Mushroom poisoning, or "mycetism," is another occasional cause of hallucinations (Critchley). For years a variety of mushroom called the *Agaricus muscarius* has been taken by the inhabitants of Siberia as an intoxicant. The effects of this "fly-agaric inebriety," as it is called, appear within an hour or two. Twitching or trembling of the limbs is followed by a sense of exhilaration, leading to a condition of delirious excitement. During this stage auditory and visual hallucinations develop, while enlargement of the pupils produces macropsia. The subject in his frenzy may rush round until he collapses into a state of exhaustion coloured by strangely pleasurable fantasies. Lewin believes that the fury of the old-time Berserkers may have been due to agaric intoxication. The Siberians have discovered that the urine of a person inebriated by agaric also possesses intoxicating properties. As soon as the reveller finds that his drunkenness is passing off he drinks his own urine or that of another.

Summary

A description is given of hallucinations occurring in the course of various neurological disorders.

Hallucinoses associated with narcolepsy is also considered, and reference is made to the occurrence of hypnagogic hallucinations in "normal" persons.

Drug intoxications are then dealt with, distinction being made between acute delirium after poisoning from a single massive dose and states of chronic intoxication.

Kraepelin's views regarding the clinical characteristics of drug deliria are given. Finally the phenomena associated with intoxication with mescal, cannabis indica, bromides, agaric, yagé, and ayahuasca are briefly described.

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Gonococcal Carriers.—The types of "carrier" are described. The author regards as the true carrier one who harbours the organism in recoverable form, who can infect others with clinical gonorrhoea, and yet at no time has symptoms and signs of the disease. Such cases are rare but perhaps occur more often than is generally thought. In such cases the organism can be found for a limited period only, and before it can be regarded as a gonococcus it must show the usual cultural characteristics, including the characteristic sugar fermentation reaction.—Carrier Problem in Gonorrhoea. W. Burger.—*Arch. Derm. Syph., Wien.* March, 1939, **178**, 562.

PUERPERAL SEPSIS AND HAEMOLYTIC STREPTOCOCCI

BY

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In 1932 the results of a study of 4,655 deaths directly attributed to childbirth in this country showed that 38 per cent. were due to puerperal sepsis. Almost half (46 per cent.) of these deaths from sepsis followed normal deliveries. In other words, infection following normal labour caused 18 per cent. of all deaths in this series. It was estimated that not less than 85 per cent. of these fatal infections following normal labour were due to haemolytic streptococci. These organisms were also responsible for a somewhat less but variable percentage of infections following instrumental or difficult labour. In view of this evidence the importance of the study of haemolytic streptococci needs no emphasis for those interested in the reduction of maternal mortality.

As a result of recent research it has become possible to differentiate between various types of haemolytic streptococci. By means of a precipitin test, Lancefield (1933) divided haemolytic streptococci into several groups designated at first A, B, C, D, and E, further groups being added later. Strains from various human infections were found almost invariably to belong to Group A; Lancefield and Hare (1935) showed later that almost all the infecting strains in a series of cases of severe puerperal sepsis belonged to Group A. They found also that Group A streptococci were extremely rare in the genital tract of women with afebrile puerperia or with minor puerperal infections.

In organizing our attack on puerperal sepsis as a contributory factor in maternal mortality, emphasis has to be laid upon two facts: (1) Since almost half of the deaths from sepsis follow normal labour, it is clear that more must be done than can be effected by improving ante-natal treatment or by increasing the amount of dexterity or judgment exercised in operative obstetrics. (2) Since evidence is accumulating that the upper respiratory tract of the patient herself (or more often that of her contacts) is the most probable source of puerperal infection with haemolytic streptococci, attention must be directed to possible methods of preventing the transfer of organisms from these sites to the genital tract immediately before, during, and after childbirth. The following report of an investigation in a consecutive series of 120 students examined during the last two years contributes data on the incidence of Group A haemolytic streptococci in women of college age.

In 1936 it was decided to take a swab from the throats of all medical students before they began their work in the maternity wards of the obstetrical and gynaecological unit of the Royal Free Hospital, London. In each case the throat swab was taken about three weeks before the student was due to come into residence in the hospital for her two and a half months' training. If a growth of streptococci was found, McLeod's test was carried out to see if it showed soluble haemolysin, and, if it did, the Lancefield group to which the haemolytic streptococci belonged was ascertained by the precipitin reaction.

Incidence of Haemolytic Streptococci

In 22.5 per cent. of cases a growth of haemolytic streptococci was obtained. This carrier rate of haemolytic

streptococci seems slightly higher than the average incidence in temperate climates as worked out by Hare (1935), Walker (1920, 1921), Tongs (1919), Bourn, Carpenter, and McComb (1933), Topley and Wilson (1936), and White (1935). It is worthy of note that one-third of these students were at work in children's wards. The exceedingly high incidence of haemolytic streptococci in the throats of children in hospital is well established by Pilot and Davis (1919), Blanton, Burhans, and Hunter (1919), Pilot and Tumpeer (1926), and Burpee (1937). In 6 per cent. of the students the haemolytic streptococci were reported to belong to Lancefield Group G.

Incidence of Group A

Only in five out of the 120 students examined—that is, in 4.2 per cent.—did the haemolytic streptococcus belong to the Lancefield Group A. (This carrier rate is below that judged by Hare to be the rate for the adult population—namely, about 7 per cent.).

About a year ago Frisch (1938) published the results of a study of the carrier rate in a group of 621 men and women students. One interesting finding was that, although the carrier rate of the whole group was 6.4 per cent., that for the 152 women included in the series was only 1.9 per cent. (The proportion, if any, of these who were students of medicine was, however, not stated.)

The present small series, spread over two years, gave no evidence of any seasonal variation in the frequency of the carrier rate of all haemolytic streptococci or of Lancefield Group A. This finding fits in with the diversity of the distribution throughout the months of the year of the maximum carrier rate of haemolytic streptococci reported by Burpee (1937), Meleney (1927), and Burgin and Higgins (1934).

Throat Conditions and Group A Haemolytic Streptococci

We may next consider whether there was any relation between the condition of the throat and the incidence of haemolytic streptococci, Group A.

Students with Positive Initial Throat Swabs.—Only in two of the five students had tonsillectomy been performed (in one case in childhood and in the other two months before the swab was taken). In a third tonsillectomy had been performed, but two small patches of granulation tissue were present in the tonsillar beds, and these required early treatment by diathermy. In the remaining two students the tonsils were enlarged to some degree, and in both there was evidence of sepsis. The antra and sinuses were, however, reported to be in a satisfactory condition.

Students with Negative Initial Throat Swabs.—Two students in whose throats no haemolytic streptococci were found at their routine throat examination developed sore throats during their training, and Lancefield Group A streptococci were then grown from their swabs. Neither gave a history of frequent sore throats (one was tonsillectomized and the other was not). A third had a history of sinusitis which had been treated by lavage for one year, with consequent great decrease in the frequency of the complaint of sore throat. The right tonsil was enlarged. The presence of Lancefield Group A haemolytic streptococci was discovered because she was in contact with a case of puerperal sepsis.

There is therefore no evidence of any relation between the incidence in the throat of haemolytic streptococci belonging to Group A and the presence of tonsillar tissue. Complete tonsillectomy had been performed in about 50 per cent. of all the students. Haemolytic streptococci were absent in as large a proportion of students with tonsils or remnants of tonsils as of those in whom complete tonsillectomy had been performed.

Treatment of the Haemolytic Streptococci Group A Carriers

Each student was given leave of absence, and more emphasis was laid on moderate exercise in the open air than on painting or gargling of the throat (though this was done in four cases) or on the administration of prontosil or proseptasine (which was done in three cases). Whenever it ceased to be possible to grow Group A streptococci from their throat swabs the students were considered fit to begin obstetric work. The time required for treatment varied, but the persistence of the positive throat swab was most noticeable in those students whose nasopharynx was in an unsatisfactory condition. Students were not re-examined after return to work unless they were known to have been in contact with a possible source of infection, such as scarlet fever in a district home or a case of possible puerperal sepsis, or unless they developed catarrh of the upper air passages.

Medical Work Previous to Obstetrics

This series of 120 students may be taken to represent a group of healthy women between 20 and 30 years of age. It is of interest to ascertain the nature of the medical work which the five students were doing in whose throats Group A haemolytic streptococci were found at the initial test. One out of the five was taking classes in a hospital for infectious diseases, in radiography, orthopaedic surgery, psychological medicine, and physical medicine, but this work was also being done by 16 per cent. of the total group of students. Four out of the five were working in the children's ward at the time that the Group A streptococci were found. This is worthy of comparison with the fact reported above that one-third of the students in whose throats haemolytic streptococci of some type were found were at work in the children's ward. The students' curriculum, however, was so arranged that as many as 39 per cent. of the whole group were also being taught in the sick children's wards immediately before their training in the obstetrical wards.

The groups of students none of whom had haemolytic streptococci Group A in their throats were found to be working at the following subjects in order of frequency: diseases of ear, nose, and throat, diseases of the chest with senior pathology, medicine, casualty, cancer, gynaecology, and venereal diseases.

While the number of cases in the series is too small to justify categorical assertions, there seems ground for the suggestion that the curriculum of medical students should be so arranged that work in the children's wards should not immediately precede or be contemporary with work in obstetrics unless special steps are taken to control the carrier rate in the children's wards. Those in contact with respiratory ailments should exercise particular care, with the knowledge that their own susceptibility to act as carriers of Group A haemolytic streptococci may be an important factor in the transmission of the infecting organism of puerperal fever.

Group A Haemolytic Streptococci and Subsequent Enforced Absence

The relation between the incidence of failure to remain continuously at work during the ensuing months of obstetric training and the initial finding of Group A haemolytic streptococci is of interest. Only two of the five students were off work for a few days, at the end of their second and third months respectively, but in the

throat of one only of these were haemolytic streptococci Group A again found.

In order to judge the significance of this occurrence—namely, that two of the five students who originally had Group A haemolytic streptococci in their throats were later absent on account of catarrh—it is essential to consider the frequency of illness in the whole group of 120 students.

Only 9 per cent. of the students were imperfect in their attendance at work on account of slight illness, and 7.5 per cent. of the total group had catarrh severe enough to lead to cessation of duty. An interesting finding is that 44 per cent. of these students did not have Group A haemolytic streptococci demonstrated in their throat swabs either before or during the attack of catarrh. Of the remaining students 60 per cent. had Group A streptococci during the attack of catarrh, although they had had none in their throats before starting their work in obstetrics. In 20 per cent., though Group A streptococci were demonstrated at the original examination, none were found in the throat during the attack of catarrh. The remaining 20 per cent. had the Group A streptococcus demonstrated before and on several occasions throughout their training. Two students were put off duty because they had been in contact with a patient in whom Group A haemolytic streptococci had been found, and haemolytic streptococci were demonstrated in their throats, but in only one of the students did these prove to belong to Group A.

Puerperal Pyrexia and Patients' Throats

It may be of interest to record that only on four occasions during these two years, when throat swabs were examined because a patient had developed puerperal pyrexia, were haemolytic streptococci found in the patient's throat, and in two cases these did not belong to Group A, B, C, or G; in one they belonged to Group B and in one to Group A. In this latter case the same strain of haemolytic streptococcus was isolated from the patient's cervix and also from the throats of a student and a nurse in contact. Only in one of the other cases was a student found to be a carrier.

Conclusions

As many as five carriers of Group A haemolytic streptococci were found in a group of 120 apparently healthy women of college age.

The importance of these findings appears to lie in the suggestion that greater facilities for the routine examination of throat swabs should be made available to the medical and nursing profession.

It would seem advisable, also, that the students' curriculum should be so arranged that under present conditions contact with children's diseases should not be made immediately before work in obstetrical wards, nor should it be made contemporaneous with such work.

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OPHTHALMIC SERVICES TO THE CIVIL POPULATION IN NATIONAL EMERGENCY*

BY

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Modern warfare carries the evil promise of two new principles—the terrorization of the civil population and the "Blitzkrieg"—the lightning war. The organization of the medical services to the civil population has thus passed beyond an errand of mercy into a primary weapon of defence, for a successful attempt on the morale of the civil population would inevitably be a major disaster. The role of organized medicine in any future war will therefore be of a different character from that in the past. In the Boer War there were more casualties from epidemics among the troops than from actual war injuries; in the great war medicine served in the dual function of tending the wounded and evolving a public health system which prevented the spread of epidemics, though not altogether successfully, as the influenza pandemic of 1918 showed. In a future war medicine will have to face the task of tending to a new type of casualty: civilians subjected to all the rigours of hostilities, for each individual home will be part of the battlefield.

To the established duties of military medicine in tending the maimed in the armed forces and maintaining public health services as a safeguard against epidemics in the civilian and military populations will thus be added the new obligation of evolving an organization to deal with civilian casualties. This situation is new in yet another sense, for the weapons of attack on the civil population are as yet largely untried and their potentialities are not fully known. In this welter of uncertainty one thing stands out: contrary to past experience, the first duties of medicine will not be on some limited battlefield amid the clash of armed forces but among the civil population, against whom the concentrated fury of modern agents of destruction will be unleashed. As the limitations of aerial warfare are still undetermined, and as the technique of the "Blitzkrieg" tactics involves the maximum possible damage to be inflicted at the very beginning, it is likely that every possible means of destruction will be used experimentally—poison gas and incendiary bombs, which are probably relatively inefficient weapons, no less than the various types of heavy explosives. Every possible kind of injury is thus to be expected. More stable conditions are likely as the momentum of the "Blitzkrieg"

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