Recollections of student life and later days / [C. J Bond].

RECOLLECTIONS OF STUDENT LIFE AND LATER DAYS

BY

C. J. BOND, C.M.G., F.R.C.S., F.L.S.

A tribute to the memory of the late
Sir Victor Horsley, F.R.S.

LONDON
H. K. LEWIS & CO. LTD.
1939.

6/-

RECOLLECTIONS OF STUDENT LIFE AND LATER DAYS

BY

C. J. BOND, C.M.G., F.R.C.S., F.L.S.

A tribute to the memory of the late
Sir Victor Horsley, F.R.S.

LONDON
H. K. LEWIS & CO. LTD.
1939.

RECOLLECTIONS OF STUDENT LIFE AND LATER DAYS.

A tribute to the memory of the late Sir Victor Horsley, F.R.S., in grateful recognition of his help and co-operation in research work by a fellow student and friend.

C. J. BOND.

Leicester,
Feb. 1939.

CONTENTS

	PAGE
Preface	6
Student Life at University College, London	7
Early Acquaintance with Victor Horsley	7
The Philomathic Society	7
Hughlings Jackson and the Inheritance of Acquired Characters	8
Life at 1 High Row, Kensington	9
The University College Medical Students' Society ...	9
The effect of Anæsthetics on Cerebral function	10
Horsley's Ill-health, persistent Cough	10
The Bedford General Infirmary	11
Horsley's Career as a Student at University College ...	12
The Vacancy for Assistant Surgeon at University College Hospital	13
Trypanosomes in the blood of a wild mouse	14
Lodgings in Charlotte St., Fitzroy Square	15
Holiday in Italy	16
The Brown Institution	19
Research on the Position and Movements of the Heart in the Chest	19
The Brighton Meeting of the B.M.A.	21
Marriage	21
Horsley's Interest in Archæology	22
University College Old Students' Dinner	23
Prof. Ehrlich's Visit to University College	24
The Effect of Projectiles on the Skull and Brain	25
University College Student's Society: Lecture on "Medicine and Heredity". C.J.B.	25

PAGE

Research on the Secretion of the oviducts in animals and the human subject 26

Uterine and Ovarian Physiology and Pathology in Rabbits 28

The British Medical Association. The Leicester Meeting, 1905 28

Visit to Canada. The Toronto Meeting B.M.A. 29

Addresses and Lectures in 1909 29

The Linacre Lecture 30

The Lecture at the Royal Institution, 1885 30

Psychological Fusion 33

To Sum up the Argument 35

Holiday in the Orkneys 36

The Holme of Scotness. The Rabbit Population ... 37

C. J. B. Visit to Vienna and Berlin 38

The Zoological Gardens, London. The Optic Disc in Birds and Animals 38

Research on the Regeneration of testicular tissue in Birds after orchidectomy 39

Horsley's Political and Sociological Interests 40

The National Health Insurance Act, 1911 40

Candidature for Parliament 41

Work for Temperance Reform 42

Capacity for Self-detachment. Ambidexterity 43

Brotherhood and other Addresses 44

The War. France, Egypt, India, Mesopotamia 44

Conclusion 46

Postscript 47

BY THE SAME AUTHOR.

The Nature and Meaning of Evil and Suffering. 1937.

Biology and the New Physics. 1936.

On Certain Aspects of Human Biology.
The W. Withering Lectures.
University of Birmingham. 1932.

Essays and Addresses by a Surgeon. 1930.

Racial Decay. The Galton Lecture. 1928.

PREFACE

THE fast diminishing number of his surviving friends and colleagues must be my excuse for recalling certain events in the life of the late Sir Victor Horsley, which show the wide field of his activities, and the ever ready help with which he encouraged fellow-workers to investigate problems in which, it might perhaps be thought, that he himself was not especially interested.

A further reason for drawing attention to this side of Horsley's work is, that it enables me to express the deep debt of gratitude that I myself owe to his memory for the kind and valuable help he was always eager to give in the carrying out of certain conjoint enquiries which, as far as I know, have not been referred to in any of the Victor Horsley Memorial Lectures, and only incidentally in Stephen Paget's Life of Horsley.

C. J. BOND.

Leicester, Feb., 1939.

STUDENT DAYS AT UNIVERSITY COLLEGE, LONDON

MY earliest acquaintance with Victor Horsley began in the Winter Session 1875-6, when, as fellow-students at University College, London, we both attended Professor Viner Ellis's Anatomy lectures, and Professor Burdon Sanderson's lectures on Physiology.

In the following winter I acted as a junior demonstrator in the dissecting room, and had as senior colleagues, J. Rickman Godlee (Lister's nephew), G. Dancer Thane, Ellis's successor in the chair of Anatomy, Stanley Boyd, late surgeon to Charing Cross Hospital, and Leander Starr Jameson, afterwards Prime Minister of South Africa.

Horsley was then working in the Physiological Department under Burdon Sanderson and Schäfer, and I well remember going on a deputation with Horsley and Boyd to Professor Sharpey, lately Professor of Physiology, to enlist his sympathy and support for a memorial which the students were raising to Professor G. V. Ellis, who was about to retire from the chair of Anatomy.

Horsley acted as one of the Junior Anatomy Demonstrators in the following Winter Session, 1877-8.

The Philomathic Society.

During these early student days I recall several events.

One was Horsley's keen interest in fundamental questions.

In collaboration with Dudley Buxton, Hubert Murray, H. D. Waugh, Horsley, myself, and one or two other students, a small society, called the "Philomathic Society" was started.

An opening paper on some philosophical subject was circulated, and members were invited to write down their criticisms which were also sent round. In this way a written discussion took place.

The first opening paper by Dudley Buxton was on the question, "Can there be an absolute Right or Wrong independently of a Theistic Existence".

On another occasion Horsley asked me to state in writing, "My own conception, not anyone else's, of the Nature of the Soul". I fear that even to-day, I should not be able to add much of importance to what I then gave as my answer to that difficult question.

In looking back over those early years I regard it as a privilege to have shared in the friendship of men like Horsley, Stanley Boyd, Hubert Murray, H. Maudsley, junior, F. W. Mott, Sainsbury, Dudley Buxton, and others, many of whom in later years filled important Hospital posts, and nearly all of whom have now passed away.

No doubt our excursion into the sphere of Philosophy suffered from the inexperience of youth, but I sometimes think that it was Horsley's interest in these questions of the Mind, which helped to determine his future career. Thus we find him giving a lecture at the Royal Institution on the Mechanism of the Will at the age of 29. No doubt, like his contemporary, Macewen, of Glasgow, he was also influenced by the fact that the Surgery of the Brain and Spinal Cord was at that time an unexplored field, just being made safely accessible, however, by Lister's work.

No doubt also Ferrier's pioneer enquiries into the localisation of Cerebral function, and Hughlings Jackson's classical observations and teaching guided Horsley's thoughts in the same direction.

Hughlings Jackson, The Inheritance of Acquired Characters.

I have mentioned Hughlings Jackson's name. Although the correspondence took place some years later, *i.e.*, in 1903, I will here mention some interesting letters I received from Hughlings Jackson (to whom I had sent a paper "On the inheritance of Acquired Characters")*, asking me if I would

* Trans. of the Leicester Lit. & Phil. Society, Vol. V., Oct., 1899.

carry out certain experiments on a quick-breeding animal like the Rat.

The problem for investigation was, whether the paretic effects which follow the removal of certain motor centres in the brain would be transmitted to offspring.

Jackson explained that he hesitated to ask Horsley to perform the operations as he was so busy.

But as I possessed no facilities for carrying out the experiments in Leicester, the project fell through. I was sorry at the time not to be able to further Jackson's interest in the young Science of Heredity, but from what we have learned in more recent years about the Inheritance of Acquired Characters, I do not think that the suggested experiments would have thrown any additional light on the problem.

Life at High Row, Kensington.

Another event of interest was connected with my frequent visits to Horsley's home in High Row, Kensington. There I made the acquaintance of his father, J. C. Horsley, R.A., the distinguished painter, his mother, and his brothers and sisters, all gifted members of a gifted family. I also remember the incident mentioned in Paget's life of Horsley, when the over-zealous practice with firearms by the young Horsleys, in the garden at the back of the studio, shown in the sketch by Mendelssohn, who had been a frequent visitor, resulted in serious damage to one of J. C. Horsley's paintings.

The Medical Students' Society.

We were both in those days frequent attendants at the meetings of the University College Medical Students' Society.

Horsley read a paper during the 1875-6 Session "on the ending of the tendons in the rat's tail," and another "on the structure of the intervertebral discs," for which he was awarded a prize of £5 by the Students' Society.

It was at another meeting of the same Society that I demonstrated, on myself, voluntary contractions of the Tensor

Tympani muscle. This was shown by means of a tube inserted into the meatus, connected up with a U-shaped tube containing water. Contractions of the muscle caused a disturbance of the level of the water in the tube.

It would be interesting to know how many individuals in the population possess this power to contract at will one of the internal ear muscles which normally, are under automatic control.

On the Effect of Anæsthetics on Cerebral Activity.

While filling resident posts in the hospital, Horsley carried out a remarkable series of observations on the effect of different anæsthetics on his own cerebral activities.

With the assistance of fellow Residents, taking notes during the inhalation of the anæsthetic, it was found that the loss of brain function always took place in the same order. He then went on to study the effect of the inhalation of nitrous oxide gas on the reflex movements of his limbs. These experiments are recorded in Paget's life, and in "Brain," October, 1883. They are also referred to in the Rees and Raper Memorial Lecture, "On the effect of alcohol on the human brain" (April 27th, 1900).

Ill Health and Persistent Cough.

It was at this period, and after he had completed his appointment as House Surgeon to Professor John Marshall, F.R.S., that Horsley developed a persistent cough. He himself believed he was suffering from Phthisis.

He was depressed by the thought that he might not be able to carry out his contemplated researches into the Physiology and Surgery of the Central Nervous System.

Fortunately for Science and Humanity he ultimately regained robust health.

He wrote me a characteristic letter at the time expressing his doubts about the future, and sent with it a beautifully

made little Trephine, about 4 m.m. in diameter, suitable for trephining the frog's skull.

During the following vacation in Leicestershire, I succeeded, with the help of this little instrument, in removing the greater part of both cerebral lobes in a Toad.

The animal recovered from the operation and could catch worms and flies, but the loss of the forebrain was followed by the arrest of the normal toad's instinctive habit of digging itself into loose ground at the approach of winter.

The normal toad does this by an outward shovelling movement of the flexed hind limbs, by which it lowers itself, tail end first, into the loose ground.

The Bedford General Infirmary.

After qualifying as M.R.C.S., L.R.C.P., in 1879, I was appointed House Surgeon at the Bedford General Infirmary. At that time the House Surgeon at Bedford was the only qualified Resident Medical Officer. He also had charge of Small Pox, Typhoid, and other cases of infectious disease in a separate building in the Infirmary grounds. The nurses were uncertificated elderly women, but with much practical experience of illness.

Horsley, who was then acting as Surgical Registrar at University College Hospital, spent several week ends with me at the Bedford Infirmary, and was much interested in some observations I was making into the structure and function of the Salivary glands in the Woodpeckers.

In these birds the non-sticky Ptyalin, and the adhesive Mucus secretions are formed in two separate but loosely connected glands.

Horsley cut sections and made drawings of this dual gland, but the records of these observations were never published. It is probable, I think, that the formation of two distinct secretions in two separate glands, depends on the need for making the surface of the long whip-like tongue sticky, when it is thrust into the bark of a tree or an ant's nest, and free from adhesive

mucus when it is withdrawn into the bird's mouth, and the adherent insects are swallowed.

Horsley's Career as a Student.

Horsley's career as a student at University College and Hospital was a brilliant one. Besides securing high honours in the London University Examinations for the M.B. and B.S. degrees, he carried off a number of medals in the College Class Competitions.

He also filled with distinction Resident Appointments in the Hospital. Marcus Beck, at that time Assistant Surgeon to the Hospital, expressed his firm conviction that Horsley was a genius and would have a brilliant future.

A prophecy which was abundantly fulfilled

The later stages of Horsley's career are recorded in Paget's life.

He was appointed Assistant Surgeon to University College Hospital in 1885, Full Surgeon in 1893, Surgeon in Charge of Hospital Beds in 1900, and Consulting Surgeon on retirement from the Acting Staff in 1906.

In 1882, he was appointed Assistant Professor of Pathology in the College, and in 1884, Professor Superintendent of the Brown Institution.

In spite of long and crowded days, he found time to help fellow workers in other fields.

New calls upon his time and energy seemed to act as stimulants to further effort. Brimful of kindness and enthusiasm for new knowledge, he shed abroad among fellow workers the glow of his personality. In the heyday of youth and vigour, never tired, and, apparently untireable, he was then, as in later days, ever eager for the fray.

In these earlier years, however, he was mainly engaged in wresting secrets from "Nature," and struggles with "Nature" do not leave embittered memories; whereas in later years he was immersed in differences with fellow human beings. He

became active in dispelling ignorance in high places, in combating antiquated ideas and outworn methods in the Social and Political sphere, and in attacking vested interests.

Struggles of this kind are apt to leave bitterness, and a sense of resentment in the minds of those who lose, and sometimes in those who win the day.

The Vacancy for Assistant Surgeon at University College Hospital.

In June, 1893, Horsley wrote to me saying that he had heard that I might possibly become a candidate for the then vacant post of Assistant Surgeon at University College Hospital, if I were invited to apply.

I replied, that much as I appreciated the suggestion, I felt that, as my living depended on my private and hospital practice in Leicester, I should not be justified in taking the risk of applying for the post in London.

I received a characteristic letter in reply, from which, since it throws light on consulting surgical practice in London at that time, I will quote the following. Horsley writes: "There can be no doubt, I fear, that your philosophic reasoning is correct. . . . It is however, worth while to look for a moment at the present state of consulting surgical practice in London. Formerly, *i.e.*, up to 20 years ago, there were large numbers of consultants living, not by the merit of their opinion so much, as by their skill in operating. . . Now they are nearly extinct, and what remains? Why simply the fact that operations are done in many cases by General Practitioners, certainly in the Provinces, and the Consulting Surgeon in London is fast specialising, and devotes himself to training his opinion in obscure cases. . . If you came to London on your general reputation, I am sure it would not be appreciated, for the reason that the demand no longer exists. If you began to work at a special branch, you would be five years before the Profession recognised your work at its proper value."

I have no doubt that this view accurately represented the position of surgical practice in London at the time it was

written. The great increase in the number of operations performed all over the country both in private and hospital practice in later years, has however restored to London surgeons an increased demand for the highest operative skill in difficult cases.

In reply to my expressed desire to obtain better facilities for Research Work in Pathology, Horsley wrote: "Now for your wishes re Pathology, with which I need not say how deeply I sympathise. For several years I have concluded that the only way to reach this end is as follows. Never to give up working at original Research for more than 6 months, in order not to lose touch, and not to trust to be able to withdraw later from practice for this end. In actual method, and in order to carry out (1) it is clearly necessary to devote a day a week to Pathology. I choose Saturday. On Saturdays I see no one whatever, save of course, urgent cases and country visits, which I cannot afford to refuse. As regards Laboratory accommodation, there you are hardly placed in Leicester, and I cannot tell what to advise. One remedy would be your taking a week occasionally, and come and stay here, and work out the beginning of some Research in my laboratory, and organise the method. It is so difficult to make suggestions, but I have one more, I mean the employment of an Assistant. I am sure that men delay too long on this point. For any one to preserve freshness of originality, he must be free from the drudgery of Practice. By drudgery I mean the having to remember and think over relatively trivial matters."

I shall refer later to this very kind offer of Laboratory facilities. I may also add that the absence of facilities for Pathological Research mentioned in my letter to Horsley, was largely remedied a few years later, by the establishment of a Pathological Department at the Leicester Royal Infirmary.

The Occurrence of Trypanosomes in the Blood of a Wild Mouse.

Horsley's keen interest in the work of fellow students was shown on many occasions thus: I was spending a Sunday

during the summer of 1882 with F. G. Penrose* (a fellow old Reptonian), at Wimbledon. During an afternoon walk I noticed a mouse, evidently ill, with ruffled coat, sitting in a semi-conscious state on the railway bank near Penrose's house. I was interested in the Pathology of the blood and had written a paper on the subject (see Lancet, September 10th and 17th, 1887), and I was anxious to examine the blood of the mouse microscopically. We found it crowded with actively moving Trypanosomes (probably Lewisii), as Lewis's observations on Trypanosomes in the blood of rats in India had recently been published.

Penrose showed a slide of the mouse's blood the following day to Ray Lankester, then Professor of Zoology at University College. Horsley took a keen interest in the discovery, which, as far as I know, was the first occasion on which the presence of Trypanosomes in the blood of a wild rodent had been recorded in England.

He also stained a number of slides showing the organisms in the blood, and I still possess one, on the label of which he wrote in his cheery way, "To C. J. Bond, from his devoted admirers, F.P., D.G. and V.H."

Rooms in Charlotte Street, Fitzroy Square.

Having resigned the House Surgeonry at the Bedford Infirmary in the spring of 1882, I returned to London to study for the final F.R.C.S. Examination, and for some months shared a bedroom and sitting room with Horsley at 101 Charlotte Street, Fiztroy Square. He was at that time acting as Surgical Registrar at the Hospital.

As an example of his energy and enthusiasm, I recall one occasion when, after working in the wards all day, Horsley suggested that we should spend the night in operating on the dead body in the old post mortem room. This we did, and resumed work in the wards the following day. This practical experience was very useful to me in view of the approaching F.R.C.S. Examination.

* Penrose's father was at one time head of the British School of Archæology in Athens.

During the same year, Horsley carried out a number of important observations on "The Transplantation of Tumours," and also wrote a long report for the Local Government Board "on Septic Bacteria" (see Paget's Life, p. 43 and 44).

Holiday in Italy.

In October of the same year we spent a delightful holiday together in Italy. We went by sea in the S.S. Malta from Liverpool to Genoa, calling at Gibraltar on the way.

An account of this holiday has been given in Paget's Life of Horsley. I will now therefore only mention a few incidents which are not alluded to in any detail in that book.

On our arrival at Gibraltar, the captain of the Malta received an urgent message enquiring if we had a surgeon on board. It appeared that, during some change in the rigging, the main boom had fallen on to the deck of a Collier lying outside the harbour. The captain and one or two of the crew had been seriously injured.

Horsley and I went aboard the Collier and in descending the companion ladder leading down from the iron deck, my heels slipped up, and I fell on the back of my head. On coming round from the momentary unconsciousness, I can recall the feeling of security which I experienced, when I remembered that any possible head injury would be well looked after by Horsley.

We found that the captain had several broken ribs, and was also suffering from internal injuries which required his removal to the hospital on shore. He died a few hours later.

On leaving Gibraltar, we passed a section of the British Fleet returning from the bombardment of Alexandria, and after an enjoyable cruise we reached Genoa.

After visiting Pegli and the Corniche Road, and Pisa, with its famous Campanile, we went by sea to Naples, where we said goodbye to the "Malta." We called at the Dohrn Marine Biological Station and the Naples Museum, and then made our way over Vesuvius to Pompeii.

The volcano had recently been active; we ascended by the railway, and after an inspection of the crater and the issuing streams of molten lava, we walked down on the Pompeian side, through the ashes which partly covered that side of the mountain.

We stayed the night at Pompeii, and I can recall an altercation with an Italian sentry who objected to our moonlight ramble through the streets of the deserted city.

While at Naples we also made an excursion to Paestum, where we spent an enchanting day exploring the Grecian Temples which then stood in their lonely grandeur on the plain which at that time was infested with malaria, and was not entirely free from Bandits. Horsley seemed pleased that he was carrying a revolver, while I sincerely hoped that no occasion for its use might arise. In recalling these incidents it should be remembered that the conditions of life, both in the cities and in the country districts were very different in the Italy of 1882 from those present in the Italy of to-day.

From Naples we made our way to Rome, where we spent some very instructive and strenuous days. Horsley's life-long interest in Roman civilisation and Roman remains began, I believe, with this, his first visit to the "Eternal City."

The Forum, The Colosseum, the Palace of the Cæsars, the Temples, the Fountains and the Aqueducts, all appealed to him in a wonderful way.

He conjured up in imagination the ancient civilisation and the life of a bygone age.

Many visitors to 25 Cavendish Square must have admired the large photograph of the Castle of S. Angelo and the Tiber, which hung on the dining room wall.

While at Rome a visit was made to the Campagna. In those days this undrained area was infested with malaria. Many of the peasants, especially the children, showed the protruberant abdomen, due to the enlarged Spleen, or "Ague Cake," and the anæmic look characteristic of malaria. We called on Professor Machiafava, who was then studying

malaria, and we spent several days and nights exploring the Mediæval Churches, the Vatican, and the remains of the ancient City as far as these were visible in the Rome of 1882.

A visit to the Polyclinico Umberto Hospital revealed a different kind of picture. In 1882 maggots could be seen dropping out of the exposed suppurating wounds, while to-day, a statue of Lister, carrying on his beneficient work, adorns the Facade of the same hospital.

At that time the antiseptic method of wound treatment had not reached Rome. It was indeed only just gaining an entry into some of the London hospitals. At University College Hospital it was more favourably received, largely owing to the teaching and example of Marcus Beck and Rickman Godlee, both relatives of Lister.

From Rome we went to Florence, and spent some delightful hours in the Campanile, the Logia, the Civita Vecchia, and the Uffizi, and Pitti Galleries.

While visiting the latter we were fortunate enough to come across Sir Fredick (afterwards Lord) Leighton, P.R.A. Sir Frederick was a friend of Horsley's father, and was very pleased to meet his son.

Sir Frederick's talk on Italian art, as illustrated by the masterpieces on the walls of the gallery, by a master of the subject, was an experience to be treasured in the memory.

Our next journey from Florence to Venice was an eventful one.

It was the year of the great flood in the Valley of the Po. Many of the rice fields were under water, and the journey from one railway station to another, where the railway track was submerged, was made by boat.

We returned from Venice to England via Milan and the St. Gothard Pass, and reached London in November.

We had lost no time in seeing all we could in the few weeks at our disposal, and we saved a considerable amount on hotel expenses by sleeping in the train, when travelling by night from one place to another.

The Brown Institution.

I have already mentioned that Horsley was appointed Professor Superintendent of the Brown Institution in 1884, at the age of 27. He held the post from 1884 to 1890. It was at the Brown Institution that he began those researches on Cerebral localisation, and on the function of the Thyroid gland, and Myxædema, which made his name famous. His work on the prevention of Rabies in dogs which followed his visit to Pasteur in Paris, was largely instrumental in stamping out the disease in this country.

His researches on the Brain and Spinal Cord were continued later in collaboration with Charles Beevor and Professor Schäfer (see Paget's Life, p. 50, etc.).

Research on the Movements and Position of the Heart in the Chest.

It was at the Brown Institution that Horsley greatly helped me with an "Enquiry into the effect of changes in bodily position, and thoracic movements, on the position of the Heart in the Chest, and on Intracardiac pressure."

While House Surgeon at the Leicester Royal Infirmary, I had devoted much of my spare time to the investigation of this subject.

By means of a rubber collapsible air tampon passed down the gullet to a point where the left Auricle lies in contact with the Oesophagus, and by connecting this tube, carrying the air tampon, with a tambour and a pen writing on a recording drum, I was able, both on myself and on one of my assistants, to demonstrate the "base beat" of the heart, and the effect of changes in bodily position and respiratory movements on the position of the heart in the chest.

If the partly transparent diaphragm of the guinea pig be observed from below, through an opening in the abdominal wall, the heart will be seen to recede on placing the animal on its back and the lungs to encroach on the space formerly occupied by the heart's apex.

Having obtained all the information I could by experiments on the human subject, I was anxious to confirm and extend these facts by observations on animals. Horsley most kindly offered to carry these out at the Brown Institution in London.

The effect of changes in bodily position on the intra-cardiac blood pressure was observed by means of a flexible tube passed down the internal jugular vein into the right auricle in a fully anæsthetised dog, and also later in a sheep.

This tube was connected with an air tambour and recording drum as before, and the effect of changes in bodily position on the Intra-Auricular blood pressure was thus recorded.

These experiments on animals confirmed the earlier observations made on the human subject. They also showed that the death of a sheep after lying on its back for some time in a depression, or as farmers say, when "cast," is not due to any interference with the respiration, but to the fact that when a sheep lies on its back for any length of time the heart falls back on its base against the spine, and the Auricles and eventually the Ventricles do not fill with blood. When a four-footed animal like the sheep is in the standing position the heart hangs suspended by its large vessels from the spine, whereas when lying on its back in a furrow, the wool prevents it from rolling on to its side, and regaining the standing position. These observations with a short reference to Horsley's share in the work were published in the British Medical Journal of December 12th, 1885.

They received further confirmation during the War when a soldier (J.W.H.), was wounded while lying on his back, by a machine gun bullet from an enemy aeroplane, on September 29th, 1917.

The bullet entered the chest to the left of the Sternum and became imbedded in the wall of the Left Ventricle.

By the help of X-Ray screening, and Radiograms, it was possible to accurately measure the movements of the bullet (and

so of the Ventricle), under varying changes of bodily position and respiratory movements.

The late Sir James Mackenzie kindly examined this patient, and took Electro Cardiograms, which however showed little interference with normal Cardiac function.

The patient is still alive, and is able to do light work, 21 years after the injury.

This case was reported with tracings of the heart movements in the R.A.M.C. Journal of September, 1918.

The Brighton Meeting of the British Medical Association.

At the Annual Meeting of the British Medical Association held at Brighton in August, 1886, Horsley read a paper on "Brain Surgery." He showed three patients on whom he had operated at the Queen Square Hospital.

Charcot and Hughlings Jackson were present, and congratulated Horsley on his brilliant results. Sir John Erichsen, who presided, expressed the opinion that Modern Surgery would, in the future, owe its advance to those means of experimental research which were being worked out in Biological and Pathological Laboratories.

Surely a striking tribute to Horsley's use of the experimental method.

I well remember Horsley calling to me as we were leaving the meeting, to go with him for a walk along the sea front, in order, as he said, to allow the boiling in his brain, aroused by the enthusiastic reception of his paper, to settle down.

Marriage.

On October 4th, 1887, Horsley married Eldred Bramwell, a daughter of Sir Frederick Bramwell, F.R.S., the eminent Engineer.

He brought his wife to visit us in Leicester on several occasions. I recall one such visit which followed the Nottingham Meeting of the British Medical Association, at which Horsley presided over the Section of Pathology.

INTEREST IN ARCHÆOLOGY.

We visited the Leicester Museum, with its Roman antiquities, the Roman Milestone, and other relics of the Roman occupation of Ratæ (Leicester).

Horsley's interesting description of these and other objects revealed his wide knowledge of other Roman remains in Great Britain, in the exploration of some of which he had himself taken an active part.

If he had been alive to-day he would have seen with delight the excavations which have been going on for the last two years in Leicester under the able direction of Miss K. Kenyon, M.A. These have now revealed the foundations of the Roman Baths, the Basilica and Forum, which occupied the centre of the Roman and the Mediæval, and now the Modern city of Leicester.

Horsley's deep interest in Archæological Research continued throughout his life. Whenever the opportunity occurred, during holidays in different parts of England, Scotland, or the Orkney Isles, he was always eager to explore some Pictish mound or barrow, some stone circle, cathedral, or monastery.

On the little Orkney Island of Eyn-Hallow, and its ruined monastery, we spent some happy hours.

When stationed in Egypt during the War, Horsley showed the same interest in the Temples and Tombs, and other relics of an ancient civilisation. He was also an authority on Prehistoric Trephining, and gave several lectures on the subject, including one on the Paris Neolithic skulls, which show evidence of that operation.

It was during one of his visits to Leicester that he lectured on "Asphasia" to an audience of medical men in the Board Room at the Leicester Royal Infirmary. In that address he described the bearing of the new knowledge on the subject, and on certain points in which he differed from Professor Bastian's views.

UNIVERSITY COLLEGE OLD STUDENTS' DINNER. "THE SURGEON AS PATHOLOGIST."

It was at the commencement of the Winter Session a few years later, that I was invited to preside at the University College Old Medical Students' Dinner. In the course of some after dinner remarks, I gave it as my opinion that a Surgeon should also be a Pathologist.

This met with some criticism on the part of a subsequent speaker, a member of the Hospital Staff.

It so happened that Sir J. Rickman Godlee was sitting on my right, and Victor Horsley on my left, and I remember feeling reassured when I realised that both my neighbours were not only eminent Surgeons, but also distinguished Pathologists.

Evidently the old tradition of the Surgeon as merely a craftsman, still lingered in the minds of some of my hearers.

And yet when we come to consider the matter it is difficult to understand how any one can be a fully equipped Surgeon unless he understands, to some extent, the working of the predominant partner in the healing process, I mean the "Vis Medicatrix Naturæ."

As Sir Jonathan Hutchinson wisely said, "A Surgeon should be a Physician who knows how to use his hands."

Some years later, on November 10th, 1921, I referred to the same point in the Mitchell Banks Memorial Lecture given at the University of Liverpool. The title of my address was "The Surgeon as Pathologist."

My old friends, the late Sir Robert Jones and Professor Thelwall Thomas were present, and both were kind enough to express their approval of my remarks concerning the importance of some knowledge of Pathology to the Surgeon.

In this connection the name of Lister at once rises in the memory.

It was largely Lister's knowledge of Pathology and Bacteriology that enabled him to extend and apply Pasteur's

discoveries to surgical practice, and thus led to his own magnificent contributions to the prevention of Suffering, and to the Health and Happiness of Mankind.

I remember listening to the somewhat bitter criticisms made by Sir Wm. Savory and other Surgeons of the old school, of Lister's methods, at the Annual Meeting of the British Medical Association at Cambridge in 1882. I also recall Lister's dignified and convincing reply.

One then realised that it was largely because Lister's opponents did not understand, nor appreciate, the principles underlying the practice of Antiseptic Surgery, that led to their bitter attacks on Listerism, and even in some cases on Lister himself. In fact the critics were neither Pathologists nor Bacteriologists.

I should here like to refer to the excellent address given by Professor William Bullock, F.R.S. "on Lister as a Pathologist and Bacteriologist," published in the British Medical Journal, April 9th, 1927.

It is also of interest to note that Horsley himself delivered the Mitchell Banks Memorial Lecture at Liverpool in 1914. He devoted the main portion of his address to a description of Mitchell Banks' valuable contributions to the Art and Practice of Surgery.

Professor Ehrlich's Visit to University College, London.

In 1894 while Superintendent of the Brown Institution and Professor of Pathology at University College, Horsley was investigating, with Dr. Butler Harris, the oxidising capacity of the different bodily tissues, especially the Brain.

I recall a demonstration in the Laboratory at University College, at which Professor Ehrlich was present and in which, after the intravenous injection of Methylene blue in the leuco, or colourless form, Horsley exposed the motor area in the cat's brain, and then applied electrical stimulation to certain cortical centres. The areas so stimulated rapdily assumed the blue colour, and I recall Professor Ehrlich's excited remark, "Blau, Blau!" on seeing the change take place.

It may be of interest to add that, when the International Medical Congress, over which Sir Thos. Barlow presided, was held in London in 1913, Professor Ehrlich attended the Congress, and several members of the Medical Research Council (including myself), had the pleasure of meeting him at a reception given by Lord Astor, then Chairman of the Council, at Clieveden on the Thames.

The Effect of Projectiles on the Brain and Bodily Tissues.

It was also in 1894 that Horsley was investigating the effect of projectiles on the bodily tissues, and the Brain.

During a holiday spent at Worthing he persuaded a local butcher to allow him to shoot one or two beasts with the new Lee Mitford Service Rifle, in order that he might observe the explosive effects of the bullet on the brain and skull.

These and other experiments on Intra-Cranial pressure, as a cause of death, occupied much of his attention at that time. They formed the subject of an important lecture at the Royal Institution in 1894, and also led to a wider enquiry into the question of Cerebral Compression in the human subject.

University College Medical Students' Society. Lecture on "Medicine and Heredity."

In 1912 I received an invitation to give an address to the University College Medical Students' Society, and chose for my subject, "Medicine and Heredity."

Although Mendel's work on Heredity had been rediscovered by Correns, Bateson, and others in 1900, very little was known or taught about Genetics in the Medical Schools or Universities in 1912.

I do not think that Horsley was greatly interested in the subject of Heredity at the time though he became so later. His interest was probably stimulated by his subsequent enquiries into the effect of Alcoholism on the germ cells. He also wrote an article on "Parenthood and Alcohol" in Pitman's Dictionary. One of his old patients on whom he had operated

wrote in 1902, "Sir Victor holds that boys inherit their brains from their mothers, and whatever brains his own sons possessed were inherited from their mother."

To return to the subject of the lecture, Horsley, with J. Rose Bradford and other members of the Hospital Staff were present, and in his remarks in the discussion which followed, Horsley began by saying that "he was born of poor but respectable parents," and went on to speak of the circumstances which had influenced his own career. I remember thinking at the time that his discription of his parents as "poor but respectable," was far too modest an estimate, and inadequately represented the intellectual gifts and artistic endowments which the members of the Horsley family had inherited from parents and ancestors.

This lecture on "Medicine and Heredity" was published in the University College Magazine for April, 1912.

Since that time the Science of Genetics, and in a less degree, our knowledge of Human Heredity, has grown by leaps and bounds. It is beginning to permeate the teaching in our Schools and Universities, and is slowly influencing our attitude to Social and National problems.

The Heredity chart of the Horsley family, prepared by Miss Pocock, with the help of Lady Horsley, illustrates the way in which the special musical, artistic, manual dexterity, and intellectual and temperamental characters were incorporated into the hereditary constitution of the Horsley family by intermarriage with members of other gifted families during previous generations.

Research on the Secretion of the Oviducts in Animals and the Human Subject.

Another Research in which Horsley helped me was concerned with the secretion of the Fallopian Tubes in the human subject, and the oviducts and uterine cornua in animals.

By doubly ligaturing a section of the Uterus and by comparing the nature of the fluid in the distended cornu with

the secretion which collects in a blocked Fallopian tube, or Hydro-Salpinx, we found that this watery saline fluid resembles, in chemical constitution, sea water, or rather the more concentrated sea water of an earlier geological period.

Thus, the watery environment which surrounds the Mammalin Ovum after it escapes from the Ovarian follicle, resembles in Physical and Chemical composition that into which the Ova of fishes and other marine animals was (and is still) shed when the land animals began to exchange a marine for a land environment. The same is also true to a certain extent in the case of the male Germ Cells.

Although certain albuminous fluids are added by the Prostate and other glands, yet the secretion in the efferent ducts of the Epididymis into which the Spermatozoa pass from the Tubuli seminiferi of the Testis, is a clear watery saline fluid such as we find in a Spermatocele. This may, however, be opalescent if Spermatozoa are present in the fluid. As the evolution of land animals proceeded and the mammals came into existence further changes occurred in the structure and function of the lining membrane of the uterus whereby the implantation of the fertilised ovum became possible.

But even in the female mammal, the secretion of the Fallopian tubes and oviducts is still a watery saline fluid under normal conditions. In the birds further specialisation has taken place whereby the ovum becomes encased in a protective calcareous shell.

A record of some of these observations was, through Horsley's influence, published in the journal of Physiology, February 18th, 1898. Other papers on the same subject also appeared in the British Medical Journal, June 4th, 1898, and in the Lancet, July 22nd, 1899.

I hope some Biologist interested in the subject will examine the secretion of the oviducts in the Amphibia.

Double ligature of a section of the oviduct in the female frog followed by a chemical examination of the retained secretion would, I think, confirm the facts now described.

RESEARCH ON UTERINE AND OVARIAN PHYSIOLOGY AND PATHOLOGY IN RABBITS.

During 1902-3 I was investigating some points in Uterine and Ovarian Physiology and Pathology in the rabbit.

Horsley most kindly performed the necessary operations and gave me valuable help. Although his share in the enquiry is only briefly alluded to in the published paper describing these results in the British Medical Journal, July 21st, 1906, this apparent omission will be explained later.

Through this enquiry we hoped to throw further light on (1) The influence, if any, of the mucous membrane of the Uterine Cornua on Ovarian growth and function.

(2) On the secretion of the saline fluid by the Uterine and Tubal mucous membranes.

(3) On the question of compensatory hypertrophy occurring in the remaining ovary, after unilateral ovariectomy.

(4) On the conditions which favour the occurrence of extra Uterine pregnancy in the rabbit.

The animals were kept at Leicester before operation, and after recovery. The operations were performed in Horsley's laboratory at University College, London.

THE BRITISH MEDICAL ASSOCIATION. THE LEICESTER MEETING, 1905.

1905 and 1906 were very busy years in Horsley's life.

The Annual Meeting of the British Medical Association was held in Leicester in July, 1905. Horsley presided over the Representative Meeting of the Association, which he had done so much to develop on Democratic lines. He, with Stanley and Mrs. Boyd, F. W. Mott, F. Hinds, Hubert Murray, and other old University College friends stayed with us for the gathering.

It was my privilege to give the Address in Surgery at the same meeting (British Medical Journal and Lancet, July 27th, 1905).

Visit to Canada.

In the Summer of 1906, my wife and I travelled with Sir Victor and Lady Horsley and family to Canada, where he was to give the Address in Surgery at the Toronto Meeting of the British Medical Association.

This Address was a masterly exposition, illustrated by photographs and lantern slides. In it Horsley reviewed the whole field of Brain Surgery up to that date.

It was a very important lecture, and the University of Toronto conferred on him the degree of LL.D. in recognition of his pioneer work in the new field.

It fell to my lot to open the discussion on "Septic Peritonitis," in the Surgical Section at the same Meeting (British Medical Journal, November, 1906).

The Horsleys and ourselves arrived in Quebec, by way of the St. Lawrence River, some ten days before the meeting began. We joined in an excursion to Roberval, on Lake St. John, some 250 miles north of Quebec, where we had the exciting experience of returning, during a storm, across the lake in birchbark canoes, paddled by Indians. We landed at St. Jerome and made the return journey to Tadousac, on the St. Lawrence, by boat down the Sagenay River, passing Chicoutimi on the way.

From Tadousac we travelled by rail to Toronto. Later we went to Montreal where we visited the McGill University, and then on to Ottawa.

Horsley gave a number of lectures and addresses on Temperance, and other socialogical problems while in Canada. My wife and I journeyed up the Great Lakes as far as Soult St. Marie, before returning home.

Other Addresses in 1909.

I have mentioned Horsley's "Address in Surgery" at Toronto in 1906.

He also attended the British Association Meeting at

Leicester in the following year, when he was President of the Physiology Section.

The Linacre Lecture, 1909.

In 1909 he delivered the Linacre Lecture to the Master and Fellows of St. John's College, Cambridge.

Stephen Paget, in his Life of Horsley, describes this address as the most philosophical of all Horsley's writings on the Nervous System.

It deals with a number of Psychological problems from the Physiological and Neurological points of view.

In it Horsley pointed out the inportance of regarding "the anatomical construction of the Cortex Cerebri" (as Hughlings Jackson had previously insisted), from the evolutionary standpoint. Thus he says:—

"There is no such thing as a purely motor centre. Every Brain Centre must be sensori-motor in structure and function," and he supported this conclusion by experimental and clinical evidence.

In his Hughlings Jackson lecture given in 1906, Horsley had expressed the opinion that the localisation of function in different areas of the Brain is relative and not absolute. He writes, "The Brain works as a whole. Every part of the body is conceivably represented in every nerve centre."

The Royal Institution Lecture, 1885.

Another very important earlier lecture was that given at the Royal Institution on March 27th, 1885, "On the motor centres of the Brain and the Mechanism of the Will."

In it Horsley showed, or attempted to show, by means of observation and experiment that "the consciousness of our existing as single beings, the consciousness of our possessing one will, while at the same time we know that we possess a double nervous system is due to the fact that pure volition is dependent entirely on the exercise of the attention, which connotes the idea of singleness." And again he says, "I deny

that two voluntary acts can be performed at the same time. The conditions necessary for the fulfilment of volition can be summed up in the word attention."

He went on to make use of his ambidextrous capacity to show that, if an attempt be made to draw a circle with one hand and a triangle with the other, the result will be a circular triangle and a triangular circle; whereas if we possessed a dual instead of a single mind then, assuming that each cerebral hemisphere is capable of sending a message from its intellectual to its own motor area, then the figures drawn would be correct and distinct, and not fused.

I have dealt at length with Horsley's explanation of the singleness of the "Ego" because in this lecture he arrived at the same conclusion as that which he subsequently reached in his Hughlings Jackson Lecture, namely that the Brain works as a Whole.

We conceive of ourselves as a single, not a dual Person, in the same way that we interpret the two retinal images of a single object which are received by the two optical centres in the occupital lobes of the Brain as a single image.

As Horsley writes, "If the brain appears to us to be engaged on two ideas, or in carrying out two distinct motor actions at the same time, then one of these must be automatic and not strictly voluntary." In other words we cannot fix our attention on, or retain in focal consciousness two distinct ideas at the same time, though two ideas can of course occupy focal consciousness alternately.

What then is the significance of this remarkable fact, that while the Brain and the Body are double the Mind, at any rate in the normal waking state, is single? There is no doubt that the possession of a unified Consciousness and a co-ordinated Will, has been of great value to man in the struggle for existence, and in securing a larger measure of control over the environment.

As to the means by which this acquisition of a unified, in place of a dual mind, has been brought about, we know that

it has developed pari-passu with the increased growth of the commisural nerve fibres which connect different areas of the same cerebral hemisphere, and one hemisphere with the other.

But this development means a higher degree of "Organisation," or in Herbert Spencer's phrase, "Integration," of the central nervous system.

Moreover, when we speak of an imperfectly unified consciousness, or of a more or less disintegrated Personality, we approach the abnormal, and are concerned with those mental states with which Psycho-analysis and Psychotherapy deal, and by the help of which the re-integration of the disintegrated Personality is, or may be brought about.

I have spoken of "Organisation"* and "Integration" as the process by which a unification, or synthesis of the consciousness, or mind, is brought about in the individual. The question arises whether we may not also conceive of the same process as acting in a wider sphere, that is as a factor or influence in bringing about the unification of the Thought and Mind of the Universe. In this connection I may refer to Chapter xiii. in my book, "Essays and Addresses by a Surgeon," 1930. Is there a Social Consciousness?

Although human beings, in common with other vertebrates, possess a dual Brain, yet the two halves or cerebral hemispheres are by no means symmetrical in structural or functional pattern. For instance, the sensori-motor centres for written and spoken language are, in right-handed persons, situated in the left hemisphere, namely that which controls the movements of the right side of the body. Moreover, this asymmetry of convolutional pattern increases as organisms rise in the evolutionary scale. It is more marked in man than in the Anthropoid Apes. On the other hand it does not interfere with the synthesis of the mind which is a characteristic feature of Homo Sapiens.

*This use of the word Organisation may seem to be opposed to Hughlings Jackson's statement (Croonian Lectures B.M.I. 1884) that the "highest Cerebral Centres are the least organised".

By Organisation I here mean the process of *becoming organised* and not the result, namely, complete organisation or automatism. Consciousness is associated with the *process*, not with the *result*.

I have dealt with this question of asymmetry in my Withering Lectures, 1932, Lecture 1, "on the genetic significance of hemilateral asymmetry in the Vertebrate Organism."

Moreover these cerebral sensori-motor co-ordinated responses or, in Pavlov's phrase, "Conditioned Reflexes" form a graded series, as indeed we should expect since they have been developed through an evolutionary process.

At one end of the scale we find conjoined bilateral automatic movements as in smiling or blinking, then come movements which though normally automatic and bilateral, can yet be performed independently and unilaterally under voluntary control, as in closing one eye or in one sided contraction of the facial muscles, and at the other end of the scale movements which are initiated and learned voluntarily but later become automatic, as in playing the piano with both hands acting simultaneously.

In learning to play a musical instrument bimanually, we are able to see, as it were, this integrating process actually at work. The movements of each hand are first learned and executed separately. They then undergo a process of synthesis or unification in the higher cerebral centres and become more or less automatic.

Conscious control is then again set free to deal with the piece or symphony as a whole.

In learning to speak on the other hand, volitional control over the movements of the laryngeal and accessory muscles concerned in speech, acts from the first bilaterally. Both vocal cords move in unison. Any failure in joint action would result in chaotic, meaningless voice sounds.

Psychological Fusion.

In the sphere of sense impressions the unification of the two retinal images of a single object into a single impression in the optic centres of the cerebral hemispheres provides perhaps the best example of this neuro-psychic synthesis. It is carried out unconsciously and yet it can be interfered with by causing the

image of the object to fall on different focal points in each retina. Moreover, each retina with its corresponding optical cerebral centre is capable of independent function.

Sir C. Sherrington's observations (The Integrative Action of the Nervous System) with the rotating Lantern indicate that the simpler forms of binocular perception are the result of the fusion of elaborated binocular sensations, and are not, as in learning to read or write, dependent on the use of records stored in one hemisphere only.

If it were possible to recall the experiences of our own Infancy we should probably find that when a baby looks at any object, say its thumb, the two different visual sensations it gets simultaneously from the two Retinal images give the impression that two objects exist. But when it compares these visual with its tactile sensations of the same object, the object is seen as one.

On the other hand the tactile impression of doubleness, which we experience when we examine an object with two adjacent, but *crossed over* fingers, remains throughout Life because it is not habitually checked by experience.

But this misleading tactile experience can be corrected by looking at the object while it is being examined by the crossed fingers.

The two different sensations from the one object must however be presented in Consciousness *simultaneously* in order to undergo psychological fusion.

As Sherrington has said (*ibid.* p. 384) "Pure Conjunction in Time without necessarily Cerebral Conjunction in Space, lies at the root of the solution of the problem of the *Unity of Mind.*"

The neurological basis on which, learning to read or write rests, is different.

The late Elliott Smith (Essays on the Evolution of Man, 1927) has pointed out that, "when a child learns to read or write, records are stored up in each cerebral hemisphere. In

the right-handed child the left hemisphere plays the predominant part, and the mirrored symbolism in the right hemisphere becomes suppressed.

The child reads with the left hemisphere. But while this learning process goes on, the mirrored image in the partly unused hemisphere still persists in a weakened form, and this (persistence) delays the handing over of the learning process wholly to the appropriate hemisphere."

We know from experience that when a child is compelled to use the untrained or disused hemisphere for reading or writing, then various conflicts, such as stammering and mirror writing, are apt to appear.

Thus learning to read or write is not the result of the fusion of the records stored in both hemispheres, but it depends on the use of the records stored in one hemisphere, which in the case of the right-handed child is the left.

To sum up the Argument.

When two dissimilar images of the same object appear in Consciousness *simultaneously,* they tend to be perceived as a "fused" or single image, as in binocular vision. Whereas, dissimilar images (representing two different objects), which follow each other with sufficient rapidity, are perceived in Consciousness as a changing image, showing the passage of one object or event into the other, as for instance in a Kinematograph film.

In other words the closer the approximation in time the greater the tendency to unification of the images in Consciousness.

Thus the psychological fusion of different cerebral perceptions, the unification of Consciousness as a whole, and the Integration of the will, are the outcome of experience, and comparison between the different sensations which reach the Brain from the various sense organs.

But even so we still ask, How has it come about that the neural machinery exists for the carrying out of neuro psychical activities in a dual manner, while on the psychical side, the more highly organised, later evolved responses, are perceived and executed by a unified consciousness, and a single will?

Before we can find a complete answer to this question we must know more than we now do about the nature of the relationship between Neurosis and Psychosis, between Body and Mind. At present this problem lies outside the range of human knowledge.

In this somewhat lengthy digression I have tried to indicate some of the conclusions which I think we may legitimately draw from a careful study of Horsley's numerous lectures and writings on the central nervous system.

In the Royal Institution Lecture given in 1885, over 50 years ago, as in the Linacre and Hughlings Jackson addresses, and in the Boyle Lecture at Oxford in 1905, we get a glimpse of his insight into the deeper and more philosophical aspects of neuro-psychical function.

Although he was himself a pioneer in the study of cerebral localisation, he yet realised that the Brain works as one whole. He also insisted that Psychology must always rest on a sound Neurological basis.

In these as in other conceptions of cerebro-spinal activity he was in advance of the scientific thought of his time.

Holidays in England, Scotland and the Orkneys.

I have already referred to happy holidays spent with the Horsley family in various parts of England and Scotland.

Through their generous hospitality, opportunity was afforded for meeting old, and making new friends. Among others, Sir Felix Semon, Sir John Rose Bradford, Professor Mayo Robson, Dr. Brook, of Lincoln, Dr. Henry and Mrs.

Head, Gerald and Mrs. G. Horsley, Frank Gotch and Mrs. Gotch, Dr. Frank Hinds, Professor Howard Kelly (Baltimore), Sir Fred. Bramwell, J. Lister, and others.

During the summer of 1911, we stayed with the Horsleys at Trumland, on the Island of Rousay in the Orkneys.

Days spent on the moor, or in fishing in Lake Wasbister, exploration of cairns and Pictish burial mounds, visits to the little farms of the islanders, excursions to neighbouring islands, Eigleshay with its Saxon Church dedicated to St. Magnus, Vera with its seals, Eyn-hallow with its flocks of Arctic Terns, and its ruined monastery, these, and other places of interest were visited and photographed.

The Holme of Scotness. The Rabbits.

The little uninhabited island, the Holme of Scotness, provided a much wished for opportunity to carry further an investigation into the hereditary aspect of "odd eye colour, or Heterochromia Iridis," in the native rabbit population of the island.

This consisted of a large proportion of cross-bred animals which were descended from a cross between the native brown rabbit and the Dutch breed. The hybridisation occurred when a number of Dutch rabbits were turned loose on the island a few years previously.

Among these cross-bred rabbits a few showed the odd eye colour, either partial or complete, in the same individual. Horsley carried on the enquiry after my departure, and later sent me a list of 52 rabbits shot on the island. Of these, 43 had the wild brown coloured coat and brown eyes, 7 were brown with white, or black and white markings, while in 2 individuals, the two eyes were of a different colour, with segments of blue in an otherwise brown coloured iris.

The results of this enquiry were included in a paper on "Heterochromia Iridis in Man and Animals from the Genetic Point of View," Journal of Genetics, Vol. 2, No. 2, June, 1912.

Visits to Vienna and Berlin.

An invitation from Count Larisch, who had recently recovered from a hunting accident in Leicestershire, to stay with him at his country seat in Austrian Silesia, in the summer of 1907, gave me an excuse for visiting the hospitals in Vienna and Berlin. I tried to persuade Horsley to join me, but he was unable to leave London. He very kindly, however, gave me personal letters of introduction to Professor Von Eiselsberg in Vienna, and Professor Krause in Berlin.

These introductions from a man of Horsley's reputation, were very useful in helping me to see more of the surgical practice in the hospitals of those cities than I could otherwise have hoped to see.

The visit to Count Larisch's country home in Austrian Silesia, which included journeys to Cracow and Troppau, the latter now in the Sudeten German area of Czecho Slovakia, also provided an excellent opportunity for observing the mediæval, almost feudal, conditions of life among the land-owners and the peasants in that part of Austria in 1907, and for comparing them with the conditions of life there to-day.

The Optic Disc in Birds and Animals.

In February, 1912, Horsley very kindly obtained from Sir P. Chalmers Mitchell, F.R.S. (then Director), consent for me to study, by ophthalmoscopic examination, the shape and other characters of the Optic Disc in some of the birds and animals in the London Zoological Gardens.

This examination was not easy to carry out, and needless to say, it was not attempted in the case of the larger Carnivores.

I made, however, some drawings of the disc in some of the birds and in some members of the sheep family.

I am not aware of the publication of any complete series of observations on this subject. Such a comprehensive enquiry would be very valuable from the genetic standpoint.

I must mention one incident in the course of our investigation which greatly amused the keeper and myself. I had been

examining the optic discs of a Crane in one of the Crane's paddocks. When I had finished, the keeper relaxed his hold on the bird's beak. The crane made a profound bow, and then slowly walked away.

I was also indebted to Sir Peter, and the Prosector at the Gardens, for material in the shape of preserved eyes from many species of birds.

Through a microscopic examination of these specimens, I was able to learn that the ciliary muscle and the constrictor of the iris in birds, contain striated voluntary muscle fibres.

The late Professor J. A. Thompson, Professor of Zoology at Aberdeen, also sent me the eyes of the young and the adult "herring gull," an examination of which threw additional light on the problem of the pigmentation of the iris in birds.

The results of these enquiries were published in the Journal of Genetics, Vol. 9, No. 1, December, 1919; and also in a letter to "Nature," September, 19th, 1912.

Thus from small beginnings with Horsley's help, and that of other friends, this somewhat lengthy enquiry was brought to a partly successful termination.

Regeneration of the Testis after Subcapsular Orchidectomy in Birds.

Early in 1913 it occurred to me that something might be learned from an experimental enquiry into the problem of the regeneration of testicular tissue after subcapsular orchidectomy in birds.

The fact that a compensatory overgrowth occurs in the remaining ovary after unilateral ovariectomy in rabbits had already been shown in a paper already referred to (see British Medical Journal, July 21st, 1906). I had also previously made a practical enquiry into the subject of Mendelian inheritance in fowls. I also had some acquaintance with the literature of the subject, and was therefore in a favourable position to undertake the enquiry. The question to be answered by the proposed investigation was whether, (supposing

that regeneration did occur) the chickens from eggs fertilised by the regenerated spermatozoa would show any difference in Mendelian characters when compared with chickens reared from eggs which had been fertilised by the earlier generations of spermatozoa formed before orchidectomy and the regeneration of the testicular tissue had taken place.

Horsley again most kindly performed the operations, bilateral subcapsular orchidectomy, in a number of fowls and pigeons, in London.

The birds were sent back to Leicester after recovery from the operation, and the breeding experiments were all carried out in Leicester. The results, which were somwhat complicated, were published in the Journal of Genetics, Vol. 3, No. 2, September, 1913.

This was the last enquiry in which I had the great privilege of Horsley's most valuable co-operation and help.

The War broke out in the following summer.

Horsley's Activities in the Political and Sociological Sphere.

Stephen Paget's Life contains a fairly full account of the more important of Horsley's activities in Sociology, Politics and Public Life. I shall therefore only mention here such events as came within my personal knowledge, or are referred to only briefly in Paget's Life of Horsley.

National Health Insurance, October, 1911.

In 1911, Mr. Lloyd George introduced his National Health Insurance Bill.

I was appointed a member of the Central Advisory Council set up, with Sir Robert Morant as Chairman, under the Act. I soon found myself in the midst of the controversy which arose between the Medical Profession and the Minister in the stormy days of 1911-12.

A small group of medical men, including myself, under the leadership of Christopher Addison, later Lord Addison,

were trying to find some common ground of agreement between the Government and the Profession. It was not an easy task.

Horsley agreed with us in thinking that the Act, if properly administered, would not only benefit the doctors, but would also ensure a better medical service for the insured workers.

Experience has shown that this view was sound. Although it is no doubt capable of improvement and extension in several directions, National Health Insurance has been the foundation on which a really efficient and comprehensive National Health Service can eventually be built up.

At the time, Horsley, and others, regarded the attitude of hostility to the Act taken up by the Medical Profession, *en masse,* as short-sighted, and opposed to the best interests of the community.

He, like many of us, came in for a large share of criticism, and in some cases abuse. This was markedly shown at the mass meeting of Doctors held in the Queen's Hall, London, on December 19th, 1911, at which Horsley was howled down when he rose to speak. I frequently discussed with him the question of the relationship which ought to exist between the Medical Profession and the State. This was a matter in which we were both interested and on which I had written a chapter in "The Great State," under the editorship of H. G. Wells, published by Harper Bros. in 1912.

Though Horsley was troubled by the misrepresentation of his views and aims, he always believed that his own colleagues in the Profession would eventually recognise the disinterestedness of his motives, and would, in the future, approve of his action.

This reconciliation, however, took a long time to bring about.

Candidature for Parliament.

In 1912, Horsley was chosen as the Liberal Candidate for the Harborough Division of Leicestershire. He frequently

stayed with me during his monthly or fortnightly visits to the Constituency. His use of lantern slides as a means of illustrating statistical and other complicated facts was then a new departure in Political campaigning, and was much appreciated by village and other audiences. His outspoken advocacy of women's rights in the political sphere however, brought about an acute difference of opinion between the Executive of the Local Liberal Association and himself, especially on the question of votes for women, and the method by which this reform in the Law should be brought about. This difference, after considerable argument and controversy, led finally to his resignation as Parliamentary Candidate for the Division.

Sociological Activities and Temperance Reform.

Although Paget's Life contains a fairly full account, I must refer briefly to certain aspects of the great work that Horsley accomplished for the cause of Temperance Reform.

It was partly owing to my own interest in the subject, and partly to Horsley's inspiring example in the cause of Temperance that led me to accept the kind invitation of the Society for the Study of Inebriety to act as President for the years 1922 to 1924.

The facts about the use of Alcohol recorded in Horsley and Sturge's book on "Alcohol and the Human Body,"* also led me to choose as the title of my Presidential Address to the Society, "The Influence of Hospitals on Temperance Reform."

In that address I gave, in graph form, the yearly expenditure on Alcohol at the Leicester Royal Infirmary and the Derby Royal Infirmary over a continuous period of 110 years, *i.e.*, from 1810 to 1920.

While I fully agreed with Horsley as to the vital importance of Temperance to Individual and National Welfare, I did not always see eye to eye with him, as to the best method of bringing about the Reform in the habits of the citizens which

* Re-written by C. C. Weeks, "Alcohol and Human Life," Lewis, London, 2nd Ed., 1939.

we both so much desired. I thought, and I still think, that a more conciliatory attitude would have been more effective, and would, at any rate in his own case, have made fewer enemies, and would have alienated fewer friends. But we must not overlook the circumstances of that time. No doubt the energy, outspokenness, and enthusiasm with which Horsley joined in the fight for Temperance Reform, were to many fellow workers in the cause, a real inspiration. He took a leading part in getting the subjects of Hygiene and Temperance introduced into the School Curriculum. Numerous speeches, lectures, addresses, and deputations, and especially the publication of the book "Alcohol and the Human Body," by Dr. Mary Sturge and himself, all bear testimony to Horsley's wholehearted devotion to the cause of Temperance Reform.

Ambidexterity and Capacity of Self Detachment.

Often, when preparing some address, or replying to correspondents, Horsley, seated in the midst of a group of animated talkers in the drawing room at Cavendish Square, would write with his left hand, draw with his right, and join intermittently in the conversation (see Paget's Life, p. 235).

This ability to use a knife or other surgical instrument equally well with either hand greatly facilitated his work as a surgeon. He also possessed a marked capacity for self detachment.

I have repeatedly heard him say, during a spell of concentrated microscopical and photographic work in the basement room at Cavendish Square, that he would stop work, and go to sleep for ten minutes.

This power to put oneself to sleep for a short period after exertion, this ability to close the door to focal consciousness has also been recorded as occurring in the lives of other men of outstanding mental and physical energy. Napoleon and Gladstone both apparently possessed it.

This problem of protective mental isolation has much Psychological and Neurological interest, and it bears intimately on the

nature of the process of Inhibition. It seems to decrease with advancing years. The re-charging of the tired, elderly Brain with a store of neuro-psychic energy resembles the re-charging of a worn-out electric battery. Neither can retain the charge.

Brotherhood and Other Addresses.

Horsley's Addresses and Speeches at Brotherhood Meetings (1912 to 1915), are of special interest when read in connection with present day problems.

They proclaim his keen desire to promote human betterment and a healthier and richer life for every citizen.

Horsley was no pessimist. He had read the Book of Evolution and had studied the story of human progress. He believed that, in spite of delays and setbacks, humanity was travelling on the upward path.

He was, in spite of trials and disappointments, a good example of the "happy warrior." Happy in his work, and especially happy in his home and family life.

Virgil's line, *"Felix qui potuit rerum cognoscere causas"* is peculiarly applicable to, and true of him.

In earlier student days, as I have previously mentioned, Horsley and I shared the same lodgings in Charlotte Street. His gaiety of spirit and his good humour were very stimulating. If he were alive to-day his advice and example would be very helpful in tackling the many social and other problems with which the country is faced.

The War, 1914.

My wife and I were in Australia, attending the meeting of the British Association, when the War broke out in August, 1914.

We returned by way of India as the quickest route home, and while steaming from Colombo to Bombay, with all lights out, we passed the "Emden" in the night, on her way to Singapore. Fortunately the captain of our boat, the "Malva," was suspicious of danger, and ignored the signal to stop sent out from the German Cruiser.

Later, when serving with the late Lord Moynihan, as Consulting Surgeon to the Military Hospitals in the Northern Command, it was part of my duty to inspect the camp at Castle Donington, where I was surprised to see Capt. Müller with other German officers interned as prisoners of war.

During our short stay in Bombay, we had an opportunity of visiting the Medical Research Institution, and through the kindness of a Parsee doctor, a friend of our travelling companion, the late Professor Benjamin Moore, we paid a visit to the Towers of Silence, where the Parsees expose their dead to be devoured by the vultures which frequent the place.

While in Australia I visited the hospitals at Melbourne and Sydney, and on the return journey the Seamen's Hospital at Port Said, in order to obtain information concerning facilities for Medical Research. The results obtained from these visits were embodied in a Report to the Medical Research Council.

I called to see Horsley on my return to England in October. His two sons had enlisted as privates in the Artists' Rifles*. Later, on my return from France in December, Horsley spoke earnestly to me of his great desire to serve the country in a larger field, one in which his special knowledge and experience of Brain Surgery might be of greater use. He was at the time on the Staff of the 3rd London General Hospital. He had not long to wait. On March 28th, 1915, he joined Lady Norman's Hospital at Wimereux, and in the following May, he left England for Egypt on the Staff of the 21st General Hospital.

Others have told of the arduous work he carried out in Egypt, and his devoted labours for the comfort and welfare of the sick and wounded in India, the Dardanelles, and Mesopotamia, and of his early death at Amarah while in the discharge of his duty.

It is a great record. I did not see Victor Horsley again after he left England for Egypt in May, 1915.

* They subsequently received Commissions in the Gordon Highlanders.

CONCLUSION.

In trying to form a true estimate of Victor Horsley's services to Science, to Surgery, to his Country, and to Mankind, one aspect of his life's work comes constantly into view.

He was a pioneer, a leader, both in Thought and Action. He also had a vision of the future.

His successes in many fields speak for themselves. As regards his failure to achieve all that he strove for, we must remember that the world has often treated with neglect or scorn its pioneers and prophets, and later, sometimes even in a few short years, has accepted their teaching and followed their example.

If I were asked to say what causes appealed most strongly to Horsley's generous nature I should reply, The Search for Knowledge, The Dispersal of Ignorance, and the Righting of Wrong in every sphere of life.

His ardent wish to relieve suffering in every form, and his sympathy with the sufferer were deep rooted instincts in his nature, and greatly influenced his surgical work and outlook.

Judging by what I myself know of his attitude to suffering, and from what I have also learned from Lady Horsley, I feel sure that, if he were alive to-day, he would heartily welcome the recent movement to bring about such a change in the Law as would make Voluntary Euthanasia a legalised act instead, as now, a criminal offence.

There was no trace of jealousy or self-seeking in Horsley's nature.

He clearly realised that what the world sorely needs, is a deeper and wider recognition of the fact that selfishness and the aggressive spirit, although they no doubt had some survival value among primitive peoples and savage tribes, yet under modern condition of so-called civilisation, they act as brakes on the wheels of human progress.

I must now bring to a close this inadequate tribute to the

memory of a noble life. May we, and those who come after us, have the strength and courage to follow Victor Horsley's great example.

POSTSCRIPT.

I am afraid that some readers of these reminiscences will think that I have devoted too much space and attention to a description of my own researches. If that be so my excuse must be that, without some explanation of the nature and object of those enquiries I could not have made clear Horsley's share in our conjoint work, nor could I have adequately expressed the deep debt of gratitude I owe to his memory for the help and encouragement he was always so ready to give. Horsley's well-known reluctance to accept any recognition of his own share in any conjoint enquiry must account for the somewhat meagre references to his part of the work in the Articles or Papers as published. References are however now included to the Journals in which these Papers appeared.

I have also referred to the page or pages in Stephen Paget's life of Horsley, in which these researches and other events in Horsley's life are mentioned.

17-7-39

W. Thornley & Son, Printers, Bowling Green Street, Leicester.