and some degree of pyrexia is usual. Occasionally coma in an epileptic subject may be due to overdosage with anti-convulsant drugs.

Exogenous Poisons

Here the diagnosis will usually depend primarily upon circumstantial evidence and the exclusion of other causes of coma. Special features to be noted are the cherry-red complexion in *carbon monoxide* poisoning; the smell of stale alcohol in the breath in *alcoholic* poisoning; the association of fits, raised blood pressure, and a "lead line" in the gums in lead *encephalopathy*; the hyperpnoea and violet urinary ferric chloride reaction in *aspirin* poisoning; and the normal or subnormal temperature and pin-point pupils in *opium* poisoning.

Intracranial Infections and Tumours

Meningitis in its various forms can sometimes be a cause of rapidly developing coma, especially the fulminating *meningococcal* variety. Diagnostic difficulties may nevertheless be considerable when the temperature is subnormal and neck rigidity is inconspicuous. A purpuric rash is commonly present in *meningococcal* infections, while in other forms there may be a focus of infection elsewhere in the body. Usually, however, the diagnosis can be established only by lumbar puncture.

In cases of *localized intracranial abscess formation* coma is likely to be a late event. Headache of increasing severity and drowsiness are outstanding premonitory symptoms, mastoiditis and intrathoracic suppuration being the commonest sources of infection. Occasionally coma supervenes rapidly if the abscess ruptures into the cerebral ventricles or subarachnoid space, in which case there will be neck rigidity associated with high temperature.

Coma is also usually a late development in cases of *intracranial tumour*, whether it be primary or secondary in origin. Occasionally it may develop rapidly when there is cystic degeneration or haemorrhage into a tumour, but differentiation from intracerebral haemorrhage is usually impossible on clinical grounds alone.

Physical Agents

Heat hyperpyrexia is a serious condition due to failure of the heat-regulating mechanism as a result of prolonged exposure to high temperatures. It is usually fatal without adequate treatment and is characterized by progressive hyperthermia, absence of sweating, convulsions, circulatory collapse, and coma.

An individual accidentally subjected to the *effects of an electric current* may be rendered comatose. Diagnosis will depend upon the detection of skin burns and a consideration of the circumstances.

Mental Disorders

Severe states of stupor occurring in hysterical, schizophrenic, or depressive illnesses may sometimes give rise to diagnostic difficulties. In cases of this kind the patient is not likely to be truly unconscious, since he may show some evidence of mental activity or betray the fact that he is not entirely unaware of his surroundings. Diagnosis will depend upon the absence of physical signs and evidence of psychological disturbance in the history obtained from friends or relatives. Organic disease must be assumed to be present, however, if the patient is genuinely comatose, even if there is a history suggestive of mental disorder.

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PROFESSIONAL BOXING AND THE DOCTOR

BY

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In an editorial comment in the *British Medical Journal* of December 25, 1954 (p. 1535), the hope was expressed that the controlling body of professional boxing would listen to the advice of its medical advisers.

In order to show that the professional controlling body does, in fact, listen to its medical advisers, I propose to give a short account on the control of professional boxing, with special reference to the medical aspects of professional boxing.

Prior to 1929 the control of professional boxing in the British Isles and on the Continent was practically non-existent. Owing primarily to the efforts of the late Lord Lonsdale, the British Boxing Board of Control was formed in that year. Lord Lonsdale became the first president. The constitution of the Board is a president, two vice-presidents, and a number of stewards, all of whom have some specialist knowledge of boxing and are not in any way financially interested in boxing. The stewards serve in an honorary capacity and meet their own expenses. Should a vacancy occur, it is filled by invitation from the president and the stewards.

An account of the ups and downs of the Board of Control from 1929 to the present time, although interesting, would be out of place here, but a short account of the present organization is necessary.

Organization of the Board of Control

The Board now consists of a president, two vice-presidents, and up to 25 stewards, divided into stewards of appeal and administrative stewards, and has through its regulations complete control of all professional boxing in Great Britain and Northern Ireland, except fairground boxing booths. It has the authority to issue licences at its absolute discretion to all persons connected in any way with professional boxing (boxers, promoters, managers, referees, trainers, seconds, etc.). Without a current licence no one can officiate in any capacity at a professional boxing tournament.

The Board functions from head offices in London and is assisted by eight area councils covering the whole country and Northern Ireland. The area councils are made up of licensed members of various categories—promoters, boxers, boxers' managers, seconds, etc., elected annually by the licensed members in the area. Each area council has two representative stewards, who are elected annually by the council members, and who represent the views of their councils to the stewards at board meetings.

Before the second world war the medical arrangements were rather sketchy. A principal medical officer was appointed who was one of the administrative stewards. His main duty was to advise the Board on any medical matter which cropped up and to examine boxers where necessary on behalf of the Board.

During the second world war the control of boxing suffered, as most of the stewards were engaged in one or other of the Services. After the war, when the Board got into its stride again, it was quickly realized that a medical organization was a necessary part of the controlling body, and by 1950 such an organization was instituted as follows. An honorary area medical officer was appointed to each of the

eight areas. These medical officers, together with any medical men who happened to have been elected as representative stewards, constituted a medical subcommittee under the chairmanship of an administrative steward, who is also a medical man. Since 1951 it has been found necessary to appoint one or more deputies to the area medical officer in each area.

Since the formation of the medical subcommittee, its recommendations have been implemented without question by the Board of Control. Further, owing to the efforts of the president of the British Boxing Board of Control, the European Boxing Union was formed in 1950. This controls professional boxing throughout Europe, and is served by a medical commission elected from the principal medical officers of member countries.

The objects of the medical subcommittee are to advise the stewards on medical matters and how to make boxing freer from the isolated instances of permanent injury, particularly the results of brain injury. Some of the medical aspects of professional boxing which have been dealt with by the medical subcommittee are:

1. Medical Examinations

Every applicant for a boxer's licence is subject to a comprehensive medical examination, the results of which are reviewed by the area medical officer, who then recommends the granting or withholding of a licence. The boxer must be medically examined before and after every contest.

If a boxer has been knocked out he must be medically examined before contracting to box again. Medical officers, promoters, seconds, managers, council members, or area secretaries can insist that a boxer be medically examined at any time there is reason to think he is suffering any brain injury. Unless the boxer receives a certificate of absolute fitness from the area medical officer, his licence is suspended for a varying period or withdrawn altogether.

Only first-series—that is champion or near champion—professional boxers are allowed by the Board to box outside the British Isles, and by agreement with other members of the European Boxing Union each must be medically examined by an official medical officer and certified fit immediately before leaving for abroad. All licensed referees are examined annually before their licence is renewed, because to referee several contests during the course of an evening requires a fit man.

2. Various Recommendations Made by the Medical Subcommittee and Implemented by the Stewards

Action to be Taken by Seconds After a Knock-out.—The theory has been advanced by various observers that there are two kinds of knock-out, and experience seems to bear this out. They are adequately described by La Cava (1952), who classifies them as (1) a reflex from a hard blow on the chin, and (2) a final loss of consciousness as a result of a blow when a boxer has reached a state of collapse due to a number of blows. Managers, seconds, etc., are now instructed in words of two syllables how to treat an unconscious boxer by the first-aid methods applicable to any other case of concussion, always bearing in mind the possibility of more serious damage. Ear rubbing, strong smelling-salts, and any form of stimulation are expressly forbidden.

Haemostatics.—Formerly it was the custom for each manager or trainer to have his own particular solution to stop bleeding from a cut sustained during the course of a contest. Many of these, whilst achieving the end desired by the managers or trainers, resulted in serious tissue damage. Nowadays it is an offence for anyone to use a substance which has not been approved by the medical subcommittee. Many substances have been examined, the only one approved at present being adrenaline solution. If adrenaline solution will not control the haemorrhage, then the contest is either abandoned by the manager or stopped by the referee.

Stimulants.—No form of stimulant, either real or imaginary, is allowed by the Board, except cold water sprinkled on the body or used as a mouth wash.

Drying Out and Weight Reduction by Turkish Baths.—In the past, matches were made for a boxer at a weight which was often below that at which he was 100% fit and strong. This weight was achieved by withholding all fluids for, in some cases, up to 48 hours before the weigh-in, and by turkish baths. On the recommendation of the medical subcommittee, because of their weakening effects, these practices have been stopped and managers' licences have been withdrawn for indulging in them.

Blows to the Kidneys and Back of the Head.—The original rabbit punch, barred by the rules of boxing for many years, was a chop with the side of the hand to the back of the neck, and a similar chop was delivered over the kidney region. Either of these blows has for many years resulted in the instant disqualification of the boxer who delivered them. On the recommendation of the medical subcommittee, because of the risk of brain or kidney trauma, blows with any part of the fist to the back of the head, or to the region of the kidney, are deemed foul and referees have been instructed to see that their use is stopped.

Duration of Contests.—These have been standardized for various classes of boxers and the duration reduced to eight minutes' actual boxing for novices.

Eye Injuries.—Serious eye injuries are extremely rare. Visual standards have been fixed so as to prevent a myope being licensed, to reduce the risk of a detached retina.

Many instructions covering minor points of the medical aspects of boxing have been issued dealing with widely separate subjects such as the correct position to hold the hand within the glove, scabies or infectious skin diseases in boxing stables, and the best method of suturing cuts. The prevention of fatal accidents or permanent brain injury to boxers remains the main problem facing the medical subcommittee.

Fatal Accidents

Much has been done in this connexion. Since the war there have been five fatal accidents to professional boxers at licensed promotions. Death in all these cases, as indeed it has been in the cases reported from abroad, was due to haemorrhage from cortical veins. No case of a fractured skull has been reported. The type of injury—tearing of the cortical veins—and the history lead to the conclusion that the injury in most cases was caused not by the blow but by the boxer striking the back of his head on the ring floor, causing an abrupt deceleration of the brain mass. With this in mind, the medical committee has recommended that a special type of ring flooring developed by Cornell University, U.S.A., be obtained and tried out in this country. In the meantime, some resilient substance, such as sponge rubber, is put under the canvas of all rings.

Permanent Brain Injury

Before the days of an adequate control, an appreciable percentage of professional boxers suffered from a condition known among themselves as being "punch drunk." This condition is also met with in some steeplechase jockeys and amateur riders who have had more than a fair proportion of falls in the hunting-field or steeplechasing. The term "punchy" was often used of a boxer as an expression of contempt. Because of the stigma attaching to the name it was decided to substitute the term "chronic concussion" whenever it had to be referred to. The signs and symptoms of an established case have been frequently described by various observers. Agreement regarding the pathology, however, is not by any means unanimous. What is obvious, however, is that, as a result of a series of concussions, the brain does receive damage which, if severe, is irreversible, but which if detected in the early stages seems to clear up. In the absence of any specific treatment, it is the obvious

duty of the medical subcommittee, through the Board of Control, to prevent its occurrence, and this is being done in the following way.

All licensed referees are lectured by the area medical officer on the medical aspects of boxing, with particular reference to chronic concussion. They are instructed that they must not allow a boxer to take unnecessary punishment, and must, under no circumstances, allow a defenceless boxer to be struck. Flagrant disregard of this warning by a referee will result in his losing his licence, or being suspended for a varying period, or being degraded to a lower category of referee. During 1954, in implementing this instruction, 360 contests out of 1,973 were stopped by the referee before either a knock-out or the end of the contest had occurred. One curious result of this is that the spectators at any boxing tournament now protest vociferously if the referee in their opinion does not stop the contest soon enough.

Professional boxers have a hard system of training to follow, which, amongst other things, involves sparring. Brain injury can occur in the gymnasium as well as in the ring. All managers, trainers, promoters, and others connected with professional boxing are instructed, in the boxers' interests, to report at once any early signs of chronic concussion. The relatives and those associated with a boxer in training are the ones who notice some slight abnormality before it is detected in a normal routine examination. Obviously, area medical officers, deputy medical officers, and tournament medical officers are constantly on the lookout for any early signs of chronic concussion. Once a boxer is suspect, he is ordered to be examined by the area medical officer, and unless he is given a complete clearance his licence is withdrawn or suspended. During 1954 19 licences were withdrawn or not renewed on medical grounds. The reason for the withdrawal is explained to the boxer, and he is advised to abstain from any form of sparring in the gymnasium until given a clearance by the area medical officer.

It was thought that electroencephalography might be a means of diagnosing early chronic concussion. In this connexion the results recently published by Kaplan and Browder (1954), who spent four years studying the brain-wave patterns of 1,043 professional boxers, are disappointing, a disorganized E.E.G. showing at most that a complete physical and neurological survey is indicated.*

Conclusion

The aim of the Board is better and safer boxing. To this end they will implement any reasonable recommendation of the medical subcommittee. It is due solely to the efforts of the present president of the Board that the European Boxing Union, of which he is also the president, is in existence and that it has a medical commission. Further, again owing to his efforts, a World Boxing Union was formed consisting of a representative from the New York State Athletic Commission, one from the European Boxing Union, one from the National Boxing Association of America, and one from Great Britain and the British Empire. This World Boxing Union has, in its turn, appointed a medical advisory board.

Finally, the medical subcommittee of the British Boxing Board of Control will be grateful for any suggestion, from any medical man interested in this pre-eminently British sport, that makes for safer boxing.

REFERENCES

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*Of the 1,043 subjects, 197 had repeated electroencephalographic examinations varying in number from 1 to 6. The interval between examinations was less than one year in 141 subjects, between one and two in 29, between two and three in 21, and between three and four in six. Forty subjects had the examination repeated within 10 minutes of losing a contest. Ringside cinematography (slow-motion and ordinary) was used to assess the type and extent of trauma to the head.

PROFESSIONAL NEGLIGENCE

LECTURE BY A QUEEN'S COUNSEL

At the City of London College on January 12 Mr. J. P. EDDY, Q.C., delivered the first of a series of Travers Memorial Lectures on "Professional Negligence." He said that the main principle he was about to put forward was that before there could be negligence there must be a duty to take care or to exercise reasonable skill. That duty might arise in one of two ways: (1) in common law (as, for example, to exercise reasonable care when driving a car), and (2) under contract, as in the relationship of doctor and patient.

Three elements had to be considered when dealing with common law liability. The first was a duty to exercise care or skill or both; the second, a breach of such duty; and the third, an actual loss to the other party as a result of such breach. The late Lord Macmillan had pointed out in a case in 1932 that the law took no cognizance of carelessness in the abstract; there must be carelessness when there was a duty to take care, and it must be proved that failure in such duty caused damage. When there was a contractual relationship negligence might be a breach of such contract by act or omission.

Responsibility of the Professional Man

A man or woman who practised a profession was bound to exercise care and skill—the skill of an ordinary competent practitioner in that profession, whether it be of accountant, banker, solicitor, or doctor. The important principle had been laid down that every person who entered a learned profession undertook to bring to its exercise a reasonable degree of care and skill. He did not undertake, if he was an attorney, that his client should win his case, or, if he was a surgeon, that he would cure his patient; nor did he undertake to use the highest degree of care and skill of which some persons in his profession might be capable, but he undertook to bring to the case a fair and reasonable competence. It followed, therefore, that where the duty to exercise care and skill existed one of two things might give rise to an action for damages for negligence: (1) that the defendant did not possess the requisite skill, or (2) that, although he possessed it, he did not exercise it in the particular case.

In some cases an action might arise out of tort at common law—that is, neglect of a duty towards persons generally; in others it might arise out of contract—that is, an agreement between the parties whereby there arose a duty to exercise a reasonable degree of care and skill; and sometimes there might be an overlapping of tort and breach of contract. But the first essential was to recognize that before there could be a liability there must exist a duty—a duty in the case of a professional man to show the average amount of competence associated with his profession. The expected degree of competence varied with the times. Two generations ago surgical operations were conducted in a manner which, by the standards of our own time, would be accounted negligent.

What Constitutes Negligence?

Mr. Eddy went on to point out that in a contract as between doctor and patient only those two people were concerned; only the partners to a contract, one or other of them, could complain if there was negligence.

A person who was himself under a duty to take care could not get rid of his responsibility by delegating the performance to someone else. He was answerable for the wrongful act of his servants or agents committed in the course of their employment. The principle of vicarious liability for the wrongful acts of others rested on the legal maxim, *Qui facit per alium facit per se* (he who does anything by another does it himself). But the wrongful act must be done in the course of employment. If a doctor employed a dispenser who, while dispensing, spilt some liquid over a patient and injured him or damaged his