An organic process can develop in a patient with a psychogenic process, and this case record is a testament to that dictum.

The record of Case II illustrates a very unfortunate complicating factor in myasthenia gravis—that is, the development of a psychosis with an extreme degree of psychomotor activity. The latter without a doubt contributed in no small measure to the fatal outcome.

I am greatly indebted to Professor D. K. Henderson for his permission to publish these cases from his services at Jordanburn Nerve Hospital and West House, of the Royal Edinburgh Hospital for Mental Diseases.

RECENT WORK ON THE QUALITY OF HEAT RAYS

BY

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Effects depending on the quality of heat rays when these affect the skin are of considerable interest. It is known that warming an area of skin reflexly produces vasodilatation in the mucous membrane and consequent narrowing of the nasal airway. Cooling the skin has the reverse effect (L. Hill, 1919; Grant, Mudd, and Goldman, 1920). In a series of publications since 1932 (Hill, 1932, 1933a, 1933b, 1934, 1935a, 1936a, 1936b) I have described also the reverse reflex effect—namely, vasoconstriction, and widening of the airways, both nasal and pulmonary—(Hill, 1936c) produced by short infra-red rays. While Dufton and Bedford (1933) and Winslow, Greenburg, and Herrington (1934) failed to obtain this effect, Thomson (1934) and van Dishoeck (1935) confirmed it.

The Nose-widening Effect of Short Infra-red Rays

The failure of critics to obtain the short infra-red ray effect was due to their employment of a method that was not sufficiently sensitive. They did not realize that the normal airway of the resting subject is very much larger than that required for quiet breathing (Hill, 1935b). I invented a simple apparatus for measuring the airway of either side of the nose (Hill, 1936d), and found that while normally the narrowest part is about 30 sq. mm. in area, 14 sq. mm. and even less sufficed for normal quiet breathing. Van Dishoeck and I also pointed out that while the narrowing effect of dark heat on the nasal airway, and widening effect of cold, are found in almost all subjects, the nose-widening effect of short infra-red rays can be shown in many, but not in all, subjects. Dishoeck chose his subjects from those readily sensitive to the action of adrenaline and histamine. I pointed out that antagonistic effects of cooling influences, such as cold feet or a draught, must be kept in mind. The reflex effects vary in different individuals and for the same individual from day to day, for the infra-red rays exert a nose-widening effect only so long as the surface of the skin is cool, not when heated by strong irradiation and high external temperature or by muscular exercise.

G. Lehmann (1939) has recently confirmed the "L. Hill nose reflex," and carried on this discovery by showing that the reflex applies not only to the airways but to parts of the skin other than that irradiated. As sources of infra-red rays he used (1) an iron plate electrically heated to about 300° C. (dark heat), and maintained at that temperature by a thermostat; (2) a small naked arc lamp. For observing the reflex effects on the skin he used a

plethysmograph fitted to a finger, with an outer case which was kept at a constant temperature of 25° C. He also used the external auditory canal as a plethysmograph. The size of the nasal airway he recorded by an accurate method, and one which had the least disturbing effect on the normal conditions. The subjects were kept at rest in a cool room, and the effect of cold feet and draught avoided. To eliminate any psychological effect experiments were carried out, as I had done, on subjects who did not know what reaction was expected, and the dosage of heat from the iron plate and from the arc was so adjusted that the subject did not know, when blindfold, which source was being used.

Effect of Infra-red Rays on the Skin

Lehmann not only confirmed the nose-widening effect of the short infra-red rays, but showed that the vasoconstrictor effect applied also to the skin, and that high-frequency waves (6 metres "ultra-short" diathermy) gave a like result. These waves, and short infra-red rays, penetrate and warm the deeper skin, while long infra-red rays and long diathermy waves do not penetrate, and warm the surface, whence heat is conducted in (Sonne, 1921). The natural condition of the skin is a fall of temperature from within, where the warm blood flows, to the cool surface, and this temperature fall, acting on nerve endings in the Malpighian layer of the epidermis, reflexly causes vasoconstriction of the skin and of the membrane of the airways, with consequent widening of the latter. When this fall is reversed by warming the surface the opposite results—vasodilatation, with consequent compensating body-cooling effect, and narrowing of the airways. I pointed out that the reflex was of nervous, not humoral, transmission, because it occurred in three to five seconds. Lehmann confirmed this conclusion. On stopping the circulation in a hand which was irradiated with long infra-red rays (this was effected by means of a sphygmomanometer cuff) he found the vasodilatation and nose-narrowing effects were prevented, to return on renewal of the circulation. This was because after stoppage of the circulation the deeper skin, no longer being cooled by the blood, became as warm as the irradiated surface. Short infra-red rays, when the circulation was stopped, on the other hand, made the deep skin warmer than the surface, and produced their usual reflex effects. If, while the hand was irradiated with long infra-red rays and the circulation through it stopped, the blood in the axilla was cooled by an ice pack, then on letting in this cold blood reflex vasodilatation and nose-narrowing resulted, to cease when the circulation was again stopped. This was so because the cooled blood, on reaching the skin of the hand, intensified the reversal of the natural fall of skin temperature from within out.

Sunlight is rich in short infra-red rays, long infra-red rays being filtered off by the atmosphere, and so long as the surface of the skin is cool these produce vasoconstriction and nose-widening effects. With high outside temperature, little air movement, and strong irradiation the surface of the skin becomes warmer than the blood, and the reflex effect is then reversed. The purpose of the reflex, which is subconscious, is to compensate for local warming of the skin by vasodilatation of other parts of the skin and the airways, and for local cooling by the opposite effects. With fresh ventilation and cool sunlit outdoor conditions the natural fall of temperature in the skin from within out is maintained, with constricted capillaries and wide-open airways. In stuffy conditions which heat the surface, such as are produced by dark heat and ill ventilation indoors, these conditions are reversed.

Hence the importance of bright sources of heat and cool well-ventilated rooms. Where dull red and dark sources of heat are used there should be sufficient ventilation with cool air to prevent stuffiness.

Infra-red Rays in Treatment

In selecting a source of infra-red rays for purposes of treatment it should be kept in mind that there are no rays in the infra-red region which have an effect other than that of heat, that long infra-red rays from dark sources do not penetrate, but warm the surface of the skin, while short infra-red rays and red rays from bright sources penetrate, in part, beyond the blood in the derma. "Ultra-short waves," 6-metre wave-length, provide a source of heat for deep penetration. These waves have no other action than that of heat, but are most effectual in treatment of sinus and other inflammations.

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next three weeks she became much better and was allowed to go home, the diagnosis being still in doubt.

The patient was readmitted on November 13 with a recurrence of the symptoms. She was said to have collapsed twice since discharge, and she now complained of pain in the neck. The physical signs were unchanged, but mentally she had deteriorated further. On November 28 she had a fit lasting three minutes, in which she became unconscious, with twitching of the left arm and incontinence of faeces. This, the first localizing sign, suggested a right frontal tumour. She rapidly became worse, and on December 1 she lost consciousness. Lumbar puncture revealed a normal cerebrospinal fluid pressure, and chiefly on this account surgical intervention was not advised. The patient became cyanosed, the chest was moist, and it was apparent that she would soon die.

At 2 a.m. on December 2 the patient suddenly became more cyanosed and respirations ceased. The maternal and foetal hearts were beating regularly: the former ceased to beat at 2.5 a.m., and it did not recommence. Thereafter the foetal heart was observed almost continuously by myself and by a probationer nurse, its action being regular apart from occasional irregular beats, which were usually accompanied by vigorous foetal movements. At 2.25 a.m. it was heard without difficulty by a qualified nurse and midwife; it ceased to beat at 2.35 a.m.

Post-mortem examination of the mother revealed a tumour of the right frontal lobe extending anteriorly to within one inch of the frontal pole, and posteriorly obliterating the anterior horn of the lateral ventricle, at the same time pushing over the anterior part of the third ventricle to the left. The other parts of the lateral ventricles were dilated. Microscopically the tumour was a glioblastoma multiforme. The uterus, foetus, and placenta and its attachments were all normal.

The question of Caesarean section was not considered, for obvious reasons, but the survival of the foetus for thirty minutes after maternal death—for an even longer interval after the onset of maternal anoxaemia and cyanosis—would suggest that there is ample time for this operation if the existing conditions make it desirable. The foetus apparently absorbs all the oxygen in the placental blood, and this seems sufficient for a considerable interval. Whether or not the more mature foetus would survive a longer time is a matter for consideration.

I am indebted to Dr. H. H. MacWilliam, medical superintendent of Walton Hospital, for permission to publish this account.

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Clinical Memoranda

Survival of Foetus after Maternal Death due to Intracranial Tumour

The following is an account of a case which I consider to be of sufficient interest to place on record.

CASE HISTORY

The patient was a woman aged 30, the mother of one child born in Walton Hospital in May, 1937. She was admitted on October 13, 1938, complaining of headaches and vomiting of one month's duration. The headaches occurred every morning, lasted four or five hours, were worse on lowering the head, and were accompanied by vomiting. She was said to have had a fit during March, 1938, but this had not been repeated. On examination she was found to be twenty to twenty-two weeks pregnant, with a normal central nervous system apart from slight papilloedema of the right optic disk (the left eye having been removed following an injury during childhood) and a certain degree of deterioration of the mental faculties. In addition there was some hypotonia of the muscles, but no other signs suggestive of a cerebellar lesion. The heart and lungs were normal. On this examination and on the history a tentative diagnosis of cerebral tumour was made, though there were no localizing symptoms.

The patient gradually improved mentally, and was later able to describe attacks, which began with a thumping feeling in the head followed by severe headache and associated with peculiar sensations in the left arm, the whole lasting about twenty minutes. Her memory was poor, and she could not give details as to the frequency of these attacks. Within the

Foreign Bodies in Oesophagus, with Streptococcal Septicaemia and Mediastinitis

The multiplicity of bronchoscopists and oesophagoscopists in England, many of whom have been trained by the father of modern endoscopy, Chevalier Jackson, has eliminated the use of castor oil, the coin catcher, and the probang from the out-patient department, for removing bones, coins, and false teeth from the bronchi and oesophagus. Nevertheless, such methods have not been completely forgotten, and so I am reporting seven cases admitted to hospital as "F.B. in the Oesophagus," between November 11, 1938, and January 14, 1939—that is, within a space of two months. One of these cases developed streptococcal septicaemia, and another was admitted moribund with mediastinitis.

CASE HISTORIES

Case 1.—A young man aged 18 was admitted to hospital on December 8 with a temperature of 102.6° F. He looked ill and gave a history of choking while swallowing a rabbit bone.