2. The condition may be primarily one of nerve absence or nerve lesion in mid-embryonic life, with secondary non-development or partial development of the mesoblastic structures due to the loss of nerve control.

3. The muscular effort perceptible at the angle of the mouth may be due to the nervous supply of the hypoglossal.

The FitzPatrick Lectures

ON

MEDICINE IN ENGLAND DURING THE REIGN OF GEORGE III.

DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

By ARNOLD CHAPLIN, M.D., F.R.C.P.,

PHYSICIAN, CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST.

(Concluded from p. 690.)

VIII. PHYSICIANS WHO DETERMINED THE ADVANCE OF MEDICAL KNOWLEDGE.

FROM the general topics discussed in the earlier part of his lectures Dr. Chaplin went on to give an account of the individual work of physicians during the reign of George III, considering first the work of those who contributed to the advancement of medical knowledge and then giving an estimate of the activities of those who widened the boundaries of general science.

An idea of the scope of medicine taught during the first thirty years of the reign could, he said, be formed from the work of Dr. George Fordyce of St. Thomas's Hospital, the *Elements of the Practice of Physic*, which appeared to be the chief students' textbook of those days. For thirty years Fordyce lectured on medicine at his house in Essex Street, Strand, and his book might be taken to be the substance of what he was accustomed to teach. Its first hundred pages were devoted to the natural history of the human body—physiology—the remainder to the symptoms, distinctions, prognostics, and cure of fevers and inflammations, all the morbid conditions physicians were called upon to treat being included under these heads. In accordance with the doctrines of the time, little or no attempt was made to distinguish and classify the various forms of fever.

The elder Heberden was the great prototype of the modern clinical physician, and the connecting link between Sydenham on the one hand, and Bright, Addison, and Watson on the other. His *Commentaries*, published after his death in 1801, contained the results of his study and experience, extending over sixty years. So sound was his doctrine, so cautious its treatment, and so endowed with excellent common sense that much of it would require little editing at the present day. It contained no fantastic theories, no appeal to metaphysical disquisitions, but simply the results of the close study by an acute observer of signs and symptoms of disease at the bedside. Dr. Chaplin referred next to Sir George Baker, a former president of the College, whose essay on lead colic might justly be quoted as a model of inductive logic.

Towards the end of the eighteenth century the existing order of clinical physicians, which depended entirely upon knowledge gained at the bedside, was beginning to be replaced by a race who enlisted the sciences of chemistry, anatomy, and physiology in order to elucidate many problems. The desire to profit from knowledge gained by an examination of diseased parts on the *post-mortem* table received its first stimulus in England in the publication, in 1769, of Dr. Alexander's translation of the great work in which Morgagni for the first time directed anatomical knowledge to the service of medicine. The study of morbid anatomy was carried on and advanced in France by Bichat; but it was Matthew Baillie, great as a physician and great as a morbid anatomist, who was the father of medical pathology. His celebrated book on *The Morbid Anatomy of Some of the Most Important Parts of the Human Body*, published in 1793, was the first English treatise on morbid anatomy. Baillie summarized the purpose of his work under the four following heads: (1) To explain the changes of structure arising from morbid conditions; (2) to distinguish between morbid changes which have been generally confounded; (3) to detect diseased alterations in

the organization of parts which are but little or not at all known; (4) from the observation of morbid structure theories taken up hastily about disease will be occasionally corrected." The chief characteristics of the work were its conciseness and accurate observation; the plates, produced after the appearance of the book, afforded unimpeachable evidence of Baillie's unerring accuracy. Baillie scarcely lived to see the full fruits of his pioneer work, but looking back we could detect in it the beginnings of the science of pathology.

At about the same period the sciences of chemistry and pathology were beginning to be seriously applied to the art of medicine. Chemistry had received considerable attention from certain London physicians, one of the first of whom was Dr. William Saunders of Guy's Hospital, who lectured on chemistry from 1766 onwards. He assisted Sir George Baker in the chemical part of his inquiry into lead colic. Berzelius greatly stimulated study of the subject of animal chemistry, and a translation of his essay on the *Progress of the Present State of Animal Chemistry* was published by Young. It was, however, Dr. William Prout who was the first physician to bring a sound and comprehensive knowledge of animal chemistry to the aid of practical medicine. Prout was one of the famous quartet of great scientists, the others being Young, Wollaston, and Wells, who adorned the medical profession towards the end of the reign of George III; but unlike the other three, he added to his great scientific attainments practical ability as a physician. He began to lecture on chemistry in 1813, and many fundamental truths concerning metabolism were first stated by him, among them the facts that urea was formed in the blood and merely excreted by the kidneys, and that the healthy stomach contained always a percentage of hydrochloric acid. He also was the first to enunciate the doctrine of "secondary assimilation," but his views were to a certain extent purloined by Giessen and Justus von Liebig, and given to the world under the high-sounding title of the "metamorphoses of tissues."

Dr. Chaplin turned aside to speak of the work done in dermatology by Willan—who was the first to place the classification of diseases of the skin on an anatomical basis—and of the progress in midwifery achieved during the reign. Apparently no definite instruction in midwifery was given in London until 1739, when Smellie began a course of lectures. In the same year Sir Richard Manningham established a ward in the Westminster Infirmary for lying-in women, and soon afterwards lying-in hospitals began to be erected, of which the earliest was the British Lying-in Hospital, founded in 1749, with William Hunter as its first physician.

IX. PHYSICIANS WHO CONTRIBUTED TO THE ADVANCE OF SCIENCE IN GENERAL.

Thomas Young.

Reverting then to the quartet of physicians superlatively great in science, Dr. Chaplin spoke next of Thomas Young, of whom he said that it was almost impossible to realize the extent and depth of his mental capacity. Physics, classics, mathematics, Egyptology, philology, music, biography, and actuarial science, he made them all his own; with him there was never any hurry in the acquirement of knowledge, each subject in turn was taken up and deliberately exhausted before another was attempted. He was fortunate in receiving a legacy of £10,000 from his uncle, together with a house and its contents in Norfolk Street, Strand—bequests which relieved him of the necessity of drudging for a living. After visiting Edinburgh, Göttingen, and Cambridge as a student, he was in 1802, when in his twenty-ninth year, appointed to deliver lectures on natural philosophy at the Royal Institution, and at about the same time published his undulatory theory of light, which the scientific world, with the exception of Arago and Fresnel, hesitated for some years to accept, owing largely to Brougham's attack. In the domain of Egyptology, in which he began really to interest himself about 1816, Young met with even more opposition, and had to see much of his work pilfered by others, the chief offender being the great Champollion. There was, however, no doubt that Young could claim priority over Champollion in the discovery of phonetic hieroglyphics from his study of the Rosetta stone. Some of the failure of Young to obtain recognition for his work in science was to be

attributed to faults of his own; he appeared to resent the intrusion of others into his intellectual territory, and his style was somewhat obscure, and not a little caustic. As a physician Young was not successful either in practice or as a writer; his *Treatise on Consumptive Diseases* was a compilation, and his *Introduction to Medical Literature*, though it displayed a vast amount of learning, was not in other respects remarkable. Still, Thomas Young rose above all the great men of science produced in the reign of George III in mental stature and comprehensiveness of intellect.

William Charles Wells.

For William Charles Wells, the next name in the quartet, success in the shape of social fame and emolument never came. Of him Dr. Chaplin said: He began his career in London penniless, and after sixteen years of toil was unable to command an income of more than £307 from all sources. Ill health clogged his steps; in his forty-third year he was seized with a slight stroke, and henceforth, for him, it was a grim fight against time to finish the work he had designed. But in spite of these disadvantages he laboured on bravely in his humble lodging in Serjeant's Inn, scarcely known to any but five close friends, and when his work was accomplished, he desired only the modest epitaph that "he had tried to extend the boundaries of knowledge." Shrewd judges of mankind, such as Brodie, described Wells as one of the most remarkable intellects of the age, but his peculiar temperament, and somewhat cold scientific type of mind did not lend themselves to the showy mental exploits beloved by the multitude.

In the sphere of natural philosophy the name of Wells will be for ever honoured. It was his good fortune to investigate and establish the laws which govern the formation of moisture in the air, and although physical chemistry has advanced in all directions, the fundamental principles enunciated by him have never been seriously challenged. For this work Wells was awarded the Rumford medal in 1814, and since then his name has been inseparably connected with the subject. Previous to his work it had been supposed, since the days of Aristotle, that dew was formed in the lower atmosphere in consequence of its moisture being condensed by means of cold, and that in its formation cold was produced. Wells became doubtful of the accuracy of this view, and accordingly carried out a series of experiments in the garden of Mr. James Dunscombe, a merchant friend, who lived in Surrey, three miles from Blackfriars Bridge. To this country house Wells betook himself late in the afternoons, and, with varying intervals caused by ill health, prosecuted his experimental work during the nights, returning in the early morning to his house for the day's work. In his *Essay on Dew* he pays an affectionate tribute to his friend Dunscombe for allowing him to use his garden "at considerable inconvenience to the members of the family." Wells also conducted experiments in Lincoln's Inn Fields when increasing infirmity rendered it impossible for him to go into the country.

Wells used pieces of wool of known weight, and these he weighed again after they had absorbed the dew in various situations and under varying conditions of atmosphere. He thus became acquainted with the laws which govern the deposition of dew. For instance, he found that the exclusion of the sky from the wool diminished the quantity of dew formed, that more was deposited on wool when on grass than when placed on gravel, mould, bright metals, or when suspended in the air. Having obtained these data, he then investigated the part cold played in the formation of dew, and at this stage his original discovery was made. He found, as others had done before, that the temperature of the ground was higher than that of the air above, that passing clouds cause a rise of temperature, and, what was of the utmost importance, that certain substances placed on the ground took on a lower temperature than the ground itself. From these facts he deduced his theory that "Dew is the production of a preceding cold in the substances upon which it appears." He also established the fact that the production of water from the atmosphere actually produces heat. All this was contrary to the view, hitherto accepted, that dew was formed by the cold of the night, and that in its formation cold was produced.

Such was the work of Wells. It is a melancholy picture,

this last effort of his, feverishly labouring to finish his experiments, with water-logged legs, and the agony of cardiac asthma ever present; spending nights in Dunscombe's garden which should have been devoted to repose, and then hurrying back to town in the early morning to write down his results lest death should claim him ere his task was completed. Surely few scientific workers have battled so bravely with adverse conditions.

The medical work of Wells has not, perhaps, received the consideration it deserves. His chief claim to distinction in this sphere rests on the papers he communicated to the Society for the Improvement of Medical and Chirurgical Knowledge, in which he dealt with the occurrence of albumin in cases of dropsy. His first paper, read on November 4th, 1806, related only to cases of dropsy following scarlet fever. This phenomenon had been observed by Plenck of Vienna, Cruikshank, and Berserius long before, but it was Wells who noticed that blood and albumin were present in the urine in these cases. He also established the fact that the dropsy occurred in the upper parts of the body, and described—without, however, giving them a name—the uraemic seizures to which such cases are liable. He found evidences of inflammation present in all the abdominal organs, including the kidneys, and inferred that the process was essentially inflammatory in origin.

On June 4th, 1811, he read another paper before the same society, in which he pointed out that albumin was to be found in cases of dropsy other than scarlatinal, and drew a distinction between hydrothorax, ascites, and dropsy of the skin, in that the two former, if primary, did not have albumin in the urine. This was the first attempt to differentiate between the various forms of dropsy. The point was used with great advantage by Blackall, who, writing two years later, still further elaborated it, but the merit of pointing it out belongs to Wells alone. In support of his contentions, Wells quoted two *post-mortem* examinations, in one of which "the kidneys were much harder than they usually are, and the cortical parts were thickened," while in the other he says, "the kidneys were larger and softer, and on the outside were several vesicles." He gave the credit of the discovery of albumin to Cruikshank who mentioned it in 1798, but points out that he had discovered it independently in 1799. Wells had, therefore, established the fact of albumin in dropsy. He had differentiated the forms of dropsy in which albumin was found. He had even indicated that the kidneys were diseased, but he failed to point out the causal relations between the two. This momentous clinical fact had to await the advent of Richard Bright, but it was Wells who prepared the ground. To complete the consideration of the work of Wells it is to be remembered that Darwin himself, in his historical introduction to the *Origin of Species*, gives to Wells the credit of having been the first to enunciate the principle of natural selection, in a paper read before the Royal Society in 1813. Altogether Wells was one of the great men of the profession during the reign of George III; a man of great scientific ability, with a lofty conception of duty, and with an adherence to truth which never swerved.

Wollaston.

William Hyde Wollaston was so little associated with the practice of medicine that his work can scarcely be considered from that point of view. Very early in his career he definitely severed his connexion with medicine, owing, it is said, to his unsuccessful application for the post of physician to St. George's, and henceforth devoted himself entirely to science. Some of his scientific work, however, related to problems in medicine, and in this field he initiated inquiry which led to important results. He was one of the first to study the composition of calculi and other abnormal constituents of the urine; work which, no doubt, paved the way for the further extension of the subject by Prout and Marcet. He also explained the phenomenon of hemianopia, and demonstrated the partial decussation of the fibres in the optic commissure. But with these exceptions the whole of the scientific work of Wollaston belonged to physics, chemistry, and metallurgy. He discovered rhodium and palladium, and devised a process for rendering platinum malleable. He was the first to see the dark lines in the spectrum, since known under the name of Fraunhofer's lines, but failed to appreciate their true significance. As a point of peculiar interest at the present time, it may be

mentioned that Wollaston invented the periscope, an instrument so frequently in our thoughts to-day.

Excessively cautious, fearing to advance by bold deductions, Wollaston constantly allowed others to reap where he had sown. In this way he lost his claim to be one of the first sponsors of the atomic theory.

CONCLUSION.

Dr. Chaplin concluded his review of the progress made in medical knowledge during the reign of George III in the following words:

We have seen that soon after the beginning of the reign a distinct revival of activity in its study became evident. We have shown that, at first, the revival manifested itself in an increase of clinical knowledge gained almost entirely from observation of symptoms during illness. We have pointed out the manner in which the obstacles to the advance of clinical medicine were surmounted by the application of the sciences of pathology, physiology, and chemistry, which, towards the end of the eighteenth century, had been placed upon a sound foundation. We have also devoted space to the consideration of those physicians whose activities were mainly scientific. In all this the main features of the spirit of the eighteenth century, which laboured unceasingly for the emancipation of the human intellect, for freedom of thought, and for inquiry on scientific lines, can be clearly observed. We owe to the physicians of the age of George III an immense debt for the excellent foundations they built, often with rough and improvised tools. Like the Georgian architecture, the Georgian silver, and the Georgian glass, they were large and solid, and were fashioned to stand the test of time. Men of the stamp of Hunter, Baillie, Prout, and Willan flung open the portals of medical science, through which their descendants have passed to realms of spacious and accurate knowledge.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

FIBROID UTERUS TREATED BY X RAYS.

THE patient, a married woman aged 42, came to me in February, 1917, for a fibroid causing discomfort from its size, with constant backache and pressure symptoms. She had a bilobed fibroid of the whole wall.

During three months she received eight x-ray treatments, each of two to three pastille doses, filtered. The monthly periods were regular before treatment. Under x rays she had one heavy followed by two ordinary

periods, and they have stopped entirely since the sixth treatment, now five months ago.

The fundus was 4½ in. above the pubes. During treatment it was reduced to 2½ in., and three months later was only 2 in. above the pubes. In width the tumour was reduced from over 5 in. to 4 in. during treat-

Diagram of fundus uteri to scale.

ment, and since then has become reduced another inch.

The front wall was bulged out so that the distance from pubes to umbilicus was 7½ in. at first; this has come down to being flat, and now measures 6 in.

Except during the first monthly period, she has not been in bed for a day since treatment was first begun; pressure symptoms are relieved and the backache is gone. The patient is well and strong and very pleased with the final result.

This is the fourth case of fibroid I have treated in a similar manner, and all with remarkably good results. In one case the menopause was brought about, in the two other cases the periods were only reduced in quantity.

London, W.

FLORENCE A. STONEY, M.D., B.S.

HYPERPYREXIA IN ENTERIC FEVER.

THE case of hyperpyrexia in enteric fever recorded in the JOURNAL of October 20th by Dr. Fonseca recalls a case complicated with pneumonia I saw a few years ago. The temperature was taken every two hours.

H. S., a girl aged 15, who was abnormally fat for her age, was seen for the first time on January 29th. Her mother said she had been ill for a week. Her face was flushed; she complained of headache; pneumonia was present at the base of the right lung. The temperature was 103.6°.

On the following day the temperature was 104°, and there was occasional delirium at night; pulse 140; haemoptysis. The next two days the temperature remained at 104°; there was still occasional delirium, and haemoptysis occurred on each day; pulse 130.

February 2nd. Temperature 103.6°; delirium constant; pulse 130, respirations 40; tympanites, spots appeared on abdomen.

February 3rd. Temperature 104°; delirium constant; pulse 130, respirations 52.

February 4th. Temperature 104.2°; delirium constant; pulse 140, respirations 72. Calomel was given.

The patient was sponged every day, which brought the temperature down, but it soon went up again.

February 5th. Temperature 105.4°; delirium constant; pulse 140, respirations 67. The temperature went up to 105.8° and then suddenly, after the patient had been sponged, it jumped to 109°, when the patient died. Ten minutes after death the temperature was 106°.

P. VERNON DODD, M.D.,
M.R.C.S.

Hythe, Kent.

Reports of Societies.

VALUE AND LIMITATIONS OF SANATORIUM TREATMENT FOR TUBERCULOSIS.

THE discussion on this subject (see BRITISH MEDICAL JOURNAL, November 17th., p. 650, and November 24th, p. 690) was continued at the meeting of the Medical Society of London on November 26th, when the President, Sir ST. CLAIR THOMSON, was in the chair.

Dr. CAMAC WILKINSON, while thinking sanatoriums invaluable and indispensable in the treatment of certain forms of tuberculosis, expressed the opinion that the present system could only touch the fringe of the disease. The victims who could not pay for their own treatment numbered at least 250,000 to 300,000. After the war, including soldiers and dependants, there would be 300,000 needing treatment. There were 11,000 beds in sanatoriums, and all authorities now admitted that each case needed, on an average, six months' residence. Thus there would be room for 20,000 every year. This meant that 6.6 per cent. of these victims could have treatment in one year, and 50 per cent. of these were dead in three to four years, so that benefit was chiefly limited to 3.3 per cent. of the total. Thus 93.3 per cent. of the cases needing treatment could not enter a sanatorium for at least a year. In other words, 20,000 cases were treated and 280,000 left out. The problem should not be discussed as it affected a small proportion of victims; no system could be called a success which could not offer immediate, expeditious, economical, convenient, and effective treatment to the majority of sufferers. The cost might be stated in three distinct ways: (1) The bare cost of treatment, which would certainly be £50 for each case, representing £1,000,000 for 20,000 cases; (2) every man was worth at least £50 a year to the State, many ten times that amount—this represented a further dead loss of £500,000; (3) the economic loss from loss of occupation and wage, varying from £50 to £150 per case, represented another £1,000,000 to £3,000,000 per annum. The total loss from prolonged residence in sanatoriums was from £2,500,000 to £4,500,000 every year. He disagreed with Dr. Lister's opinion that the tubercle bacillus was a harmless pest to most of us, considering that it caused one-third of the total deaths of men and women occurring in the prime of life.

Dr. CRACE CALVERT thought that statistics were not of much use, as it was difficult to get particulars of patients who had gained permanent benefit, most of whom did not report again to the sanatorium. Every patient should be given sanatorium treatment except those suffering from advanced or marked disease. He thought sanatorium should be given before home treatment. Sanatoriums