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## SOME PSYCHOSOMATIC ASPECTS OF GENERAL ANESTHESIA \*

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In almost every branch of the healing art, Europe has long been the mentor of America. In anesthesia the situation has been reversed. America has taught Europe the alphabet of anesthesia (1). This holds true for all aspects of the subject except perhaps in the field of "psycho-anesthesia" and the emotional constellation surrounding "chemo-anesthesia."

Most textbooks on anesthesia devote some space to the history of the subject and place "psycho-anesthesia" in its true frame of reference. They relate the experiences of Mesmer (2, 3), Elliotson (4, 5), Braid (6, 7, 8), Esdaille (9), Volgyesi (10, 11) and others in the use of the hypnotic state for surgical anesthesia. In reviewing the sixty-two textbooks on anesthesia available in the English language, however, the greatest percentage of which have been written in the past decade, I find no mention made of the psychosomatic aspects of this procedure. There are three possible exceptions if the term "psychosomatic" is applied somewhat loosely. One is found in Hewer's book on anesthesia in which he devotes two pages to the psychologic instruction of the student anesthetist (12). Raper's "Man Against Pain" deals at some length with the dreams experienced under anesthesia (13). The third exception is Hornabrook's discussion on the advisability of suggestion during induction for muscular relaxation (14).

Several articles on this subject have appeared in the *British Journal of Anesthesia* (15, 16, 17) but these have been more of an effort to remind the anesthetist that he is dealing with human beings and that while their fears, apprehensions, complaints and behaviour are like

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"old wornout gramophone records" to the anesthetists, nevertheless, anesthesia to the average patient is a new and frightening experience. On this continent, Bourne was one of the earliest authors to mention the patient's emotional needs (18, 19, 20). In his Diploma Course at McGill University, several lectures are devoted to psychologic principles and are given by psychiatrists.

I must confess to having had a pitifully small experience in the practical administration of anesthetics to patients for the purpose of surgical anesthesia. I have had more experience, however, in the investigation of the pharmacology, the physiology and the psychology of anesthesia during the past twenty years. The practice of psychosomatic medicine has given me the opportunity to study patients under great emotional strain (21). This background has given me the chance to see the problems of anesthesia stereoscopically: the chemical, physiologic and organic view on the one hand and the psychodynamics involved on the other. While this stereoscopic view of the problem may not be in focus completely, nevertheless it has given me a greater depth of understanding.

In re-evaluating some of our earlier investigations in anesthesia, I am embarrassed now at some of the conclusions arrived at then. Let us take but one simple example which may be of some interest for purposes of illustrating the need of taking into consideration the psychologic aspects of anesthesia. Fifteen years ago Dr. Wesley Bourne and I attempted to evaluate the problem of anoxaemia in nitrous oxide-oxygen anesthesia in man (22, 23). Up to that time it was proved quite satisfactorily that in laboratory animals surgical anesthesia cannot be produced without a marked reduction in the oxygen content of the arterial blood, but no similar work had been done on human beings. It was quite conceivable that since the nervous system in animals is less sensitive to anesthetics than is that of man, human beings might be better subjects for nitrous oxide anesthesia than laboratory animals. We undertook, therefore, to find out whether anesthesia for minor surgical operations in man could be obtained with an 80 to 20 mixture of nitrous oxide and oxygen and, were this possible, to discover whether cyanosis is an essential factor in its production.

Taking accepted standards for the degree of surgical anesthesia, the criteria of cyanosis and anoxia and making certain that the patient actually received the specified amounts of nitrous oxide and oxygen, we took samples of the arterial blood of patients undergoing dental extractions and minor surgical procedures. This blood was examined very carefully for its nitrous oxide as well as its oxygen content. In the interpretation of the results we took into consideration factors apart from the administration of the anesthetic which in themselves may produce a lowering of the arterial oxygen content. Any mechanical obstruction of the respiratory passages such as saliva and blood in the mouth and throat tends to reduce the oxygen supply. As is well

known, this is a very important factor in dental operations since these procedures cause a certain degree of respiratory obstruction. The rapid shallow breathing incidental to anesthesia is in itself conducive to the production of anoxaemia and may result in reducing the arterial oxygen to as low as 91.7 per cent saturation. When the respiratory volume is low or the circulation is sluggish or when both these factors are present together, the oxygen content tends to be lower. In the recumbent position, the respiratory function is not as efficient as in the upright and, further, any interference with the movements of the diaphragm operates in the same direction.

From the blood studies made under rigidly controlled conditions and taking all the factors mentioned into consideration, we came to the conclusion that in man, nitrous oxide anesthesia is not necessarily accompanied by cyanosis. In less susceptible subjects, however, and in some instances probably because of obstruction and abnormalities of respiration, some degree of cyanosis is inevitable (22, 23).

This work was quite objective and took all possible factors into account—except the psychologic. In subsequent years I have had occasion to study and to demonstrate that under identical conditions but with the application of psychologic technics, one could often reduce the anoxaemia almost to a vanishing point or conversely increase the anoxia markedly by using the wrong psychologic approach (24, 25). As a control for these experiments, the same trained anesthetists administered the same anesthetic by the same technic to different patients or to the same patients on different occasions. The resulting presence or absence of cyanosis depended almost always upon the psychologic preparation of the patient. Using the wrong technic, the patient was purposely upset. He was unjustly reprimanded for his supposed tardiness in keeping his appointment or it was inferred that his appointment was for another day. He was kept waiting unnecessarily and then rushed into the operating room. There was considerable turmoil going on in the outer office. The surgeon was curt and demanding. Instruments were exposed to view and rattled carelessly. While all this may appear rather crude, nevertheless there are some patients whose experience in these matters makes them feel that it is just what is to be expected.

The anesthesia was started abruptly and instead of silence, surgeon, nurse and anesthetist kept on talking in loud voices in complete disregard of our knowledge that the sense of hearing is the last to disappear under anesthesia. As expected, the induction and maintenance of anesthesia was more difficult and accompanied by marked cyanosis. From a psychologic point of view, recovery from the anesthetic left much to be desired.

Where the proper psychologic technics were used, the patient was well prepared for the operation. It was realized that the "induction period" does not start with the administration of the anesthetic but

begins at the time the decision is made that an operation is necessary. Preliminary contact with the anesthetist was made. A careful explanation of the whole anesthetic procedure was outlined. The patient was made to feel that someone "cared" for the way he felt and that his sensibilities would be taken into consideration. He was assured that the surgeon would not start operating before the patient was completely anesthetized. Suggestions were given for muscular relaxation and for sleep as the anesthesia began in much the same way as patients were put to sleep under hypnosis without the additional help of an anesthetic agent. In this way fear, resulting in increased heart rate, respiratory rate, basal rate, blood pressure and secretion of epinephrine, was diminished and a smoother induction, maintenance and recovery were observed, as expected. I believe that had we paid as much attention to the psychologic needs of the patients we reported on fifteen years ago as we did to the methods of collecting blood and to the technic of examination of the specimens, the conclusions arrived at would have been somewhat different and much nearer the truth. Even now I occasionally see reports in the literature based on these somewhat incorrect conclusions (26).

We cannot safely or scientifically convert the findings of experimental work on animals to human beings without taking into consideration the effects of apprehension, anxiety, fear and the memory of previous loss of consciousness. It is important to remember the presence of fear of anesthesia; it may be the fear of losing consciousness, of mutilation, of attack under anesthesia, of death, of the unknown, fear that the surgeon may start operating before the patient is really "under," or of the abnormal sensory and emotional changes which accompany anesthesia. All these fears may result in marked changes in the normal physiology of the patient or accentuate any pathologic condition present. These may be reflected in the increased output of epinephrine with resulting increase in susceptibility to ventricular fibrillation. When Sir James Simpson was to administer chloroform to a patient for the first time, the patient died. He did not die from the anesthetic because none had been administered: he died of fright. Fear may also reflect itself in an increased basal metabolic rate (27). In this eventuality the quantity and concentration of the anesthetic needed to produce adequate surgical anesthesia are increased. As is well known, fear elevates the blood pressure, increases the heart rate and may produce irregularities of rhythm and decreases coronary flow. Fear and emotional tension also affect capillary permeability, urinary output, rate and depth of respiration and the carbon dioxide content of the blood.

The degree of response to this fear both psychologically and physiologically depends upon a set of adaptive patterns characteristic of the individual. Since more than half of the patients seen by physicians and anesthetists are neurotic, more often than not the patient's re-

sponse to the fear of operation and anesthesia will be a neurotic one, that is, inadequate to the needs of the situation. The anesthetist's reassurance, while helpful in quieting the patient's fears, is usually too superficial and perhaps too offhand or too hurried to be of maximum help.

Up to this point in this discussion I have mentioned only those psychologic mechanisms which would be acceptable to any nonpsychiatric medical group. For the purpose of this presentation, however, a more profound understanding of the patient's psychologic needs is required. It is at this point that the psychosomatic aspects of general anesthesia meet with considerable resistance. A discussion of the psychodynamics involved tends to place the average anesthetist on the defensive. This defensiveness serves the purpose of warding off emotional insecurity which results from an "attack" on their orthodox training. Since, however, this Society has chosen to call itself a Society for the **ADVANCEMENT** of General Anesthesia in Dentistry, I take courage in opening up the next phase of this paper. I will start with a very brief discussion as to what is meant by "resistance" and attempt to give some insight as to why certain well-trained men are unable to accept factual evidence which to them appears to be emotionally charged, while others accept these very same facts as definite.

The study of resistance in our patients and ourselves covers fairly well all the more recent concepts of psychiatry (28). It can be said that most of the training and investigation revolves about its understanding and appreciation. Acceptance or rejection of the presence within us of motivating forces not known to us and at variance with what we seem to think about ourselves probably determines the success or failure of our efforts to understand recent concepts in psychology. There is much motivation in us to reject such thoughts and usually in a most arbitrary manner. The sum total of these forces and motives which militate against our acceptance of these elements of our personality may be called resistance (29).

It is inferred that the causation of much of our behaviour and feelings is unknown to us and that our motivations are at times obscure and hidden or, to use an everyday term, "rationalized" beneath a veneer of culturally accepted mores. It is further inferred that anything which disturbs the adjustments we have made and the balance we have arrived at, whether it is in our own personal lives, politics, medicine, dentistry or anesthesia, this disturbance appears to us a threat which must be avoided else the deliberately arrived at balance is upset. When this balance is upset, anxiety results. In a manner of speaking, the handling of anxiety, the avoidance of situations which produce it or having to tolerate it when a greater future benefit will derive, is the basis of all our actions (29). Who amongst us had not observed some of our colleagues upset at some new concept in their field of practice when it meant that if they accepted the concept they would have to un-

learn a great deal and learn still more? In order to avoid the anxiety which results from the insecurity engendered by this new concept, the physician may ridicule, reject or minimize it in an effort to make himself feel more secure and comfortable. In other words, he may reject a concept which is obviously true and which many others have accepted just to keep himself from becoming insecure and anxious. It may be for these reasons that most anesthetists have paid so little attention in the past to the effects of the emotions upon the induction and maintenance of anesthesia. The study of the organization and development of the normal personality and the physical and mental symptoms resulting from its malformation or maldevelopment might upset their sense of security, a security obtained after many years of practicing anesthesia without benefit of psychologic principles. Most anesthetists are satisfied with the status quo with regard to the emotions of the patient but they must have realized that few patients respond to anesthetics in the same way or the same patients to the same anesthetic under different emotional conditions.

Most of us seem to have forgotten that medicine and its various subdivisions or specialities is not a true science in the sense in which mathematics and physics are sciences. Science is not a collection of facts but the organization and generalization of those facts and the formulation and understanding of the general laws which govern them. President Conant of Harvard University emphasizes the fact that the great advances in science have come, not from the collection of new data, but from the development of new concepts. We have always been aware in a superficial way that the emotions and personality make-up of a patient may affect the physiology and pathology in that person and later may even effect antaomic changes. In the same way, we have known also that various therapeutic measures, be they surgical, chemical or psychical, may produce varying results in different patients or in the same patients at different times depending on their physical and emotional state at the time of treatment.

In order to study the relationship between the psyche and the soma more scientifically and more extensively, the American Society for Research and Psychosomatic Problems was formed in 1942 (30) with the *Journal of Psychosomatic Medicine* as its official organ (31). The formation of this Society accelerated both clinical and experimental research in this field and while it is still extending its scope, it has not yet embraced the field of anesthesiology. The psychosomatic approach is an attempt to integrate psychopathology with heretofore isolationist biology and physiology. The psychosomatic approach refers only to a point of view; a psychologic orientation to all disease from an aetiology as well as a therapeutic point of view. In this concept, it is a guiding principle of medicine which should apply to all illnesses and to all therapeutic procedures and should represent the view of the surgeon, the internist, the anesthetist, as well as that of the psychiatrist.

From this point of view, the psychosomatic approach is a punitive one intended to reorientate medical thought from localistic thinking. If in years to come, this orientation is accomplished, no doubt the term itself will be dropped as physicians learn to use this approach naturally.

But even with the present-day knowledge of psychosomatic medicine there is still far too wide a gap between the use of the word psychosomatic (and sometimes its glib use) and the deep understanding of what it really means and its therapeutic implications. What has been gained, however, is the acceptance of the psychosomatic approach by the medical profession (32, 33), although there are still many who are not even receptive to the ideas underlying this concept as explained under the heading of resistance. I believe it is very difficult, if at all possible, to teach the psychosomatic approach to those whose orthodox training and orientation have become fixed. To them, physicians who seem to have gained some insight into psychologic phenomena are either disregarded on the whole or relegated to the group of more or less "queer doctors" who have wandered off into metaphysics and philosophy. Because of the psychodynamics involved in this orientation, the psychosomatic approach appeals more to the youth of our profession.

Leake (34), in discussing the theories of anesthesia, found that after one hundred years of practical success in the control of pain in surgical procedures, we still do not know what anesthesia is. He stated prophetically that "it may be possible indeed not only to afford pain relief through anesthesia, but even to develop such principles as effectively may prevent pain. While these principles may be chiefly concerned with human relationships, they need not be beyond the scope of medical endeavour, since the prime purpose of medical men is to alleviate and to prevent pain." This statement was published in 1942 with the expressed hope that at the bicentennial celebration of surgical anesthesia a hundred years hence, a more satisfactory explanation of surgical anesthesia in relation to the emotional life of the patient would be found. I hope to show in this presentation some trends which I believe have considerable significance in this direction.

I am not inclined to agree with those (15) who state that the personality of the anesthetist is nontoxic and it does not throw any strain on the patient's heart, liver or kidneys nor does it depress respiration and who state that it is more than can be said for many types of premedication. I am more inclined to agree with Raper (13) in that "the proficiency of an anesthetist, whether he be physician, dentist, nurse or special technician, depends as much on aptitudes and capacity as on schooling and experience; and, as in other spheres of human endeavour, certificates of qualification and degrees do not afford an entirely reliable means of measuring efficiency." We know that occasionally a wrong technic carried out by a man of suitable personality may do more

good than the right technic used by an individual of unsuitable temperament for the procedure involved.

Psychologically the course and direction of progress in anesthesia has not been altogether accidental. Early in its development, men had taken it up as a speciality often because they consciously or unconsciously did not want to be bothered with the patient-physician relationship. Some entered the specialty because they could not tolerate the resistances and antagonism of patients and preferred a specialty which allowed them to get rid of some of their own hostility (repressed) by "slapping" on a face mask and putting their patients to sleep and consequently into a more submissive role. Some became anesthetists because they thought that since even a nurse or intern could administer an anesthetic it should be one of the easiest of specialties to master. The dramatic results of anesthesia appealed to others, while still others specialized in it because they found themselves to be too passive for ordinary practice and preferred to work under the direction of the more aggressive surgeon. Some became anesthetists because they obtained some conscious or unconscious gratification by working in an operating room with all the so-called glamour associated with it in the lay person's mind. That they did not become surgeons instead of anesthetists might be due in part to the lack of aggressiveness and displaced sadism in their make-up, qualities seen more often in surgeons. When oral surgeons become anesthetists some adjustments may have to be made in the course of their instruction, as will be mentioned later.

In any event, for many years the anesthetist assumed a secondary role in the surgical team. As more investigations were carried out in the field of anesthesia and as it became a more important and more complex specialty, it drew to it men of greater vision and endowments. It was not too long before this type of anesthetist realized that while he sat "at the head of the table" in the operating room, this relative position did not give him the respect or the benefits accorded the man usually considered as sitting at the head of the table. This paradoxical situation had other psychologic results. Some anesthetists whose personality integration made them susceptible to it began to use members of the surgical team as mother and father figures, sometimes with surprising results.

An anesthetist patient of mine consulted me for gastrointestinal symptoms accompanied by fatigue, insomnia, irritability and mental depression. When he was a small boy his father was strict and belittling in front of strangers. Whenever the patient met with his father's displeasure he would have nausea, diarrhea, apprehension and generalized tension. His mother, a passive, kind and giving individual, would console him and comfort him on these occasions. The precipitating causes of his present illness were the arrogance and demands of the surgeon for whom he gave most of the anesthetics. He had worked with the surgeon for one and a half years without encoun-



tering too much trouble, but when the kind, understanding and friendly head surgical nurse was transferred to another hospital he was unable to cope alone with the surgeon whom he had identified with his father. The withdrawal of the protective nurse as a mother figure upset the psychologic balance in that constellation and he broke down. When the psychodynamics of the problem were explained to him he found work with a less aggressive surgeon and developed a more realistic attitude to the needs of the situation, with resulting freedom from symptoms.

With the rapid extension of the frontiers in the science of anesthesia, some anesthetists became dissatisfied with their secondary role in the surgical team and did something about it. They refused to remain on the outskirts of medicine. They broadened the field of anesthesia to incorporate a more thorough knowledge of the anatomy and physiology of respiration. They included oxygen therapy for various medical and surgical conditions as part of their work and later on absorbed the block injection technic for control of pain regardless of its medical or surgical origin. With this marked broadening of their scope of work, it was not surprising that they gave this field of endeavour a new name—*anesthesiology*.

With this new term signifying a new and much broader view of the whole subject of anesthesia, it was not unexpected to find that in the last few years those responsible for outlining the course for specialist training have included lectures on the psychologic aspects of the subject. It is well recognized that no one can diagnose a psychosomatic illness or treat it adequately without taking into consideration the psychologic components. This holds true to no lesser degree in the administration of anesthetics. Of course, medicine and anesthesia have been practiced by many without benefit of any psychologic consideration whatever, just as, in emergencies, limbs have been removed without anesthesia or before anesthesia was discovered. One may grant, however, that these methods left much to be desired. A dentist or a physician or an anesthetist will never reach the optimal results in his own field regardless of his diagnostic acumen or his manual dexterity and skill if he does not take into consideration the patient's emotional needs. The ability to understand and handle a patient's emotional needs extends the scope and usefulness of the doctor. A few examples may illustrate this point.

It is well known that in the presence of fear or anxiety the parotid glands do not secrete adequately. The individual then complains of dryness in the mouth, a thick tongue and a bad taste. There are considerable numbers of people who are under constant but minimal anxiety and tension. The relationship between the decreased salivary secretion and the unnoticed nervous tension is not correctly interpreted by the diagnostician unless he is trained and aware of the possibilities inherent in this relationship. It would seem to be reason-

able to suppose that alteration in salivary secretion over a period of years could alter dental physiology. To arrest this type of dental decay psychiatric intervention might do more than many procedures now used.

As another example of a dental problem in which emotional factors play a part is the patient one encounters occasionally who never feels that his dentures fit properly or comfortably. He goes from dentist to dentist in a vain attempt to get a better "fit," collecting on the way many spare dentures. On psychiatric investigation some of these patients turn out to be "oral characters" whose oral needs have never really been satisfied in childhood and who, as adults, use the oral cavity for vicarious gratification when under strain. The "fit" they are seeking may lie in another direction altogether and then dentures represent a displacement of their wishes. While the psychodynamics involved in such cases are very complex indeed, they are mentioned as examples only because this type of patient is often met.

Lastly there is the patient who wishes to reconstruct the incisors either to fill gaps between them or to improve the colour of the enamel or the alignment. While many patients are satisfied with the results obtained there are always some who, although in the eyes of an impartial observer have achieved an excellent result, nevertheless are dissatisfied and complain constantly and bitterly at what they consider a poor result. Psychiatrically, these patients may be found to have attempted to please a loved one or to impress someone, hoping that the dental improvement would do the trick. They become bitterly disappointed when it does not work and tend to blame the dentist instead of realizing that perhaps it was their personality which needed to be straightened out instead of their teeth. Such patients usually have a great need to be wanted, needed and loved.

If these three simple examples of neurotic behavior can be accepted, we may then go on to some emotional relationships involved in general anesthesia. It is well recognized from general observation, if not from personal experience, that there is fear of the unknown in many people. Children who have been brought up by being pushed into new situations without adequate support, explanation or "briefing," learn to meet these difficult situations with fear and apprehension. Later in life when they become more mature and more integrated they may be able to hide their fear even from themselves by suppression, providing the situation to be met is not too frightening. If, however, dental procedures happen to be one of their fears, they may displace this fear onto the anesthesia. Since anesthesia itself may cause fear, the cumulative response of the two may be completely out of proportion to the needs of the situation. In the presence of this type of panic the anesthetist must exercise special caution. Many anesthetists tend to become too aggressive in this frustrating situation. Instead, there is a need for the repression of the anesthetist's own anxiety and hostility

if a smooth induction is to be effected. In this type of case as in many others, the use of more psychology will result in the use of less of the anesthetic agent, a smoother and quicker recovery with less psychic trauma.

Each person handles anxiety in a different way (35). When anxiety is expressed directly, he experiences it with all the physiologic and somatic discomfort implied in a sense of impending disaster. It may be expressed through the cardiovascular apparatus in terms of palpitation, irregularities of rhythm, precordial discomfort, dyspnea and a sense of choking. Not all individuals, however, handle anxiety directly. They may "blot" out the anxiety experience from conscious recognition and develop a substitute for it such as hysterical manifestations, a not too uncommon experience in the practice of dentists and anesthetists. They may mediate this anxiety directly through organs and somatic functions. In these cases the anxiety is transmitted through the autonomic nervous system and is translated into functional disturbance of various organs or parts. Anxiety may be focused on some past experience, such, for example, as fear of suffocation experienced as a child while swimming or by some manipulation of the upper respiratory passages during some form of treatment. Then again, anxiety may be thinly disguised and lead to obsessive thinking or compulsive activity or it may be disowned and projected into others such as the dentist or the anesthetist in terms of suspicion or distrust. When the anxiety is expressed indirectly, the anxiety itself is not recognized as such. This type of patient may say: "Doctor, I'm not afraid, go ahead and do what you want to do." Instead of anxiety he may develop vasomotor changes and possibly syncope. Or he may use the gastro-intestinal tract for expression of his anxiety in the form of vomiting or diarrhea. In any event he himself and perhaps the anesthetist, too, may be surprised at the turn of events. This occurs because of the displacement of anxiety, which had not been fully recognized and appreciated, to other organs and systems. It is of importance to note here that not only anxiety but also unrecognized fear, anger and resentment may produce these responses.

A satisfactory anesthesia results in a certain amount of satisfaction for the anesthetist. Any untoward manifestations, however, may result in frustration instead. As we all know, frustration results in aggressive behavior (36). The aggression may be shown directly as illustrated by the following expressions: "Now don't act foolish" or "I'm not going to hurt you, just inhale normally" or "Don't be silly, act your age" or "This patient is obstinate, what else can you expect from her?" The aggression may be displaced as, for example, by bawling out the assistant, throwing instruments down on the table, slamming the door, pushing the footstool or squeezing the rebreathing bag more forcibly than necessary. This type of aggression occurs when a more direct expression is unacceptable for one reason or another.

Fortunately or unfortunately, since the patient himself is also a human being and as such responds to frustration by acts of aggression in the same way, all efforts should be used to minimize his frustration, else more of the anesthetic will have to be used. The anesthesiologist should learn to appreciate this type of behaviour both in the patient and in himself. He would realize then that when he himself is frustrated at home, or caught in a snarled traffic jam or involved in professional difficulties, the resulting frustration might lead to a more vigorous, or shall I say a more aggressive, anesthesia with perhaps less satisfactory results. Similarly the patient's emotional status in this regard might be evaluated and measures taken to overcome them by means less drastic than by pushing more of the anesthetic agent down the respiratory tract or into the blood stream. It might be well every once in a while to remember that at one time or another the anesthesiologist may himself be operated on and have to have an anesthetic. Just how would he like to be handled? Too often medical procedures become too routine and tend to jeopardize the patient's welfare.

Some physicians are naturally aggressive and this aggressiveness may suit the needs of some patients who, because of childhood experiences, require a stern strong decisive father figure. Others may be passive, quiet, gentle and sympathetic and they in turn may suit the needs of quite a different emotionally orientated patient. Thus the patient's emotional needs are suited more by a hit or miss stroke of chance than by a well considered evaluation of the individual patient's needs. Too often are we inclined to allow ourselves the luxury of having the patient fit himself to our emotional needs rather than to attempt, objectively, to conform and satisfy the patient's own needs. Sympathy, while being an acceptable and comforting expression, is to be less desired than empathy. Empathy is the objective realization of the patient's needs without becoming emotionally involved in the situation.

The dentist's interest in anesthesia is a very natural one indeed. Relief from pain is not more urgent in any field of medicine or surgery than it is in dentistry. While some dentists find general anesthesia indicated only occasionally in their practice, there are those specialists in oral surgery who find that general anesthesia is a constant need. The propinquity between these two needs has made these surgeons have more than a passing interest in the subject of anesthesiology. It should be emphasized that the qualities which make for a fine oral surgeon do not necessarily apply to the qualities required for an excellent anesthesiologist. It is for this reason that it is necessary in some instances to make some adjustments. It is not unheard of for an oral surgeon to become more famous and more proficient as an anesthesiologist than as oral surgeon. Theoretically at least, if not always practically, the secondary training in anesthesia which an oral surgeon is subjected to can be as adequate as his "first love"—dentistry. One of the pit-

falls in the training of oral surgeons in anesthesia, from the point of view of this presentation, is that he is likely to treat this field in somewhat the same way as his manipulative work in dentistry—he learns a technic. Consequently, he must be made aware of the fact that the basic psychologic needs of the patient are vastly different when undergoing anesthesia from those when undergoing ordinary manipulative work in the mouth.

If more need be said to demonstrate the fact that a correct psychologic approach to the induction of anesthesia can reduce the quantity of the anesthetic agent and reduce subsequent physical and mental sequelae, one needs only to remind oneself of the methods used for anesthesia before anesthetics were discovered. For years prior to the development of anesthesia, major and minor operations were performed under mental anesthesia alone. The original protocols and publications are still available. Occasionally even now one hears of all types of operations being carried out under hypnosis. While some of them have been done that way for acceptable indications, many, however, are done only to feed the hypnotist's desire for the dramatic or for publicity, since better anesthetics than hypnosis are available for the average case. Nevertheless, in spite of the availability of excellent anesthetic agents of all kinds, one should not forget that when one masters the psychologic principles involved in hypnosis, he can combine it with the use of suitable anesthetics for considerably better results than can be obtained by either method alone. "Psycho-anesthesia" and "chemo-anesthesia" have more than a superficial nodding acquaintance with one another. They may be more deeply related than we suspect. With our present-day knowledge of physiology, pharmacology and psychobiology, we know that the exhibition of sedatives increases the suggestibility of the patient. This increased suggestibility can be used to augment surgical anesthesia without increasing the amount of the anesthetic agent.

Viewing the subject of anesthesia from a psychiatric perspective, one is impressed with a concept connecting the two which I have not heard discussed. Anesthetists have been active in seeking and remarkably successful in finding better and more efficient anesthetic agents for the relief of pain. Psychiatrists in their own field have been searching for shorter and more efficient methods for uncovering the psychodynamics of the neuroses and psychoses and for shorter and better treatment for these conditions. In the past decade they have found that certain analgesics and anesthetics (intravenous sodium amytal and sodium pentothal) were most helpful in the evaluation and treatment of certain types of neuroses (37, 38, 39, 40). The most prominent effects of these drugs have been shown to be exerted on the central nervous system. They are manifested chiefly by a change in the mental state of the patient characterized by drowsiness, euphoria, detachment, and willingness to discuss intimately personal matters (49). "What-

ever salutary effects may follow the administration of sodium amytal in painful conditions, they do not stem from the blocking of pain perception. They must occur either because of alterations in the reaction of the patient to the painful experience or from interruption of the mechanism responsible for the obnoxious stimulus" (50). Thus, sodium amytal and sodium pentothal have been used for two totally different purposes: for anesthesia by anesthetists and for narcoanalysis and narcoanalysis by psychiatrists. While narcoanalysis had its greatest impetus during World War II (41, 42, 43, 44, 45, 46, 47, 48), actually this method of treating the neuroses was known for a long time by those who resorted to hypnotherapy (51, 52, 53, 54, 55). The change in nomenclature and the stress placed on the effect of the barbiturates instead of the emotional elements involved allowed orthodox medicine, which had been committed to a denial of the efficacy of psychic healing, to welcome narcoanalysis with acclamation. There may be some merit in having anesthetists attend several interviews with patients under amytal carried out by psychiatrists. This would give them an opportunity to witness some of the effects of the drug, effects and reactions they are usually unfamiliar with.

The effect of alcohol and the barbiturates upon the inhibited nervous system is different from that of nitrous oxide. Working with conditioned reflexes in animals (1937) (56, 57, 58), we were able to demonstrate that alcohol, amytal, nembutal, avertin and paraldehyde were effective in weakening the processes of inhibition. This "disinhibition" or removal of inhibition is made use of by psychiatrists for the treatment of the neuroses and some of the psychoses. Nitrous oxide had somewhat the opposite effect. We observed that the use of bulbocapnine, carbon dioxide, ethylene and nitrous oxide had a uniformly depressant action on the animal's experimentally induced inhibitions. The true significance of these findings, while not yet clear, may account for the "slap-happy" attitude observed in some patients during the anoxic period of nitrous oxide anesthesia. Nitrous oxide produces a change in the patient's emotional state and in his rapport with the physician. This pharmacologic action differs from that of nitrogen inhalation which leaves the patient emotionally unchanged (59). Nitrous oxide has been used for the treatment of psychiatric disturbances such as schizophrenia (60, 61) and manic depressive psychoses both for the manic and depressive phases (62). Nitrous oxide anesthesia, by lowering the oxygen content of the blood and by its pharmacologic action on the emotional center, facilitates mental function and makes the patient more accessible for psychotherapy and insight. The insight gained is not the result of disinhibition as with alcohol and the barbiturates but rather through reintegration of the conscious mental functions (62). Further studies of the significance of these differences in mode of therapeutic action are contemplated.

The aim of the anesthetist in the use of these anesthetics is the

opposite to that of the psychiatrist. The psychiatrist uses macroanalysis to produce three principal effects: (1) lowering of inhibition which results in increased expression of suppressed and repressed ideational content; (2) externalization of repressed effects ("abreaction"), and (3) establishment of better rapport with the psychiatrist. The anesthetist, on the other hand, is interested only in producing surgical anesthesia and in suppressing painful memory of the surgical procedure and the anesthesia. While the psychiatrist has no interest in the surgical anesthesia produced by these anesthetics, the anesthetist should have some interest in the emotional climate induced in the patient during and following anesthesia. Our concept of the reversibility of anesthesia holds true more in the physical field than it does in the emotional sphere.

It is not uncommon in the field of medicine to find that some drugs or some procedures have more than one use. Thus, arsenic may be used to treat anaemia but it may be used also to treat syphilis. X-rays may be used not only for diagnostic purposes but also for therapeutic procedures as in the treatment of malignant growth. Judging from the contents of the textbooks on anesthesia and from the literature on anesthesia in general, the various uses of anesthetic and analgesic agents have not been clarified. Their use for surgical and psychiatric purposes has not been evaluated fully. In contrast with the examples mentioned in the case of arsenic and x-rays, the use of the analgesics and anesthetics for two vastly separated procedures has a very important common bond, namely their effect on the emotional centers. It would seem necessary to remind ourselves that not enough attention has been paid to the pharmacologic and psychologic actions of the various anesthetics and related substances upon the emotional centers. It may be for these reasons that most anesthetists are not sufficiently aware of the emotional implications of surgical anesthesia. This hiatus in the training and research in anesthesia calls for corrective measures if we are to attain a really "balanced anesthesia." Balance in anesthesia not only calls for various anesthetic agents to complement and implement each other but it also calls for a better balance between the "chemo-anesthesia" and "psycho-anesthesia."

The altered emotional state of the patient recovering from anesthesia is utilized by the psychiatrist for investigation and treatment. For the anesthetist, the recovery phase is the period during which he can relax or prepare for the next patient. I believe that too little attention is paid to this phase by the anesthetist. While he is not expected to use the recovery period for psychotherapeutic measures, he should at least try to prevent emotional trauma which results from the talking, movements, confusions and noises that usually take place before recovery is complete.

Although we have a great deal of data in the fields of anesthesia and psychology, a real advance in anesthesia may be made by developing

new concepts which would tend to integrate these two fields of knowledge. Such an advance would do much to reduce the dichotomy which now exists in the use of anesthetic and analgesic agents. The viewpoints expressed in this paper should not be accepted or rejected too hastily. A scientific attitude here is essential; a calm, impersonal, dispassionate view of the natural laws concerned. As mentioned at the outset, great advances in science have come not from the collection of new data but from the re-examination and re-evaluation of older knowledge in the development of new concepts. Anesthesiology has yet to bridge these two fields of knowledge: the production of anesthesia through hypnosis and the anesthesia resulting from anesthetic agents.

#### SUMMARY

While remarkable advances have been made in the field of surgical anesthesia, comparatively little attention or research has been devoted to its psychosomatic aspects. Examples of this are given.

Resistance to psychologic interpretations by nonpsychiatrically orientated physicians is explained.

A psychologic interpretation of the course and development of the science and practice of anesthesiology is described.

Research in psychosomatic medicine is helping the anesthetist obtain a better perspective of his specialty. Given some psychologic insight, he is more apt to view the subject more stereoscopically—with a greater depth of perception.

A concept envisioning a dichotomy in the use of anesthetics is suggested wherein the anesthetist uses only the anesthetic fraction of the agent while psychiatrists use the disinhibiting fraction of the same agents for diagnosis and treatment of the neuroses and psychoses.

In view of the above, a more integrated use of anesthetic agents is suggested.

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These were announced formerly to be held at the Palmer House in Chicago from October 8-11, 1950. The Secretary-Treasurer now calls attention to a change in location from the Palmer House to the Edgewater Beach Hotel, 5300 Block-Sheridan Road, Chicago, Illinois. The dates for the examinations remain unchanged.