conditions. As a basis for decisions of state insurance tribunals, a panel of five prominent Swiss psychiatrists (Kläsi *et al.*, 1939) have published a report on the question of attributability of schizophrenia to military service under peace conditions. After many quotations, mostly from German literature on the subject, they came to the following conclusions: (1) Schizophrenia is a hereditary and endogenous disease, therefore in no causal relation to military service. (2) There are two exceptions: (a) reactive schizoid psychoses clearing up within a short time; (b) rare atypical, schizophrenia-like psychoses occurring in previously healthy people after a severe injury or damage to the brain. Compensation should be granted for a few months in the reactive schizoid psychoses (a); if the patient is not cured within this time a new expert opinion on the case should be asked for, which will probably establish that the schizophrenia was an endogenous one. The cerebral damage in the schizophrenia-like psychoses (b) may be of traumatic, infectious or toxic origin; these cases are fully attributable to service conditions. In general the report holds that schizophrenia cannot be permanently aggravated through military service, but psychological and physical experiences under service conditions may accelerate the onset of a schizophrenic attack which would have occurred some time later without service. In such cases it is suggested that compensation should be granted up to the maximum time of one year. Every case of this kind, however, has to be decided on its own merits; the decision should be based on the expert opinion of a psychiatrist.

Maclay and Guttman (1940), discussing the war as an aetiological factor in schizophrenia, take approximately the same line. Psychological and physical stress can precipitate or hasten but never cause schizophrenic illness. If such precipitation is probable they suggest compensation for 6 to 18 months according to the circumstances of the case; beyond this the disease or relapses are not attributable. They also recognize the rare instances in which psychotic states after head injury, severe bodily illness or "psychological shock," may merge into chronic schizophrenic illness in uninterrupted sequence, and regard such cases as caused by the service. Difficulties can be foreseen in the possible interpretation of the term "psychological shock."

Cerebral injury and schizophrenia is discussed in a paper by Feuchtwanger and Mayer-Gross (1938) presenting in detail 23 cases from the last war. Most of these were found among over 1,500 pensioners controlled by the Munich head injury centre. The percentage of schizophrenia-like psychoses and schizophrenias together among this material was four times that calculated by other workers for the average German population of the same age-group. Without the schizophrenia-like psychoses, most of which were schizophrenic pictures in cases of post-traumatic epilepsy or traumatic dementia, the number of "pure" schizophrenias among the head injured was not significantly higher than in the average population. The case-histories, many of them followed up till 1930 and later, illustrate the various combinations of schizophrenic symptoms with defects due to cerebral damage with and without epilepsy. Frontal damage was almost twice as frequent among the patients with schizophrenic symptoms as in the total material, while parieto-temporal lesions were correspondingly rarer; more detailed correlation between symptoms and site of injury could not be established.

The views on the role of mental deficiency in the incidence of schizophrenia are still highly contradictory. In a group of over 2,000 antisocial and excitable defectives James (1939) diagnosed three-quarters of the small number of psychotics as schizophrenia. Kallmann and his collaborators (1941) have surveyed the literature, and pointed out the difficulties of the problem and the inconsistencies in terminology. They tried to distinguish between idiopathic, symptomatic, and exogenous forms of either group, and found no evidence that mental deficiency is a predisposing factor of schizophrenia. Using statistical data from genetic research and twin studies, they found no evidence either of an increased incidence of schizophrenia in the consanguinity of mental defectives or of an increased tendency of the blood-relatives of schizophrenics to be feeble-minded. Combinations exist, but not more than could be expected by chance; the idea of an unspecific inheritance leading to alternative incidence of mental deficiency or schizophrenia, as suggested by Rosanoff, was not supported by the authors' work.

3. PATHOLOGY AND PHYSICAL SYMPTOMS.

Since the spell of frustration hitherto cast over studies on metabolism in schizophrenia was broken by Gjessing's work on periodic catatonia, investigations have been eagerly resumed in many places; but only a few workers have followed his method of long-section serial studies in a few patients who served as their own controls. War has considerably delayed progress. Before Gjessing's publications and, perhaps, his work were stopped by the invasion of Norway, he published the results of thyroid treatment which he regarded as a kind of verification of his working hypothesis. By the phasic variation in total nitrogen balance and in autonomic function which he found associated with the periodic mental changes, he had opened up two ways of approach to the pathology of schizophrenia, the study (*a*) of liver and thyroid function because of their regulating and controlling role in nitrogen metabolism, and (*b*) of the autonomic changes themselves.

Investigation of the total metabolism in periodic catatonia modelled on Gjessing's work was carried out by Hardwick and Stokes (1941) in one patient and one control case over 18 months. They confirmed the association of stupor periods with negative nitrogen balance, and found a weight of evidence against the simple view that the nitrogen change is secondary to the mental disturbance. On the other hand, when a high level of general nutrition indicated by increased body-weight was attained, the rhythm of mental disorder persisted without parallel nitrogen over-excretion. There were some other points in which Stokes' results differed from those of Gjessing; but as their work was interrupted by the war, their only conclusion is a pointer to the urgent problems awaiting solution.

Serial studies of protein metabolism were also carried out by Greving (1941), following up his former work with Jahn. From the abstract of his publication which is available at present, it appears that he confirmed what Jahn called "asthenic metabolic changes" occurring in schizophrenics as well as in schizoid psychopaths, and contrasted them with findings in pyknic, cyclothymic patients. The asthenic changes are, according to Greving, the basis of the somatic syndrome in schizophrenia. In the four schizophrenics he investigated, he found "nitrogen retention preceding the onset of an active psychotic phase; furthermore, disturbances in urea synthesis and in esterization of cholesterol, all of which were attributed to pathological fermentative action of the liver." These changes disappeared in patients with good remissions, but an unfavourable course in patients with nitrogen retention persisted, in spite of strong metabolic stimulants, such as artificial fever. Further proof of the importance of nitrogen retention due to a faulty liver function was seen in results of phlorizin experiments. In clinically unalterable stupor cases phlorizin produced no increase in nitrogen excretion, despite the great loss of sugar, while nitrogen excretion increased parallel with sugar excretion in prognostically favourable cases. Another interesting observation mentioned by the same author was that of nitrogen retention in animals poisoned with mescaline. Excretion returned to normal after withdrawal of the drug, which in man produces many schizophrenic symptoms (Agadjanian, 1940; Stockings, 1940).

Tests of liver function were carried out by Quastel and Wales (1938), using Quick's method of detoxication of benzoic acid. In a preceding paper with Wheatley, Quastel had shown that certain intermediary products of protein metabolism inhibited oxidation in brain tissue just as narcotics do. Eighteen catatonic patients showed a diminished excretion of hippuric acid in the urine, indicating a disturbance of the detoxicating process of benzoic acid, while in non-catatonic schizophrenics and in other patients the results were normal. Ström-Olsen and his collaborators (1938), however, could not confirm these findings. In their material the proportion of cases with low excretion of hippuric acid was about the same in catatonic as in non-catatonic schizophrenics. Quastel and Wales (1940) repeated their experiment in twelve catatonics, each of whom excreted definitely less than the normal value. To avoid delayed absorption of benzoate from the intestine as a possible factor, they gave it intravenously with the same result. Davies and Hughes' (1940)

results in 45 schizophrenics of which 17 had catatonia were on the whole in favour of Quastel's statement, but they do not regard the phenomenon as specific for catatonia, because they found low excretion in a number of non-catatonic patients. The explanation that the results in catatonics could be due to their muscular rigidity and immobility was suggested by Finkelman and co-workers (1941), but Gildea reported two patients immobilized in a plaster cast for three months, who responded normally to an intravenous hippuric acid test. Berkenau (1940) tested a relatively small mixed group of patients with a battery of liver function tests. Quick's benzoic acid test gave low values of excretion in all his patients with catatonic features, among whom were a number of depressions and involutions melancholias.

The hypothesis of a toxic substance, possibly an amine, being responsible for the mental and autonomic changes in periodic catatonia was criticized by Richter and Lee (1942). They argued that the retention of nitrogen observed by Gjessing applied to all nitrogen degradation products found in the urine, and proved nothing about a single protein intermediate which might have a toxic effect. They tested by new methods of their own the blood of a mixed group of psychotics, among whom were 19 schizophrenics, for both simple amines and lipids containing an amino-group. No increase of the former was found, but a statistically significant increase of the amino-lipids was obtained in schizophrenics. This work suffered from the frequently deplored shortcomings of psychiatric biochemistry; it did not deal with a clinically homogeneous material, and took no account of the condition of the patient at the time of the test.

Thyroid treatment was applied by Gjessing (1939), not as substitute therapy for hypothetical hypothyroidism, but to catabolize body nitrogen in order to prevent the storage of nitrogen and its supposed toxic effect. He placed his cases on a low protein diet, and gave thyroxin in an ascending scale of dosage up to the point of mild intoxication; he followed it up with thyroid gland extract to maintain the nitrogen depletion. From his parallel studies of the metabolism, there can be no doubt that he succeeded not only in compensating the somatic disturbances in the four cases published in his last article, but also in abolishing their periodic psychoses (stupor or excitement). Hardwick and Stokes (1941) have tested his method in six similar cases with, on the whole, identical results. Their clinical criteria for exhibition of thyroid are: A rhythmic illness, association of the phases of illness with rise in temperature, pulse-rate and blood pressure, good tolerance of thyroid, and increase in weight during treatment.

For selecting the type of schizophrenic likely to respond to thyroid treatment, Sargant, Frazer and Brazier (1938) used the impedance angle, because they observed that a rise of its value coincided with spontaneous recovery in psychotics. Patients with a low impedance angle seemed to derive the greatest advantage from the drug, while in a case of quiescent schizophrenia with a high impedance angle before treatment the symptoms were activated by thyroid.

For a long time clinical observers have recognized that hyperthyroidism among schizophrenic patients is very rare. Hemphill (1942) found only five cases of toxic goitre among 4,750 psychotics of the Bristol Mental Hospital,

and described a clinical syndrome which he considered characteristic for "hyperthyroid catatonia."

Massive and prolonged medication with thyroid has no toxic effect in chronic schizophrenics. Cohen (1939) applied the desiccated gland to eight patients in a state of advanced deterioration. Somatic reactions included: increase of basal metabolic rate, of pulse rate and pulse pressure, loss of weight, etc., but not the expected degree of hyperthyroidism. The psychiatric changes produced were only quantitative; more repetition and more perseveration of the patient's usual primitive, highly automatized activities, no elaboration of symptoms, no qualitative change in delusions or hallucinations, etc.

Thyroid function as a link in the disturbed autonomic integration was the subject of a comprehensive investigation in 129 cases of early schizophrenia by Rheingold (1939). Non-protein nitrogen, carbon dioxide combining power, dextrose and cholesterol were tested in the blood, so were oxygen consumption, blood picture, blood pressure, pulse rate and weight, and the results analysed statistically. More than half of the subjects had been ill less than one month; the majority were hebephrenics, but the other clinical groups were represented as well. The most marked abnormality was the low oxygen consumption rate; but there were other signs of hypometabolism. Rheingold refers his findings to the thyroid because of the similarities in the somatic status of his patients with that in the non-myxoedematous form of hypothyroidism recently described by American workers. However, in search of causative factors he ends up with the hypothalamus. The failure of central autonomic regulation inhibits in the author's view the action of both the naturally produced hormone of the thyroid gland and the hormone introduced from outside if thyroid is administered.

This idea of a primary disturbance of central autonomic regulation in schizophrenia has found new support on most diversified grounds. Many writings are heuristic speculations only, like an article by Grinker (1939), who spoke about "deficiency in some central autonomic co-ordinating process" professing its speculative nature. He tried to link up the physiological abnormality with the psychopathology of instincts in schizophrenia. Referring to Hess's theory of autonomic functions in sleep and wakefulness, Boss (1941) collected interesting self-observations of schizophrenic patients about the depth and nature of their sleep and about their incomplete wakefulness in daytime. Loss of the diurnal rhythm is undoubtedly a symptom in many schizophrenics, and may be due to a failing central regulation in the hypothalamic region.

The striking autonomic symptoms observed during insulin and convulsion treatment are, according to Gellhorn (1938), mainly responsible for the efficacy of these treatments. He believed that the slackness of central autonomic function produced by the schizophrenic illness is thus overcome, and supported his view by insulin estimations in the blood of schizophrenics, in which he found a vago-insulin predominance if compared with normal subjects (Gellhorn, Feldman and Allan, 1942).

Correlation between size and shape of the cutaneous capillary loops and mental characteristics or types of constitution has been studied with the idea

that capillaries are indicators of autonomic equipment of the subject. Olken (1939) has worked out a quantitative method of assessing capillaries. After testing 6,000 healthy persons of all ages, thus gaining a control material, he investigated 1,100 schizophrenics. Their capillaries showed striking deviations from the normal. The severity of the disease was expressed in the derangement of capillary structure, and the writer suspects corresponding anomalies of capillaries in the brain with disorders of circulation. As physical illness which might cause similar capillary pictures was absent in his cases, he concludes that "schizophrenia falls in the category of vegetative and metabolic disorders."

The most important argument against the view of a primary central autonomic disturbance is still the absence of any histological change in the hypothalamic region, but there is also opposition from the physiological and clinical side. Jung and Carmichael (1937), registering plethysmographic reactions after the immersion of limbs in water of varying temperatures, were able to explain all clinically observed vasomotor anomalies in catatonic stupor by the immobility of these patients. Vasomotor responses and central heat regulation were all found normal when tested under the scrutiny of experimental conditions. These findings were confirmed by Abramson and collaborators (1941) testing peripheral blood-flow. Rosenfeld (1938), giving a general survey of the role of the autonomic nervous system in psychoses, discarded from the point of view of the clinician the localization of schizophrenia in the vegetative centres without, however, denying the occurrence of marked autonomic symptoms in certain schizophrenic states.

There is much to be said in favour of a guiding formula through the many isolated and contradictory somatic abnormalities reported in schizophrenia. Hoskins, who devoted much work to this problem, has now suggested, in an article with Angyal and Freeman (1940), the application of the term "withdrawal" for both psychological and physiological changes. Withdrawal is "expressed psychologically in lack of interest, apathy and indifference," physiologically in a general hyporeactivity, a diminution of responsiveness to various stimuli. Hyporeactivity to metabolic stimulants was demonstrated in experiments with large doses of thyroid (Cohen and Fierman, 1938), and with dinitrophenol as an oxidative stimulant (Freeman, 1939). In a severe stress situation in which schizophrenics breathed hot moist oxygen, their autonomic responses were markedly below those of normal controls (Freeman and Rodnick, 1940). Hyporeactivity was also found as measured by the number of nystagmus beats resulting from caloric and rotatory stimulation of the vestibular nerve (Angyal and Blackman, 1941). Again, when guinea-pig serum (Molholm, 1942) was injected intracutaneously, the mean maximum area of erythema was significantly smaller in schizophrenics. They also proved more resistive to insulin, and showed less rise in blood sugar and less autonomic signs when adrenaline was given following insulin (Freeman, Looney, Hoskins and Dyer, 1943). Studying the effect of rotation on postural steadiness as expressed in the amount of the subjects' sway, again the schizophrenic subjects were less reactive than normals (Freeman and Rodnick, 1942).

Hoskins and his collaborators are aware of the complexity of the problem, and appreciate that in some respects the reactivity of schizophrenics is identical

with normals or even increased. Dyne and Tod (1940), for instance, found the somatic response to adrenalin and doryl not different from that of controls. The "psychobiologic" approach to schizophrenic withdrawal certainly has provoked a number of specific studies. It remains to be seen if the hope of the introductory paper will be fulfilled, and the "concept (of withdrawal) which is used with a somewhat vague and general connotation gains a new and rather definite meaning."

Carbohydrate metabolism in schizophrenics was studied by Lofvendahl and Valatin (1941), using new physiological methods. In the blood of catatonic and of restless patients they found abnormally high values for bisulphite-binding substances, pyruvic acid and lactic acid, while in quiet patients the findings were normal. Two tolerance tests of lactic acid after injection of sodium lactate or of adrenalin also gave abnormal results in the same type of patient. The number of patients and of controls was relatively small. A more comprehensive investigation of this kind is suggested.

The final results of the enigmatic metabolism in chronic schizophrenics as expressed in the patient's body-weight were studied by Baganz and Norris (1943), who followed up the weight of 374 hospitalized patients over a period of eight years and compared it with that of the total hospital population. While the degree of malnutrition did not differ from the controls on admission, the proportion of schizophrenics showing underweight was 50 per cent. greater after eight years. More active patients lost less in weight than the quiet cases. The extent and degree of malnutrition was independent of the intake in calories. Whatever the nature of the unknown "factor lacking in the digestion, absorption or metabolism of schizophrenic patients," they easily gained weight when small doses of insulin were given, as demonstrated by the authors in a special group. Broch (1938), however, who examined 90 undernourished patients, mostly schizophrenics, in a Norwegian hospital, found their ascorbic acid level in the blood low and blamed inadequate diet.

Occasional abnormalities in the C.S.F. of schizophrenics, especially increased protein content, has been reported in the literature. Testing 1,281 patients of the Indianapolis State Hospital, Bruetsch and co-workers (1942) found an increase of protein in 5 per cent. of the male and 3.2 per cent. of the female cases. Only four times was the protein over 100 mgm. A few of the patients had a parentage suspicious of syphilis; otherwise there was neither an explanation from the clinical observations nor from the post-mortem findings of two cases who had shown positive C.S.F. reactions.

The interest of the pathological anatomist in schizophrenia has recently centred around the cases of sudden death in catatonics. Single cases with post-mortem findings of vascular changes in the brain have been reported by Bruetsch (1940), Horanyi-Hechst (1940), and Malamud and Boyd (1939). Cases without cerebral lesion have attracted special attention in the hope of finding lesions indicating metabolic dysfunction. Palmer (1941) recently reported an observation clinically similar to Scheid's "febrile cyanotic syndrome," but with in addition intense fatty change of the liver. Fatty degeneration of the lobular centres was also present in five catatonics examined post-mortem by Gaupp (1940).

An exhaustive study by Locher (1941) on sixteen cases of sudden unexpected death in catatonic states should remove much misunderstanding and controversy in this field. A critical survey of the literature is followed by the case-histories and full post-mortem findings of her own patients and the causes of sudden death in mentally normal people are discussed. In fourteen out of sixteen cases the fatal outcome could be easily explained by somatic findings, which were not clinically diagnosed because of the abnormal behaviour of the patient or were indirectly due to the psychotic condition, e.g. circulatory collapse during motor excitement in a long-standing cardiac failure, etc. Brain or liver changes were absent, and it was unnecessary to resort to the psychosis itself as the immediate cause of death. Of the two remaining cases one was a G.P.I. with catatonic symptoms, while the other showed the much discussed "brain swelling" which at one time was considered a common finding in catatonia. The author concludes that the "acute lethal catatonia" of Stauder, Scheid and others is very rare.

4. PSYCHOPATHOLOGY.

With so much attention centred around the somatic pathology of schizophrenia, literature on its psychopathology has become scarce and little work can be reported from the period covered by this survey.

A study on language in schizophrenia by Woods (1938) is based on the analysis of verbatim reports of conversations with 125 patients. The following are some of Woods' interesting findings: The schizophrenic used superficially conventional language to express vague emotional states instead of ideas; he condensed complex ideas with many associations in one single word or a short phrase; neologisms and metaphors signified purely personal connotations without effort to render them meaningful to the listener. More deteriorated cases tended to condense whole sentences in one word, the meaning of which was unstable and unprecise like their thinking. Significant according to Woods is the influence of the affect in all these anomalies, neither language nor thinking being primarily disturbed. Hence, like Bleuler, he considers the fundamental psychological disturbance of schizophrenia as affective.

Two hundred dreams collected from twelve schizophrenics by O. Kant (1926) were examined for any characteristic peculiarity. The dreams themselves showed no specific anomalies, but the patients often accepted them as if they were part of real life. Schizophrenic mechanisms were present in the dreams. Dream analysis proved useful for elucidating the psychopathological network of symptoms in dissociated cases, but was neither diagnostically nor therapeutically helpful.

Early schizophrenics of the educated classes are by far the most suitable subjects for studying the psychology of schizophrenia. Baynes (1940) described the analytical treatment of two cases with the method of C. G. Jung, using active fantasy production in drawings and interpretation of dreams. One patient was a talented artist whose published drawings are remarkable examples of schizophrenic art; the other was quite unskilled in drawing. Both produced a sequence of pictures expressing, according to Baynes, progress

from schizophrenic symptoms through a stage of regression to final restoration on a religious basis. Following Jung's ideas on the psychology of schizophrenia, Baynes discussed the archaic contents of the unconscious which were accessible thanks to the lowering of conscious control. By the purposive direction of the libido into the unconscious and the expression of its contents in fantasy and drawing the patient was—in the author's view—helped to regain control over these archaic contents, which otherwise might have got the upper hand and led to a progressive schizophrenic psychosis.

The handicap in emotional expression so characteristic of schizophrenics was demonstrated by Reitmann (1939) in drawing experiments. He asked patients to copy from memory simple drawings of faces with laughing, crying, etc., expressions which they had been shown immediately before. While other patients did it without difficulty, the drawings of schizophrenics came out stiff and without expression, even if they were able to understand the expression of the original and spoke reasonably about it. Starting with details they ended up with some lines, but did not reproduce the picture.

Such experiments are closely related to Rorschach's ink-blot method, which yields characteristic results in schizophrenics (Benjamin and Ebaugh, 1938; Morhardt, 1941; Weil, 1941). Two Hungarian workers, Böszömenyi and Merai (1940), had the chance of testing a schizophrenic patient who had been tested by the same method before his psychosis. They found a qualitative change in reaction, affirming similar findings of Skalweit. Prevalent introversion before onset of the psychotic attack was replaced by extraversion during the psychosis. They interpret the change as a sign of removal of repressions through the disease.

Hemphill (1939) collected cases in which physical illness influenced the content of the patients' delusions. Together with Stengel (1940) he observed the psychological reaction of three paranoid schizophrenics to physical illness which involved an interruption of the body surface (wounds, disturbance of cutaneous sensitivity); all developed the delusion that something from outside intruded through the break in the body surface. The authors refer to the loss of stability of the boundaries of the ego characteristic of schizophrenia as the possible mechanism causing the idea of introjection.

An extensive investigation on the influence of imagery on the symptoms in nineteen schizophrenics was carried out by L. H. Cohen (1938) with test methods used in vocational guidance. He confirmed clinical impressions like that of the association in the same patient of hypochondriacal delusions and hallucinations of taste, smell, and kinaesthesia. Other conclusions, such as the difference of imagery in schizophrenics and normals, seem to be generalizations based on too small a group of patients and need further substantiation.

The question whether schizophrenia leads to deterioration in the sense of loss of abilities or material has been taken up by Lehrman (1940), who found twenty patients over sixty well adjusted to hospital routine, on parole, etc. He therefore favoured the view lately put forward by French writers that they are not deteriorated in the same sense as organic psychoses, and proposes the term regression for their handicap. It is significant that there were no catatonics among his cases. No special tests or experiments are suggested

to differentiate between regression and deterioration. It is unlikely that the problem can be solved by such arguments on definition.

5. CLINICAL PICTURE AND PSYCHOLOGICAL SYMPTOMS.

(a) *Simple Type.*

Wyrsh (1940) adopted this stepchild among clinical pictures and analysed the histories of thirteen cases observed and followed up for many years. The results of this descriptive study confirmed the classical views on the type. Although Bleuler's primary symptoms were often not manifest, Wyrsh asserted that the cases could be diagnosed from their behaviour even without knowledge of their history. The course is insidious, leading slowly to destruction of the personality; productive symptoms are completely lacking. Shallowness of emotions, indifference or callousness, absence of will or drive and of any kind of periodicity are the main features. The patients have no feeling for their own shortcomings, no consciousness of the progressive change or of their isolated position in life, no complaints except perhaps some vague hypochondriasis. They find that everything they experience and do is natural. These patients were not mental defectives, although it can be appreciated from the description that such a misconception might arise. Loss of affective response is shown to be the leading symptom of simple schizophrenia.

(b) *Hebephrenic Type.*

No similar clinical investigations can be reported on hebephrenia. Thought-disorder, its principal feature, has mainly been studied with the help of special tests. The results are reviewed in Chapter 10.

Inappropriate laughter and silliness, so characteristic of hebephrenics, were the object of a study by Kant (1942c), who got relevant information from eight patients about the mechanism of their hilarity. They told him that their laughing was activated more easily since the onset of their illness and that it relieved their tension. He interpreted their descriptions as follows: The psychosis leads to a disintegration of the patients' personality. This is followed by an overwhelming sense of frustration, to which the patient reacts, not with despair, but with helpless mirth. Kant does not maintain that this is the origin of hebephrenic laughter, or even its meaning in every case, but considers that what he calls "loosening of the personality" in the beginning of the psychosis prepares for such an emotional reaction, which may become stereotyped and deprived of any content in a later stage of the illness.

Schizophrenic "Vorbeireden," talking past the point—"a false response of a patient to the examiner's question where the answer, although wrong, clearly indicates that the question has been grasped"—has been discussed by Anderson and Mallinson (1941) in an article on psychogenic episodes in major psychoses. This symptom often combined with hebephrenic silliness, did not differ in itself from similar responses in hysterical twilight states; differentiation was only possible from the setting in which it was observed.

(c) *Catatonic Type.*

In an effort to clarify the picture of catatonia Sprague (1941) analysed the symptoms of 100 cases diagnosed as dementia praecox, catatonic type, in one of the New York hospitals during the past decade. His method is not statistical, and while he tried to establish a "fundamental pattern" of specific symptoms, his aim is not pure description, but the finding of a formula covering the motor as well as the ideational side of catatonia. He sees it in the "force concept." Force and power are displayed in the abrupt and violent muscular phenomena, in stupor, negativism, excitation and violence as well as in delusions of being influenced by the force of drugs, infection, electricity, telepathy, or any kind of persecution, etc. "Whether in the non-language purely somatic realm, or in the domain of thought, power seemed to be the chief focal interest." Surely it would need some forced interpretation to include the perplexity, bewilderment and sleeplessness of catatonics in a concept of this kind. The author does not suggest why there should exist in our normal language a concept covering the different aspects of an abnormal phenomenon.

Rosenthal (1939), who some years ago described attacks of wakefulness with immobility in narcolepsy, collected similar observations in schizophrenics. Spontaneous descriptions were rare, but on questioning, one quarter of 70 cases reported states of stiffness with immobility in the early stages of their illness. The symptom was sometimes accompanied by fear and fright, sometimes by hallucinations, but often without any content of psychological motivation, and consisted of a feeling of being spellbound, lasting from minutes to hours. Rosenthal discusses its relation to nightmares, to narcolepsy and encephalitis, and suggests a possible cerebral localization in the central autonomic region.

The catatonic pupil first described by Westphal in 1907 as a diagnostic sign and much debated since was the object of a clinical and experimental study by Levine and Schilder (1942). The mechanism of the inconstancy of pupillary reaction to light found in a certain percentage of catatonics, but also in some cases of alcoholism and encephalitis, has never been explained. The authors compared it with findings in anoxia, and after instillation of drugs like eserine, atropine, cocaine, and acetylcholine into the eye of normal controls. Their theory of an autonomic imbalance with parasympathetic predominance is in keeping with many other observations in catatonia. As to the origin of the phenomenon, the following observation was important: Pupillary reaction similar to that of the catatonic pupil occurred as an intermediate stage before complete fixation of the pupil following instillation of drugs like atropine.

(d) *Paranoid Type.*

C. W. Miller (1941) studied 400 cases in which paranoid symptoms were present. They were of various aetiology, including manic-depressive, involuntional, senile arteriosclerotic and other organic psychoses. About half of the patients were diagnosed schizophrenia. He found much similarity of the clinical features in the various diagnostic groups. One of the most common occurrences in the whole group was inadequate or unsatisfactory sexual and

marriage adjustment. Only 50 per cent. of the schizophrenics were what is usually called schizoid personalities in childhood; 280 of the total series had prepsychotic paranoid traits. A plausible immediate cause for the onset of the psychosis was surprisingly rare, and gross environmental factors did not play any definite role in the development of paranoid symptoms.

As to the various aetiological theories, the author found cases confirmatory of every theory, but no theory that fitted all cases, e.g. 12 cases could be adequately and convincingly explained by the psychoanalytic conception of paranoia; 36 could be fitted to this theory with some effort, but the majority defied explanation on this basis. He also mentioned cases without any paranoid symptoms in which all the causative factors stressed in the psycho-analytic theory were at work. The same was found to be true of other theories. Miller accepts Lange's idea of a "paranoid syndrome" which may appear in many settings, may play the chief role in one psychosis or only colour partially or transiently a non-paranoid illness.

In a second paper on prognosis in paranoid cases, Miller (1942) found that of 290 patients one-fourth had a "relatively good" outcome. After an informative survey of the factors which might be responsible for prognosis, he is unable to provide a general rule or an easy formula; personality and its assets, type of delusion and their fixity, age, insight, environment, all co-operate in forming the clinical picture and its course.

6. SOCIAL EFFECTS OF SCHIZOPHRENIA.

Everyday experiences of the psychiatrist seen through the eye and studied by the methods of an anthropologist are the content of an article by Slotkin (1942). He studied the social interaction of a dozen schizophrenics who during three months came into a room with tables, chairs and games, and for two hours every afternoon were left to themselves except for the observer with his notebook. He collected striking illustrations of the private character of the patients' symbolism, of their lack of sympathy, of their inability to organize themselves socially and of their minimum of customs and co-operative activity. The author follows rather too readily the commonplace explanations of psychiatry by schizophrenic withdrawal and introversion, and offers no theory from his own scientific field.

It has been known since Rüdín's investigations of mental disturbances in prisoners with life sentence that many of them suffer from schizophrenia. Wilmanns (1940) reconstructed the life-histories of seven murderers transferred to a psychiatric hospital after showing signs of mental abnormality during imprisonment. In four it was certain and in the others probable that they had committed their crime in the prodromal stage of a schizophrenic illness. He quotes many similar cases from the literature, and surveys the psychological factors leading to unexpected acts of violence in the period of an insidiously developing schizophrenic psychosis. He also discusses the difficulties the judge and the psychiatric expert have to face in dealing with the responsibility of capital offenders when their crime has become a matter of public interest through reports in newspapers. He strongly objects to capital punishment

in such cases even if it may appear more humane than imprisonment for life, especially because of the indelible stain cast on the criminal's family.

7. DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS.

If one resigns oneself to the Meyerian idea that psychiatric diagnosis is and never will be anything but a non-exclusive "shorthand description" of symptoms (Curran and Guttmann, 1943), one cannot expect much effort or progress in the diagnostic field. Consequently, American literature, on which this survey is mainly based, contained little worth recording. In contrast, Langfeldt (1939), who, like most Scandinavian workers, is strongly influenced by continental teaching, followed the example of Kleist in revising the diagnosis of schizophrenia in all cases in which he found no deterioration after 6-12 years. This is discussed under "Prognosis." Attempts to separate smaller, diagnostically more uniform groups from the bulk of schizophrenics are commented on in the introductory section (p. 231).

Diagnosis has not yet benefited from the results of biochemical or other physical investigations, some of which have been reported above. Lehmann-Facius' reaction (1937) for lipoids in the C.S.F., which claimed to be a diagnostic laboratory test for schizophrenia, has not proved specific when used by other workers (Roeder, 1939).

Early detection of schizophrenia has become a matter of special interest because of the better results of physical therapies in cases in which there has been little progression towards chronicity. D. E. Cameron (1938) studied the early symptoms from the histories of 100 patients in Worcester State Hospital. Tables of the non-specific and specific symptoms are given in the terms used by the patients' relatives and friends. Cameron also inquired under what social conditions and by whom the mental abnormality was first noticed and into the immediate cause for hospitalization. Better psychiatric education of the family doctor and periodic surveys of mental health in whole populations are some of his preventive suggestions.

A catalogue of the principal schizophrenic symptoms ranged in order of diagnostic difficulty in early cases was given in an article by Mayer-Gross (1938) mainly addressed to the non-psychiatrist.

Another practical diagnostic problem, especially of the psychotherapist, are schizophrenics whose illness begins in the form of a neurosis during which the typical symptoms make their appearance. W. R. Miller (1940) published a number of such cases in detail, but did not seem much interested in their early differentiation, though this may be highly important for the choice of an appropriate therapy.

O. Kant (1940a) has made a bold attempt to introduce the German concept of personality-stratification to English-speaking psychiatrists. Between the deepest somatic stratum and the highest psychological stratum there is an intermediary level which he calls the vital stratum. He illustrates by many examples that schizophrenic symptoms cannot be understood on the purely psychological level, that the vital stratum is frequently involved in the formation of symptoms. He sets out diagnostic criteria on which a distinction can

be based whether a given symptom belongs to one or another stratum—has therefore to be regarded as neurotic or as schizophrenic—and shows how the specific schizophrenic characteristics may be explained by this working hypothesis.

8. COURSE AND PROGNOSIS.

Special attention has been given to prognosis during the past five years, probably because of the need for an accurate assessment of the newer forms of treatment. A number of workers have followed up cases treated before the introduction of shock therapies as a control group for present-day cases, and have attempted to assess the factors of prognostic significance :

Author.	Number of patients.	Percentage total remissions.	Length of time observed.
Blair (1940)	120 .	6 .	1-6 years
Cheney and Drewry (1938)	500 .	12 .	2-12 ..
Kant (1941a, b, c)	308 .	6.62 .	7½-10 ..
Malamud and Render (1939)	177 .	14 .	5 years or more
Guttman, Mayer-Gross and Slater (1939)	188 .	21.5 .	3 years
Rennie (1939)	500 .	24.56 .	9-20 .. (or death)
Rupp and Fletcher (1940)	608 .	6.6 .	5-10 ..
Silverman (1941)	271 .	10 .	15 ..
Stalker (1939)	129 .	12 .	1-6 ..

The percentage of total remissions varies from 6-24.56 as shown in the above table. The discrepancy between results is probably accounted for by the difference in material, criteria of diagnosis, and definition of the term full remission.

Favourable Features.

1. *Acute Onset.*

The value of this factor as a good prognostic omen has been fully borne out by recent investigations. Rennie (1941) found in an exhaustive analysis of 100 recovered schizophrenics that in 71 of them symptoms had come on acutely.

2. *Short Duration of Symptoms.*

Rupp and Fletcher found in a study of 641 cases of schizophrenia that 37.5 per cent. of those with symptoms of less than six months' duration prior to hospitalization were improved, while only 15 per cent. of those with symptoms for two years or longer benefited. Similarly Guttman, Mayer-Gross and Slater found a spontaneous recovery-rate of 35 per cent. in patients who had been ill for a year or less before hospitalization.

These figures are indicative of the findings of most workers, and it may be concluded that the duration of illness is a major consideration in arriving at a correct prognosis.

3. *Good Prepsychotic Personality.*

Good adaptation to life especially in the spheres of work, social and sexual adjustment mean a well integrated personality likely to get over a psychotic breakdown. Inadequacy of reaction shown by withdrawal, compensatory day-dreaming and autistic thinking are unfavourable features.

Stalker, in emphasizing this factor, points out that analysis of reaction must not be confused with analysis of personality type, and that a schizoid type must not be equated with maladaptation without consideration of the facts of the individual case. He suggests that the conflicting views may be due to the degree to which the various writers have intermingled "reaction" and "personality." For instance Rennie found that 66 per cent. of his recoveries were of the schizoid type. Other workers like Kant and Malamud and Render found a predominance of the cyclothymic personality type among their recoveries, and regard a schizoid make-up as of poor prognostic significance.

4. *Presence of Precipitating Factors.*

Adequate precipitating factors are a hopeful feature, especially if they can be removed. Kant (1942a, b) studied the question of psychogenic precipitation in some detail. He found such factors in the history of 74 per cent. of his recovered cases, but in only 15 per cent. of those who did not get well. However, the precipitating factor was found to be of an objectively extraordinary nature in only a small proportion of cases. Factors of a chronic type were found to be about five times as frequent in the recovered as in the deteriorated group. Prolonged overstrain and external conflicts predominated in the recovered group, single events and endogenous conflicts in the deteriorated group. The assessment of this factor seems especially liable to subjective bias. A more objective causative factor is bodily illness, and it is generally agreed that its presence is in favour of recovery, e.g. Rennie found 35 per cent. of his recoveries showed somatic disturbances as opposed to 22 per cent. of an undifferentiated group.

5. *Atypical Reaction.*

A high proportion of the cases which do not readily fit into one of the diagnostic sub-types of schizophrenia have been noted among completely recovered cases by most workers. The atypical symptoms in this favourable group are usually of a manic-depressive type. That trends of this nature are favourable is shown by Kant. When he excluded all cases which showed a fairly close connection with the manic-depressive group his figures for the percentage of total remissions fell from 6.62 per cent. to 1.65 per cent. In fact, of cases which displayed purely schizophrenic features only 2, or 0.66 per cent., of his 308 cases recovered. The good prognosis of the atypical cases in 100 schizophrenics observed by Langfeldt (1939) led him to study these "schizophreniform" cases in greater detail. His material was 100 cases of psychoses admitted to the University Clinic, Oslo, during the years 1926-32, who at the end of observation were discharged with a diagnosis of "? schizophrenia." In his opinion the practice of most hospitals of including this group with schizo-

phrenia accounts for the very variable results of different workers. The cases were followed up from 6-12 years.

He found 32 completely cured, 25 improved and 43 unchanged or worse. On re-examination and review he considers that only one of the 32 cases could be called genuine schizophrenia, while out of 43 uncured cases 36 were typical schizophrenias.

His claim that these typical schizophrenias can be differentiated from the schizophreniform psychoses at an early stage in 90 per cent. of cases requires further substantiation. The diagnostic criteria on which he laid emphasis were pre-psychotic schizoid personality and the presence of schizophrenic process symptoms in a clear setting.

6. *The Presence of an Affective Response.*

Collins (1943), in a study of affect in schizophrenic reaction types, concludes that "patients where affect remained strong itself and in harmony with cognition and conation have a better chance of remission."

This point is also made by other workers, notably Rennie, who found that 63 per cent. of his recovered patients showed at some time during their illness a capacity for genuine affect. This does not refer to mere laughing or crying; "the laughter must be infectious or the expression of emotional pleasure, or the weeping must be accompanied by suitable facies and manner, sense of guilt or statement of depressive mood."

7. *Clouding of Consciousness.*

An element of clouding of consciousness in the clinical picture is a good sign. This is especially stressed by Kant (1941), who found that in 26 of his group of 39 recovered patients clouding of consciousness was an outstanding feature. In a comparable group of deteriorated patients it was found only three times.

8. *Heredity.*

An unexpected finding of most workers in recent years was that a positive family history of psychosis is not an unfavourable factor.

Rennie found that 53 of his 100 recovered cases had a family history of psychosis, of which 22.6 per cent. were schizophrenic and 41.5 per cent. affective psychosis. He contrasted this with a group of 500 unselected cases of schizophrenia which he followed up in a previous study, and found 40 per cent. with a family history of psychosis, of which only 9 per cent. were schizophrenics. He considered the difference significant, and offered in explanation that "these patients are more susceptible to the development of schizophrenia, which in itself is of less significance than a comparable development in a better organized personality."

Malamud and Render also emphasized the high percentage of negative histories in unimproved cases as compared with hereditary tainting in those who recovered. Kant confirmed these findings, but pointed out that the incidence of manic-depressive psychosis in his recovered patients was $4\frac{1}{2}$ times

greater than that of schizophrenia. Similarly Hutter (1941), who made a long term study of 229 cases, stated: "In general the outcome in those with demonstrable heredity was somewhat more favourable than in those with no evidence of hereditary taint." Conversely Blair, surveying earlier literature and following up 120 cases, concluded that a family history of schizophrenia renders the outlook dubious.

9. *Good Response to Sodium Amytal.*

An additional aid to prognosis has been suggested by Harris, Horwitz and Milch (1939) in the reaction of the patient to intravenous sodium amytal. Prenarcotic doses of the drug were given to 55 cases of schizophrenia. An ameliorating response was obtained in 30 patients, and of these 23 responded favourably to insulin therapy. No ameliorating response was obtained in 25 cases, and of these 16 failed to respond to insulin. Gottlieb and Hope (1941) also consider this a useful prognostic criterion. Of 100 cases which they observed 15 had shown good reactions to the drug, and all made either a complete or a social recovery. Of 61 patients who had shown poor reaction to sodium amytal 53 were unimproved. "The more closely the patient's behaviour approaches normal under the influence of the drug, the better the prognosis."

Features of Doubtful Significance.

(1) *Age.*—Rennie found that 40 per cent. of his recovered group broke down between 21-30 and considered this the most favourable age of onset, but Malamud and Render found a preponderance of the unimproved group among those whose illness began in the third decade. Other workers, e.g. Guttman, Mayer-Gross and Slater, Rupp and Fletcher and Stalker, found no evidence of statistical significance with regard to the effect of age on prognosis.

(2) *Sex.*—Guttman, Mayer-Gross and Slater found that the recovery-rate from first attack and subsequent relapse was greater in females and the relapse rate lower. Rennie supports this view, and found that 55 per cent. of his recoveries were women in his group of 500 cases.

On the other hand, neither Kant nor Stalker could find a definite trend in favour of either sex, and Malamud and Render found a slightly higher proportion of males among their recoveries.

3. *Body build.*—Attempts have been made to utilize Kretschmer's somatic types in the assessment of prognosis. Findings varied considerably, probably because of differing criteria used by individual observers.

Extremes are represented by Kant, who found pyknic physique in more than half his recovered cases, and Malamud and Render, who did not find one of this type in their completely recovered group. Gottlieb (1940), in a study of prognosis in hebephrenia, says: "Patients of pyknic and dysplastic habitus as a rule develop an atypical form of hebephrenic schizophrenia and show a tendency to improvement or recovery." Though it is not possible to be dogmatic, the general tendency is to consider athletic and pyknic builds as favourable factors, while dysplastic and asthenic types are against recovery.

(4) *Intelligence and education.*—Malamud and Render found a relatively

high proportion of intelligence quotients over 105 in recovered patients, with a noticeable preponderance of "scatter" of five years or more in other groups. Rennie, on the other hand, divided his 100 recovered patients according to different educational levels, and found the highest percentage (38 per cent.) in the lowest scholastic category. He pointed out that a psychosis in a person of limited intelligence or poor education may be prognostically more favourable, because the illness itself is less alien than similar manifestations would be in a person of good intelligence and training.

Unfavourable Features.

In general these are the opposite qualities to those listed under the heading "Favourable Features." Besides this Chase and Silverman (1941), in a critical review of the literature on prognosis, state: "The presence of true process symptoms, especially in the absence of the element of confusion, is of the greatest significance." They quote Langfeldt's (1937) conception of process symptoms in schizophrenia:

- (1) Massive catatonic stuporous symptoms.
- (2) Depersonalization.
- (3) Derealization.
- (4) Massive sensations of influence.

It may be concluded that a high proportion of the following factors can be relied on to indicate a good prognosis: Recent acute onset of symptoms which do not easily fit into a diagnostic subtype, and show manic-depressive trends with well-retained affect in a person of previously good personality. If there is a family history of psychosis, especially of the affective type, if the symptoms appear on a background of clouding of consciousness, and if an adequate precipitating factor, psychogenic or somatic, can be found, so much the better. The age, sex, body type, or intelligence in the light of present knowledge cannot be relied on to give an accurate clue to the outcome. Of grave significance is a gradual onset over months or years without discernible cause in an inadequate individual, who displays little affect and evinces marked process symptoms in a clear setting.

9. TREATMENT.

Treatment by insulin, convulsions and prefrontal leucotomy is discussed in Chapters 25-27.

Following the favourable results obtained by the use of so-called shock therapies, efforts have been made to find a means of achieving the same results by a method less time-consuming than insulin and with fewer complications than convulsion therapy.

On the basis of the suggestion that the chief mechanism of improvement in these forms of therapy is cerebral anoxia, Alexander and Himwich (1939) treated 12 cases with nitrogen administered by a gaseous inhalation anaesthesia apparatus. By this means they claimed to produce a temporary depression of cerebral metabolism, and so avoided irreversible changes. Treatments were given three times weekly and as many as 46 were given in a course. They consider their results encouraging. Fogel and Gray (1940) report 24 cases

treated by nitrous oxide inhalations using a similar technique. They obtained good results in early cases, but found chronic cases of more than two years' standing showed no change. It is claimed that these methods are safer (in the hands of a skilled anaesthetist), less objectionable to the patient and cheaper than insulin or convulsion therapy. Green and Adrian (1940) treated 17 schizophrenics with nitrogen inhalations, using the technique (slightly modified) advised by Alexander and Himwich. Their results were disappointing, and did not compare favourably with expectations on the basis of experience with insulin and metrazol in similar cases.

The temporary improvement in some schizophrenics noted after the administration of intravenous sodium amytal led Davidoff (1941) and others to give it over a prolonged period alternating with benzedrine, in order to depress and stimulate the central nervous system. On one day benzedrine (amphetamine sulphate) in doses of from 10-40 mgm. was given intravenously, and the following day sodium amytal 0.6-1 gm. by mouth, and this alternation was continued for periods up to two months. In 51 out of 80 schizophrenics reported the psychosis was of less than two years' duration, and of these, 22 were discharged to their homes much improved. In the remaining 29 with a psychosis of more than two years' standing 7 were discharged, giving a recovery-rate of 36 per cent. for the whole group.

Renzikoff (1941) applied the same technique in 15 schizophrenic patients without any evidence of deterioration, 10 being under one year's duration. The results were "uniformly disappointing." None of the patients showed any more improvement than other schizophrenics who did not receive any specific therapy.

At a time when purely physical methods of treatment are so much in the forefront, there is evidence in current literature that the necessity for less specific measures has not been forgotten. There is general agreement that patients improving under insulin or convulsion therapy or after leucotomy need individual attention, and every effort should be made to help them to maintain their contact with reality and to readjust themselves to life. Similarly the aim of the modern mental hospital is to prevent deterioration in chronic patients by individual attention and stimulation of interest through occupational and recreational therapy. Myerson (1939) has shown what can be done with these methods in chronic schizophrenics. Under the term "total push" he included such general measures as daily showers, massage and douches, exercise and games, which were specially devised to encourage the individual patient to take part. Food was made interesting and varied, clothing attractive, details of toilet carefully attended to and patients induced to take a pride in their appearance. A system of reward and punishment was used whereby privileges were given or withheld according to the patient's behaviour.

Corwin and Thompson (1939) reported on the use of similar methods, and state that of 26 patients of varying lengths of illness, at least half being chronic, 18 showed improvement. Such intensive measures require a large and highly skilled nursing staff, but it is at least a standard to aim at in the management of chronic cases, and some measure of it is an essential part of the specific

treatments. In contrast to these disciplinary and educational methods, Schube and Cowell (1939) gave their patients complete freedom in the use of water colours, clay, pencils, etc., to give scope to creative abilities, and found that schizophrenics responded with increased activity.

To stimulate initiative and counteract the effect of hospitalization Bierer and Haldane (1941) tried the experiment of a patients' self-governing social club at Runwell Hospital. While difficulties can be foreseen in the successful functioning of such an organization, its potential benefit to schizophrenics would be considerable by encouraging a feeling of independence, freedom from discipline and a sense of responsibility.

The scheme described by Wootton and Minski (1940) for the rehabilitation and resocialization of patients is especially important for schizophrenics. The organization helped patients in the critical period immediately after discharge from hospital to obtain re-employment in their former vocations, and where this was impossible or undesirable, provided means of training them for more suitable work.

Practical suggestions for the organization of after-care for mental patients have been made in the Feversham Report, and already some of them have been carried out. Individual after-care along such lines is an essential part of the treatment of schizophrenics.

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