THE INTEGRATION OF MEDICINE WITH MENTAL HEALTH ACTIVITIES*

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If anything of what I say appears to coincide with the content of the paper by Prof. L. A. Hurst† on 'Undergraduate and postgraduate psychiatric education', this repetition must not be regarded as careless redundancy, but rather as purposeful and symbolic of the way in which he as Professor of Psychiatry and I as Professor of Medicine at the University of the Witwatersrand attempt to treat our patients and at the same time teach our students the principles and practice of integration between internal medicine and mental health.

Not only must the student, the doctor, the psychologist, the social worker, the occupational therapist and the nurse be led to appreciate the close and inevitable link between psyche and soma, and the way in which the one works on the other through various physical and psychological mechanisms, but the patient must also be made aware of this same linkage and must appreciate that there is nothing mystical, unphysiological, shameful or humiliating about his psychoneurotic, ulcerless dyspepsia. It is a short step, sometimes beset with difficulties, to translate from the understanding and management of the individual problems to the understanding of community problems, for the behaviour of the community is based upon the behaviour of the individual.

An understanding of the mechanisms that link psyche and soma is mandatory for anyone concerned with the promotion of health and the treatment of illness, be it physical or mental. I cannot discuss all the linking mechanisms and their intricacies this afternoon, and have chosen just one, which is within the realms of measurable

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†See page 151 of this issue.

physiology, namely, the autonomic nervous system—that part of the nervous system that works automatically without conscious control. I shall discuss just one segment of that system, namely, the part that subserves the stomach. Of all the organs in the body, the stomach reflects nervous tensions most, and commonly 'protests', in the face of adversity and maladjustment, with symptoms of pain and discomfort. But what I shall say can be regarded as the pattern followed in many other systems of the body.

The Effect of a Psychological Stimulus on the Stomach

A number of years ago, Dr. Harold G. Wolff,[1] of Cornell Medical School, described the case of Tom, a middle-aged adult who, as a young child, had swallowed too hot soup and developed a permanent stricture of the oesophagus as a result. He had fed himself all his life through a 'gastrostomy', i.e. an opening into the stomach through the upper abdominal wall. This showed as a pouting ring of stomach about 2 inches in diameter protruding through the abdominal wall just above the navel. At the age of about 50 he was rescued from an uphill battle to earn a living by Dr. Wolff, who gave him sheltered employment in his laboratory. In return, Tom was happy to have observations made on the vascularity, the motility and the acid secretion of his stomach under different conditions of physical and psychological stress. Vascularity was graded by colour in relation to a haemoglobin scale, motility was estimated by a balloon in the stomach connected to a recording manometer, placed through the stoma into the stomach, and acid secretion was estimated in the usual chemical way.

Pallor (with reduced motility and reduced acid secretion) and loss of appetite occurred under the stimulus of fear such as, on one occasion, the threat of dismissal from his sheltered employment. Fear halted the physical digestive functions of the stomach. Anger and resentment caused the stoma to redden to the colour of blood with grossly increased vascularity, so much so that it bled. This increased vascularity was accompanied by increased acid secretion and by increased motility. Increased motility is one of the factors concerned in the production of pain of gastric origin. Had Tom a gastric ulcer, anger and resentment could well have precipitated severe haemorrhage in that ulcer, or a bout of pain.

A Physiological Explanation

Having presented some factual evidence of the physical effect of a psychological stimulus—and examples could be given relating to blood pressure, heart rate, respiration and many other bodily functions—a physiological explanation of these observations must be sought next.

The diagram (Fig. 1) shows the brain, the spinal cord, the stomach (and incidentally the heart and the suprarenal gland, which is responsible for the production of cortisone and which in turn has an hormonal effect on the stomach). What you see with your eyes and hear with your ears, to mention only two of the senses, may induce disturbances of emotion such as anxiety, fear, resentment, frustration, and of course pleasurable emotion. Common 'life situations' that may induce emotional disturbances are listed under the six B's—the bedfellow (it is well

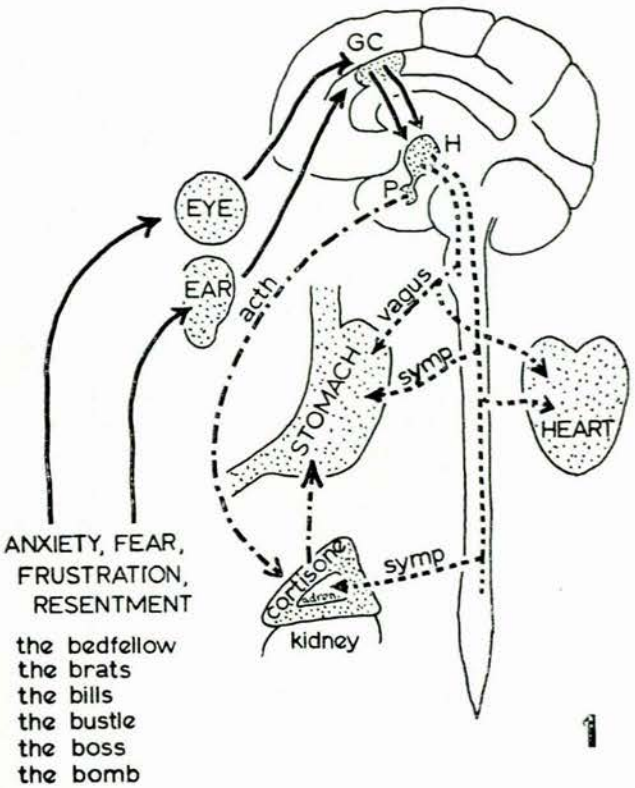

Fig. 1. Psyche-soma linkages.
Continuous line-pathway from exogenous stimulus through eye and ear to cortex (GC = gyrus cingulatus) to hypothalamus (H).
Dotted interrupted line-pathway from hypothalamus to viscera *via* parasympathetic (vagus and sympathetic).
Long-short interrupted line-pathway from hypothalamus to viscera *via* pituitary (P) and its hormones (e.g. ACTH).

known how common incompatibility in this sphere is found to be a cause of psychoneurosis), the brats (representing the family, cynically called by some 'an autocracy ruled by its sickest member'), the bills, the bustle, the boss (kind, unkind or just enamoured), and the bomb.

A psychologically induced stimulus is sorted out by the brain at known points. As far as the stomach is concerned, this would appear to be part of the inner surface of the frontal lobe, namely, the cingulate gyrus and the posterior orbital gyrus. Electrical stimulation of these areas in anthropoids leads to increased gastric motility, secretion of acid, and vascularity, which is exactly the same effect as anger and resentment had on Tom's stomach. From these cortical areas connecting neurones proceed via the medial thalamic nuclei to the hypothalamus.

The hypothalamus, no larger than the tip of a thumb, is a most remarkable area of the brain, being the centre for the autonomic nervous system. From the anterior part of the hypothalamus arise the parasympathetic neurones, of which those forming the vagus nerve are the most important as far as the stomach is concerned. Electrical stimulation of these nerves excites the stomach to hyper-

secretion of acid, hypermotility and hypervascularity, and inhibition of secretion results in the opposite effect, namely, hypomotility, pallor and hyposecretion. The operation of vagotomy for peptic ulcer is based upon the principle that removal of vagus effect reduces secretion of acid and gastric motility. From the posterior part of the hypothalamus arise the sympathetic neurones of which those forming the splanchnic nerves (from thoracic segments 5 to 12) are the most important. Stimulation and inhibition of these nerves produce opposite effects to the effects of the vagus, but the effects under maximal stimulation are much weaker.

The hypothalamus has many other functions, all of which may play a part in mediation between psyche and soma. It controls secretions of the anterior lobe of the pituitary and therefore has a controlling influence on all other endocrine glands through the hormones of the pituitary, and it controls water secretion through its antidiuretic hormone, regulates water balance, blood pressure, body temperature, appetite, sleep-waking mechanisms, and some forms of emotional behaviour. It is one of the most important integrative centres of the body. Surely this transcends the most perfect man-made transistorized system!

The body-mind relationship is extremely complicated, but there is no doubt that health depends on a balance of somatic and psychological functions, which balance is affected by both physical and psychological environmental stresses. There is in fact no such condition as a purely physical or a purely psychological illness. A patient with a coronary thrombosis can be gravely harmed by emotional disturbance, and a psychoneurosis has many objectively observable physical manifestations. We have but to watch the expert mime on the stage, to see that gesture can convey emotion far better than words. There are many aetiological factors in asthma, but unquestionably psychological causes can be responsible for inducing attacks, including the very serious condition of status asthmaticus. The patient with coronary artery disease, who experiences anginal pain on effort, can have his pain induced by psychological stimuli, through the medium of the autonomic nervous system which, as a result of emotion, induces tachycardia and overaction of the heart just as does exercise. A patient with chronic bronchiectasis will secrete six to eight times as much material from his bronchi while under stress. And even if the patient is unconscious, there is still a psychological aspect relating to the family around the sick-bed.

Practical Applications

Having accepted the facts of the body-mind relationship, how do we convert this knowledge to the management of personal, family and community health and ill-health, both mental and physical? The ideal would be to study each personal, family or communal problem by a team consisting of the physician or surgeon, the psychiatrist, the psychologist, the social worker, the occupational therapist and the nurse. Included in the team should be the student of medicine, the student of psychology, the student of social work and occupational therapy and the student of nursing, for these students must learn their future way of life. This ideal is impossible to achieve for a number of reasons: There are and always will be insufficient trained persons to form enough teams; much work is wasted on less hopeful problems while there are so many more hopeful problems requiring attention; and there is the admission to be made that not all physicians, psychiatrists, psychologists, social workers, occupational therapists and nurses have the warmth and interest in human situations that are essential for success in this field of work.

Nevertheless, we must each do the best we can under the circumstances, and work and hope for better. I for my part concentrate on making it possible for the undergraduate and the postgraduate medical student, the psychiatrist, the physician (myself) and the patient (any patient suffering from any condition for which he is admitted to a medical ward) to come together to see how we can help the patient mentally and physically, and at the same time teach ourselves and the students our integrative philosophy.

In my ward we meet once a week, when one of a group of 3 or 4 final year medical students presents a case of his selection. Apart from immediately helping the patient in the discussion group, we hope in time to produce a generation of medical practitioners who will not be afraid of tackling psychological situations in their patients, their patients' families or in the community, and who will be competent to know when such problems are beyond their own abilities and must be referred to suitable experts and appropriate organizations for help in the solution of the problem. This new generation of doctors, now in production, will, we trust, be competent to perform a service for the individual and the community that is not only complementary to the service given by the psychiatrist, but will also save specialist psychiatrist man-hours—thus permitting the psychiatrist more time to spend on problems that demand his specialized training. Some degree of alleviation of the shortage of psychiatrists will therefore be provided. Not all of this new generation will be influenced. Some seed must fall on stony ground, and some soil will provide abundance from virtually no seed. The majority between these two extremes will, we hope, be favourably influenced.

CONCLUSIONS

The road towards the ideal is hard. I asked Dr. Stanley Cobb, Professor of Psychiatry at Harvard Medical School, how he had managed to induce the orthopaedists to attend his weekly case discussions. His reply was: 'It took 20 years of hard work, and persistent but gentle persuasion.'

I have selected as my main theme the physiological basis of body-mind linkage. But not every physical or psychological phenomenon in man can be explained on a basis of physiological and biochemical metabolism, be it natural or be it man-induced by drugs such as lysergic acid. To quote Julian Huxley:[2] 'Physiological metabolism utilizes the raw materials of objective nature and elaborates them into biologically operative physico-chemical compounds and systems.' Under this metabolic category man has been defined genotypically as 6 foot of a parti-

cular molecular sequence of carbon, hydrogen, oxygen, nitrogen and phosphorus atoms. Huxley[2] coins the term 'psychometabolism', in contrast to physiological metabolism, which, 'utilizes raw materials of subjective experience and elaborates them into psycho-socially operative organizations of thought and feeling, such as the principles of causation, categories like space, abstractions like truth'. These psychometabolic functions cannot be objectively measured, but yet are as much a part of life as the measurable processes of physiological metabolism.

I conclude by reminding you of the story of Psyche, the patron saint of psychology and of psychiatry. Psyche was the beautiful daughter of a king of Greek mythology, whose surpassing beauty excited the jealousy of Venus. So Venus sent her son Cupid to cause Psyche to fall in love with a monster. But instead Cupid fell in love with Psyche and took to visiting her, but only in the darkness of the night. Psyche at last could no longer bear an ecstatic relationship with someone whom she had never seen with her eyes, so one night she lit a lamp whilst Cupid was asleep beside her, but carelessly she let some hot oil fall on his shoulder as she strained to see his face, and Cupid suddenly awoke; thereupon he leapt up and raced away pursued by Psyche, who ultimately fell captive to Venus who made her a slave and subjected her to the indignities of many menial and degrading tasks. But in the end Venus relented and agreed to a marriage between Cupid and Psyche. But Psyche, of course, was a mere mortal. So she was given to drink from the cup of ambrosia which induced in her the immortality of the gods, and Cupid and Psyche lived in happy immortality. We, of course, have no ambrosia, but we do have tranquillizers! By whatever means we find best, let us aim at a psyche and a soma living together in happy and immortal unity.

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2. Huxley, J. *in* Wolstenholme, G. ed. (1963): *Man and His Future*, p. 3. (Ciba Foundation Volume). London: Churchill.