THE JOURNAL OF ABNORMAL PSYCHOLOGY

JUNE-JULY, 1911

THE PATHOLOGY OF MORBID ANXIETY'

BY ERNEST JONES, M.D., M.R.C.P. (LONDON)

Associate in Psychiatry, University of Toronto. Director of the Ontario Clinic for Nervous and Mental Diseases

HAT the present subject is one of immense importance becomes evident from the following considerations. Including its indirect manifestations, morbid anxiety is the most frequent single symptom in psychopathology, and, I feel tempted to add, perhaps in all medicine; it has been called, and without gross exaggeration, the Alpha and Omega of practical psychiatry.2 Secondly, the intensity of distress it may give rise to is equalled by that of very few other forms of suffering. Thirdly, the study of the pathogenesis of it is qualified, as perhaps no other, to lead us towards a comprehension of those deeper biological problems concerning the relation of body to mind that underlie the questions of the derivation of mental disturbances in general. Lastly, it is a disorder that in a great many cases obstinately resists treatment, unless this is based on a proper understanding of the pathology of it. This feature of refractoriness is dwelt on by most writers of experience, and was, for instance, one of the reasons why Oppenheim proposed the subject for discussion in a symposium held at the last meeting of the Society of German Neurologists.³ He quotes a touching letter from one of his

¹ Contribution to the Symposium of the American Psychopathological Association, May 10, 1911.

² Dick. Die Angst der Kranken. Allg. Zeitschr. f. Psychiatrie. 1877. Bd. xxxiii. S. 231.

³ Oppenheim. Pathologie und Therapie der nervösen Angstzustande. Deutsche Zeitschr. f. Nervenheilk. 1911. Bd. xli. S. 173.

patients: "I have been going about being treated now for six years without my condition being even temporarily bettered; I have visited the authorities of every country. Is the science of medicine really so poor that some one who is bodily and mentally sound cannot be freed from such an affliction?" He further states that, "As a rule a psychotherapeutic treatment to be at all effective must be extended over many months. And I know a number of patients of this kind who need a permanent mental directing, or who have to undergo mental treatment for at least several months of every year." Fortunately this pessimism is not justified in fact; it only arises when, from an imperfect knowledge of the pathogenesis, the proper line of treatment is not carried out.

The first problem is to define as nearly as may be what is to be understood under the term "morbid anxiety." It is at once obvious that the word "anxiety," the significance of which has been debased through the use of such expressions as "to be anxious to meet some one," etc., has now a much weaker meaning than the term needed to denote the condition under consideration, and which is more accurately described by the German word Angst; when, therefore, the word anxiety is employed in the following pages it will be in the more significant sense of Angst, or intense, morbid anxiety. It is customary to distinguish anxiety in this sense from fear,3 but it would seem that the resemblances between the two emotions are great enough to predicate a common biological source for them, and there is little doubt but that the differences between the two are due rather to the respective circumstances under which they arise than to more fundamental divergences. All writers seem agreed in regarding these differences as the same as those existing between normal and morbid fear, which can be formulated, as Oppenheim has done,4 under two distinct headings:

¹ Ibid. Op. cit. S. 188.

² Ibid. Op. cit. S. 190.

³ See, for instance, Hoche, Pathologie und Therapie der nervösen Angstzustände Deutsche Zeitschr, f. Nervenheilk. Bd. xli. S. 195. Janet, Les Obsessions et la Psychasthénie, 1903. t. 1, p. 463.

Oppenheim. Op. cit. S. 183.

- (1) Preponderance of certain physical symptoms, many of which can be objectively investigated. Hoche, indeed, defines Angst as fear plus specific bodily sensations. The main symptoms will presently be enumerated.
- (2) Disproportion between the intensity of the emotion and the occasion of its occurrence. This is a more accurate statement than the one describing anxiety as an exaggerated form of fear, for normal fear may be very intense whereas anxiety need by no means always be so; it is not so much an excessive fear as a relatively excessive fear. The essential feature is the disproportion, anxiety being evoked on a given occasion where the normal would either experience a slighter degree of fear or none at all. It is obvious that in estimating the morbidness of a given attack of anxiety one has thus to judge by an empiric standard of how much fear is to be allowed to the normal under various circumstances. Often it is easy to decide this, but considerable difficulty may arise in borderland states; it will presently be pointed out that for certain definite reasons our standard of normality is too low, so that we are too generous in allotting some degrees of fear to the normal that, strictly speaking, have a pathological basis.

On taking up the clinical features of anxiety states we have to note the following facts. First, anxiety may appear as a symptom of any form of psycho-neurosis or psychosis. Those in which it is most prominent are hysteria, in the special form to which Freud has given the name anxiety-hysteria, in the compulsion neurosis, as obsessive phobias, in melancholia, especially in the cases occurring in women past the climacteric age, and in alcoholic conditions, especially the acute ones, such as delirium tremens. As is well known, Wernicke in 1894 attempted to mark off a group of psychoses as an independent condition, to which he gave the name anxiety psychosis.² This view did not find any wide acceptance, and, since the appearance of Forster's detailed clinical study,³ it may be regarded as a settled matter that

¹ Hoche. Loc. cit.

²Reported in the Allg. Zeitschr. f. Psychiatrie, 1895. Bd. li. S. 1020. See further his Grundriss der Psychiatrie. 1900. S. 236.

³ Forster. Die klinische Stellung der Angstpsychose, 1910.

anxiety occurring in any psychosis is merely one symptom of some more comprehensive condition. Secondly, on the other hand, there is no doubt that as a neurosis anxiety states may appear in a pure form. The first delineation of this condition was given by Hecker, but it was Freud' who recognized the unitary nature of the syndrome and its nosological independence. It is true that this condition is most frequently found to be complicated by some other neurosis, but the occurrence of it in a pure form, called by Freud the anxiety neurosis, gives one a unique opportunity to investigate the pathology of the main symptom, anxiety, and was the occasion of Freud's formulating his views as to the significance of this. Thirdly, intense anxiety is such an unendurable form of suffering that every effort seems to be made on the part of the organism so far as possible to get rid of it. At all events it is found in experience that in any long-standing case of anxiety neurosis one of two things - or both — has happened. Either the physical manifestations increase at the expense of the mental — tending to replace them to a greater or less extent,—or the person guards against the outbursts of anxiety by the creation of sundry inhibiting phobias. These processes occur to a very varying degree in different cases, and they are hardly ever completely successful; the problem, however, is greatly complicated by their presence, and for the elucidation of the pathogenesis of pure anxiety one does better to investigate the cases in which they are less prominent. The importance of the former of these processes is twofold: In the first place it raises the difficult question of the relation of mental to bodily processes, and is one of the reasons why stress has so often been laid on the organic causes of anxiety states. In the second place, it is a matter of considerable practical importance, because when a patient's symptoms are referred to one or other system of organs the physician's attention is

¹Hecker. Ueber larvierte und abortive Angstzustände bei Neurasthenie. Centralbl. f. Nervenheilk, und Psychiatrie. 1893. S. 565.

²Freud. Ueber die Berechtigung, von der Neurasthenie einen bestimmten Symptomenkomplex als "Angstneurose" abzutrennen. Neurol. Centralbl. 1895. S. 50. Republished in the Samml. kleiner Schriften zur Neurosenlehre. S. 60, and the Selected Papers on Hysteria and other Psychoneuroses, Transl. by A. A. Brill, 1909, p. 133.

apt to get focussed there, and the general nature of the condition may be overlooked; the mistakes in diagnosis that in this way arise are very numerous, and though these clinical aspects do not here concern us they are referred to because they go to explain the fact that the great frequency of anxiety states is not generally recognized. The latter of the two processes also raises a series of fresh problems, concerning the psychogenesis of specific phobias, which have to be kept distinct from those relating to anxiety proper.

It is not necessary here even to enumerate the different views that have been put forward concerning the pathology of anxiety; those interested in the historical aspects of the subject may be referred to the writings of Forster, Hartenberg,² Loewenfeld,³ Pitres and Régis,⁴ etc. We have, however, briefly to review the types of explanations that have been offered, which can fairly well be classified into definite groups. It may be said at the outset that very few writers now believe in either an exclusively mental or exclusively physical origin of anxiety, and that there is a general convergence towards the conclusion that both kinds of factors are operative. This biological conception, which is the one adopted here, in itself indicates that the solution of the problem is likely to be found by investigation of the inherited instincts, for it is in this sphere that the physical and the mental aspects of the human organism approach each other most closely. Before developing this conception it will be convenient first to consider the mental and physical aspects separately, from both a descriptive and pathological point of view.

In the mental manifestations the emotional element is naturally the most prominent. It consists in a curious admixture of dread, panic, terror, anguish, and apprehension. It varies greatly from, on the one extreme, a slight abashment, awkwardness, embarrassment, or confusion to, on the other, a degree of indescribable dread that may even rob the sufferer of consciousness. Common to all degrees

¹ Forster. Op. cit.

² Hartenberg. La névrose d'angoisse. 1902.

⁸ Loewenfeld. Die psychischen Zwangserscheinungen. 1904.

Pitres and Régis. Obsessions et phobies. 1903.

is a sense of something impending, of anxious expectation of something harmful or awful. One needs an artist to portray the higher grades of dread. Guy de Maupassant in his novel "La Peur" sketches with a few rapid strokes a strikingly accurate picture: "C'est quelque chose d'effroyable, une sensation atroce, comme une décomposition de l'âme, un spasme affreux de la pensée et du cœur, dont le souvenir seul donne des frissons d'angoisse. Mais cela n'a lieu, quand on est brave, ni devant une attaque, ni devant la mort inevitable, ni devant toutes les formes connues du péril! Cela a lieu sous certaines influences mystérieuses, en face de risques vagues." The anxious expectation may become especially linked to certain ideas or occasions, usually loosely, so that it readily passes from one to another; the commonest of these are hypochondriac ideas, ideas of moral scrupulousness, fears of loss of property or of professional capacity, etc. Freud speaks of there being in this stage a quantity of "free, floating anxiety" which becomes attached to one idea after another. We here have the beginning of the passage of the condition into a true phobia, where the fear is, so to speak, precipitated on to a given idea, and becomes localized. The general mental effect shows an alternation or a combination of over-excitation and inhibition; as a rule the former is found with slighter grades, the latter with higher grades of anxiety. For instance, the thought processes may be either hurried and agitated, one idea rapidly chasing the other, with very superficial associations between them, or there may be a blocking of them, an inhibition, so that the mind may even "become a blank." The various kinds of insomnia frequently met with in this affection should here be mentioned, as also the bad dreams (anxiety dreams) that almost constantly accompany it; I have elsewhere pointed out that the nightmare is a typical symptom of the anxiety neurosis. The fullest account of the mental state is given by Loewenfeld.2

In the genesis of anxiety most writers attach importance to mental factors. Mannhardt³ says that one of the chief

¹ On the Nightmare. American Journal of Insanity, Jan. 1910, p. 383.

² Loewenfeld. Op. cit. S. 306-308, 318-330.

⁸ Mannhardt. Die nervösen Angstgefühle. S. 15.

causes of the condition is overwork, Oppenheim finds that in most cases grief or some psychical shock has been the provoking agent, Dagonet' traces it to a feeling of depression, which infects the mind with a sense of danger, and similar remarks will be found in most writings. So far as I know, the only writer that holds an intellectualistic (ideogenous) conception of anxiety is Dubois,3 who consequently believes that it can be treated by means of persuasive reasoning with the patient. He maintains that such patients show a general mental deficiency, superstitiousness, and lack of judgment; he attributes both anxiety and phobias to "faintheartedness and defective logic." This conception approximates to Janet's4 less intellectualistic one of a "lowering of the mental tension" and "incapacity to give attention or to experience emotions demanded by the circumstances," i.e., a general psychasthenia; similarly Varendonck⁵ describes the origin of fear as a "mode of adaption to the new." In contradistinction from Dubois practically all other writers⁶ point out that such patients often show an astonishing general courage in face of real danger and difficulties, with unusually high intelligence and strong will power: many a hero of the battlefield has been overcome with extreme nervousness (i.e., anxiety) on having to make an afterdinner speech, and they often remark that they would rather face the former situation than the latter; the same applies to men distinguished for moral courage. As Oppenheim⁷ epigrammatically, but unfortunately not metaphorically, remarks, "Der Mut kann im Grosshirn herrlich thronen, während im Bulbus die Angst gebieterisch ihre Herrschaft

¹Oppenheim. Op. cit. S. 174.

²Dagonet. Les sentiments et les passions. Annal. méd-psychol. 1895. t. II. p. 5.

³ Dubois. Psychologie und Heilkunst. Berl. Klin. Woch. 1909. Nr. 25. Zur Psychopathologie der Angstzustände. Ibid. Nr. 33. Pathogenese der neurasthenischen Angstzustände. Volkmanns Sammlung Klinischer Vorträge. 1909.

⁴Janet. Op. cit. p. 561.

⁵Varendonck. Phobies d'enfants. La Revue psychologique, mars, 1910. Vol. III, p. 38.

⁶Cf., for instance, Janet. Op. cit. p. 464.

⁷Oppenheim. Zur Psychopathologie der Angstzustände. Berl. Klin.Woch. Juli 12, 1909. S. 1294.

ausübt." Further, most observers are agreed that the various fears and anxieties cannot be influenced by mere explaining and reasoning in the way Dubois believes; there is no question but that any success obtained by Dubois is, as Oppenheim² remarks, to be ascribed to suggestion.³ fact the patients rarely need telling that their fears are groundless; much of their distress arises from their being unable to control fears that they realize are "foolish." Oppenheim4 puts this forcibly, when, referring to the dread of thunder, he says, "Versuche nur, sie zu beruhigen und von der Nichtigkeit ihrer Furcht zu überzeugen. Und wenn du mit Engelszungen zu ihr sprächest und die Redekraft der Propheten besässest, es gelingt dir nicht, sie der qualvollen Lage zu entreissen." We shall see that the reason why morbid fears cannot be removed by appeals to the patient's conscious processes is that the cause of them does not lie there. The conscious process, e.g., the idea of an approaching thunderstorm, that evokes the anxiety attack is not the cause of this, but only the exciting agent; it is merely a signal that acts by arousing through association the real cause, which is entirely unconscious. A view allied to Dubois's superficial conception of the genesis of these troubles is that which attributes them to implanted ideas and fearful emotions, e.g., by the bogie stories of nursemaids or an erroneous religious training. This notion would hardly be worth discussing, in spite of its prevalence, were it not that in the latter instance there is a modicum of truth, there being in fact a close connection between morbid anxiety and most forms of religion. Those who trace morbid anxiety to early religious ideas, however, are guilty of a curiously simple error of logic. Because the two stand in a certain relation to each other it is inferred that one must be the cause of the other, the truth being that they are both manifestations of a common cause. To hold that an overreligious training is the cause of anxiety is like holding that

¹See, for instance, Loewenfeld. Op. cit. S. 305.

²Oppenheim. Deutsche Zeitschr. f. Nervenheilk, Bd. xli. S. 190.

⁸See Ernest Jones. The Action of Suggestion in Psychotherapy. JOURNAL OF ABNORMAL PSYCHOLOGY. Dec. 1910. Vol. V. p. 217.

^{&#}x27;Oppenheim. Berl. Klin. Woch. Loc. cit.

the smoke of a fire is the cause of the heat it gives out. Turning to the physical symptoms of anxiety we note the same admixture of over-excitation and inhibition phenomena as that referred to in connection with the mental symptoms. Thus one sees at one time a rapid, excited heart's action or a polypnœa, at another time a feeble pulsation with bradycardia or a bradypnœa with deep, sighing inspirations; pollakuria may alternate with retention of urine, hunger with loss of appetite, etc. The symptoms themselves need not here be detailed, as they are well known from the writings of Freud, Janet, Loewenfeld, Mosso,4 and others. They may be described with fair accuracy as excessive manifestations of the normal, physiological accompaniments of fear. They are, however, rarely developed in a uniform manner; in most cases certain manifestations stand out with great, or even almost exclusive, prominence. The most frequent regions in which this occurs are, in order, those of the precordium, the head, the sternum, and the epigastrium, the first being by far the most frequent.⁵ In such cases the patient often actually refers his anxiety, usually under the name of "nervousness," to the region most concerned; in other words, he feels it to be there, just as he would in the case of a painful sensation. As a rule the feeling is one of great weight and choking oppression, which may be accompanied by disagreeable paræsthesias, sometimes hardly to be distinguished from pain. Pseudo-angina is merely a symptom of precordial anxiety,⁶ as so-called bronchial asthma is of the sternal variety.7 The bodily secretions are profoundly affected, cessation of the salivary and gastric flow, with increased pouring out of urine and sweat, being the rule. Excessive and irregular functioning of the involuntary muscle fibers takes place, which may result in a peristaltic diarrhœa, strangury,

¹Freud. Op. cit.

² Janet. Op. cit. pp. 218-231.

³Loewenfeld. Op. cit. S. 308-312.

⁴Mosso. Fear. Engl. Transl. 1896.

⁵Forster. Op. cit. S. 15.

⁶Loewenfeld. Op. cit. S. 309. Stekel. Nervöse Angstzustande und ihre Behandlung. 1908. Ch. vi.

⁷Loewenfeld. Loc. cit. Stekel. Op. cit. Ch. vii.

tenesmus, seminal or vaginal emissions, vaso-motor constriction with coldness of the skin, etc. From this outline it will be evident that bodily processes are affected which are not at all under control of the "will" in the ordinary sense, though it has experimentally been proved that all of them may be influenced by deeper, automatic mental processes. Ignorance of the latter fact has contributed to the opinion being formulated by many writers that the cause of anxiety states is to be sought exclusively in organic processes, other adjuvant factors being the general materialistic leanings of the medical profession, the inadequacy of the mental explanations commonly proffered, the failures of psychotherapy, and the remarkable extent and severity of the physical symptoms just mentioned.

The explanation of the pathology of anxiety on a physical basis has been, and still is, attempted along many different lines, and only a selection of the views held need be referred to. In general they may be divided into two classes: those that postulate an undue excitability and readiness of response on the part of the nervous centers concerned with the regulation of the visceral organs, and those that postulate an undue excitation of the nervous system as a result of disturbance of those organs. Of the two the former seems at present to be the more widespread; it was maintained in two of the three papers on the subject read at the last meeting of the Society of German Neurologists. It is foreshadowed in Roller's hypothesis of a "functional disturbance in the medulla oblongata," and in Luys's2 opinion that there is in these cases an ischæmia of the brain. The most modern form of it is expressed by Hatschek,3 who postulates a "special excitability of the subcortical, or spinal and sympathetic, centers," and by Oppenheim,4 who speaks of a "morbidly heightened excitability of the vasomotor-secretory-visceral nervous centers." It need

¹ Roller. Zur Pathologie der Angst. Allg. Zeitschr. f. Psychiatrie, 1880, Bd. xxxvi, S. 149.

² Luys. Traité clinique et pratique des maladies mentales, 1881, p. 496.

³ Hatschek. Zur vergleichenden Psychologie des Angstaffektes. Deutsche Zeitschr. f. Nervenheilk. Bd. xli, S. 211.

^{&#}x27;Oppenheim. Deutsche Zeitschr., Op. cit. S. 187.

hardly be said that no evidence whatever has been adduced for this hypothesis, which remains a pure supposition. According to Oppenheim and Hatschek the modus operandi is that these lower nervous centers react more readily, not so much to visceral excitations, as to "ideas and sense impressions"; there is, therefore, a relative inefficiency of the normal cortical inhibitions.

The second view was first formulated by Arndt, who saw in an abnormal functioning of the heart the primary cause, an idea closely allied to that of Krafft-Ebing's2 of an "over-excitability of the vasomotor nerves of the heart with consequent vascular constriction." Ball³ speaks of "reflex impulses that arise in the internal organs and are conveyed by way of the sympathetic," and Régis4 sees in coenæsthesic troubles the starting point of the disorder. It is little wonder that, in view of these conceptions, Mannhardt⁵ has proclaimed massage over the solar plexus to be a sovereign remedy for the trouble. Hoche⁶ also definitely regards it as essentially of physical origin. He states that it may arise in two ways, as the result either of reflex irritation or of poisoning (mostly with carbon dioxide); of these the latter is, according to him, considerably the more frequent. Meynert's hypothesis is a combination of these two sets of views; he supposes a "dyspnœic nutritional state of the cortex the result of vaso-constriction produced by excitation of the vasomotor cortical centers."

Plainly the views just mentioned arise through attention being especially directed to the physical symptoms of the anxiety syndrome. If there were no other symptoms to be accounted for, the inadequacy of these views would not be so evident, but it cannot be disguised as soon as we begin to apply them to the mental symptoms. These are supposed essentially to consist in the apprehending of dis-

¹ Arndt. Allg. Zeitschr. f. Psychiatrie, 1874, Bd. xxx, S. 89.

² Krafft-Ebing. Lehrbuch der Psychiatrie, 1890, S. 141.

⁸ Ball. Leçons sur les maladies mentales, 1890, p. 178.

^{&#}x27;Régis. Précis de Psychiatrie, 1906. 3e éd., p. 251, etc.

⁵Mannhardt. Op. cit., S. 16.

⁶ Hoche. Op. cit., S. 196, 200.

⁷ Meypert. Psychiatrie, Klinik der Erkrankungen des Vorderhirns. 1884.

agreeable physical sensations, a conception practically identical with that underlying the James-Lange hypothesis of the emotions. It is hardly possible satisfactorily to discuss the views in question without first considering in detail this hypothesis. This, however, cannot be done in the space at my disposal, and I propose to avoid the difficulty by assuming that the criticisms of numerous psychologists—Lipps, Wundt, etc.—have been effectual, so that at the present day the hypothesis is no longer tenable, at all events in its original form. I would only remark that in my opinion the purely clinical study of anxiety states affords weighty evidence against the probability of the hypothesis. Janet has commented on the obvious objection that, in the case of various organic diseases, e.g., morbus cordis, the physical manifestations characteristic of the anxiety syndrome may occur in an even more severe degree than here without being followed by any anxiety,2 and Loewenfeld3 has pointed out that the occurrence of the abortive anxiety attacks, i.e., pronounced physical manifestations with little or no anxiety, stands in direct conflict with the James-Lange hypothesis. Indeed, writing on the subject of fear, Stanley Hall4 goes so far as to say, "What problem could better illustrate the crude scholastic stage of the contemporary psychology of feeling and emotion than the elaborate recent discussions of the problem whether they are the results of tension of muscles, vessel walls, etc., or (whether) the latter are primal and causative?"

An escape from the deadlock in regard to the question of "physical or mental" has been sought by endeavoring to state the problem in terms of biology. Biologically fear must be regarded as being a protective mechanism, a defensive reaction against anticipated harm, and Stanley Hall, developing a suggestion of H. M. Stanley, has very plausibly

¹ Janet. Op. cit. p. 463.

²The reason why anxiety sometimes occurs in these cases will be pointed out later.

³Loewenfeld. Op. cit. S. 314.

⁴Stanley Hall. A Study of Fears, American Journal of Psychology, January, 1897, p. 241.

⁵ Ibid. Op. cit. pp. 242, 243.

argued that even in man it fulfils many beneficial functions. It is interesting to recall that with morbid anxiety the anticipatory dread of impending harm or danger, of pain in the broadest sense of the term, is a constant and characteristic feature, and this fact, therefore, should not be lost sight of when discussing the pathology of the emotion; in regarding anxiety from this point of view it is not necessary, however, to agree with Forster that it is possible to trace it to older memories of bodily pain or that the physical manifestations are nothing but reflexes evoked by the pain sense.

It was Darwin² who first expressed the thought that perhaps the tendency to fear certain objects is inherited from past generations. Stanley Hall³ has elaborated this suggestion to explain why fear arises in certain situations of life, under certain circumstances, in connection with certain ideas, etc., and recently Hatschek4 has also laid stress on the atavistic nature of morbid anxiety. No one can doubt that this is a very valuable point of view, and unquestionably true so far as the predisposition, the capacity of fearing, is concerned; the tendency to fear must in other words be regarded as a true inherited instinct. But when it comes to explaining by the same atavistic hypothesis the fear of certain objects, the anxiety under certain circumstances, serious, and in my opinion insuperable, objections can be raised. In the first place inherited habits, whether mental or physical, are characterized by stereotyped behavior, by regularly occurring under similar circumstances, and so on. Anxiety and fear, on the other hand, as King⁵ has pointed out in this connection, show just the opposite features, varying remarkably in intensity, and in regard to the kind of situation that evokes them, being in many cases very difficult to predict the occurrence of even in the same person. Then, again, the conception that certain ideas or memory contents can be directly inherited is not supported by any evidence,

¹ Forster. Op. cit. S. 13-15.

²Darwin. The Expression of the Emotions in Man and Animals, Pop. Ed. 1904, p. 40.

Stanley Hall. Op. cit. pp. 244-248.

⁴Hatschek. Op. cit. S. 210.

⁵King. The Psychology of Child Development, 2d edition, 1906, p. 56

and is quite foreign to our experience of child development."

The results of the discussion up to the present may be summarized in the following three statements: (1) As the condition frequently occurs when the bodily health is, so far as can be determined, otherwise perfect, there is no evidence in support of the views either that the nervous centers are in a state of primary over-excitability or that abnormal irritative impulses are arising in any pathologically altered visceral organs. (2) Morbid anxiety and its physical accompaniments are essentially an exaggerated manifestation of a normal biological instinctive activity, the function of which is to protect the organism against pain (in the wide sense). (3) As the outburst of anxiety frequently takes place as a reaction to trivial occasions, which in the normal give rise to little or no anxiety, and also occurs quite spontaneously, independently of any ascertainable external cause, it follows that the external agents (including here also ideas of danger, etc.) cannot be regarded as the true cause of the anxiety, but at most as evoking factors. We have further noted the difficulty, which theoretically indeed amounts to an impossibility, of explaining the condition by either an exclusively "mental" or an exclusively "physical" hypothesis, and should be prepared to give the preference to any explanation that accounts equally for the mental and physical symptoms. Before formulating a unitary explanation of this kind, however, it will first be necessary briefly to separate again these two classes.

Further light on the mental aspect is obtained by a study of the psychogenesis of phobias, i.e., conditions in which outbursts of anxiety are more or less successfully guarded against by the building up of specific, protective fears. The subject itself does not properly belong to the present discussion, so that I will only shortly state two conclusions which are invariably reached whenever a psychoanalysis of a phobia is made. (1) Morbid fears of external objects or situations are projections of fears on to the outside that arise in relation to internal mental processes.

¹The distinction between inherited mental activities and acquired mental contents has been sharply drawn, and the subject strikingly developed, by Otto Gross. Ueber psychopathische Minderwertigkeiten, 1909, S. 15, etc.

This process of projection, as is well known, is very common in everyday life. To give a simple example: A business man, whose affairs were financially unsound, heard a harmlessly meant reference to the finance of his business made by a friend, and immediately began to defend this with unnecessary heat; he had projected his inner feeling of reproach on to his friend, and read into the latter's words a meaning that was not intended. Qui s'excuse s'accuse. In dementia præcox, as Freud, Jung, and Maeder have shown, the process is remarkably frequent. The following is an instance of it in the present connection: One of my patients had a phobia of flower seeds, and this had arisen as a defence reaction against certain internal temptations relating to seed of another kind. (2) Morbid fears are the external expression of internal wishes. It is plain that every fear is but the obverse of a wish, e.g., a wish that the feared event may not happen. Two opposite mental processes are always closely associated with each other, so that it is not surprising that in psycho-analysis one finds fear to be intimately connected with desire; this becomes especially comprehensible when one recollects the fact, familiar in daily life to every one, that the readiest way of disguising a thought is to replace it by its opposite. This is, however, far from being the only mechanism at work in the construction of a phobia. The fear has morbid features only when the underlying wish is of a repressed kind, so that the phobia replaces this in consciousness. A simple illustration of the process is afforded by the case of a patient of mine whose child was the only obstacle that stood in the way of a divorce and a prospectively happy remarriage; she suffered intensely from the continuous dread that her child might in some way die, and had great difficulty in admitting to herself the possibility that she might have harbored a corresponding wish.

¹ Freud. Weitere Bemerkungen über die Abwehr-Neuropsychosen. Neurol. Centralbl. 1896, S. 447. Reprinted in Sammlung, etc., S. 132, and Brill's transl. Op. cit. p. 173.

² Jung. Ueber die Psychologie der Dementia Præcox, 1907. Translated by Peterson and Brill, 1909.

³ Maeder. Psychologische Untersuchungen an Dementia-præcox Kranken. Psychoanalytisches Jahrbuch, 1910, Jahrg. ii, S. 237.

Returning now to the physical aspects of the problem, we have seen that practically all writers on the subject are agreed in reducing the matter to a question of over-excitation of the nervous centers. Whether this over-excitation is a relative one, due to the action of normal stimuli on overexcitable centers, or an absolute one, due to the action of pathological stimuli on normal centers (the two "physical" views discussed above) is irrelevant to the main point; the failure to discover a source for pathological stimuli has led most writers to predicate the former supposition. failure, however, may have been due to the search having been directed solely to pathological stimuli, the possibility of abnormally strong physiological ones being overlooked. Janet has stated the problem at this stage very justly: "En deuxième lieu l'angoisse contient des sensations de troubles organiques, ceux-ci nous apparaissent comme le résultat d'une décharge intéressante les appareils des fonctions organiques. Cette décharge est en rapport avec une fuite du courant inutilisé par les phénomènes supérieurs. Des fuites de ce genre sont nombreuses: un exemple bien frappant nous est donné par l'excitation génitale et la masturbation."2 In other words everything seems to point to the symptoms being an aberrant discharge of excitations or impulses that cannot find their suitable outlet, or, as I have elsewhere³ expressed it, an excessive afferent excitation with deficient efferent outflow. Freud, agreeing with other writers up to this point, solved the difficulty by showing that the abnormally directed impulses were not, as had been thought, of a pathological nature, but physiological sexual impulses that were not finding a suitable outlet. Although Freud arrived at this conclusion quite empirically as a result of clinical experience, it would seem as though a priori reasoning, if logically carried through, could lead to no other result, especially in view of such considerations as the failure to find any source of pathological stimuli, the plain hint of a

¹ Janet. Op. cit. p. 561.

²He then relates some interesting examples of the kind.

³The Relation between Organic and Functional Nervous Diseases. Dominion Medical Monthly, December, 1910, p. 205.

^{&#}x27;Freud. Ueber die Berechtigung, etc. Op. cit.

biological solution in relation to one of the inherited instincts, the nature of fear as being a defensive function, and so on. However, conclusions are apt to seem easy once they have been pointed out; c'est le premier pas qui coûte.

If one now tries to formulate Freud's conclusion in general terms it would run somewhat as follows: Under certain circumstances, which will presently be mentioned, sexual excitations arise that cannot follow their natural course of leading to either physical gratification or conscious desire for such; being deflected from their aim they manifest themselves mentally as morbid anxiety, physically as the bodily accompaniments of this. The circumstances in question may be of either a physical or mental nature, usually there being a combination of both; in both cases a state of tension due to physical over-excitation results from the unsatisfactory functioning of an important organic system. impossible to enumerate here more than a few of them; for further details Freud's writings must be consulted. physical ones are conditions which cause sexual excitation without satisfactory gratification, such as the over-arduous embraces of engaged couples, coitus interruptus (probably the most frequent cause), abrupt introduction of girls or women to gross sexual experiences, disproportion between desire and potency, and, under certain circumstances, particularly when previous indulgence is suddenly given up, sexual abstinence. Freud has pointed out the resemblance of the physical accompaniments of anxiety states to those of the sexual act (rapid heart's action, hurried breathing, sweating, dry mouth, peristaltic contraction of involuntary muscles, etc.). The mental conditions are those that lead, by means of repression, to unconscious fixation of important components of sexual desire, so that they cannot reach consciousness; such are infantile conflicts arising during the normal suppression of perverse tendencies or incestuous

¹This term is here used in its strict sense, as defined by H. v. Müller (Sexual-Probleme, 1909, S. 309), as meaning abstinence from physical gratification of the type of sexuality characteristic of the person concerned. Thus a person whose main sexuality is of a perverse type is abstinent even though exercising normal intercourse, while a normal person is abstinent even if he masturbates daily.

²Freud. Sammlung. Op. cit. S. 81.

attractions. A consideration of great practical significance is that such fixations may render the person incapable of obtaining gratification even though regularly exercising sexual relations; the case is then one of anxiety-hysteria. Morbid anxiety is commonly described by Freudians as being derived from repressed sexuality. While this is clinically true, it is psychologically perhaps more accurate to describe it as a reaction against repressed sexuality. Desire that can find no direct expression is "introverted," and the dread that arises is really the patient's dread of an outburst of his own buried desire. In other words, morbid anxiety subserves the same biological function as normal fear, in that it protects the organism against painful mental processes of which it is afraid. It has a further biological root in being an exaggeration of the normal feminine apprehension of sexuality, and is thus a form of masochism.

I wish to lay stress on the fact that, at least so far as the somatic anxiety neurosis is concerned, the conclusion just enunciated is not a matter of psycho-analysis, so that it can at any time be tested by means of direct clinical investigation. Indeed it has been extensively confirmed by a number of observers who are either firmly opposed to psycho-analysis or else indifferent towards it; their unbiased testimony is therefore of especial interest. A few writers, on the other hand, admit the facts, but deny the conclusion. for instance, says: "If one can get information and admissions regarding the sexual life of the patients, one sees that it is almost always disturbed, and that it is in fact disturbed just in the manner indicated by Freud. . . . I admit, then, the fact to which Freud has called attention, but I believe that it has to be interpreted." He then discusses the lack of gratification obtained by such patients, evidently cases of psychical impotence, but considers this failure to be merely a manifestation of their general psychasthenic defect.³ Psycho-analysis shows, however, that these defects, like all "psychasthenic" ones, are the result of specific disturbances

¹ Typified in the common fear of becoming insane, i.e., of losing control of oneself.

² Janet. Op. cit. p. 622.

³ Ibid. Op. cit. pp. 562, 623.

in the early development of the psycho-sexual life, and clinical observation shows that when the defects concern the sexual function itself, as in Janet's cases of impotence, the physical tension that results secondarily leads to an anxiety neurosis: there is in fact a vicious circle in the pathology. The objections raised by other authors are more superficial and have been fully met by Freud, both in his original paper and in a later one; to answer them here would be merely to repeat Freud's words. Many consist of nothing but irrelevancies; thus, the only reason Oppenheim² gives for not accepting Freud's theory of the anxiety neurosis — a matter which has nothing to do with psycho-analysis — is that he cannot agree with Stekel's interpretations of dream symbolisms. Freud's observations and conclusions were confirmed, quite apart from psycho-analysis, by Gattel,3 Kish,⁴ Strohmayer,⁵ Tournier,⁶ Tschisch,⁷ and others. A great number of writers have published their experience of disorders resulting from sexual abstinence that are plainly symptoms of the anxiety neurosis: I need only refer to Erb, Féré, Gyurkowechky, Kafemann, Krafft-Ebing,

¹ Freud. Zur Kritik der "Angstneurose." Sammlung. Op. cit. S. 94.

²Oppenheim. Op. cit. S. 180.

³Gattel. Ueber die sexuellen Ursachen der Neurasthenie und Angstneurose, 1898.

⁴ Kish. Névrose cardiaque d'origine sexuelle chez la femme, 1897.

⁵Strohmayer. Ueber die ursachlichen Beziehungen der Sexualität zu Angstund Zwangs-zuständen. Journ. f. Psychol. u. Neur., Dec., 1908. Bd. xii, S. 69.

⁶Tournier. Essai de classification étiologique des névioses. Arch. d'anthropologie criminelle, 15 Janv., 1900.

⁷Tschisch. Sixth Congress of the Society of Russian Physicians, 1896.

⁸Erb. Bemerkungen über die Folgen der sexuellen Abstinenz. Zeitschr. f. Bekämpf. d. Geschlechtskr, 1910.

⁹Féré. L'instinct sexuel, 1899.

¹⁰Gyurkowechky. Pathologie und Therapie der männlichen Impotenz, 1897.

¹¹ Kafemann. Die Sexualhygiene des Mannes in Beziehung auf ansteckende Krankheiten und funktionelle Störungen. Sexual-Probleme, 1907, S. 97 u. 194.

¹² Krafft-Ebing. Ueber Neurosen und Psychosen durch Abstinenz. Jahrb. f. Psychiatrie u. Neur., 1889. Bd. viii, S. 1.

Loewenfeld, Marcuse, Neisser, Nyström, Porosz, Runge, and Rutgers. This mass of work cannot be ignored by any one whose discussion of the subject is to be taken seriously.

An interesting indirect confirmation of the truth of Freud's conclusion has lately been afforded through Herz, of Vienna. In a book² devoted to the subject, and in a number of articles,³ he proclaimed the discovery of a special form of cardiac neurosis, to which he gave the name of "sexual psychogenic cardiac neurosis — phrenocardia," because the essential cause of it consists in lack of sexual gratification. The nosology and sexual etiology of this phrenocardia has been confirmed by Erb,⁴ Romberg,⁵ Rumpf⁶ and others; the general importance of sexual disturbances for the pathogenesis of cardiac neuroses has also been emphasized by Curschmann,⁵ Hoffmann,⁵ and Treupel.९ Now,

¹Loewenfeld. Op. cit., S. 358, and Sexualleben und Nervenleiden. 4e Aufl., 1906, Ch. vi and vii.

Marcuse. Die Gefahren der sexuellen Abstinenz für die Gesundheit. Zeitsch. f. Bekämpf. der Geschlechtskr., 1910, Bd. xi, Heft. 3. Also published in brochure form.

Neisser. Mittheilungen der Deutsche Gesell. f. Bek. d. Geschlechtskr, 1904, S. 10.

Nyström. Das Geschlechtsleben und seine Gesetze, 1904. Die Einwirkung der sexuellen Abstinenz auf die Gesundheit. Sexual-Probleme, 1908, S. 398.

Porosz. Ueber das Wesen der sexuellen Neurasthenie. Monatsschr. f. prakt. Dermatol., 1903.

Runge. Das Weib in seiner geschlechtlichen Eigenart. 1900.

Rutgers. Sexuelle Abstinenz und Lebensenergie. Die Neue Generation, 1900, S. 271.

²Herz. Die sexuelle psychogene Herzneurose (Phrenokardie), 1909.

⁸ Ibid. Seufzerkrampf, Wien. Klin. Woch., 1909. Nr. 39. Die Herzneurosen, Die Heilkunde, 1910. Nr. 1. Ueber die psychischen Behandlung von Herzkranken, Wien. Klin. Rundsch., 1910, S. 75.

⁴Erb. Monatsschr. f. Psychiatr. u. Neur., Aug., 1909, Bd. xxvi, S. 170, and Münch. Med. Woch., 1909, Nr. 22.

⁶Romberg. Die Lehre von den Herzneurosen. Deutsche Zeitschr. f. Nervenheilk, 1910, Bd. xxxviii, S. 185.

⁶Rumpf. Zur Diagnose und Behandlung der Herzund Gefässneurosen. Deutsche Med. Woch., 1910, S. 1305 u. 1353.

⁷Curschmann. Ueber Angina Pectoris vasomotoria. Deutsche Zeitschr. f. Nervenheilk, Bd. xxxviii, S. 216.

⁸Hoffmann. Die Lehre von den Herzneurosen. Deutsche Zeitschr. f. Nervenheilk. Bd. xxxviii, S. 207.

⁹Treupel. Deutsche Zeitschr. f. Nervenheilk, Bd. xxxviii, S. 228.

although Herz does not mention Freud at all, it is apparent to any one who has read Freud's papers published in 1895 that phrenocardia is identical with the cardiac symptoms of anxiety neurosis there fully described; indeed, Stekel' had, in 1908, devoted to the subject a special chapter of his book.²

I have not cited the writings of any members of the Freud school in support of the conclusions here maintained, but need hardly say that the experience of all Freudians is unanimously in favor of them. Indeed, to any one who has carried out psycho-analysis it is an obvious truism that morbid anxiety is but another expression for unsatisfied sexuality, a truism that is confirmed anew in every case studied. I will only refer to the hundred cases narrated by Stekel³ in a book that gives an excellently full account of the clinical and therapeutic aspects of the different varieties of anxiety states.

Only two analyses of cases of anxiety states have been published in English, by Jung⁴ and Brill⁵ respectively. I have space here to record only a condensed abstract of a third one, chosen, out of a considerable number, because of several interesting features. It represented an unusually pure form inasmuch as the anxiety had remained undiminished in intensity for some years, and was further striking in that the localization of the physical symptoms was strongly determined by mental factors.

The patient was a lady, aged forty-six, who had been brought up amid well-to-do and refined surroundings. Her education had been fairly good, and her chief interest, apart from the usual social ones, lay in music, particularly in piano music. There was no history of nervous trouble

¹ Stekel. Op. cit., Ch. vi.

² This unblushing plagiarism of Herz's has recently been followed by another on the part of De Fleury (Bull. de l'acad. de méd., Déc. 21, 1909), Church (Journ. of the Amer. Med. Assoc., July 23, 1910), and Mendel (Neurol. Centralbl., Okt. 16, 1910), who have independently of one another discovered a "male climacteric," also described years ago by Freud as part of the anxiety neurosis. Church and Mendel consider it to be due to regressive changes in the sexual organs.

³ Stekel. Op. cit.

^{&#}x27;Jung. The Association Method, American Journal of Psychology April, 1910, p. 252.

⁵ A. A. Brill. The Anxiety Neuroses. Journal of Abnormal Psychology, June-July, 1910, p. 60.

in any other member of the family. She had married at the age of thirty-five, had borne two children, and had enjoyed a happy married life; seven years later her husband died suddenly. She herself had had no illness or nervousness until the age of twenty-six, when an attack of influenza left her with chronic indigestion. When this was bad it was accompanied with some slight general nervousness, but neither seriously inconvenienced her until the onset of her present trouble. This occurred eight months after her husband's death, and took the form of a severe "breakdown" which confined her to bed for several months, and from which she had never recovered. In the past four years her condition had varied somewhat from time to time, but for two months previous to my seeing her she had again been confined to bed. Her symptoms were as follows: In the region of the stomach was a sensation of discomfort and distension, with some nausea and flatulence. Accompanying this, and largely situated there, was a feeling of extreme "nervousness" and agitation. Mentally there was great restless anxiety, with a sense of uncontrollable dread at some unknown impending terror. Physically the attack was characterized by violent trembling of the whole body, especially of the limbs, hurried breathing, excited and irregular heart's action, and profuse cold sweating. continuously to some extent from these symptoms, being never quite free of them, but they were much worse during the attacks, which lasted for several hours, and occurred daily in the early morning; on this account she could never sleep after about two A.M. No evidence of any organic gastric affection had ever been made out, though diligent search had been made (internal measurements of the stomach, analysis of the contents, etc.). Careful treatment, chiefly directed towards the stomach condition but also of a psychotherapeutic nature, had been carried on throughout her illness, but without any avail. Weir-Mitchell treatment, as is so often the case with such patients, had only made her condition worse, and had had to be given up after a six weeks' attempt.

Such were the main facts elicited by an ordinary medical inquiry. No doubt the condition would, as a rule,

have been interpreted as being due to a severe grief occurring to a patient who was subject to chronic "functional dyspepsia," a sequel of influenza. Oppenheim states that grief and mental shock are such satisfactory explanations of the etiology of anxiety states that it is not necessary to search for repressed sexual complexes. The presence and activity of such complexes, however, is not affected by ignoring them, whereas they can be robbed of their power for harm by introducing them into consciousness. In the present case the effect of so doing was that after a month's treatment the patient was sleeping regularly throughout the night, after another month she was once more able to take up with enjoyment the social duties she had had to neglect for the past four years, and after a third month the malady was at an end.

The first important step in obtaining a sexual history was when the patient, under a display of shame and remorse as painful as I have ever witnessed, confessed that from the age of twelve up to the present time she had lived through an almost continuous struggle against masturbation; she had kept her guilty secret from her mother, her husband, and every doctor who had treated her. With a partly correct intuition she interpreted her anxiety symptoms as a dread against once more succumbing to the temptation, which had naturally been greater since the cessation of marital relations. In fact the "nervous breakdown," eight months after her husband's death, had been preceded the month before by a temporary relapse in this direction.

Such intense shame and remorse is rarely seen as a reaction against ordinary masturbation beginning at the age of puberty; as a rule it has deeper sources, being formed as a reaction against infantile auto-erotic tendencies, which have been repressed into the unconscious, and to which the later habit has become unconsciously associated. Liberation of these unconscious complexes causes the reaction to assume more normal proportions, and this is followed by a diminution in the force of the remaining temptation; these fortunate results followed the usual rule in the present case. The memories of the earlier auto-erotic activities were

¹Oppenheim. Op. cit., S. 179.

brought to consciousness by means of psycho-analysis, mainly of dreams. They concerned both phantasies and onanistic acts relating to the urethra and the two alimentary orifices, with the corresponding excretions. Bedwetting, continued almost nightly up to the age of thirteen, had acquired the significance of a nocturnal pollution, as it indeed frequently does. It had caused her great embarrassment and shame, for it so happened that it affected her social life in a considerable measure. On account of it she was not allowed to drink anything after three P.M., a restriction she evaded by guiltily stealing forbidden drinks; as a radiation of the corresponding affect she acquired a fondness for glycerine, vinegar, and whiskey. At the age of three and a half a baby sister was born, and her imagination, excited by the event, subsequently elaborated the following explanation of it: Children grew inside the body, and were evidently formed out of food; they entered the world through the only possible orifice, the anus. food was stimulated to this activity through admixture with some fluid (analogy of urine and fæces, later, watering and manuring of vegetation). This fluid was supplied by the doctor, was therefore some special kind of medicine that had to be swallowed. She acquired a "fascination" for medicines, and throughout her childhood days drank all she could obtain. In later years she had a pronounced loathing for medicinal fluids that had features at all resembling semen, for instance, buttermilk, flaxseed emulsion, and koumiss, all of which were forced on her with the aim of bettering the stomach condition.

As she grew older and buried all memory of these tendencies by repression they manifested themselves in partly sublimated and partly reactive activities; for instance, the habits of finger-sucking and nail-biting (both of which were preserved through adult years), of biting and eating slate pencils, revelling in the making of sand pies, of mixing earth and water in a pot to make flowers grow (which was followed later by a passionate delight in flowers and in gardening), of manufacturing cold cream, cakes of soap, etc., and later in a fastidious abhorrence of dirt or untidiness in any form. She managed to prevent the crea-

tion of any neurosis, as a compromise formation on the part of the complexes, until she was twenty-six, when she had the attack of influenza. At this time she was severely disappointed in a love affair on which she had built many hopes; simultaneously it was decided, on account of bad wrist trouble, that she must forever give up the practice of piano playing. The latter had served as an outlet for much of her emotional life, partly through the æsthetic pleasure of music, partly because, as is often the case, it was unconsciously associated with the act of masturbation, and was serving as a sublimated vent for this tendency. Her adult emotional (psycho-sexual) outlets and aspirations being thus violently checked, she was thrown back on the infantile forms, on the basis of which was constructed the neurosis. The first symptom of this was distressing nausea occasioned by the medical administration of whiskey. which was in many ways—one was mentioned above—associated with the infantile complexes. The various gastric symptoms, nausea, distension, flatulency, pain, etc., were individually psychically constellated, and were products of the infantile forms of her sexual life. Her hetero-sexual tendencies became fully awakened in marriage, and the renouncement of them was followed by a still more stormy return to old conflicts, with the outburst of the graver stage of the neurosis.

In this case we see the early stages of a tendency to phobia formation, to which the neurosis did not actually lead. Many phobias of edible substances, or of objects resembling these, are but elaborations of a basis similar to that just described. The case illustrates one of the ways in which anxiety symptoms may become localized in one or other system of organs. Another way is through the presence of actual organic disease. I have observed, for instance, that cardiac symptoms are pronounced when an anxiety condition supervenes on a case of heart disease more frequently than when it occurs alone; even in such instances, however, psychical factors generally play a part in determining the localization. The basis for the production of an anxiety hysteria is so common that even when, as in the case just described, they have previously remained latent, the

altered mode of life, e.g., sexual abstinence, caused by an organic disease, particularly heart disease, may provoke the first outbreak of a neurosis; this is the reason why anxiety symptoms are far from being a rare complication in chronic cases of, for instance, heart disease.

Attention carefully directed to the study of anxiety states has shown that they are a great deal commoner than is generally supposed, the significance of the symptoms being often overlooked through clinical ignorance. Psycho-anallytic research has further made it highly probable that many kinds and degrees of fear that pass for normal, e.g., fear of fire, of mice, etc., take their origin in unconscious complexes and are psychologically as "abnormal" as any phobia. If one reads the description of fears amongst normal people, such as these collected by Binet, Calkins,2 Stanley Hall,3 and Varendonck,4 the analogy between them and hysterical phobias inevitably forces itself on one. is assuring to reflect that much of the fear, and anxiety, that bulks so large in the sum of human distress, even amongst the so-called normal, is entirely avoidable, and will one day be prevented when psycho-analytic experience is more widely recognized.

The conclusions thus reached can be condensed into the statement that morbid anxiety means unsatisfied love. That already the Greeks had an intuition of the close connection between these two instincts is indicated by their belief that Phobos and Deimos, the gods of Fear, were born of Aphrodite, the goddess of Love.

¹ Binet. La Peur chez les Enfants. L'Année psychol., 1895, pp. 223-254.

²Calkins. The Emotional Life of Children. Pedagog. Seminary, Vol. iii, pp. 319-323.

³ Stanley Hall. Op. cit., pp. 147-249.

Varendonck. Op. cit., pp. 5-45.