

starting point of European civilization. Unfortunately, no record existed of the surgery of the golden age of Crete or of Mycenae; no surgical abode had been dug out, although discoveries had been made of bodies bisected longitudinally, which suggested that anatomy was studied by means of frozen sections. Homeric surgery was chiefly descriptive of wounds. In the eighth book of the *Iliad* the horse of Nestor was wounded in the brain by an arrow shot from the bow of Paris, and it was related that in agony the horse sprang into the air and rolled round and round, causing confusion among the other horses of the team. The lecturer suggested that the horse of Nestor was wounded in the cerebellum, which in the horse was very large as compared with the cerebrum, and that it was the peculiarity of the cerebellar wound to cause this rotatory movement. Hippocrates was the father not only of medicine but of surgery, and whatever personal contributions he made to surgical knowledge, his greater task was to take in all that had been done before him, select the valuable from the worthless, and make surgery a science, independent of superstition and sophistry. His tradition was a priceless asset to the profession for all time. His knowledge of injuries to the head was extremely complete; in some cases he recommended operation in order to slacken the "tightness of the head," he also decompressed when there was inflammation or a foreign body inside the skull. Hippocrates recommended trephining as a cure for blindness when there was no evident disease of the eye; he also recommended operation for meningitis. His trephine had a collar or cross bolts to regulate the depth to which it could go.

The next great period was that of Celsus and Galen, the former of whom described the trephining operation, while Galen, so far as he knew, was the only experimental physiologist before Harvey. Then came the long ages during which men were content without surgical inquiry. Such learning as escaped the blight was preserved in the monasteries of Europe, mostly, so far as medicine was concerned, among the Benedictines. The slow re-creation of surgery was a fascinating study. To come down at once to very recent times, the lecturer said that when he was elected on the surgical staff of the National Hospital for the Paralyzed and Epileptic, thirty years ago, the two great men with whom he came immediately into contact were Hughlings Jackson and David Ferrier. The former remained in his vision as the Socrates of neurology, and his papers were of extraordinary interest. Ferrier belonged to that small group of great men who rediscovered and re-created the science of experimental neurology, which had been lost to mankind since the time of Galen. It was difficult to realize (with Sir David Ferrier sitting immediately in front of him) that his first paper was published in 1873. Then there was Victor Horsley, who from 1884 to 1891 published eight papers of the greatest importance. Godlee was the first to remove, under modern conditions, a tumour of the brain, which he did in 1884, and by the end of 1886 Horsley had done ten such operations. Horsley had long and intimate acquaintance with operations on the brains of monkeys, and the lecturer believed that to this was largely attributable Horsley's success in brain surgery, and any slight success of his own was due to the same opportunity.

The Lesson of History.

What was the lesson to be gathered from the story of the surgery of the brain which he had so imperfectly sketched? In the gradual evolution of truth, at the end of each stage of the world's history, it would seem that a great man appeared who focussed the best thoughts of the preceding centuries or was the messenger of new knowledge. Carlyle, in speaking of the hero as poet, said that ten silent centuries found a voice in Dante, and he spoke of Dante "deep, fierce, as the central fire of the world; Shakespeare, wide, placid, far-seeing, as the sun, the upper light of the world." So it had been in surgery. Hippocrates, John Hunter, Lister—all marked epochs in the advancement of knowledge. There were lesser names bridging the gaps—Morgagni, for instance, between the famous anatomists of the Middle Ages and the great pathologists of the first half of the nineteenth century; and after Hunter there were Astley Cooper and Pierre Ouvrard (a French refugee in Russia), and others. John Hunter awoke in the minds of his pupils and later followers a desire to explore the old ground by the

new experimental method and to discover truths long concealed. There was a spirit of adventure with Hunter and his school akin to that of the Elizabethan explorers. The torch which Hunter lighted was carried forward by Cooper and others, burning with a brighter flame. Galen and Harvey had been like Hunter in their enthusiasm for the experimental method, but neither of them left behind a great band of pupils and followers. In a volume which he himself had had to read as a student it was written that surgery had then reached its furthest limits. But in the fullness of time Lister, the peerless knight of surgery, the "upper light," the herald of the dawn of scientific surgery, arose and inspired a deeper insight into surgical thought and practice. In the fullness of time also came a man specially trained and of great ability and enthusiasm named Victor Horsley, and created a new department—that of neurological surgery—making what was before his time haphazard and dubious to rest upon the surest foundations in the practice of every surgical clinic. None of them had seen Hippocrates in the flesh, but his spirit ruled and energized their teaching and stimulated their clinical investigation. The wonderful character and spirit of Hippocrates, as Dr. Charles Singer had said, were more real and living now than ever they had been since the eclipse of the Greek scientific intellect. None of them had seen John Hunter in the flesh, but his spirit was very evident in the Hunterian Museum, and also in the genius for inquiry and experiment which he had elicited.

The Sacred Duty.

In conclusion the lecturer confessed to an uneasy feeling, shared by some of his friends, that during the last two or three decades the cult of the operator among some of the younger Fellows of the College had displaced in part the recognition of the sacred duty upon each one of them to lay one more stone on the building of surgical knowledge. They were all of them pilgrims of surgery who had only as yet reached the threshold of truth. A vast field of their art and science remained unmapped and unexplored. He trusted that succeeding generations of surgeons would devote time to research work. Research added such zest and satisfaction to life. There was no thrill like that which accompanied the first perception and the slow unfolding of some new truth or principle. Thus might they as surgeons rightly forge new weapons against disease and death.

Wisdom and yet more wisdom was their goal as they groped their way onward upon this bank and shoal of time, for was it not written, "She is more beautiful than the sun, and above all the order of the stars, and being compared to the light, she is found before it; she is the brightness of the everlasting light, the unspotted mirror of the power of God, and the image of His goodness."

LEAD POISONING AND THE INTERNATIONAL LABOUR CONFERENCE.

BY

PROFESSOR HENRY E. ARMSTRONG, D.Sc., F.R.S.

ONE of the decisions taken at the recent Geneva Conference (of which a note appeared in the *BRITISH MEDICAL JOURNAL* of December 3rd, p. 958) involves the early introduction of regulations protecting health in the painting trade. Undoubtedly, the dust produced by dry rubbing down is the chief risk, and if this be eliminated and careless work deprecated, there should be little, if any, objection to house-painting as an occupation. Lead poisoning is practically unknown amongst the painters in Scotland; probably their immunity is that which intelligence provides—the Scottish painters seem to be more careful workers than painters generally. Proof has been given, by a long series of practical trials carried out recently in Manchester and London, that it is not only possible but advantageous to rub down paint after wetting with water, then removing the debris with a wet sponge; in this way all dust is prevented. Several large firms in the painting trade have already adopted this method.

The Belgian and French inspectors asserted at Geneva that regulations are unworkable; probably they have a careless, if not unintelligent, class of worker to supervise. Apart from regulations, however, if it once be made really

clear to painters what they have to gain, if the public also be made aware of the one chief danger attending painting, an opinion will soon be established and a fashion set, so that official inspectorial interference will be unnecessary.

The risks from lead poisoning, which were formerly great in the white lead and pottery industries, it is well known, have been all but entirely abolished by the introduction of mechanical methods of removing dust and of wise regulations imposed upon employers and workers. The white lead bogey, however, still stalks among painters; in fact, the painter has only to consult his doctor for a pain in his stomach to be told, more often than not, that he is a victim of lead poisoning. There may, however, be other causes at work which are not always suspected.

Ten years ago two Departmental Committees of the English Home Office inquired into the risks attending the painter's occupation. I was one of those who gave evidence; it so happened that I had been working, on the action of hormones on living matter, in a direction which made my testimony of consequence.¹ The question at issue was the poisonous character of white lead paints. The assertion had been made that volatile compounds of lead were given off from paints.

By an exhaustive series of experiments Mr. C. A. Klein and I were able to prove that such was not the case.² The assertion was once more made in 1914 by M. Herman, a Belgian worker. Mr. Klein and I have recently repeated his experiments and have been able to demonstrate their fallacious character³—he had been misled owing to the presence of minute quantities of copper in filter paper; recently, at the Geneva Conference, the transcript of a statement by M. Herman was handed to us in which this observer admits that we are correct in our conclusion. The "volatile lead" bogey may now be regarded, we trust, as laid for ever. I may add that our conclusions have been confirmed by the Government chemist, Sir James Dobbie, to whom the matter was referred in 1913 by the Home Office Committee.

When first called into consultation in 1911 I was not conversant with the medical history of the subject. I was told that paint had a poisonous effect on animals, and it was suggested that a volatile lead compound was operative—this was before I had made specific experiments. I could only scoff at the suggestion as an entirely improbable explanation from a chemical standpoint. I pointed out that paint did not only contain white lead but also oil and turpentine, and that the oil underwent changes in drying. When told that basophilic granules had been observed in the blood cells of the animals exposed to paint and that this condition was an indication of lead poisoning, I suggested that the turpentine and perhaps also the vapour given off on drying might well be the cause of the phenomenon. The experiments were repeated and my forecast verified. At the meeting I had produced leaves poisoned by turpentine.

The effect is so striking, so easily demonstrated and so instructive, that I would urge every medical man to observe it for himself and reflect on its deep meaning.

All that is needed is to enclose a leaf of the ordinary spotted laurel (*Aucuba japonica*) in a wide-mouth bottle, such as a pickle bottle, together with a few drops of turpentine. After an interval, depending on the temperature, the leaf begins to darken and eventually becomes black; the action is rapid at blood heat. The turpentine vapour penetrates the leaf surface and produces a disturbance within the cells which determines the interaction of an enzyme with a glucoside, one of the products of change being a substance which blackens in the air. Equally striking is the result when an ordinary laurel leaf (*Prunus laurocerasus*) is used together with a strip of paper dipped in an alkaline solution of picric acid. The yellow paper soon becomes orange and eventually brick-red through the action of the hydrogen cyanide (prussic acid) liberated from the leaf, which gradually becomes brown. Chloroform produces the effect more rapidly.

In view of the frequency with which persons sleeping in newly painted rooms have been affected, and of the work done, especially by French observers, extending back into the earlier half of last century, it is more than remarkable that the influence of turpentine in paint has been so little considered by the medical profession and every disturbing symptom displayed by a painter attributed, of late years, to lead poisoning. The work done in America, Germany, and elsewhere, showing that volatile liquids generally have most deleterious effects on health, seems to be recognized only in narrow circles.

Mr. Klein and I in 1913 summarized the situation in the following terms:

"The toxic effects sometimes experienced from drying paints are to be ascribed to turpentine, and due allowance must be made for this in dealing with the hygienic phase of the problem. Our inquiry also shows that, in many cases, effects have been regarded as due to 'lead poisoning' which are attributable to other causes, especially to turpentine.

"The whole available evidence indicates that the dangers attending the use of lead compounds are only the well-known mechanical dangers.

"There is no foundation for the importation of a new element of danger into the consideration of the question of paints. Lead paints are to be objected to only on the ground that they may enter into the system through careless handling or in the form of dust such as is produced by rubbing down old paint."

We have again dealt with the subject in a recent paper read at the Royal Society of Arts,³ and have stated our conclusions in the following paragraph:

"In point of fact, all solvents of oil which can be used in paints and varnishes as thinners are lethal substances. It is only seldom that painters compelled to work in confined spaces are overcome by their vapours; such cases must be regarded as abnormal, because they are, in fact, acute cases of poisoning, due to the high concentration of the vapours in the air breathed. In the ordinary practice of house painting the worker is exposed almost daily, during long periods, to air containing vapours at a low concentration; under such conditions, owing to the slow nature of the attack, the effects are frequently overlooked, though deep-seated changes may be in progress, the extent of which, even to-day, is not fully appreciated."

At Geneva, the question "Is medical science, generally speaking, in a position properly to diagnose lead poisoning?" was referred to a medical subcommittee composed of Dr. Desiré Glibert (Belgium), Dr. Frey (Germany), Geheim Hofrat Professor K. B. Lehmann (Germany), Professor Curschmann (Germany), Dr. T. M. Legge (Great Britain), Professor Loriga (Italy), Dr. José Gonzalez y Castro (Spain), Sir Kenneth Goadby, K.B.E. (Great Britain).

This Committee reported unanimously that:

"Medical science has been able for a long time to diagnose satisfactorily typical and severe cases of saturnism.

"Modern methods of diagnosis in the hands of specially trained medical men enable them:

"(1) To recognize saturnism in most doubtful cases.

"(2) To exclude cases of alleged saturnism.

"(3) To recognize lead absorption and lead intoxication at an earlier stage than heretofore."

This report told us only that specially trained medical men—in other words, the certifying doctors—could diagnose saturnism; of these, I believe, there are not a dozen in the country. Sir Thomas Oliver, one of the few lead experts, in his recent special address to the British Medical Association at Newcastle-upon-Tyne, mentioned cases within his knowledge in which death certified as due to lead poisoning was proved by *post-mortem* examination to be due to malignant disease of the intestine. We had with us at Geneva a master painter from Manchester, who told the Committee that his medical advisers long insisted that he was suffering from lead poisoning, although he assured them that he had not been in contact with paint for years; when ultimately he was operated upon he was found to be suffering from gall stone. For some unexplained reason my attempt in the committee to discuss the influence of turpentine was objected to especially by M. Glibert, the Belgian factory inspector and medical man.

When it was proposed to refer the following questions to the Medical Subcommittee—

1. What is the degree of risk of lead poisoning attaching to the painting industry, according to statistics?
2. What are the channels by which lead penetrates most frequently into the organism of the body?—

the further proposal was made to add:

Amongst painters' diseases attributed to white lead, should any proportion properly be attributed to any other cause than white lead?

This was defeated, and consequently my attempt to bring the question of volatile thinners under proper discussion was thwarted. Such are the methods of conferences; the scientific treatment of a subject appears to be barred.

The report of the Medical Subcommittee was:

"That, in so far as concerns painters using white lead or other lead compound, saturnism is the chief professional risk, but that the statistics are vitiated:

"1. As to mortality—(a) primarily, by the exclusion of cases of death due to saturnism which are grouped under other

headings; (b) secondarily, by the inclusion under saturnism of cases of death due to other causes.

"2. As to morbidity, by defects in notification and certification and by other imperfections."

As to the second question the Committee reported that:

"By far the most important danger is from dust which enters through the nose and mouth."

Of late years I have given much further attention to the effect of chemically neutral substances, anaesthetics and antiseptics, on living tissues. Their penetrating power and their power of exciting disturbances within the normal cell is astounding. My considered opinion is that the medical profession has yet to appreciate the insidious and often deep-seated effects that may be produced by repeated and continued exposure even to small amounts of vapours such as that of turpentine. Painters are known to be subject to sicknesses from which lead workers are as a rule free—such as kidney complaints and hardening of the arteries. It will be necessary to take careful note of the influence of such exposure in any future attempts to diagnose the symptoms and assess the danger arising from the use of lead paints.

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ST. BRENDA'S PRIVATE HOSPITAL, BRISTOL:

A HOSPITAL FOR PAYING PATIENTS.

BY

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REGISTRAR.

In the issue of the BRITISH MEDICAL JOURNAL for February 21st, 1920, Mr. William Billington published an article on the St. Chad's Private Hospital, Birmingham, and on July 16th, 1921, a discussion was opened at the Royal Society of Medicine by Sir Thomas Horder on the private clinic system. The following account of a private hospital which has been started in Bristol under the group system, and which is intended for patients of limited means, may therefore be of interest at the present juncture.

In Bristol, as in Birmingham, there was no provision for that large number of patients who were unable to afford the heavy expenses incident to an operation in a private nursing home, and who yet were not of the class for whom the voluntary hospitals are primarily intended—a state of affairs which is bound to lead to hospital abuse. It was felt, therefore, that a non-charitable, self-supporting institution, like that in Birmingham, which would take these patients at fees well within their means and give them all the advantages of the up-to-date modern hospital, would be a great boon, not only to the patients themselves but, it was hoped, also to their family doctors.

In drawing up the lines on which the hospital should be run there were obviously two schemes to be considered—one in which the institution should be run on the lines of St. Chad's; the other, in which it should be run in the same way as a modern general hospital, with its own staff and a fixed scale of fees. After a good deal of deliberation the second alternative was decided upon, and it was further laid down as a fundamental principle that no patient should be admitted without a note of recommendation from his own doctor.

Finance.

It was decided that no financial assistance should be sought from the general public, so that the staff, and the staff alone, would have the management, thus eliminating the danger of lay control with its desire for financial success and temptation to advertise, which would surely follow, as pointed out by Mr. Bishop Harman.

The fees to be charged were next decided. With these as a basis, it was resolved to start with 40 beds. Careful calculation and inquiry showed that, with 40 beds and the low fees, the hospital must be run on the small ward system, as separate rooms would mean too high fees for the restricted incomes of the patients to be catered for. Having arrived at this point, the number of the staff was decided upon as follows: Two surgeons, two physicians, a gynaecologist, an ophthalmic surgeon, a dermatologist, a surgeon in charge of the ear, nose, and throat department, two anaesthetists, a skiagraphist, and a bacteriologist, all of whom are on the junior staff of either the Bristol Royal Infirmary or the Bristol General Hospital and the Clinical Board of the University of Bristol.

Legal advice was then sought, and the twelve members of the staff formed themselves into a limited liability company. The company has issued ordinary and preference shares, all of which are at present held by the staff.

This is the present constitution of St. Brenda's, but it is meant to be only a temporary phase. The number of beds we could afford to open was limited, thus limiting the staff. This limited staff, on the advice of the lawyers, became a limited liability company. But the intention is not to rest here. As the hospital grows, and we have experience enough to show that it will grow, the staff is to be enlarged. It is hoped that when debentures have been paid off the constitution will be altered to take in the bulk of the junior staffs of the Bristol hospitals.

Premises.

The question of premises was one of the greatest difficulties the staff had to face. Building, at present prices, was out of the question, so, after a considerable amount of trouble, two large semi-detached dwelling houses in Clifton Park, close to the Clifton Downs, were secured and thrown together, and converted into a hospital on the small ward system. The majority of the wards contain three or four beds. There are two floors available for wards. The ground floor contains the surgical beds, the theatre and x-ray installation, and the second floor the labour ward, nursery, medical wards, and day rooms for men and women. This provides accommodation for forty beds. The pathological department and the dark rooms are in the basement. The rooms are lofty and well ventilated, and central heating has been installed.

The hospital is run on the lines of an ordinary general hospital. A great feature is "team work," and patients are more thoroughly overhauled than is usual in a general hospital. Very close touch is kept with the general practitioner who sends the case in. He is given a preliminary report on his case, and, if necessary, an intermediate one. On the discharge of the patient he receives a full account of the progress, treatment, and suggestions for further treatment. In any case of difficulty he is called in to the consultation, and is always warned as to the time of operation in a surgical case. Careful records of each patient are kept by the registrar.

The fees are 3 guineas a week for maintenance, 1½ guineas for professional attendance, and from 2 to 10 guineas for operations, according to their severity, and from 1 to 3 guineas for special investigations, such as x rays. No charge is made for routine clinical pathology, drugs, or dressings.

The hospital has been opened six months, and it has been found that the system works admirably. A factor which is greatly appreciated by the general practitioner and the patient is that the cost of treatment, investigation, or operation is known beforehand, as there are no extras whatever.

THE Swedish Parliament has allotted 6,000 kronen for the establishment of an institute for racial biology at Upsala, under the direction of Professor Lundborg.

The *Gazette Hebdomadaire* states that there are 22,990 medical practitioners in France and its colonies, of whom 5,415 reside in Paris.

THE London County Council is urging the Government to take steps to introduce legislation to give permanent effect to emergency measures passed during the war to permit a reduction in the number of jurors on coroners' inquests and to allow a jury to be dispensed with altogether in certain cases. In three districts, out of 152 inquests, 140 were held without a jury, with no complaint and with a great saving of expenditure.