THE COMMON CAUSE IN THE FUNCTIONAL INSANITIES

BY

T. C. GRAVES, M.D., F.R.C.S.

Chief Medical Officer, City of Birmingham Mental Hospitals Committee

Psychotics are physically infirm. The purpose of this contribution is to demonstrate the existence of a common cause for the mental and physical illness.

In the organic and toxic insanities a parallel exists between the somatic and toxic causal factors and the mental manifestations; but in the remaining insanities, a group provisionally labelled functional although in their course bodily illnesses occur, no such similarity is shown; in fact, erraticness appears to be characteristic of the somatic and psychotic interrelationship.

Psychological Considerations

In discussing the causation of these functional insanities psychological conceptions loom large, though they are, with the system of Freud (the latter self-admittedly), useless therapeutically. The conception of mixed causation—indicating that any psychological factor, otherwise regarded as primarily causal, has produced its effects in a physically sick person—is more appropriate than pure psychogenesis.

If the relation of these physically sick states to the functional psychoses is reviewed a full circle of opinion appears. Thus the stress of bodily illness can cause mental symptoms; both somatic and psychotic conditions can occur independently of each other; insanity can cause some somatic disorders; emotional states are of "specific importance" in the causation of certain disease states; psychological factors cause gross bodily disease, and this should be treated psychologically; mental conditions give rise to physical maladies; and nervous conditions produce sickness which calls for medical attention. In contrast, some presumed psychotic symptoms, attributed to "action of unconscious motives," have neurological bases. Hence if there is not agreement as to the nature of the interrelationship between the somatic and mental states of ill-health there is agreement on the frequency of their association.

Physiological Considerations

Considering these insanities from the somatic physiological aspect there appear certain deficiency conditions, held to be especially potent in subjects hereditarily predisposed to insanity. However, as one has to treat but cannot rebuild the patient, knowledge of predisposition is of little value, for the chances of recovery are about equal in those who have or have not this predisposition. Deficiency of inherent vital power, or primary abiotrophy, has been postulated, but its primariness has been questioned, as its manifestations have been met in tuberculosis and cachexia.

The epochal periods of life—puberty, childbirth, the climacteric—are regarded as causal factors in insanity, indicating a serious deficiency in biological adjustment. However, a patient may recover while such a cause is yet operating, and another may continue psychotic long after such a period has ceased. Nutritional deficiencies, as of vitamins, have been considered as factors; but in these,

as well as in deficiency of metabolic supplies, a pathological cause preventing absorption and utilization has to be looked for.

Sensory deficiency, congenital or acquired—for example, deafness—occurs frequently; but recovery from insanity can ensue although the deprivation persists. Deficiency of emotional control through the psycho-autonomic endocrine mechanism is a basal state in the functional psychoses, varying in severity from the mildest manifestations, which might be regarded as physiological, to the most extreme states. In these responses, which may seem those of "pure psychogenesis," an emotional excitant can always be found to explain any display; the subject appears sensitized so that the physiological mechanisms are facilitated, and the emotional reaction to a minor situation is augmented—that is, its action is sustained and/or has an intensity out of all proportion to the alleged cause. Thus a young woman, apparently healthy, is disappointed in love and immediately develops delirium, which, partly subsiding, lingers on as a delusional state and progressively deteriorates towards dementia. Again, the death of a favourite cat was the alleged cause of a severe psychosis, ending fatally in bronchopneumonia: the real cause was a splenoidal empyema. The autonomic endocrine mechanism is activated by environmental changes, but an explanation of sensitization or excessive response of this mechanism is needed.

Evocation, other than Psychogenic, of the Autonomic Endocrine Response

Infection can affect the autonomic endocrine mechanism, seen clinically in vascular and cutaneous changes, and the symptom of fear, seen in the "malaise" of an acute infective illness. Cannon showed that painful sensory stimulation, moderate asphyxia, also cold and fever induced by injection of typhoid vaccine, activate the mechanism. Crile concluded that exertion, overwork, emotion, auto-intoxication, and infection, two or three of which usually operate simultaneously, work through an identical mechanism. Cramer has emphasized the conception of the autonomic thyroid-adrenal apparatus as a common mechanism responding to several activators, and considered that those measures are beneficial which stimulate the apparatus without exhausting it. He examined the effect of several agents.

Effect of Fever, Heat, and Cold.—Cramer found that an injection of the pyrogenic β -tetrahydronaphthylamine stimulates an active secretion of these glands; and, observing the similarity between the aseptic fever thus induced and that produced by bacterial infections, concluded that both have the same physiological basis in increased functional activity of the thyroid-adrenals. He viewed this apparatus as concerned in control of body temperature. He held that changes in temperature, if not too great, are more stimulating than uniformity. Both physical and mental activity reached pronounced maxima in the spring and the autumn, with minima in midsummer and midwinter. The beneficial effect of a bracing climate is a rise in metabolism due to increased activity of the apparatus. On the other hand, the intensely depressing effect resulting from exposure to cold with insufficient clothing leads to mental and physical deterioration through exhaustion of the glands.

Effect of Bacterial Action.—These glands are susceptible and responsive to the action of many bacterial toxins, especially in the acute infections, such as malaria and influenza, which are accompanied by the greatest disturbance of the heat-regulating mechanism. Small doses of certain bacterial toxins stimulate the glands to increased activity with a tonic effect, while in larger doses they exhaust—a toxic effect.

Interrelation of the Adrenal Medulla and Cortex in Bacterial Infections.—In bacterial infections a migration of cortical lipid toward the adrenal medulla occurs. The disappearance of the lipid as a specific result of infections of such virulence that they rapidly lead to death indicates that in the absence of lipid the new formation of adrenaline is impaired and the gland exhausted. In experimental streptococcal septicaemia, so severe that animals died within four days, the adrenal medulla was completely exhausted and the cortical lipid had disappeared. The gland resembled that of animals dead from gas-gangrene toxin. With a less virulent strain the animals were ill but not dead in four days, and in these the adrenals were not exhausted, the medulla showed active secretion, and the cortical lipid was not diminished. The pneumococcus produces an intense hyperaemia with haemorrhages. In contrast certain bacterial vaccines evoke very active secretion of adrenaline.

Self-regulation of Adrenal Functional Activity.—Cramer finds the adrenal gland controls its activity, so preventing self-exhaustion. Injection of adrenaline and prolonged feeding with thyroid produce changes in the medulla which effect a control of the gland. Also there is a mechanism located in the cortex and manifesting itself by disappearance of the lipid, which effects an "inhibition" of the activity of the gland.

Effect of Carbohydrate Metabolic Control.—As bacterial toxins act on the adrenaline mechanism they affect this process, hence infections in diabetes mellitus aggravate the hyperglycaemia and glycosuria and increase insulin resistance. Cramer found that some bacteria produce a rise in blood sugar, another group a fall, but a third group no change.

Pathological Considerations

That there is a pathological quality in the somatic aetiological considerations is apparent; but when search is made for correlations recognized as comparable to those just discussed the result is less helpful. The apparent erraticness of the association of the functional psychoses and the unhealthy somatic conditions have been indicated. If a disease entity association could be established it would pass into the organic psychoses group. It is still necessary to find a pathological linkage.

Organ Inferiority.—This conception has been advanced as an explanation where functional psychosis occurs with disease of certain organs—lungs, and especially in all cardiac cases. However, in many cases these psychoses may continue for long years without associated disease of these organs.

Painful conditions indicated in intelligible language may be very few, though there may be allegations of ill-treatment from imaginary sources. Headaches, if they occur, have been regarded as psychogenic if evoked by mental effort or excitement; similarly one can so easily show that other distressing conditions of organic origin, such as tinnitus aurium, are singularly minimal in these psychoses. It is possible thus to report that the insane as a mass are physically healthy, yet inquiry will show that in the pre-psychotic stage physical ill-health and painful conditions have occurred.

Relation of Psychotic Symptoms to Discharging Diseases

Reviewing the somatic diseases of infective origin in relation to onset, exacerbation, and amelioration of mental symptoms, it is an ancient observation that apparent cessation of a discharge may be followed by the onset of mental symptoms, and, conversely, even long-standing mental symptoms may remit when associated with the occurrence of discharging diseases such as bronchitis and pneumonia, to return, however, after the discharge has "subsided." In a case of pyonephrosis the mental state

was lucid, though depressed, so long as pus passed in the urine, but when the pyuria ceased mental confusion passing on to acute delirium developed, which, together with the depression, ended when drainage was made effective. Similarly, so long as nasal catarrh is active and drainage good the psychotic or other symptoms are either absent or minimal, but when the discharge diminishes or ceases from drainage defect or failure to react, neurological, psychotic, or other symptoms appear.

An objection to the application of the principle involved in these observations is the variety of organs and infections which can be concerned. Here Rose Bradford may be quoted: "Many morbid processes that are described as diseases of organs are not really limited to the effects produced in such organs; the interrelation of the various organs affected is not a physiological one but is dependent really on the fact that the cause of the disease is a more widely acting one than is often recognized."

The Functional Psychoses and their Associated Bodily Diseases

When we examine the associated diseases for a widely acting cause the conception of a chronic infective process due to the common septic organisms emerges. It includes all that is connoted by the term "focal sepsis," but indicates more than localized areas of unconnected disease, for emphasis is placed on the unity of the process permeating the whole body, one which includes not only "focal" and "superficial" sepsis but also "deep" and "residual" as well as "open" and "closed," together with secondary septic processes; and it causes, usually gradually, degenerative changes in distant organs as effectively as an acute infective process. Such a process, less obvious clinically than the psychotic and bodily disease states, by being the cause of both provides the link between them. This process is now termed the common cause. This basal cause may exist without either psychotic or somatic disease accompaniment, although it is persistent, perhaps for life, and progressive—usually slowly and insidiously, but also by exacerbations followed by incomplete remissions. Sometimes an exacerbation is so severe that death ensues early. The origin of this chronic infective process appears to be related to a transmissible familial infection, although generally its first appearance as a lesion is as a residuum from an acute infective process, during which the patient may have shown mental symptoms—for example, fear and delirium.

The lesion usually appears in the adenoid tissue of the pharynx, the muco-periosteal membranes of the nose, nasal sinuses, ear, and mouth, spreading gradually therein, especially to any area weakened, as by injury. In the early stages symptoms are generally insignificant and are regarded as "usual and common"; this may be the attitude even when extension occurs in an acute process with general bodily and perhaps some mental disturbances; for such an exacerbation is usually succeeded by remission. Later there may appear, as secondary manifestations, bodily-disease entities—appendicitis or bronchitis—due to, but having no obvious common causal relation with, the primary lesion. Meanwhile the condition of the mother lesion may be changing—for example, from efficient drainage ("open" sepsis) to deficient drainage ("closed" sepsis). A psychosis may appear, also having no obvious common causal relation; and, like the somatic secondaries, it may remit and recur or may continue. Thus there may be a succession of these various secondary mental and bodily conditions, the latter including functional change—for example, amenorrhoea

—as well as permanent organic disease. The mother lesion in the head extends its area, and its primary infection becomes complicated by other organisms—pathogenic, putrefactive, and saprophytic—whose combined action increases the potency of the emanating toxæmia. The lesions can involve the peripheral sensory and motor mechanisms and so interfere with the capacity to know and react to environment. With the remission of the activity or removal of the common cause the secondary manifestations tend to heal and their symptoms to decline or cease. If untreated the process is progressive, and there is seen that mutation in the symptomatology which marks the stages in the pageant of physical and mental deterioration called insanity. Thus the chronic infective process, usually apyrexial or with subnormal temperature, bears to the state of chronic insanity a relation parallel to that which the acute infective process, with its pyrexia, bears to acute delirium.

While in the life of one patient there may be a succession of these mental and bodily manifestations, perhaps spaced so that they do not appear to be related, variations from this sequence occur. At one extreme some never have mental disorder, but have severe bodily illnesses; others rarely suffer from severe bodily disease, but mental illness is their life's incapacity. There are other cases in which there is closer association between the two forms of manifestation; and here the appearance of the mental symptoms may, like those seen in relation to an acute infective process, precede, coincide with, or succeed the physical illness.

When there is a close time relation it is not difficult to understand the tendency to regard the mental symptoms as causal of the physical condition. However, by investigation and treatment of a common cause a bodily disease which might be supposed to depend upon a mental cause, or in which psychological factors are considered to be of "specific importance," can be dealt with successfully, as well as the mental condition which was its apparent cause. Interference with the process by operating on the secondary conditions—for example, appendicitis, hæmorrhoids—and leaving untreated or partially treating the mother lesion, has frequently been followed by the precipitation or intensification of a psychotic state; but the complete treatment of the mother lesion, even when psychosis has supervened on operations on daughter conditions, has resulted in recovery from insanity. It is imperative before a case is dismissed as purely psychogenic that it be reviewed as possibly due to a common cause, though not demonstrable without skilled assistance.

The common-cause conception cannot be limited to the insanities. If applicable to them it must also apply to the subpsychotic states which may evolve into them—namely, the neuroses and psychoneuroses—and if anxiety neurosis and neurasthenia are due to somatic disorders of the sexual apparatus then an explanation is available as to the possible cause of these sexual disorders. All depend on a common cause. Similarly the psychogenic origin of certain physical symptoms—for example, amenorrhoea, tinnitus aurium—should be reviewed, for the common-cause conception provides a causal process for both the "insanity," which is alleged to cause them, and the symptoms, and is one in consonance with their accepted causation in general medicine.

Lesions of the Common Cause in the Functional Psychoses

During the last forty years a literature, not limited to psychiatric journals, has with increasing insistence stressed the causal relation of chronic infective processes to these

psychoses. The lesions, generally multiple and extensive, not infrequently have a foulness unbelievable as consistent with life. Certainly the oral conditions found include the maximum of severity and extent of dental disease. Having regard to the fact that influenza is a potent cause of both psychosis and sinus disease, and that dental disease has also a causal relation to nasal sinus disease, a high incidence of the latter in these psychoses is not surprising. Similarly tonsillar disease is frequent and ear disease occurs. Anomalous indications owing to the frequency of "closed" sepsis, possibly mistaken for a healing state, beguile investigation and enhance the necessity for uniformity of technique. Inquiries about the pre-psychotic stage usually elicit indications of chronic infective processes in the head and trunk and sometimes of operation.

Dynamics of Absorption from the Lesion.—The severity of symptoms may depend on the three modes of absorption of bacteria and toxic matter. In simple absorption material passes into the mucosa and adjacent lymph spaces, including nerve sheaths. In mechanically augmented absorption this process is hastened by action squeezing the material into the vessels. Following extraction or manipulation of a tooth in an infected socket, and even during mastication, bacteraemia occurs; also after handling tonsils in tonsillectomy and even before operation (Elliott; Round *et al.*), suggesting tonsillar squeezing during swallowing. The nasal sinus lining, like the nasal mucosa, has the power of swelling. Not only is "open" sepsis thus "closed," but when the pressure rises the only escape for exuded fluid is by vascular channels (Russell). The third mode of absorption, by ulceration, thrombosis, or embolism, provides for a larger invasion. A constant bacteraemia occurs from these infected tissues and is increased by normal movements—mastication. Fleming concluded that obscure sources of infection, such as the gall-bladder, nasal sinuses, and intestine, are probably the cause of the increase in the number of immature polymorphs found in psychotics.

Relation of Bacteraemia to Endogenous Activation of Autonomic Endocrine Mechanism

Either successively in one patient or individually in a group of psychotic cases can be seen the stages from adrenalthyrototoxicity with pyrexial reactivity to extreme adrenalthyrototoxicity with subnormal temperature. The latter condition may be seen with corresponding emotional display in the exacerbation reaction following interference with advanced lesions of the common cause: for example, after extensive removal of septic teeth there may be the first appearance of emotional disturbance or its rapid intensification, and this during the period when a bacteraemia occurs.

Thus the stages from adrenal-thyroid stimulation to exhaustion by the common cause will depend on the severity and duration of sensory excitation and dosage and type of bacteraemia, separate or variously combined. In the early stages, with free discharge, minimal bacteraemia, and no pain, the effect may be stimulating, with enhanced muscular power. Painful stimulation then evokes irritable-to-anger states. Increased bacteraemia tends to produce fear states. With muscular weakness depressed states develop, increased by painful stimulation. Pathological exaltation represents a further stage of exhaustion which, affecting the circulation, produces cerebral anoxaemia and so facilitates psychomotor activity, the increased movement being made by muscles hypotonic through exhaustion of the adrenal-thyroid apparatus.

Seasonal Variation.—A chronic infective process augments the exhausting effect of seasonal change on the apparatus and retards the stimulating phase. The early symptoms of mental illness usually appear in the winter months, and may so worsen as to need mental hospital treatment; or, partially subsiding, they may exacerbate dramatically during heat or, again, early in the next cold season. Where the infective process is less exhausting mental deterioration appears later in the winter. Broadly, the "earlier in winter" arrival in the mental hospital will not improve and may even exacerbate as winter progresses, but the "later in winter" arrival may improve more rapidly.

Clinical Aspects of the Common Cause in Mental Ill-health

Mention of three associated somatic diseases regarded as of psychogenic aetiology will illustrate the common cause relation.

Colitis, a secondary manifestation, results from a summation of chronic infections, acquired before the onset of mental ill-health and also causing it. The importance to the diabetic of a chronic infective process is recognized. Lawrence says: "Remarkable improvement usually follows the removal of septic foci." Much is made of psychogenesis in asthma, an associate disease of and predisposing to insanity; but recent work by Russell shows the importance of the chronic infective process in asthma, and thus in the psychoses. He says: "The existence of a psychological factor is recognized, but the idea that it is of primary importance is derided." He finds a fundamental difference in the improvement obtained by radical treatment from that following other therapies. In psychoses just that same difference follows treatment of the common cause. Thus the fallacy that because B is recognized first, and C comes after, B causes C, is exposed by the demonstration that A was pre-existing to and the cause of both.

The Psychotic States

That our perception of environment is dependent on our feelings appears in tremendously magnified form in these functional psychoses. The endogenously engendered disturbances of the emotional state—fear, depression, exaltation—distort not only the appreciation of surroundings but even the perception of the sensory disturbances due to the activity of the common cause on the peripheral nerves or their special end-organs. These emotional states thus determine the appearance of their own types of ideation and conduct, of various grades of intensity from slight deviations, passable as not abnormal, to homicide and suicide. "Worry," a state of persistence of endogenous fearful ideation, is a mild stage of that which later may appear as insanity and so seem to cause it.

A mother who helped her son to choose between two careers continued to dwell on the subject, "worrying about it," so sought advice. After treatment of a common cause the worried state ceased; she was satisfied that she had acted correctly, and was able to tolerate discussion of the subject and forget it, previously impossible.

The endogenous disturbances of special and common sensation are perceived in hallucinatory guise and form the bases of delusions, being attributed to the action of external agencies, and unrecognized and mysterious or perhaps defined persons. These misinterpreted sensations have a persecutory or antagonistic significance if the patient is fearful or depressed, while if he is exalted they

are perhaps stimulating. Thus fetid smells from putrefaction of nasal discharges and foul tastes of pyorrhoea form the basis of delusions of poisoning, gassing, etc., and become the cause of accusations of marital infidelity. Similarly, too, occurs tinnitus aurium, perceived by the confused mind in hallucination and depending on pitch misinterpreted as imaginary "voices," perhaps erroneously recognized, of men, women, or children, who are variously appealing, threatening, abusing, or applauding the patient and urging him to act or not to act, depending on the endogenously engendered emotional state.

A workman developed a vertex pressure headache and later an exalted state during which he announced he was a king because he had got a crown on the top of his head. After treatment of extensive cephalic sepsis the headache and thus the "crown," and the exalted and regal states, all ceased.

An Illustrative Case

In the following case psychological, physiological, and pathological aetiological factors were demonstrable, but a common cause was present ("open" followed by "closed" sepsis with seasonal exacerbation) and recovery followed radical treatment.

An industrious childless storekeeper, aged 58, was admitted to the mental hospital on January 12, 1939, with a first attack of psychosis. He had had influenza several times, the last badly ten years ago, and since then "colds." He had been cheerful and sociable until early 1938, when he was in hospital for vesical papilloma and his wife developed cancer. He became unhappy, worried, and finally depressed. After her death on December 30 he worsened into melancholia, classified as involutional, with delusions of unworthiness and suicidal declarations. No organic disease was found, but the tonsils were purulent; the septum was bilaterally deviated and oedematous high up; antral transillumination was suggestive of nasal sinusitis, otherwise there was no indication of it. Submucous resection followed tonsillectomy. Then nasal sinus suction-exploration (Watson-Williams) found only inspissated pus and thick lining in the right sphenoidal sinus, and pus flakes in both ethmoids with a small polypus in the left. Some mental improvement followed each stage, but complete recovery with full insight only appeared after the fourth stage—namely, sphenoidal empyema drainage, ethmoidal irrigation, and removal of polypus. The patient is now able to state that for years he had nasal catarrh and recurrent pharyngitis. Muscle tone is much improved, and he has gained 15 lb. Discharged September 7, 1939. Recovery testified by solicitor in letter, October 16, 1939, thanking for "truly marvellous cure, restoring this very excellent man not only to a proper mental balance but also to physical efficiency not enjoyed for many years."

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The Italian Ministry of the Interior has equipped several motor cars for its health service similar to those which have been successfully used in Rome and Albania. Each car will contain a medical superintendent and six specialists for ophthalmology, oto-laryngology, radiology, dentistry, chemical analyses, and bacteriological examinations respectively.