The healing touch.

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THE HEALING TOUCH

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MEN OF STRESS

(Woodrow Wilson, Andrew Carnegie, Lord Leverhulme)

THE HEALING TOUCH

by

HARLEY WILLIAMS

If you cannot be one of the saints of knowledge,
then I pray you, be one of its warriors.

NIETZSCHE

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To
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PREFACE

To my friends in the United States, known and unknown, I offer sincere greetings in presenting this gallery of medical portraits. It opens with the story of a physician born in the reign of George the Third, an English king who had something to do with American history. It concludes with the lives of two of the greatest of modern surgeons, the Mayo brothers, who are as famous all over the world as they are in their own country.

The thread running through the book is that of personality. It is not history, nor a mere chronicle of diseases. This explains the title, for each of these characters taken from the modern story of medicine reveals that fundamental aim of medicine: the power to bring relief to suffering and not only that, but the art of making people whole, of helping them to realise their full mental and physical potentialities.

Physicians who may chance to read these pages will of course find much that is well known to them. I cannot hope they will agree with all my interpretations, but I trust they will get a sense of my pleasure in knowing some of them, and something of their country, as well as my sense of what American values of experiment and innovation have given to the earlier European values of tradition.

If I am fortunate, some copies of the book will fall into the hands of parents and teachers, and others not vocationally connected with medicine. For them I have tried to write non-technically, for I believe that everyone of us should comprehend the gift which is manifested in the great physicians. The tradition of medicine places the care of the individual patient before everything else, and the future depends in fostering those personal at-

tributes of mind and heart on which the sick person relies in all generations.

With confidence, and also with humbleness therefore, I invite those who are interested in qualities of personality to look through this collection of portraits. I believe, as they proceed, they will agree with me as to the value of the *Healing Touch* as an aid in medical progress and a help in personal trouble.

H. W.

ACKNOWLEDGMENTS

TO ALL who have helped him in the preparation of these biographies the author expresses his thanks. The chapter on Brown-Séquard was written before the publication of Professor Olmstead's book, but the opportunity to read his pages has been used to revise many details here. An especial debt of gratitude is due to the vivid and exhaustive biography of the *Doctors Mayo,* by Mrs. Helen Clapesettle, published in 1944, which is a rich store of material for anyone who wishes to understand the beginnings of surgery in the north-west of the United States.

The help of Dr. J. J. Keevil, D.S.O., Keeper of the Library to the Royal College of Physicians of London, has been particularly valuable in connection with the early chapters.

Dr. Ian E. McCracken, Lecturer on Public Health in the London School of Hygiene and Tropical Medicine, London, England, has kindly revised the whole book and enabled many errors to be corrected.

H. W.

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THE HEALING TOUCH

THE HEALING TOUCH

AT HEART, we all believe in the Healing Touch. It is no mere sentimental phrase but a powerful reality. We may not possess this gift, but we have certainly experienced it at the hands of others. How are we to define it? Something nearer magic than we are likely to admit. A sort of magnetic force in the personality which puts fear at rest, releases the restless currents of our being and harmonizes them in a new direction. Some people have it, the majority do not. This powerful human faculty is felt—in ordinary affairs, in politics, in business. But its most natural place is in the ancient art of healing, and in the medicine and surgery that have grown therefrom. This book deals with some of the very greatest exponents of this instinctive faculty. It is fundamental today just as much as in the simpler medicine of a previous age, and these portraits cover the period of a century and a half. They begin when medicine was almost no more than an embryo; they conclude when it has become a Science.

The theme therefore of this book is of personality, rather than science.

Even to read about the Healing Touch and its victories gives a sort of a healing balm. If such supreme manifestations of the gift have occurred, they will happen again, and can produce prodigious improvements in our tough human material.

BOOK ONE

THREE ROYAL PHYSICIANS

THREE ROYAL PHYSICIANS

LET US first observe then the healing art as it was practiced more than a hundred years ago by three eminent royal doctors, two of whom served Queen Victoria. Prime Ministers, Generals and Archbishops figure prominently in the pages of history, but if we could know the private lives of the great, we should find that the physicians had touched the real mainsprings. The doctor is there at birth, he is present at the true crises of existence, and he is in attendance at death. He sees royal Courts at the most heroic and tragic moments of privacy, those which are not caught by diaries and cameras, and that are hardly ever preserved for posterity. The physician knows more than the average courtier, for his profession gives him one unique privilege, that of receiving secrets and a trained aptitude for keeping them. Unfortunately for us, royal doctors do not write their memoirs. Their correspondence is generally burned, and we have no record of their prescriptions. So we must try to draw back the thick curtain of their professional caution and overhear them at their consultations. What dubious situations we see them in! Especially when these Court doctors are obliged to meddle in affairs for which they have no experience. We feel they are out of their depth, and we are astounded that the intimate affairs of the great should be conducted in so haphazard a fashion.

But an even more astonishing thing is to observe how these royal doctors are professionally trained for their unique roles. We might suppose that they would undergo some very special and profound method of medical education to fit them for their great responsibilities. It is a shock to realize what happens in

reality, and our chronicle of the medical servants of the Crown opens with the unorthodox professional education of a youth from Devonshire who ascended by a zigzag stairway of inappropriate experiences to become, I am sure, the most trusted doctor who has ever practised upon a king the physician's spell.

SIR WILLIAM KNIGHTON

Physicians of the utmost fame
Were called at once; but when they came
They answered, as they took their fees,
There is no cure for this disease.
HILAIRE BELLOC

1. AN ORPHAN OF DEVON

NEVER had the theory of kingship seemed so much at a discount as in the last quarter century before 1800 when William Knighton was beginning his education to become a most successful doctor to a king. Those American colonists had repudiated King George the Third; the French had put an end to their Sixteenth Louis, and the wearers of every European crown felt uneasy about the head. He was born in the very year when the Thirteen Colonies of North America adopted the Declaration of Independence, and he was seven years old at the close of the American War. When he was thirteen he heard of George Washington's election as first President, and how the serious illness of George the Third made it necessary to think of appointing the Prince of Wales as Regent. During such a period of unrest and disparagement of monarchies, this Devonshire boy commenced his most inappropriate training to become a king's physician. His preparation for such a role was entirely accidental. Probably, indeed, deep in his soul there did lurk a longing to do great things. Medical apprentices in the eighteenth century, like medical students since, did have such ambitious dreams. But the odds against his climbing to such a lonely eminence as being king's doctor were so enormous that only a romantic boy or his adoring mother could have enter-

tained the notion. William Knighton was to achieve this distinction, but it cannot have been with any premeditation. In his career, as with the two other royal physicians who follow him in this book, the emphasis is entirely upon chance.

William Knighton's father was entirely lacking in talent as a family man. He disappeared, leaving his children to be brought up by their mother. The father of this unsatisfactory parent thereupon endowed his daughter-in-law with five-hundred pounds and the children lived in an atmosphere which was distinctly religious. John Wesley had been preaching in the west country and had set a high moral tone. We can imagine the moral lessons which would be drawn for the boy out of the unexplained absence of his father. He grew up with this negative parental example always before him, and then, as though to intensify his deprivation, his mother married a second time, and he had now a step-father.

Imagine a boy's questions unanswered, his mother's anguish shared, his grandfather's disapproval, and the private theory about that father who must not be talked about. We can be sure the worldly disadvantages of irregular conduct were very constantly before him and the strict outlook of that home formed his character. William grew to be a man of the most honourable standards and strong moral sense, a man who could handle pitch and not be defiled. Yet underneath this virtuous exterior was an unexpressed sympathy with that absent and romanticized father which broadened to become an instinctive understanding of those primrose paths which were not to be explored except in fancy. Outwardly, William Knighton accepted the pious opinions of those who criticized that erring father, but inwardly, he understood. This double standard was not conscious hypocrisy, it was only the continuation of boyish perplexity into adult life.

One little story we have of his early life forecasts a masterful turn of mind which was to be one of his great assets as a man. One day when he was a child of six, he put on his mother's apron and stood on a chair in the kitchen, giving orders to the servants.

Whoever could have dreamed that it was just this habit of command and power of sympathy with the profligate rather than professional attainment that would make him so successful as a royal doctor?

An uncle happened to be surgeon-apothecary in the market town of Tavistock, and in the days before manufacturing chemists, that meant being an expert botanist and practical gardener. To this uncle William Knighton was apprenticed and he began to learn how to squeeze poppy buds for opium, to boil aconite leaves and strophanthus flowers according to the ancient formulae written out in folio volumes. The Apothecary's parlour was full of handsome porcelain jars holding leeches, and others filled with syrups, tinctures and decoctions. There were packets of roots and dried leaves, and the whole atmosphere was more that of an alchemist's den than a modern consulting room. In the daily round, William Knighton rolled bandages, compounded draughts, learned to apply leeches to the patients' skin. He followed his master and held the bowl when veins were opened, and watching the professional attitudes of his teacher, he came to know when people were really ill and how to handle their whims. In the evening he studied Virgil, Homer and Horace, and on Sunday, religious books. For in that century, literature rather than science was the basis of a gentleman's education.

Young Knighton had his dreams of travel. He had purchased a history of America, written by an itinerant Methodist preacher named Winterbottom. It cost him the equivalent of a suit of clothes to buy the book, and he was fired with an ambition

to pioneer across the American continent. But his real adventures were to lie in even wilder localities than the American frontier—the deserts and mountains of human nature.

The American War was over, and the French War had begun. As William Knighton rode along the Devonshire lanes, so far without any 'Education' in the modern sense at all, he began to feel a need for wider experience. He was twenty years old when he decided to go up to London and study Anatomy in the United Hospitals of Guy's and St. Thomas's on the south bank of the Thames. Anatomy was as far advanced in the eighteenth century as it is today, and there were brillant virtuosi who could teach him. When he thought he had learned enough, he returned to his native county and, at twenty-one, was appointed Surgeon to the Royal Naval Hospital at Devonport, near Plymouth, and married the daughter of a captain of one of His Majesty's ships. What better start in life could a Devonshire man desire than to be a surgeon in a naval port?

Knighton was always a hard worker and he kept up his reading early in the morning, while the evenings were spent at balls and parties, among the admirals and commanders who were home from the French Wars. Knighton was no innovator, he saw within himself no possibility of making scientific discovery, and believed that the key to the mysteries of medicine was to be found in books. Yet the more he read, the further did those mysteries recede, and he was obliged to conclude that: 'Medicine was one of those ill fated arts whose improvement bears no relation to its antiquity.' Such was not the temperament likely to make him another William Harvey, and that of a great leader of medicine was the least likely role he conceived himself as fitted to play. But there was one aspect of medical practice for which he developed a decided flair.

The naval captains and their wives, merchant adventurers

SIR WILLIAM KNIGHTON

of old Plymouth, those squireens who came in for the season from their manor houses all over the west country, these formed the raw material on which he learned that peculiar craft which he was to use with such an infallible touch as royal doctor. They came to him not only with the honourable wounds of war, but with their livers deranged by Peninsular port and tropical fevers; they turned to Dr. Knighton when pursued by scandals and troubled by the maladies of indiscriminate love, and his keen eyes learned to read their faces. Though he might make no vital discoveries in medicine, he was learning to handle wayward human nature. It was strange that such a man should possess this insight, for his own personal character seemed to have no failings. He was only in the twenties, but he looked and behaved like a man of forty, and he was the sort of physician of whom his patients are rather scared. They consult him penitentially, as though illness were a punishment, and when they hear his carriage move down the street they heave a sigh of relief that this awe-inspiring doctor has gone, though they feel much better for his visit.

William Knighton began to be impatient and ambitious. He needed some sort of handle to his name and he managed to put together some first-hand observations and second-hand quotations in the form of a thesis which he dispatched to the college professors in the University of Aberdeen at the opposite end of Great Britain, and they granted him a diploma. Now he could carry his cane with greater confidence among his fellow practitioners of the west country.

He might have settled down permanently to that satisfying existence, but personal tragedy intervened. Knighton passed through a personal trial which increased his disgust for the meagre resources of medicine. His little boy died of one of those obscure and irremediable illnesses that seem especially liable to

occur in doctors' families, and impulsively William Knighton threw in his hand. The Devonshire man sold his practice and decided to make a start in London.

Professionally speaking, the London of the 1790s was not so easy for an outsider as Plymouth had been for a native of Devonshire. The fashionable practice was a monopoly of the Fellows of the College of Physicians and Knighton applied for membership of the college but was not allowed to sit for the examination because of some rule about previous residence which had not before been put into operation.

This was awkward, for he had bought a house and settled down. This village-trained doctor, with his postal degree from Aberdeen, had to make a living by attending midwifery cases which were usually handled by untrained women. For a year or two he struggled on, but it seemed hopeless to make his way against the well entrenched guardians of the metropolitan health. He was admonished by the Royal College of Physicians for practising without a degree, and a second time he gave up the struggle. This time, he went to Edinburgh, then called 'the Athens of the North,' where a complete course of medicine was given in the Old College. And to make certain of his professional standing, he petitioned the Archbishop of Canterbury to confer upon him a Doctorate. At last he managed to become a member of the Royal College of Physicians and now, better equipped to conquer the capital, he started practice in the year 1806, determined upon wealth.

William Knighton was upright and clear principled, but he never pretended to be indifferent to money. 'It has been said,' he wrote, 'that riches keep out only one evil, namely poverty, but it has been well said, by a sensible woman, what good can they not let in?' A man possessing natural insight into human nature, coupled with such worldly wisdom, was sure to succeed,

and he began to find practice in London more to his taste than in a small provincial town. In the metropolis, one circle led to another, the second often more valuable than the first. A London doctor was less exposed to 'the tricks of the trader and the fire of the brandy merchant,' he wrote.

Now fate, in the disguise of war, carried Knighton on with swift steps. War, says Thucydides, offers a man a destiny which he cannot refuse. The protracted struggle against Napoleon had dragged on for years without interfering very much with the ordinary life of a medical practitioner in the West End of London, but now, when he was thirty-three, William Knighton was swept into a new existence. Lord Wellesley was going to Spain upon a special embassy, and he invited Dr. Knighton to go with him as personal physician.

Following the future Marquis through that dusty and tragic land, staying at palaces, monasteries and inns, the doctor had every opportunity of watching how great affairs were conducted. He noted, he absorbed and he was very discreet.

During the four months of the mission, he wrote home to his wife the most affectionate and graphic letters, describing the kindness of Lord Wellesley, the terrible oppression of the heat, that wonderful canvas of Murillo he had seen in Seville Cathedral. In Spain he saw grandeur and misery at close quarters, and became confident of his power to work the physician's spell. Bitterly he complained of how badly his patron is misrepresented in the newspapers at home. Knighton was faithful to his patron, but he longed to be home with his family. He promised his little daughter Dora a gold chain, provided he can pick one up tolerably cheap, 'for nothing exceeds the knavery and imposition of the tradespeople here.'

When the mission was over, Wellesley recommended him to George, Prince of Wales, who was one of those natures who

have, for one reason or another, perpetual need of doctors. Dr. Knighton was duly presented at Carlton House. His professional preparation was over. At last his remarkable career was to open.

2. THE PRINCE'S PHYSICIAN

He entered the bedroom, knelt and kissed the Prince's hand. There before him was the face upon which he was to learn to play as on an instrument, a face of a thick dusky hue, almost copper colour, with the most fascinating expression hinting at a mind intelligent though easily moved to suspicion. The Prince was suffering from lameness, perhaps from an accident, or his abuse of laudanum, and several of his doctors stood in attendance, for the Prince liked to be surrounded by medical men, whom he used for all kinds of whims, it being his royal pleasure to treat his doctors like upper servants. On this first occasion, Knighton was not invited to prescribe, a circumstance which was indeed fortunate for him, since he was quite at sea as to the meaning of the Prince's complaints. So the doctors in regular attendance were denied the gratification of seeing this newcomer and potential rival make a fool of himself. But they were not pleased when, after Knighton's departure, the Prince remarked that he was the best mannered medical man he had ever met. It was the royal humour to tease his physicians.

Next time Knighton went to Court, he felt something wrong, and suspected rightly the malevolent influence of his professional brethren. The Prince frowned and showed displeasure. Knighton was mystified, until he learned that lying tongues had reported him as having criticized the Prince's conduct towards the Princess of Wales. After a few days, however, this misunderstanding was removed.

Among the most favoured of these personal attendants was a

noisy Irishman named Sir John McMahon. In his heyday he had been a close confidant of the Prince, but now he was rapidly going to seed, and he was apt to be indiscreet in his cups. It was becoming obvious to the Court that old McMahon had reached the end of his professional usefulness. But who was to inform the Prince? The royal doctors took counsel and decided that the best person to carry out this disagreeable job was their new partner. In arranging this they did not intend any favour to their upstart colleague. Yet the awkward embassy was to prove Knighton's final entrance into the Prince's intimate favour.

As he listened to Knighton's report about the state of Sir John McMahon's health, the Prince Regent became disturbed. He was worried on the subject of certain private papers which the old courtier possessed, and at the close of the interview he made his wishes perfectly clear. Knighton was commanded to persuade McMahon in three directions: firstly to resign, secondly to propose Sir Benjamin Bloomfield as his successor and, most important of all, to yield up those personal letters.

This Bloomfield, though nominally one of the private physicians, kept his place at Court mainly through his good looks, for he had attracted the attention of the Prince when playing the violoncello at a Garrison Concert in Brighton when he had been lieutenant of artillery. He was now, on the retirement of Sir John McMahon, to succeed him as keeper of the Privy Purse, and it seemed that Knighton had been the instrument of placing someone ahead of himself in that race for privilege, though he had done it at the Regent's personal desire. He was to find that willingness to bow to such whims was the surest means of advancing his personal status.

Gradually, Knighton moved ahead of his rivals in the service of this fascinating egoist who was ruler of England. He had managed to extract from the dying McMahon those papers

about which the Prince Regent was so anxious, and now His Royal Highness was obliged to divulge that the letters came from a certain Mrs. Fitzherbert who had been a bosom friend of the late Sir John. Of course, this Mrs. Fitzherbert was none other than the notorious lady who claimed to be the Prince's legal wife, and he now unburdened his soul to his new physician.

Knighton must have known very well by hearsay the story of that nocturnal farce in Park Street, Mayfair. The whole fashionable world had talked of it and was now bored, but now the doctor heard it from the principal actor. They had both been young, so the Prince explained, Mrs. Fitzherbert thirty and himself only twenty-three, and a clergyman had been sent for to read over a few lines just to please the lady, but there had been no proper marriage licence. They had taken too much wine, and the whole thing had been in fun, just a piece of play-acting. From the Prince's own lips, Knighton heard this sordid tale which he knew at least in outline from the gossip of every drawing-room. This squalid performance had become much more than a broken romance. The lady happened to be a Roman Catholic, and she and her friends professed to regard this irregular episode in Park Street as the celebration of a Sacrament, and declared that if Mrs. Fitzherbert had her rights she would be the wife of the Prince Regent, and partner on the throne of England.

As the doctor learned the details, he saw into the heart of this self-revealing Prince, and decided that he was not wicked, but only vain and self-indulgent. He heard his royal patron describe with disgust and horror some later scenes which had taken place with his mistress, how in one of her fits of fury she had thrown a slipper at his head, and how at last they had separated after she had tried every way of making him jealous.

The new physician listened. Something drew him powerfully

towards this troubled royalty with the large eyes, sensual lips and mixture of dignity and commonness, but he concealed his thoughts.

His loyalty gave the Regent confidence and he was now entrusted with a further and even more delicate commission, for the consequences of Mrs. Fitzherbert were by no means over. The lady possessed still more letters written by the Prince, and these Knighton was commanded to secure in exchange for those of hers which had come to light from the papers of Sir John McMahon. Knighton went down to her house at Brighton and when she refused to see him, saying she was ill, he insisted on the privilege of a doctor, walked into her bedroom and bullied her. But Mrs. Fitzherbert was too artful. She produced some of the Prince's letters but kept back others, and later she even trumped up a story that Knighton had not handed over to the Prince all the letters which McMahon had given him.

How William Knighton hated her. A cunning, designing woman, he thought, very selfish, with a temper of the worst description. Deeply did he sympathize with the Prince who had been so unfortunate as to fall into her clutches. Of course, the lady could not have found that royal person altogether an angel, yet she had taken that upon herself. Knighton wrote ponderously in his diary 'the moment a woman places herself in the position of a mistress it is too late to complain of the miseries that follow as a natural consequence.'

But the mission to the lady's bedroom at Brighton had not been entirely unsatisfactory; the Prince Regent thanked him warmly, and he rose like a meteor over the heads of his brother physicians. 'I was now,' Knighton wrote, 'beginning to be made his confidential friend in all those secret concerns which a life of pleasure and sensuality had exposed him to.'

Wherever he was, at Carlton House or Brighton, the Prince

must always have him near at hand, and when he came to the throne as George the Fourth, Knighton was taken on a tour of the German dominions, and the man who had worked so hard to get his medical diploma at Aberdeen, and who had petitioned the Archbishop of Canterbury for a parchment, was now invested with an *honorary* Doctorate of Medicine of the ancient University of Göttingen, being presented therefor by the Duke of Cambridge. He was given the Grand Cross of the Teutonic Order of Guelph, and appointed to a lucrative office in the Royal Duchy of Cornwall. In 1812 he became a baronet, and when that other Royal Physician, Sir Benjamin Bloomfield, became a peer and Minister to Sweden, Knighton succeeded him as Keeper of the Privy Purse and King's Private Secretary. In 1822 he wrote his last medical prescription and became entirely the King's man of business. He was attacked in the House of Commons. Under an item of Parliamentary business called 'Ministerial Explanations,' a maiden speaker named Duncombe made a rhetorical onslaught upon 'secret influences behind the throne whose name is not even breathed, whose form is never seen, who has access to all the secrets of the State, who arranged all the sudden springs of ministerial arrangements.' The honourable member became so impassioned that he needed to burst into verse:

> At whose soft nod the streams of honour flow,
> Whose smiles all place and patronage bestow.

With this mysterious figure behind the throne, Mr. Duncombe coupled an even more formidable power—the international Jew who supported Britain's credit, and he wound up with an appeal to the Duke of Wellington and the Secretary of the Home Department that 'they should not allow the finances of this great country to be controlled any longer by a Jew, or the

distribution of patronage of the Crown to be operated upon by the prescriptions of a physician.' Sir William Knighton had not been mentioned, nor had Baron Rothschild, but everyone could supply their names.

Members of the House merely laughed and Sir Robert Peel, in his reply, ignored the vehement Mr. Duncombe. The attack exploded like a damp squib.

There was even an attempt to make Sir William Chancellor of the Duchy of Lancaster but, for once, political influence was too strong.

But he was sufficiently secure in the King's friendship. It was enough that he could receive letters signed G. R. and beginning 'Dearest Friend', and expressing sentiments such as these: 'It is utterly impossible for me to tell you how uncomfortable and how miserable I always feel when I have you not immediately at my elbow.' After a terrifying sail from Wales to Portsmouth, when the ship was nearly wrecked off Land's End, His Majesty even rose from his bed where he had been disabled by seasickness, solely for the purpose of writing to his physician, 'for I too gratefully feel the warmth of your affectionate heart towards me at all times, not only not to neglect you but to prove to you that you are always present to my mind.'

The King's pen was hardly ever out of his hand by day, and at night he must needs have Knighton sleeping in his dressing-room, so that he could summon him for long and troubled colloquies.

3. MASTER OF THE HOUSEHOLD

Sir William's psychological link with the royal libertine was an attraction of opposites. George the Fourth trusted him, feared him, and in time would come to hate him. Knighton now handled

all the King's correspondence. He was directed to undertake 'the entire management of our private affairs with a view to the observance on the most strict and rigid economy, that we may have the opportunity of relieving ourselves from certain embarrassments which it is not necessary to mention further in detail.' Sir William even began to have influence in making and unmaking the King's Ministers and, naturally, this did not please the elder statesmen. The Duke of Wellington wrote advising him not to meddle in affairs which did not concern him, but the Keeper of the Privy Purse gave a demonstration of his new power by taking this letter straight to the King, who thereupon haughtily observed to the Duke that Sir William was responsible to himself alone.

But the most onerous responsibility of the King's private secretary was the delicate duty of managing the royal ladies, and here Sir William Knighton showed superlative talent.

Lady Conyngham had appeared on the scene as royal favourite and fortunately Sir William found her more easy to handle than Mrs. Fitzherbert had been. Lady Conyngham had a husband of her own, but she was treated as the suzerain of Carlton House. Experienced judges of court magnificence had never seen anything so fine as the pearls she wore, and one evening Sir William Knighton particularly noticed, sparkling in her head-dress, a very large sapphire belonging to the Crown Jewels of England which had come down from the Stuarts. The man who had waited to purchase a gold chain for his little daughter until he could pick up one tolerably cheap, had a good eye for the value of such things, and next day he let it be known that he had observed her Ladyship wearing that particular sapphire.

He ruled these ladies as the Grand Vizier to a Turkish Pasha regulates the harem, and he was prepared to go to any length

to retrieve the consequences of scattered favours and abandoned loves, and while ready to indulge every sensual whim of his master, he was vigilant in checking the cupidity of these dames. Lady Conyngham became entirely subservient to him, so afraid was she of his influence with the King, and would not invite to dinner anyone of whom Sir William disapproved. And he kept his eye upon her and saw to it that those wonderful sapphires came back to their rightful place among the Crown Jewels of England.

Knighton was now one of the most powerful men in England, and anyone who wanted a royal favour wrote to him. Lord Liverpool thanks him for the King's gift of a thousand pounds to Trinity College, Cambridge. Sir Walter Scott writes to ask if he may use in a forthcoming book a letter from Lord Byron quoting an opinion from the Prince Regent and adding, perhaps not entirely an afterthought, that the Waverley Novels are selling well and he hopes copies have been placed regularly on His Majesty's table. George Canning writes to him for permission to take his wife to walk under the trees of the Pavilion gardens at Brighton. It was Knighton who commissioned from Sir Thomas Lawrence the fine series of portraits which formed the King's collection.

Mrs. Fitzherbert had not been the only royal indiscretion, and now the tangled errors of the past had become an obsession with the King. Who could sort them out but his ever-resourceful friend? Sir William Knighton was to have many opportunities to prove his diplomacy, and an important part of his duties came to be to range all over Western Europe, setting out often at short notice, as each fresh embarrassment came to the King's attention. To Paris, Spain, Belgium and even Sardinia, he travelled to collect and suppress. Wherever he went he visited picture galleries, and churches and museums, he listened to

music, and in his diary he wrote an account of his personal relaxations, but never of his official duties. He followed royal footsteps in those primrose paths of years before, the mere memory of which had caused the First Gentleman in Europe to wince, and he eliminated the evidence with the firmness of a faithful servant. His determination to keep the King's secrets was so successful that all the knowledge we possess now is nothing but a mere fragment of that immense web of intrigue. This man had a good eye and a facile pen. Ah, if he could only have been endowed with that faculty of secret indiscretion, we should possess a journal far more fascinating than George Greville's.

The tone of the King's letters to his Keeper of the Privy Purse is sometimes that of a suppliant. The royal quill would cover sheets of paper with commands that read more like entreaties, as though he were in the power of Sir William Knighton. 'It is you alone who can, and who I am sure (from your real affection and attachment to me) entirely put an end to, and by your powerful exertions and means, utterly eliminate and put the extinguisher upon that nest of vipers and hornets which seems particularly at this moment to have congregated itself together to sting me personally.'

And the man who had been the royal doctor never failed. To continental *châteaux* and shabby apartments he would pursue faded mistresses, and arrange for the transfer of papers covered with fading ink. We can picture his eyes measuring the movement of an eyelash, and noting ebb and flow of the colour in those expectant features, as meticulously as though in a case of wound fever, and we can imagine him calculating the smallest offer he would be obliged to go to in order to make a deal. We can think of the bitter-sweet sensations of finality in those

ladies as they hand over the letters in exchange for gold guineas stamped with the profile of the royal lover.

4. A MOST TROUBLESOME INDISCRETION

A royal warrant had been issued, authorizing the Keeper of the Privy Purse to proceed to Paris for the purpose of buying up certain fraudulent obligations, 'provided these could be purchased for not more than five pounds apiece upon an average.'

There was a certain expatriated Frenchman named Captain Merle, who lived at Brighton, in a house reported to be a 'brothel, a hell, and a receptacle of stolen goods.' He commanded a large smuggling-vessel. One of his ploys was to take large sums from would-be French emigrants as payments for landing them in England and then, after a devious voyage, deposit them on some lonely spot on the French coast. This Captain Merle, as a professional violator of frontiers, was much intrigued because Sir William Knighton was constantly moving to and fro between England and France with large boxes which passed through the Customs unexamined. He made all sorts of guesses as to the object of these travels. Perhaps Sir William was negotiating a marriage for George the Fourth, or these mysterious boxes were somehow connected with a concordat from the Pope. Captain Merle planned to gain secret information which could be sold for a handsome fee to *The Times* newspaper.

But Sir William's real object in proceeding to the Continent eluded the perspicacity even of Captain Merle, for he was on his way to instruct H.M. Ambassador at Paris to ask the Chief of Police there to place certain persons under surveillance. Having done this he then moved on to Belgium for a similar purpose. A week later, H.M. Ambassador at Brussels sent one

of his highly trusted agents to Frankfurt with instructions to seek a very secret interview with a lady called Mrs. Rochfort. They were to inform her in words that she would completely comprehend, that while the Ambassador had no wish to proceed to extremes, she must cease those annoyances which particularly of late she had directed towards a quarter which she would perfectly understand. Her persistence in those annoyances would be infallibly attended by inconveniences to which she had probably never looked. The language was guarded, but the meaning clear.

Who was this Mrs. Rochfort who had the power even at a distance to set this mighty engine of diplomacy in motion? Secret Service men at the beginning of the nineteenth century knew her well. The fashionable world of England knew her even better. A hundred and thirty years ago, she was celebrated as Henrietta or Harriet Wilson. She was indeed notorious, as a courtesan of surpassing success, and in quarters where once she had been enjoyed, she was now feared. When her memoirs were published in 1825, every gentleman in the world of fashion looked to see whether his friends were implicated, and scandalous appetites were whetted by the promise of further volumes. A man sued the publisher and secured £300 damages from the Lord Chief Justice and a Common Jury, but the fascinating revelations continued to five volumes. Their tone was set by the opening sentence, succinctly describing the earliest episode in the lady's extraordinary career: 'I shall not say how, or why, I became at the age of 15, mistress of the Earl of Craven.'

Henrietta Wilson's dazzling trajectory had crossed the brilliant orbit of Carlton House, and her embarrassing memories of the Royal Master there, and her even more tangible mementoes were now in the possession of the retired Mrs. Rochfort in her obscurity at Frankfurt-on-Main.

When the confidential man from H.M. Ambassador called with his message, Mrs. Rochfort was away from home, and surprisingly her husband did not seem to know where she was to be found. By letter, however, she stated her terms for silence: Three hundred pounds down and a hundred a year for life, and in due course this communication was placed before the Keeper of the King's Privy Purse. Sir William considered the proposal like a shrewd solicitor. He was by now accustomed to fathom the rapacity of these ladies and outmatch their manœuvres, and in this case his decision was in the negative. Let her do her worst. Nothing was offered in the way of further appeasement and Harriet Wilson faded into deeper obscurity.

While he performed such services and performed them well, the world held no attraction for Knighton. He was not in love with mystery and intrigue, and in his nature was no trace of the abnormal. 'An honest mind,' he wrote, 'shrinks from the machinery necessary to be blended with transactions of this nature: the conscience is under constant alarm lest its motives, thus mixed with vice, should suffer a taint from that source of corruption which it is its wish to counteract and destroy.' Such was the slight bewilderment of his robust mind when faced with vice, a distaste not, however, affecting the penetration of his judgment. In fact, these escapades rather bored him, and when his travels were done, he would escape back into his own very different pleasures, buying pictures, talking to Wilkie and Lawrence the artists, or spending an evening with Sir Walter Scott.

5. MENTAL ASCENDENCY

For such immense but unmentionable services, the First Gentleman in Europe would shower his private secretary and physician

with gratitude. Then, as his mood changed, and Sir William was no longer in the presence, the King might repent of his repentance, and write a long tortuous letter undoing what had been said, but with quaint consideration ordering the messenger not to deliver it before five in the morning in order not to disturb Sir William's repose. 'I am ready,' wrote the King in one of these moments of stiffening dignity, 'and prepared to act upon and to meet with even the very essence of all that conciliation, all that good temper, all that *the strictest sense of honour* and liberality can dictate.' Then, as though he feared the result of such magnanimity, his sentiments rose in a crescendo of self-justification and much underlining with the quill. 'But let the stake be *what it may,* and the risk *however great, I must not, I can not, and more I will not, tolerate even the possibility of the most trivial breath of inconsistency as of duplicity being affix'd upon me or my character. I know I may repose myself in perfect confidence in your hands and that (however difficult the chrysis may be) you will exert yourself in this cause,* upon *the same principles of conscientious rectitude which alone actuate me.'*

What, we may ask, was this royal victim of paranoia afraid of? To us, the career of George the Fourth seems so loaded with scandals that one or two more might have been unnoticed. But the King's sense of his personal honour was morbidly acute. The sordid revelations of his divorce, that shocking moment in his life when the Princess of Wales knocked on the door of Westminster Abbey demanding to be crowned as his consort, these and countless other misadventures troubled the King's imagination, and made him dread the ridicule of the world. In the crowd of courtiers and sycophants there was only one whom he could trust. Only one man who was honest and inflexible; one man who read his secrets without need to be told them,

and who none the less gave him the full respect that belonged to the throne. Now and then this man was obliged to disobey the King's command. 'I am so surrounded with cares on your Majesty's account,' wrote Knighton, 'so separated from every kind of support but what I derive from my own intellectual efforts that when I say happiness and myself are strangers, I do not mention it in the language of complaint, but only to hope that when I venture to oppose any of your majesty's commands, your majesty will believe it always arises from these feelings of devotion and honesty which are the true characteristics of my nature towards your majesty.'

The King knew his man, knew his loyalty and felt for him genuine affection. 'Let me implore you to come to me, be it but for a moment, the very first thing you do this morning; for I shall hate myself until I have the opportunity of expressing personally the pure and genuine feelings of affection which will never cease to live in my heart so long as that heart continues to beat. I am too unhappy to say more, but that I am ever your affectionate friend, "G. R." '

Such was the nature of this reciprocal feeling between the physician and the monarch. But no human being, least of all George the Fourth, could endure easily the thought of being in another man's power, and underneath his protestations, the King both feared and hated his doctor. On one occasion, when the sovereign was making merry with some Tyrolese dancers and thoroughly enjoying himself, Francis Conyngham said he would give ten guineas to be able to see Knighton's face if he should walk into the room and see them at play like servants merrymaking in the master's absence.

Another time, with his attendants all around him, George the Fourth cried out that he wished to God someone would assassinate Knighton. One of his royal predecessors six hundred

years before had made a similar ejaculation which caused a murder in Canterbury Cathedral. This time the King was preserved from the ill-fortune of being taken seriously. But Knighton made him tremble. That efficient and discreet servant who knew his weaknesses so well could cause his master's handsome and self-indulgent face to darken and the flabby cheeks to melt. The royal exhibitionist, who never concealed his faults from his valets, had a deeper level of frailty below what he would admit even to himself, and even this unfathomable depth was known to Sir William Knighton. Deeply he despised the man even while he gave profound respect to the King, and he took no trouble to hide what he thought. There is one famous remark of his which expresses a whole volume. George the Fourth, when in his cups, was given to a riotous range of fantasy, and on one occasion he was describing to his astonished but discreetly silent courtiers the Battle of Waterloo and the orders in the field which had been given on that famous occasion. The whole success, it seemed, had been due to the King's personal foresight and strategy.

We can picture Sir William Knighton's severe smile when this royal extravaganza was reported to him and he remarked: 'Let his Majesty but give up curaçao, and he will win no more victories!'

A man who had obtained so unusual an ascendency paid for his eminence much more than he ever received in gratitude. Under the pretence of solicitude for the King's interest, people attacked the Keeper of the King's Privy Purse. One horrified official who came away from the royal presence, told observers that he had actually heard Knighton contradict the King without ceremony or circumlocution, and that Knighton had even gone the length of cross-questioning, whereat George the Fourth, giving Knighton permission to finish what he had already be-

gun, said, 'You may ask him what questions you please: he is the poorer man for having known me,' and he held out his hand to be kissed. In this mood he would pour out self-justifying letters to his confidant. 'You know how honourably and fairly I have conducted myself to all parties; notwithstanding all the warmth of friendly advice I have given, everything that passes under the eye of the public proves but too much and too sensibly that is entirely disregarded and complete without weight and therefore entirely cast aside. . . .'

The troubled King, now well on in his sixties, suffered greatly from bladder irritation, probably due to a stone; he constantly took laudanum, and hardly ever went out of his over-heated rooms where he passed the days morosely comparing his symptoms with those of which his brother the Duke of York had died. His Majesty had even abandoned the attempt to preserve his figure, and allowed his belly to descend to his knees. Fear of death, fear of illness, fear of Sir William Knighton, these haunted George the Fourth in his last years. Yet he clung to his adviser. 'Though blind as a beetle, I endeavour to scribble a few lines,' he wrote mysteriously on a very familiar theme. 'All at present is buried in my own breast and *communicated to you alone*. . . . My main object is to arrange everything with you and to ensure quiet and comfort, before any alarm can be given rise to, however absurd, from any cause, but most especially before either any vague report, or article copied from foreign papers may reach us here.' This, written in the King's last year of life, shows that his morbid fear of public ridicule was still warm.

Owing to cataract in his eyes he could hardly read, and at Privy Council meetings candles had to be held at a particular angle to enable him to get through his speech. He feared the fate of his father, George the Third, who had become both blind and mad. The acid-tongued Greville said that George

the Fourth was already a little of both. But in spite of everything, Knighton's devotion never wavered. As the King entered upon the final phase of his earthly existence, the Privy Purse saw the decline and wrote to his wife from the royal bedchamber: 'We are not going on well: depend on it, this will not do: if this illness should be protracted, I see much suffering and embarrassment before us. . . . My duty is to promote the King's comfort and peace of mind: I will never consent that he shall have a moment's pain, to gratify the idle curiosity of a set of persons whose only objects are—to find fault with everything and to pull down, if they possibly could, the character of the individuals who are endeavouring to serve their sovereign by every means in their power.' He placed, unasked, a large-type bible on the King's dressing-table, with which His Majesty was much pleased.

6. THE WATCH-DOG AT WINDSOR

As the king sank more deeply into the illness from which he never recovered, no one realized better than the Keeper of the Privy Purse that the termination of his own professional career was approaching too. He kept an even more vigilant eye upon the Crown Jewels which Lady Conyngham would have liked to appropriate, though by now she had long been bored with the King. Nevertheless, wagon-loads of royal possessions were passing from Windsor to her house, and a few days before the King's death, Sir William performed his last service to his master. A mysterious financial transaction was passed through quite without a trace or record.

Thirty thousand pounds' worth of Stock belonging to the

King was sold; the proceeds disappeared into thin air, but everyone believed the money had gone to Lady Conyngham. This inflexible Keeper of the Privy Purse, who despised mistresses as much as he despised the man who kept them, made his last gesture of absolute power, as he handed over money to the woman who had been so timid of losing his favour. Thereby he brought to an end worldly authority over her and others whom he had disciplined for the King's good. It is a tribute to Knighton's character that no one suspected him of appropriating this money for himself. And here, at the risk of being too psychological, we must remind ourselves of Knighton's boyish dilemma between that secret sympathy with his erring father and the strict moral standards of his fatherless home. The King knew, everyone knew, that Sir William Knighton was endlessly indulgent to his master's whims, yet fundamentally incorruptible.

The royal illness worsened, but still Knighton thought it might go on a few days further. Then came the summons, and he was called from his rooms in the Lancaster Tower to the private apartments, just in time to witness the last sigh. 'Thus ended,' he wrote, 'the life of George the Fourth, one of the most accomplished men in Europe—full of benevolence. There will be many to deplore his loss.'

After the King's death, the Duke of Wellington opened the private escritoire and could not find enough to pay the messengers who were dispatched all over the kingdom with the news, and while the valets were unearthing a prodigious quantity of trinkets and trash, women's hair of all colours and lengths, some with powder and pomatum sticking to them, notes and letters and feminine gloves, Sir William stood by and saw that nothing of value disappeared. Suits worn for fifty years, every sort of uniform, three hundred whips, and dozens of riding-breeches, furs, pelisses and hunting-coats—enough to stock Drury

Lane Theatre, these trifles were sold by auction, while the royal watch-dog stood guard over the apartments, alertly keeping his eye both upon Lady Conyngham, and the key of the King's jewel box. Thanks to his fifteen years of vigilance the King died out of debt.

7. A PHYSICIAN'S REWARD

Sir William Knighton was a physician in the age of personal influence, when the doctor's sole resource was an intuitive understanding of the patient's temperament. He ceased to practise medicine, but he never ceased to use this extraordinary personal gift. George the Fourth changed his Prime Ministers often, but he trusted absolutely to Knighton's integrity, though dreading the silent reproaches of his eyes; chafing over his dependence upon the guardian of his disreputable secrets, yet quite unable to do without him. They understood one another perfectly, but Knighton had the fewer illusions. Bullying discarded mistresses —not a very becoming occupation for a doctor! But neither was the indiscriminate pursuit of them very ennobling in a king. We should not apply modern morals to this case. We can only marvel that an honourable man could stoop occasionally to such sordid transactions without becoming corrupted by them.

In this book about physicians, Sir William Knighton finds a place not for his knowledge of pure medicine nor for any skill in treatment. He was great only as a guardian of His Royal Patient's soul. He performed that fundamental service which every doctor must first give to his patient, that of providing mental assurance.

Knighton did this superbly, because he understood the human organism in all its weakness. Yet, at the same time, he himself was supremely robust. In the portrait of him by Sir Thomas Lawrence, in a neck cloth and unbottoned surtout, looking as

though he had just dismounted from a horse, we see a firm-willed, cheerful man, who looked life in the face and saw more good there than evil. In the letters he wrote to his children, we see that the orphan boy of Devon has become a good father, humorous, understanding, indulgent, though perhaps inclined a little to religious moralizing that nevertheless sounds transparently sincere.

Knighton's vivid diary is silent upon the subject-matter of his secret missions. It was something more than discretion. At heart he was a man of intense sympathy, but there were certain experiences which his inhibitions simply would not allow him to write down. That alert royal servant who rattled in his coach over the continental highways to interview discarded mistresses was the puritan in whose soul there lurked a libertine. The Devonian boy had felt the appeal of John Wesley telling him that the good life was more than a king's crown; yet blood was strong, and George the Fourth attracted him like a psychological magnet through a remembrance of his own father, and a boy's sympathy, overlaid by a lifetime of rectitude, made him indulgent. This clear-sighted man never forgot that Prince Charming with the curled hair and fine eyes who had fascinated him on the first audience. Each time he returned to Carlton House with a new bunch of letters and a strict account of the guineas spent in obtaining them he received from that corpulent gentleman, who sat sideways upon the throne of England, the accolade of gratitude. No statesman, no mere private secretary, would ever have been given that sort of appreciation. The King's friend could have had any reward for which he cared to ask; but he never enriched himself. He was content to remain the most powerful private person in England, and when George the Fourth died, he quitted the spheres of power and devoted himself to the enjoyment of painting and the solace of travelling through

Europe. Knighton lived on six years, devoted to artistic things.

He was permitted to see the very worst in the King's heart only because he was trusted absolutely. Often he saw the dignified character emerge from behind the self-indulgent mask, and in those moments tasted that exquisite sensation of authority which triumphant virtue has over humbled vice.

SIR JAMES CLARK

No matter if it were a scientific question or a moral question, you saw his mind balancing it like a pair of scales, and false weights were an abomination to him.

[Sir James Clark's Obituarist]

I. THE METEOROLOGIST

DURING the years when Sir William Knighton was following the trail of the King's amours all over Europe, a very different sort of doctor was moving along the highways of France and Italy with very different objectives. A tall, heavy-boned Scotsman, with an open-air look about him, and speaking a rough musical brogue from goodness-knows-where, might be seen stopping his post-chaise and making observations upon the weather. In Alpine passes, on the Corniche Road, he would write down in his notebook the air temperature, the direction of the wind, and record his almost unanalysable impressions of the atmosphere. Stored in manuscript records, he had notes of such phenomena not only as observed by him in Europe, but in the West Indies, and the Eastern coast of America. Dr. James Clark had collected such figures with a passion ever since he came out of the Royal Navy; climate and its importance was bred in his bones. While Sir William Knighton was pursuing the inscrutable in the depths of human psychology, James Clark probed the secrets of the weather.

On the austere coast of north-eastern Scotland, this son of a small farmer who lived and died upon the land, was a rebel who woke up to the magnetic pull of a larger world. James Clark

had been apprenticed to a writer, that is to say an attorney, in a small rural town, and he learned to earn his living off the soil. Not by producing crops or breeding cattle, but by settling disputes between the bonnet lairds and their tenants, writing feu-charters about the ownership of a few acres, extracting the sense out of that peculiar Scoto-Latin of the Scots Law. But at the age of twenty-five he threw down the quill pen, tired of those perpetual petty disputations, and went to Edinburgh to take a diploma in medicine and surgery. Like so many men of achievement, the adventurer from Banffshire was a late starter. He became a surgeon in the Royal Navy five years after the Battle of Trafalgar, a member of the generation which came after Sir William Knighton.

The British Navy after Nelson's time, when the wars were over, had a period of glorious adventure. It colonized, it spread civilization, it explored strange coasts, carried the mails, it policed the seas. Assistant Surgeon Clark carried out his part of the tradition by using his thermometer to measure the warmth of the ocean, writing down figures of altitudes, winds and moisture, always speculating as to their effects upon the human constitution.

Apart from war which for a whole generation had been the concentrated occupation of the Royal Navy, the naval surgeon had a good time, with leisure to indulge a hobby of meteorology or any other. There were no longer blood-curdling scenes in the cockpit when he would have to staunch gaping wounds, amputate limbs, and stitch up bleeding cavities in wounded bodies, all without any other light than a tallow candle, or any anaesthetic but two ounces of rum. In time of peace, the surgeon was a man of leisure, the most independent officer in the ship. Once he had checked his stores and examined new recruits at the start of the voyage, he had few duties, and these merely

routine. He had to dress the men's ulcers, mainly due to salt water and scurvy; he must see that they took their lime juice as a preventive, or quinine in the form of bark dissolved in wine. At weekly intervals he had to supervise the general washing day for the sailors to cleanse their belongings, and he was responsible for fumigating the ship with burning brimstone, sulphur, or even tobacco heated in great pans along the decks. Typhus, or 'ship fever,' was one of his nightmares, and he had to be present at floggings. In these rolling wooden walls of England there was always a stench, due to bilge water, but the men on the whole were healthy, and the surgeon's duties were mainly those of preventive hygiene.

Twice he suffered shipwreck, but came to no harm. He missed the great naval engagements, but he helped to discover the secret of the North-West Passage, and whenever he could he dipped his thermometer into the Gulf Stream and put up his nose to scent the prevailing wind. He had established his theory that what most mattered in health and disease was the influence of climate.

The Napoleonic Wars came to an end: careers for naval officers were closing down, and at the age of twenty-seven James Clark decided to go into civilian practice. After two years post-graduate work in the Edinburgh of the Waverley novels, he settled down in the West End of London and, like Knighton, waited for patients to come. His thesis for the degree of M.D. had been written upon the theme which echoed in his brain during watches on the quarter-deck: it was about the effect of cold upon the human body. (*De frigoris effectibus in corpus vivum.*) That very title itself is strangely prophetic of the chill which has settled upon his reputation.

In his first year of practice he had a stroke of luck which moulded his whole career.

Dr. James Clark was asked to escort a consumptive patient to Italy, and gladly he set forth once again on his travels, this time not to sea, and across the Channel to Paris, over the Alps to Lausanne, Nice and Florence, doctor and patient moved in their grand curative tour. He observed the texture of the soil under his feet and the concentration of the moisture over his head, and he speculated as to what effect these phenomena might have on the health of his patient. Clark always believed more in geography rather than in psychology, and to him it was self-evident that particular localities possessed individual healing power. Why does the Lake of Geneva suit some people and not others? Pine trees and oleanders, tamarisks and cedars, southerly exposure and loamy soil—surely these are supremely important factors in curing illness. A little temperature in a valley, slight chill upon a mountain side, a dry cough perhaps over a thousand metres—it was all new medical knowledge. James Clark used his thermometer in Alpine passes, he used it in the Gulf Stream and upon Mediterranean shores long before either he, or anyone else, dreamed of placing it in the armpit of a sick patient.

We do not know the fate of that one consumptive patient. But we know that Clark used his eyes and his notebook well, and in 1819 (the year in which Shelley went to Italy), the physician settled down and started practice among the English residents of the Eternal City. There upon the Piazza-di-Spagna he became a popular physician to the new tourists who were flocking to see Europe after the wars. For the rich had learned to travel for health's sake, and Dr. Clark was a mine of knowledge about every Spa in Southern Europe. His researches had made him a believer in 'cure by environment,' and he sent his patients to Vichy and Salzomaggiore, to Aix-les-Bains and Mentone, and when they came back, he made more notes of their reactions.

SIR JAMES CLARK

Each patient became a unit in his statistics; each locality had been so finely graded in his scheme that he could pronounce the reason why an invalid felt better in Pisa than in Florence.

Was Dr. Clark any good as a medical practitioner? We have one testimony, that of his most famous patient. He was a young man of twenty-four, who though he did not realize it, was seriously ill, and he wrote in letters home to England: 'I am to be introduced to a Dr. Clark who promises to befriend me in every way.' That youth had indeed great need of a physician's guidance, for he suffered from pulmonary tuberculosis, and between seasons of the most glorious exaltation, he was prostrated with bouts of fever, coughs and sweats. Clark did not consider Rome a good place for consumptives. The objections were, he thought, largely a question of habit and environment. 'The cold churches, still colder museums of the Vatican and capital are full of danger for the delicate invalid.' On the whole, a tuberculosis patient should not remain too long in the Eternal City. That would have been his advice. But this young man was gathering out of those museums and churches in Rome something profounder than all Dr. Clark's knowledge. A few months later he wrote: 'Dr. Clark is very attentive to me; he says there is little matter with my lungs, but my stomach, he says, is very bad.' Never was a medical opinion less justified. In this particular instance, Clark was out of his depth. How should a born meteorologist fathom the soul of John Keats? We should willingly exchange all of Clark's temperature records for a simple account of the last days of the poet.

With all his personal kindness, Dr. Clark seems to have had no comprehension of the severity of the case, and a few months after that unfortunate diagnosis, the poet died in Rome at the age of twenty-five, following repeated haemorrhages from the lung.

Dr. Clark did not mean to stay in Rome. His plan was to exercise his knowledge of the healing influence of climate among English aristocrats abroad, whom he had learned to humour, if not to understand, and he settled down in George Street, Hanover Square, London, in the district of power and fashion, where the milords passed the period between the winters when they lived abroad and the summers when they retired to their English estates. He had one faculty which well becomes the physician, a mighty power of reticence. No one could hold his peace so well as Dr. James Clark, and discretion was to help him where his knowledge of medicine failed. It is an irony that today he is remembered chiefly through the only instance where that prodigious Scottish caution suffered a lapse.

In George Street he practised with complete absence of originality except on the subject of climate. It was through this hobby that Clark met his most influential patron who became to him what Lord Wellesley had been to Sir William Knighton.

At Carlsbad, where he had followed his patients to the healing waters, Clark was presented to Prince Leopold of Saxe-Coburg, that alert matrimonial adventurer who had just missed becoming consort to the throne of England, and picked up a consolation prize as the first King of Belgium. This accomplished personage condescended to walk through the Bohemian pine woods with the young English doctor, and probably the Prince was respectfully reminded by Clark that he was really no Englishman, but a veritable Scotsman. The Prince needed a personal physician. Who could be better for such a post than this clever, cautious Clark? The Prince had another medical friend, a certain Dr. Stockmar who measured the solid gifts of this Scotsman from—where was it? yes, Banffshire. There was little the Prince did without Stockmar's advice.

In Rome a fashionable consultant, in Hanover a Court physi-

cian, well trusted by the great personages who travelled the Continent, Clark was on the threshold of his celebrity, a tall, heavy figure speaking in measured tones and moving in and out of his carriage with inexpressible dignity. He was surrounded by jealous rivals. The London doctors had not recognized this outsider who came among them by the devious route of the Royal Navy, Rome and Hanover, and Clark was never to the end of his days admitted a Fellow of the Royal College of Physicians. In spite of this, he was just about to reach the supreme professional prize.

Leaving him on the threshold of his success, let us pause for a few pages and take a glance at the book which really expresses the best of Dr. James Clark, for though his ideas belong to an almost forgotten period of medicine, he was in his own way a man of the scientific temperament.

His travels with notebook and thermometer had blossomed into a popular book—the *Sanative Influence of Climate*. Climate —that was his strong professional suit, a journey, a continuous change of air, and he could describe with abundant meteorological detail the atmosphere of every health resort then known, from Carlsbad in Bohemia, to the little Cornish village of Penzance which he pronounced to be second only to Madeira and the Azores in regard to distribution of heat throughout the year, and the little seaport of Brighton, that favourite of George IV, was described with some approval.

To Americans in search of health, he recommends a sojourn in Europe. As it were, he takes the two climates in his hands and weighs them and then sums up in favour of the transatlantic visit. He quotes one particular case of a citizen of Boston, Mass., who was out of sorts and became completely revivified by a sojourn in Paris. No suspicion is allowed to cross these earnest

pages that possibly other causes may have been at work, and that European society, libraries, museums, casinos and other pleasures may have assisted the recovery of that American from the Puritan Boston of a hundred and thirty years ago. We learn nothing from this book of those interesting commonplaces of travel for which we would willingly exchange his ponderous generalities, nothing about inns, coaches, food or beds. For all Clark tells us about their movements his patients might have journeyed across Europe in the Blue Train. We understand better that strange misadventure which is the summit of Clark's career if we form an impression of the essentially unexperiencing character of this rugged man who still spoke the Banffshire Doric as he pursued his obsession of climate in the sick rooms of Mayfair, where frail humanity, seeking the boon of good health, greedily accepted his theories that salvation was to be found in some distant place—in Mentone, or Bermuda, rather than in the familiar routine. Or if they could not manage to travel so far, there was always the nearby Brighton and the homely Penzance. Far off waters are always more alluring than the fountains of home.

When writing his books, the busy doctor needed help, not merely with the manuscript, but to express in figures some of the ideas which were vague in the back of his mind, ideas about air temperatures, and the connection between health and the weather. In his fashionable practice, he had been consulted by a very ordinary general practitioner who was struggling along in north London, and whose wife was smitten with pulmonary consumption. Dr. Clark did what was possible, and that was not much, for the wife died. The husband, whose name was William Farr, and a well-read young man, devilled for him.

Dr. Clark was faithful to his friends, and he did not forget this intelligent young man with a peculiar knack for figures,

who was able to translate into intelligible terms certain ideas which Clark was unable to express. He patronized William Farr and builded thereby a fabric far beyond his own conception. He laid the foundation of medical statistics.

This William Farr never went to college, and hardly even to a medical school, and he had never learned mathematics except from himself. His fortune was that gift of pleasing which had attracted Dr. James Clark, and it originated early in life. Farr was the son of a small yeoman near Shrewsbury and was adopted as a child by the squire of the district who apprenticed him to a local physician, and left him a legacy of five hundred pounds. On the money, Farr educated himself. He was an insatiable reader and reasoner. He began to apply mathematics to sickness, and to calculate the chances of death. He found that illness and death were not entirely capricious. They behaved indeed according to numerical laws which could be worked out, and sometimes a mass of cases of fever would function with the certainty of a multiplication table. Deaths would go up in a spiral, they would come down in a curve, and William Farr, by placing these numbers together in a certain order, could sometimes venture a prediction of what was likely to happen.

Such an idea was new to Dr. James Clark, for it was the precise opposite of the sort of medicine he was accustomed to practise. But it powerfully appealed to his mind.

What did it matter to a Dowager in Hanover Square suffering from fever that an obscure medical practitioner who worked by covering paper with pencilled calculations might predict that her chances of getting cured were approximately one in four? Cold comfort indeed. She might belong to the three who would die; on the other hand, she might be the one who would recover, and if the ingenious William Farr were challenged to prophesy which, he would have shaken his head and shyly re-

plied that medical mathematics dealt in large numbers, and was supremely uninterested in what happened to the Dowager in Hanover Square.

But Dr. James Clark was impressed. He could not use such information directly in his aristocratic practice, but he could foresee its future value, and he could form an intellectual respect for this younger man whose arithmetical talent was so much more developed than his own fumbling in figures. Clark introduced him in the right quarters, and in the year after Queen Victoria came to the throne William Farr was appointed assistant to a newly created official called the Registrar-General, at a salary of three hundred and fifty pounds a year. Thereafter, he was to spend the next forty years of his life in calculating medical chances. He sketched the chances of recovery from consumption and cholera. He tried to persuade medical practitioners to call one disease by one name, instead of by five according to their individual whims. He bent his arithmetic to discovering the causes of disease, for his brief experience of medical practice had taught him more poignantly than a longer experience had taught Clark that disease was more easily prevented than cured.

This man of statistics, who buried himself in the chambers of the Registrar-General in Somerset House on the river Thames, and who wrote fluent reports, decorated with Latin quotations about the chances of death, and the degree of certainty which is present in all accidental circumstances, was the real originator of a whole new branch of medicine. This mole of figures worked in obscurity, throwing up regular piles of results, and burrowing his underground passage in the very foundations of health and disease. Dr. James Clark gave forth his opinion in the drawing-room, and the patient listened breathlessly to his fate; while William Farr whose manner never reassured anyone, who was

as much out of his depth in clinical medicine as Dr. Clark was in the statistical average, was establishing the bond between cause and effect.

Today figures have invaded everything. The mechanization of life has come to seem almost more vital than life itself, and those ingenious engines which measure records upon hole-punched cards, and calculate destiny in hundreds of thousands, these are the natural result of the career which began when Dr. James Clark chose the obscure general practitioner to help in the preparation of the book on consumption. Of the value of that work of medical statistics his own glimmering insight was more than the prevailing darkness of his age, but even Sir James Clark, as he looked back upon his own fortunate career, was spared knowledge of the fact that his greatest discovery in medicine was the discovery of William Farr.

2. PHYSICIAN TO A PRINCESS

Sir William Knighton was watching Lady Conyngham who was watching the Crown Jewels, but the world of fashion was interested in the young princess. Ever since 1820 she had been brought up in Kensington Palace then almost in rural solitude, where her mother, the Duchess of Kent, had a small semi-official household. The personal physician, old Dr. Matson, was perhaps rather more accomplished as a botanist than as a medical man, but he had been a favourite with the Duke of Kent whom he attended in his last illness at Sidmouth, and when the physician departed to join his late master in 1836, there was a vacancy on the staff of Kensington Palace. In such important affairs, the Duchess of Kent generally took the advice of her very intelligent brother; or if not, he gave it unasked. This capable brother, of course, was no other than Prince Leopold of Saxe-Coburg, now become King of the Belgians. When consulted as to the best

person to fill Dr. Matson's place, he remembered that young Scotsman who had walked with him at Carlsbad, and who had been so favourably thought of by Baron Stockmar.

Dr. James Clark was appointed to the Duchess and thus came to know the girl of fifteen who was being trained for her singular destiny under her mother's careful eye, and upon her young mind he made an ineffaceable impression. This tall, grave man with his counsels of open air and his love for romantic watering places was an excellent doctor to advise upon the delicate nurture of this sensitive plant. We must acknowledge that in pure hygiene he was far in advance of his day, and he knew that in the bringing up of young ladies, fresh air is more vital than drugs. He made in these two short years an impression that was to be his fortune, the loyalty of an adolescent girl to whom he became hero. He divined the gulf that lay between the managing ambition of the Duchess, and the emotional life of the young princess, and saw in her young eyes a foreshadowing of prodigious will-power. Dr. James Clark became a favourite at Kensington Palace, and once more there was gnashing of teeth among his professional brethren outside.

Upon a June morning in 1837, the young Princess rubbed sleep from her eyes as she came down in her dressing-gown to receive the Lord Chamberlain and the Archbishop of Canterbury who were kneeling before her. It chanced that only the day before Dr. Clark was mentioned in her diary, but now she was faced with the consequences of an illness which perhaps she had discussed with him, that of the old Sailor King who had come to the throne only seven years before. But now the kneeling officials had come to tell her that King William was dead. Long live Queen Victoria. A new reign had begun, and among the revolutionary changes of that June morning, there was one on the periphery.

The new Queen had to make endless appointments. But when she had chosen her Ministers and worked through the Royal Household, she came to the selection of the 'medical servants of the Crown,' a group of more than twenty individuals: three physicians-in-ordinary, physicians-extraordinary, physicians to the Household, sergeant surgeons to Her Majesty, surgeons-extraordinary, surgeon to the Household, resident medical attendants, apothecaries to the Person, dentist, medical galvanist and electrician, and finally, 'cupper' to Her Majesty. There was a similar establishment in Scotland, and one in Ireland.

One would think that the sovereign's health might have lost more than it gained from the attentions of such a numerous retinue, but of course, in practice, the only one of the 'medical servants' who would normally come in contact with Her Majesty was the first of the three physicians-in-ordinary. In the parlours of the West End doctors and the halls of the College of Physicians there was much anxious speculation as to who this man would be. Most of the profession supported the claims of Sir Benjamin Brodie who had attended William the Fourth, and his name came first on the list which the Prime Minister presented for the Queen's approval. The man at the head of the list would take precedence over the two others who would have the honour without the responsibility, for they would rarely, if ever, be called in.

On the very day of her accession to the throne, Her Majesty looked at the rota of the three physician candidates put forward by the Prime Minister. Then she took a pen and crossed out the first name and substituted for it the third name on the list, and by this act Dr. James Clark became her senior physician-in-ordinary. Henceforth, Buckingham Palace was to be the principal scene of his professional work.

Among those who belonged to the household of the Duchess of Kent and who therefore stayed behind at Kensington Palace, was a certain Sir John Conroy, a dashing Irish baronet, who was private secretary to the Duchess, though rumour had it he enjoyed an even more intimate status. Sir John looked upon himself as the natural guardian of the Princess Victoria, and had discussed with the Duchess how their joint influence could be perpetuated when their ward should become Queen of England. They had even worked out a little scheme for having themselves appointed as Regents until Victoria was twenty-one years old. But the unexpected death of William the Fourth frustrated these plans. The young girl was now firmly on the throne, and in her own right.

Everyone knows that Queen Victoria's first act was to have her bed moved out of her mother's bedroom. The Duchess and Sir John Conroy remained disappointed intriguers at Kensington Palace.

Dr. James Clark was still physician to the Duchess as well as to the Queen, so that he was in the delicate position of having a foot in both palaces. But for so cautious a man of the world surely that was an easy matter. Well—we shall see.

There are other notabilities whose passions crowd into the life of the young queen, and who influence indirectly the career of the physician-in-ordinary. There is Madame de Lehtzen, daughter of a pastor in Hanover, who had been Victoria's governess. Although she had outlawed her own mother from her intimate confidence, the Queen kept Madame de Lehtzen near her at Buckingham Palace. Ministers of the Crown noticed that, although she went out of the room while they were received in audience, she came back immediately afterwards, and there was an uneasy certainty that Madame de Lehtzen was told everything that had passed. This governess hated the Duchess of

Kent and everyone connected with her, including Sir John Conroy. The venom of her tongue passed between the palaces, and there commenced a fierce tension of emotional energy, a mother-and-daughter situation tremendously exaggerated by ambitious people looking after themselves and not hesitating to exploit the innocence of the girl Queen. Such was the domestic background of two palaces in 1837.

In the foreground was the Prime Minister, Lord Melbourne, a fascinating, self-indulgent man of the world, now sixty, who had been in his day a great Don Juan, and greatly enjoyed the romantic position of being the instructor in statecraft of his young sovereign whilst they were riding horseback in the park.

These are the chief figures on the stage. Their lives revolve around the girl of eighteen who sits in dazzling light and hears in delightful whispers the advice of her gallant and whimsical Prime Minister. Sinking into obscurity at Kensington Palace there is the Duchess of Kent and her dashing secretary Conroy, ready to hold on to any shred of power, always eager for reports, favourable and otherwise from Buckingham Palace. There is Madame de Lehtzen breathing her scandals and picking up every morsel of gossip to be insinuated into the Queen's ear. As yet there is no Prince Consort to put there his masculine point of view, and in her inexperience one of the few voices which Queen Victoria can trust is that of the solemn Scottish doctor whom she remembered from childhood.

And now we have seen the Court doctor attending the beautiful Queen surrounded by her puppet ladies and gentlemen, let us introduce the tragedienne, whose life seems to have been created only to weave a brief plot before she disappears among the actresses of a single role. A handsome brunette of thirty-one, daughter of the first Marquis of Hastings, soldier and Indian statesman, she is the Lady Flora Elizabeth, and has a place as

lady of the bedchamber to the Duchess of Kent. Clever and amusing is Lady Flora, with a pretty turn for writing poetry. Poetry indeed seems to be the only outlet for an unusually passionate temperament, since her grandmother was the adventurous Flora Macdonald of Skye who rescued Bonnie Prince Charlie. In the little circle of Kensington Palace, now under a cloud of departed glory, the Lady Flora's bright ways amuse the Duchess and charm Sir John Conroy, and her rather waspish tongue finds a target in the prissy governess Madame de Lehtzen, and finds ample material in her homely Hanoverian ways and the caraway seeds she always carried in her pocket. The arrows of Lady Flora's wit frequently travelled far beyond their target, and some of them even reached Buckingham Palace. The Hanoverian governess did not need to be a demon of wickedness to form a marked hatred for the Duchess's lady of the bedchamber.

But what have these trivialities among highly placed persons to do with the newly appointed Court physician? Sir James Clark, for he is now a baronet, keeps back of the stage, almost hidden in the curtains. A more cautious and habitually reticent man never came out of Scotland. If a thing can be accomplished by careful temporizing, he will achieve it. Surely, an admirable man to have about in such an overcharged and emotional atmosphere! That was his reputation with the Queen and the Court. If the physician could have been allowed to withdraw from the prominent part he is now about to play, on the plea that a doctor ought not to meddle in Court politics, he would certainly have taken it. But that is impossible now.

3. ONLY A PALACE INTRIGUE

In February 1839, Lady Tavistock, one of the Queen's ladies-in-waiting, came up from the country to find her friends at

Buckingham Palace all of a hubbub. Another of the Queen's women of the bedchamber, the Lady Portman, was especially indignant, and they worked themselves up into a virtuous agitation over Lady Flora Hastings. What a scandal, indeed. What moral contamination in the pure surroundings of the virgin Queen. At last, unable any more to bear the weight of their responsibility, these two women rush to the Prime Minister, Lord Melbourne, and beg him to do something.

That easy-going man of the world was the very last person to take such a matter seriously. What were these good ladies making such a pother about? To him, the problem of female virtue seemed very simple, and if nature had so ordained, well, what could those excellent ladies do about it? With weary indifference he cut short their feminine expostulations, and politely sceptical, he sent them to Sir James Clark as a man better qualified than a statesman to adjudicate upon matters connected with female physiology.

As the ladies diligently pursued their inquiries it came to light that, not long before, Lady Flora had journeyed to Scotland, actually in the same coach as Sir John Conroy. Here was evidence as clear as daylight, and the Lady Tavistock and the Lady Portman congratulated themselves on having obtained proof of what they had feared to be true. They duly reported their findings to Sir James. Presently, Lord Melbourne was obliged to take notice of the affair. Poor Lady Flora's figure was becoming a matter of politics.

The worldly Prime Minister had summed up Sir James as a cautious, religious Scotsman, just the person to be careful about reputations, and now he sent for the physician-in-ordinary.

Sir James said it was perfectly natural for Lady Flora's appearance to have given rise to scandal, but then, one should not pay attention to mere gossip. Lord Melbourne said he ap-

preciated all that, but what did Sir James really think? Pressed to give an answer, the highly cautious doctor admitted that what was to be observed in Lady Flora's figure did to some extent countenance what was being said of her.

Ah! Sir James has let out what he never meant to say, whatever his private opinion. The wary man has committed himself. By that guarded understatement, by the expression in his eyes, by the way he answered the Prime Minister's probing, he has quite given himself away. He has done irretrievably what he never intended to do: he has ranged himself behind the petticoats of those censorious ladies eager for the blood of Lady Flora's reputation.

The worldly Charles Greville, Clerk to the Privy Council, wrote privately in his diary: 'Such things happen in the servants hall where housekeepers charge kitchen maids with frailty and pregnancy, but they are unheard of in good society.'

In point of fact, Sir James Clark knew more of the details of the case than anyone realized, for in January of the same year, Lady Flora had actually consulted him about the swelling of her abdomen, and for some weeks he had given her treatment which seemed to cause this mysterious enlargement to vary in size. It was true he had not properly examined her, but had only placed his hands over her dress. Indeed when he had proposed to make a fuller examination, the young lady had strongly demurred. Later on, she thus expressed herself: 'I said I would not shrink from any examination however rigorous, but that I considered it most indelicate and disagreeable and I would not be hurried into it.' Give me time, she seemed to say, and all will be well. She spoke with her eyes more than her lips: but to Sir James, this seemed highly suspicious. If the Lady Flora were 'innocent,' why would she not permit a more thorough investigation? He had made up his mind in a certain direction.

Lady Portman decided it was her positive duty to mention the affair to Her Majesty, and she obtained the Queen's permission to throw the entire responsibility upon Sir James. Now the doctor could not escape this feminine compulsion. He was obliged to inform Lady Flora that the Queen did not wish her to appear at Court until the matter was cleared up, and then, with a zeal which obsessed him from the power of suspicion among the ladies-in-waiting, he bluntly asked Lady Flora if she were secretly married, and urged her to confess as the only means of saving her character. Lady Flora gave him an indignant but steady denial: there had been no indiscretion, no clandestine marriage. She asked only for time.

The boiling energy of the Court scandal now begins to spill over. The name of Lady Flora passed from tongue to tongue in the world of fashion, and that governess in a high place, Madame de Lehtzen, who had suffered under her light-hearted raillery did not fail to pour into the Queen's ear the worst construction upon Lady Flora's predicament.

Why cannot these high-born people let the matter alone? Four or five months will settle the question of Lady Flora's virtue beyond all doubt. There was no other known method of deciding such a problem. A hundred years were to pass before Professors Ascheim and Zondek were to invent their test for pregnancy, but at least the physicians of the Palace had their equally certain method, one which was infallible—to bide the effluxion of time. But that tiresome complication of medical practice, the clacking of tongues, had now swept away science.

Sir James Clark proposed a medical consultation over the case. At first this was declined by Lady Flora, but later she did consent to be examined by the doctor who attended her own family and whose name by ironic coincidence, was Sir Charles Mansfield Clarke, spelt with a final 'e.' She might in-

deed have consulted Sir Charles before this: it would have been natural since he was her family doctor. But he had a reputation as a specialist in midwifery, and Lady Flora's thoughts were not blowing in that direction.

The lady of Kensington Palace behaved handsomely towards her favourite. Lady Flora said a mother could not have been kinder. The Duchess had indeed measured Sir John Conroy and her intuition told her that the scandalous insinuations of the coach ride to Scotland were pure nonsense. As a practical token of her confidence in the innocence of her lady-in-waiting she dismissed Sir James Clark from his post as her physician, and refused to speak to Lady Portman. She took the girl to her bosom, begged her to scorn the world, and consent to the medical examination which would clear her name once and for all. And now she agreed that Sir James and Sir Charles should have a full medical conference over the state of her health, and at the same time, she gave Sir James permission to tell everything to the Duchess of Kent. He said he would do so, but added ominously, that his own suspicions were not removed.

On February 17th, Sir Charles Mansfield Clarke met in consultation his distinguished colleague the physician-in-ordinary to the Queen. Now is the moment when this delicate question of honour will be cleared up.

Sir James began by being rather on his dignity and over cautious; he said he would leave the examination entirely to Sir Charles. But Sir Charles bowed, and said it was essential that Sir James should participate, and eventually Sir Charles had his way. The examination was conducted according to the best methods available in 1839, and the two distinguished doctors go with pens and paper into another room to discuss the phrases for writing the bulletin which two palaces, a penumbra of the fashionable world, and all the political gossips are waiting

so eagerly to read. They turn their backs upon the prostrate Lady Flora who alone knows what their solemn finding is to be, and who has had to go through all this misery because she depends upon her character for her position as much as any kitchen-maid.

Signed by both Sir Charles and Sir James, the certificate is made public. 'There are no grounds for suspicion that pregnancy does exist or ever has existed.'

At once, Lady Flora Hastings became a heroine, at Court, and in the newspapers. Says Charles Greville, the man who knew everything but wisely kept his thoughts for his diary: 'Everyone at the Court was in a great fright lest Flora should die because the Public will certainly hold an inquest on her body and bring in a verdict of wilful murder against Buckingham Palace.'

But outwardly, honour is vindicated, and Lady Flora may take her place at Court. Full of relief and gratitude she has even written forgiving Lady Portman. Could good feeling and magnanimity go further? The Hastings family were convinced that the Queen understood the misjudgment she had been persuaded into, for Her Majesty had showed her regret by generous kindness to Lady Flora, and expressed it warmly, with tears in her eyes. But so great a stormy sea of passion cannot sink into an unprejudiced calm as quickly as that. The Lady Flora might show Christian charity towards her slanderers, but the men of the Hastings family were not to be so easily appeased.

Everyone asked, 'When is Sir James Clark to be dismissed?' People sneered that such mistakes were only to have been expected for what did an ex-naval surgeon understand about women's diseases? There began a press campaign. It was nominally directed against the physician-in-ordinary, but really against the Court and even the Queen herself. As usual, the Duke of

Wellington was appealed to. 'In desperate cases,' diarized Charles Greville, 'he is always the doctor they rely on,' and as usual His Grace advised great caution, in fact counselled that nothing be done. 'It is now between these four walls; if they were to tumble down, it would be for ever buried in ruins—so let it be.' His strategy of silence was successful. The only result was that Sir John Conroy was summoned, and, with honeyed words from His Grace, persuaded to leave the country. But Sir James Clark remained at Court.

The brother of the injured lady, the Tory Lord Hastings, hurled himself furiously at the Whig Prime Minister, threatening a duel and insisting that the name of the person who started the scandal be revealed to him. He wrote to Lord Tavistock and to Lord Portman demanding that they name the author of the defamation upon his sister's name. But the Lords shielded their wives, and everyone was convinced that the real villainess was Madame de Lehtzen, but her special position as the Queen's confidante kept her immune.

The Hastings family were denied satisfaction, but the general public was not to be appeased, and anonymous pamphleteers rushed to the rescue of the heroine who was pictured as the innocent victim of an unlicensed Court. An unnamed doctor wrote a venomous brochure called *The Court Doctor Dissected.* He snorted at the idea of Lord Melbourne, 'that notorious individual, and of all men in England the last to be safe keeper of a woman's honour.' He sneered at the 'pitchforked aristocracy' of Lord Portman, but his most violent censure is kept for Sir James Clark—'this vulgar, lowbred court tool' who had set himself up as 'Inspector of Court Ladies' using language 'more suited to the meridian of Billingsgate than the meridian of Pimlico.' Often must the physician-in-ordinary have wished he had never given up lawyering in Banffshire. 'The duty of a

physician,' continued this anonymous member of Clark's profession, 'lies in a nice discrimination of equivocal symptoms.' But in this affair, the rottenness lay in the words injudiciously dropped by Sir James himself when accusing Lady Flora of frailty *'so the ladies think.'* Those incautious words had sealed his unfortunate reputation. *'So the ladies think.'* But this anonymous pamphlet was not the worst. Another nameless author burst into rhyme, and his poem, entitled, 'The Palace Martyr,' had a great vogue. It commenced with an idyllic picture of past times when 'woman was thought of not as a trifling toy, a passive instrument of seasonal joy.' This had all been changed with the appearance of 'that effete Don Juan whose seductive art should rule no kingdom but a harlot's heart.' This was a reference to Lord Melbourne.

The *Lancet,* a leading medical journal, tartly observed that Clark had figured in two capacities, those of *accoucheur,* and censor of morals, and printed an angry letter from Mr. Hamilton Fitzgerald, Lady Flora's uncle.

But now, the whole affair took a tragic turn with the illness of Lady Flora. While she was being cruelly insulted, that mysterious swelling of her abdomen which no doctor seemed to be able to cure or even diagnose, was the cause of more serious symptoms. No one seemed to have the power to help her, and she faded away, finding truly no refuge but the grave. A royal banquet had been arranged at Buckingham Palace that evening, but when news came that Lady Flora Hastings was dying, the function was put off by the Queen's orders. Her Majesty had to bear the burden of unpopularity of which her physician-in-ordinary had been the real cause.

Eventually this craggy, silent man, whose power as well as weakness lay in his insensitiveness, was obliged to defend him-

self, for his own patients were beginning to cool towards him and his enemies in the profession, those whom he had kept out of Buckingham Palace, were closing in. The editor of the *Lancet* invited him to make a statement, and for the first time the world heard something of the inside story.

Clark described the abdominal swelling which did not yield to treatment, his request for a proper examination and the patient's refusal. Later, he had found that *'it had been determined that'* he should acquaint Lady Flora with his suspicions, but this had been done with the utmost delicacy. 'That I was unable to ascertain the nature of Lady Flora's illness, I at once admit and most deeply regret.' This acknowledgment from the Queen's physician-in-ordinary was gleefully welcomed by his critics. The principal witness for the defence had suddenly turned Queen's evidence for the prosecution! 'I think it right,' Clark went on, 'to notice a part of my conduct which may at first sight seem censurable, the admission of my suspicion that Lady Flora might be pregnant before I had been permitted more fully to examine into her state.' This indeed was the main feature of the accusation, more a question of medical ethics than of medicine, and Sir James handles it with his usual insensitive ponderosity. 'Under almost any other circumstances it would have been highly improper for me to have answered an inquiry on such a subject; but as I could not remove suspicions founded on appearance which, taken alone, would in a great majority of cases indicate what I feared—I felt it my duty—to confide the doubt which was in my own mind—to those who have a right to demand a real opinion and who I felt assured could not use it in a manner unfriendly to Lady Flora.'

Here in his own words is the whole condemnation upon Sir James Clark, an illustration of the ancient law that the only censure is one which comes out of a man's own mouth. Had he

been able to preserve silence, he might have passed for a martyr, and history would have made excuses for him. But the pressure to which he was always susceptible compelled him to utter a defence that became a sentence. The tradition of medicine will forgive him for the mistake of diagnosis which has happened before and since; but medical ethics will blame him for his mismanagement of the confidence which he ought to have had towards Lady Flora Hastings from the moment when she consulted him and became his patient. Those words in the bulletin *'It had been determined that'* he should acquaint the lady with his suspicions, show that he had surrendered his own judgment to Court etiquette. There may have been extenuating circumstances; he hints at 'other facts in this very peculiar case—which do not throw the slightest shade of doubt on the purity of Lady Flora—but which it is not necessary to bring before the public.' Under Sir James Clark's massive appearance there was weakness of fibre. He could never resist pressure, particularly feminine pressure.

A village handywoman would have managed the case better. As the *Lancet* wrote slyly: 'Pillows have imposed upon parsons and been mistaken for legitimate pregnancy, but it has always seemed safer to "bide the event" rather than venture upon prophecy.' The cautious Sir James had proved himself less wise than an ordinary midwife.

No doubt Lady Flora had been a difficult patient. The *Lancet* sagely observed that 'had Lady Flora permitted an accurate examination of her abdomen at an early stage she would have been spared pain and humiliation. Many a female has undermined health and compromised existence through a similar feeling of mistaken delicacy.'

The Lady Flora was vindicated, she was triumphant. She had silenced her detractors both male and female, and in her agony

she had found friends in a great outside world she never knew. Her poems were the beats of her heart which throbbed so ineffectually in that cold and brilliant world of palaces inhabited by human monsters, and suddenly even when she knew she was victorious the struggle had been too much.

When it was all over, the Hasting's family insisted on a post-mortem examination. It was done, and the results were published in the medical press. Therein lay the final justification of Lady Flora's innocence, and the posthumous proof of Clark's blunder. The womb was that of a virgin, normal and healthy. The liver was enlarged and the glands diseased. Probably Lady Flora had suffered for years from abdominal tuberculosis, and this, not pregnancy, was the cause of that mysterious swelling. It was stated in the report, that no mental emotion could have produced or exaggerated the disease from which Lady Flora died. But on this point we may be sure that a mere post-mortem examination of the bodily organs could give no information. No tests known in 1839 or known today could measure the misery of that bright spirit, or fathom the deep injuries done by female malevolence and male stupidity. The pitfalls of medical practice lie in the abysses of human nature, and while there are romantic young women like Lady Flora, there will always be middle-aged doctors who fail to understand, and these psychological disasters will be a part of the mystery of medicine.

4. ECLIPSE OF THE MEDICAL BARONET

Three hundred years before, under Queen Elizabeth, Clark would have ended his professional career on Tower Hill. Under Queen Victoria, he remained still Her Majesty's chief physician-in-ordinary, more trusted still than all the rest of the medical household put together, and in this dark moment when he was

being laughed at in Mayfair, and criticized by his brother physicians, Clark received an even more remarkable proof that the Queen had not abandoned him. A new master had arrived at Buckingham Palace, a prince with continental traditions and a German background. Of course, he needed a physician, and who could be a better man than the doctor whom his uncle, King Leopold, had trusted and one who had passed the critical judgment of Stockmar? True, Sir James was perhaps under a cloud, but Victoria herself still believed in him.

Even during her courtship, the Queen had begged Prince Albert to make 'poor Clark' his physician. 'You need not consult him unless you wish it. It is only an honorary title and would make him very happy.' Her wishes were fulfilled, and when the Prince Consort settled in England, Sir James was more firmly in the saddle than ever. He was a familiar at the Palace and sometimes he was even consulted about speeches and proclamations. But he did not possess the temperament or capacity of a Stockmar, or a Knighton. Clark was content to be unobtrusive, quietly dependent for his position upon the personal favour of the Queen.

She allowed him to live at Birkhall in Aberdeenshire, a pleasant house not far from her own, and near enough to join picnics with the Prince and the family. In Upper Brook Street, London, the medical baronet in his consulting room was still wary in speech as though no break in his prodigious caution had ever occurred. But his practice was sadly affected, for what can be more detrimental to a physician's name than a defective diagnosis; what worse blemish could there be on the reputation of a fashionable doctor than want of discretion? When Florence Nightingale was choosing her nurses for the Crimea, a stream of candidates came to that once thronged consulting room and he shrewdly picked out those who were suitable for that dangerous

adventure in the Middle East. And when the impetuous Miss Nightingale was in difficulties he cannily helped her to introduce her ideas tactfully to the Prince Consort rather than with the Queen herself. When further difficulties arose, Sir James was entirely willing to be borne along in the masterful energy of the Lady of the Lamp.

There were frequent occasions when Sir James could practise his special knowledge of climatology. The Queen went for holidays, the prince and princesses were sent to the seaside, and the physician-in-ordinary was at hand to dogmatize upon warmth and humidity, and to prescribe a course of weather as though it were quinine or digitalis. He had one very great success in this line.

The place near Loch Laggan in the central highlands of Scotland where Her Majesty had been staying was not very satisfactory. It was low lying in a valley, had a heavy rainfall and the mosquitoes were troublesome. Sir James felt called upon to provide an alternative and it happened that he received an enthusiastic letter from his son, John F. Clark, who was fishing for salmon on the river Dee in Aberdeenshire. It was a grand spot, with fresh breezes, and rain mercifully rare. This attractive picture made Sir James think of the Royal discomforts by the side of Loch Laggan, and he wrote to the Queen describing this new paradise which his son had discovered. The dry, bracing character of the air was precisely what, in Sir James Clark's opinion, was most essential for the constitutions of the Queen and Prince. The hills were of a sandy, gravelly nature, and the rain clouds from the sea discharged themselves on the mountains before they reached this favoured place.

The royal couple became interested and surrendered, and in due course, under the shade of the fir trees in the precise spot where Clark had advised, there arose the tower of another royal castle which remains a favourite holiday place even for the great-

grand-children of Sir James Clark's royal patron. The air was gloriously clear, the scenery wild but not desolate, and there by the river the royal couple could have picnics and the Prince could shoot red deer and roe deer. As Her Majesty wrote: 'All seemed to breathe freedom and peace, and to make one forget the world and its sad turmoils.' This choice Deeside retreat was named Balmoral; it was the most successful of all Clark's prescriptions.

His advice in the matter of another royal residence was not so acceptable. Her Majesty desiring to have a place to live in the Isle of Wight, chose a little estate called Osborne, facing the south coast of England. Sir James looked up the meteorological figures and diagnosed that it was humid and quite undesirable for their majesties to live. But this time the Prince Consort, who considered himself quite as capable of judging rainfall as Sir James, thought otherwise, and his ideas prevailed. A commodious house was built at Osborne, and there Queen Victoria passed many happy years, and there she died half a century after Sir James had pronounced it unsuitable.

5. TRAGEDY COMES AGAIN

After twenty-four years as royal doctor, Sir James Clark is now a public institution. He is, if not exactly at the head of the profession, in a special situation which removes him from competition: a solemn man on committees connected with London University, a progressive force behind the scenes. In the Queen's estimation he is now 'good and faithful Clark,' and even the Duchess of Kent had forgiven him his handling of Lady Flora's case and he had attended her in her last illness at Clarence House. Time has a way of refocusing reputations so that the bizarre centrepiece fades, and the background yields up hidden

shadows to form an entirely new composition. A generation had come along which was vague about his early blunder over the lady-in-waiting, and if the Queen herself ever harboured ill-feeling, she has forgotten it, too, and the Prince Consort respected his family doctor. 'It looked as though his long and faithful service were to be rewarded by leaving the Court without a single death having occurred among its members. But it was not to be.'

Old Sir James is due for retirement, and the delicate problem of his successor has to be settled. After much pondering, Clark recommended a Doctor William Baly, and he became the physician designate. Sir James was about to lay down his burden; but the fates had prepared for him one more trial of destiny in those Courts he knew so well.

Dr. Baly had been summoned to Osborne, and reached the railway station only just in time to see the train disappear from the platform. A doctor on his way to visit the Queen had influence enough to get the train stopped, and he was bundled into the carriage and began his journey. But on that day there was a railway accident, in which one passenger was killed, the single victim being Dr. Baly. Once more Sir James Clark had to take up his responsibility.

The Prince Consort had not been very well all that summer and he had been much worried by the sudden deaths of the young King of Portugal and his two brothers in an outbreak of typhoid fever at Lisbon. In Edinburgh he had laid the foundation stone of the new post office and had been obliged to stand hatless beneath a sunless sky in a keen east wind, while long extempore prayers poured out from the Scottish Ministers. As November came, he felt wretched. He could not sleep. Many things weighed upon his mind, and he poured out to Baron

Stockmar his need for a true friend and counsellor. There was the worry about his son the Prince of Wales, then an undergraduate at Cambridge, whose lively adolescence did not satisfy his serious-minded father.

But Prince Albert went back for solace to his work, penning those endless memoranda, discussing of high policy with the Queen, and an inexorable programme of public duties. But his physical health did not improve. When he reviewed the Volunteers of Eton College, he had a queer sensation, as though cold water were being poured down his back, though he was wearing a fur-lined overcoat. On November 29th he drafted a memorandum about the dispute between England and the Federal Government of the U.S.A. Agents of the Government in Washington had seized British subjects who were on board a Confederate ship, and the Cabinet had submitted to the Queen a rather severe memorandum of protest. The Prince toned it down, but the effort of concentration was severe, and when he had finished he could hardly hold the pen. But he had prevented the possibility of war between England and America. This was the action about which Walt Whitman wrote: 'Many sayings and doings of that period from foreign potentates and powers might well be dropped in oblivion by America—but never this if I could have my way.'

The Prince had acted wisely in deflating the whole tone and magnitude of the affair, but the writing of this state paper cost him more than he could spare. On December 1st, 1861, His Royal Highness attended Service and though feeling chilly he insisted on going through all the kneeling. After lunch, Sir James Clark came over to the Castle bringing with him a certain Doctor William Jenner who examined the Prince. On December 4th the Queen wrote to the King of the Belgians that poor Albert's rheumatism has now turned out to be regular influenza which

had pulled and lowered him very much. Though feeling no better, the Prince refused to give up his engagements, but the symptoms of a 'low fever' did not abate. On some days the Prince did not put on his clothes, but lay on a couch, while the Queen read a book to him.

The Queen wrote again to Leopold of Belgium, enclosing Clark's report, and remarking that each day brought Albert nearer the end of his tiresome illness. He had passed through his first good night since it began, she said. And Leopold thanked God that the Prince was in the hands of good medical advisers, remembering that it was he who had recommended Sir James.

The Prince's mental depression was very marked; this deliberate man who always knew his own mind, had now difficulty in deciding which book he should ask the Queen to read to him. They tried Anthony Trollope's *The Warden,* but the Prince could not concentrate upon it. *Silas Marner,* the exciting new novel by George Eliot, proved no more effective in raising his spirits, and it was decided to give up all thought of reading for the evening and attempt something by Sir Walter Scott on the morrow. Sir James passed the night at the Castle and now, for the first time, put into words his hope that there would be no fever 'of which we live in dread.' Next day, when the Prince tried to compose himself to hear the Queen read to him *The Talisman,* he was in a very uncomfortable panting state.

Days passed with the patient lying listlessly on a couch and his two physicians attempting to form a clear judgment upon the alarming possibility of 'fever.' They had only their five senses to guide them. A clinical thermometer was something beyond the resources of Windsor Castle. That homely instrument had not yet been invented, and a new generation of doctors trained to use it would have to be born before the exact measurement of the body temperature would be considered anything more

than a piece of crankiness. Sir James Clark was quite familiar with the degrees of heat necessary for health at Vichy and Harrogate, but it had not dawned upon him that there was an internal climate of the human system which could be measured with precision. Only a tubeful of mercury could have revealed the invisible spiral of increasing fever that was winding itself around the Queen's husband, rising degree by degree each evening, so gradually that his increasing weakness was not fully understood.

Dr. Jenner and Mr. Brown, the Windsor apothecary who understood the Prince's constitution, prescribed their medicines, and since now they foresaw a lengthy illness, they pressed the patient to eat, a regime which he found very disagreeable. Sometimes Dr. Jenner sat up in the sick room, and the more he thought over the symptoms, the more he was convinced that the illness was typhoid, or enteric fever. That slowly developing illness, stealing over the patient day by day, bringing prostration to the delirium-haunted frame, that was what he feared. Yet even typhoid occurred in mild forms, and often the Prince felt decidedly better. On some days his pulse improved and his tongue became more clear. Even now, thought Jenner, there was hope that these suspicions were wrong, or that the capricious enemy might decide to visit the patient with a light touch.

The word fever today has lost its mysterious and terrifying significance. Bacteriology has divided up fevers, given them different names, and we understand that high temperature is merely the reaction of the human body to a microbic invader. But to doctors of the period of Clark and Jenner, 'fever' brought sinister suggestions, associated with camps and armies and death in its most sudden and uncontrollable form. The cause of 'fever' was unknown, but it was connected with smells, influences, miasmas. No wonder even two such experienced physicians were reluc-

tant to allow such an idea as this enter into their thinking.

The Prince was seriously ill, perhaps with this dreaded typhoid, and today it strikes us as singularly shocking that he was not confined to bed. Jenner had indeed proposed it, but the Prince would consent only to lie on the couch in his dressing-room. On the night of December 8th he changed his room two or three times and next morning looked ill and exhausted, and choked over a cup of tea.

In spite of Florence Nightingale's visits to Balmoral and her vast influence with the Queen, no one ever thought of calling in a female nurse. The Prince lay restlessly on his couch. His temperature rising, and with his poisoned heart and now failing circulation, he was allowed to walk about the room. This was lack of knowledge even more perilous than the lack of a thermometer.

Dr. Jenner's suspicions were correct. The physicians both ordinary and extraordinary made up their minds this was no ordinary febrile illness, yet their uncomfortable certainty could not be admitted since the Queen insisted on censoring every bulletin that was issued, partly through fear of alarming her husband who also had to read them, but perhaps mostly to quell her own fears.

The Queen knew her husband's horror of fever, with the Portuguese tragedy still fresh on his mind.

In vain did the Queen of England beg the doctors to tell her what had caused this illness. They answered: 'great worry, and far too hard work for long.' That was indeed fundamentally true, but there was another cause at work, and now the truth had to be faced. Jenner told Her Majesty 'in the kindest and clearest manner' that all along the doctors had suspected 'fever' but had been unable to judge how to treat it until now, a month since

the first symptoms. The illness must be allowed to take its course, and there was no cause for alarm or fear. Above all, the word 'fever' has to be kept back from the Prince, for since the triple fatality in Lisbon, any mention of it would be serious. On the insistence of Lord Palmerston, more doctors are summoned. Sir Henry Holland and Dr. Watson drive up to Windsor Castle. They examine the Prince: fresh bulletins are issued to the world.

The Prime Minister favoured Dr. Watson, and wrote from a sick bed where he was recovering from gout, that the Prince must not be bothered by too many physicians. Sir James Clark, Dr. Watson, and another doctor named by Dr. Watson were quite enough, and 'all considerations of personal feelings and susceptibilities must absolutely give way to the public interest.' Was he hinting already that Clark had made a mistake?

So far, Sir James considered that there had been no really serious symptom. The pulse was strong, though now and then the mind wandered as the illness passed into the phase when a natural fall in the fever was reasonably to be expected. If the strength could be kept up, the fever might end spontaneously, and all would be well.

The Prince continued to be restless and asked to be taken into a larger apartment. He was moved into the 'Blue Bedroom' and a piano was brought into the adjacent room where Princess Alice played *Ein feste burg ist unser Gott*. That Sunday, in the Chapel, Charles Kingsley preached the sermon, but the Queen heard not a word.

Sir Henry Holland was called in again. The Prince had become short of breath, and it was now obvious he was suffering from one of the most dangerous complications of typhoid, congestion of the lungs. Yet it is almost incredible that he was still allowed to undergo the severe strain of rising from bed, dressing and being wheeled to a sitting-room.

Only a year before this, Florence Nightingale had sent the Queen a copy of her book *Notes on Nursing,* and had been warmly thanked. Now, surely, was the supreme moment for that teaching to be applied in the 'Blue Bedroom' of Windsor Castle. But the fatal gulf that lay across Victorian life could not be bridged. Miss Nightingale's *Notes* had been composed for the Queen's subjects, and there was a presumption that nursing and hygiene had no place inside the household of the ruler of England.

Hope succeeded agony of hopelessness. The Queen would go into the sick room early in the morning. The sun had just risen, but the room had a sad look of night-watching, the candles were burned down to their sockets, and there was her darling Prince, his eyes unusually bright, gazing as it were on unseen objects, and taking no notice of her.

There came one moment of reassurance as when Clark and Jenner confirmed that there had been a decided rally, and the Queen's feelings were so overwrought that she went out on the terrace to listen to the band. 'We are much frightened,' said Dr. Watson, as she returned and anxiously scanned his face, 'but we won't give up hope.' Sir James himself added he had seen worse cases recover. But over the clear-cut features of the Prince, her keen eye noticed a duskiness which was not there before, and then she could not helping seeing the alarm on Jenner's face when she asked what it meant. That dark shadow was the tell-tale hue of a failing circulation. To complete the horrible unreality of the picture: the Prince began automatically arranging his hair just as he used to do when dressing.

In Windsor Castle, there was one person whose heart had renounced the slenderest hope, because the desire to go on living was not there; in the depths of his soul he courted the prospect of an exit from his troubles in this foreign land which he served

so devotedly, and which had given him in return so little gratitude. 'I do not cling to life,' the Prince had said to his wife only a few weeks before. 'You do. But I set no store by it. If I knew those I love were well cared for I should be ready to die tomorrow.' He uttered these words calmly and with no trace of sadness. To a woman of the Queen's exuberant vitality they had come as a shock, and now she remembered.

All day the Prince dozed and moaned, occasionally uttering almost inarticulate words of French. It was necessary to change his bed, and he was even allowed to get out and sit up. As a valet and page from the backstairs helped to place the Prince on the other bed, the Queen whispered in his ear: *'Es ist kleines Frauchen.'* Comfortingly, the doctors said that more air was passing through the lungs, and as long as this was so, there was hope.

They were men lost in the dark, and keeping up their courage with these freaks of imagination. The wisest doctors of their day did not know better than to countenance this tragedy of mismanagement. Their patient was in the third week of typhoid fever, he suffered moreover from pneumonia, and his toxin ridden body needed moving with infinite care and gentleness, yet these physicians permitted a valet and page of the backstairs to lay hands on him, allowed him to sit up and move, when his lips were blue and his face overspread with the dusky pallor of heart failure. Miss Florence Nightingale would have known what to do at such a crisis. Her instinct would have better served the Prince than all the medical knowledge of the great physicians.

On December 12th Her Majesty reported to Uncle Leopold that though the doctors had declared the illness to be gastric fever, there had never been one unfavourable symptom, and that after the end of the third week, an improvement might be hoped for, though the doctors had said they would not be in the least

disappointed if it did not take place until the fourth week. She could not sufficiently praise the skill, attention and devotion of Jenner, 'who is the first fever doctor in Europe, one may say, and good old Clark is here every day.'

Only two days after that hopeful letter, as the evening drew on of the fateful day, the Prince Consort became very restless, and a chill settled over the royal apartments. Sir James asked the Queen to come into the sick room and the meaning on his face was plain. The Prince's left hand was already cold, and she saw that he was breathing feebly though gently. An hour later, surrounded by his family, the face of Albert the Good passed into waxen repose, and the chest which had struggled for weeks to keep the life coursing through his body, fluttered, settled and became still.

Lytton Strachey, who uses so much acid in etching his portraits of the Victorian Age, quotes Lord Clarendon as having written: 'It is horrible to think that such a life may have been sacrificed to Dr. James Clark's selfish jealousy of every other member of his profession.' Horrible, indeed, were it true. But in this instance we can hold the much criticized physician-in-ordinary as entirely clear from professional blame. Even if we grant that the diagnosis of typhoid fever was not made at the beginning, such a slow recognition was inevitable in the confusion of the age, when all fevers were mixed up together and there were no specific tests for distinguishing between them. With no thermometer, no bacteriological test to help them, these eminent men had only the feeble light of their senses. But what indisputably proves that Sir James Clark in this case was correct in his early suspicions lay in his summoning to the Prince's bedside the man who was the most capable fever diagnostician in the country, perhaps in Europe. His calling in William Jenner shows that Clark recognized

both the difficult nature of the decision and knew the man who was above all others supremely equipped to make it. Clark and Jenner, by the light of their times, made no human error, but they were faced with the inexplicable.

6. AN INFLUENCE OF THE TWILIGHT

Statesmen who knew the Prince's quality grieved for what the British Constitution had lost; the people talked of Russian spies. The cold fact was, a personage who enjoyed the best of English life and culture had died prematurely at the age of forty-four through lack of two of the greatest discoveries of his age, sanitation and skilled nursing. But this knowledge was mercifully held from Queen Victoria. She bore no ill will towards Sir James Clark. He was the doctor she had known in her childhood at Kensington Palace, he had been recommended by Leopold, approved by Stockmar, and Albert had liked him. Those opinions and her early memories were sacred to her. The Queen knew nothing of medicine, but there was something in the personality of Sir James that appealed and she found the old man the same sympathetic hero of the far-off but happily remembered days. She had for so long permitted him to live at Birkhall, near Balmoral, and now she allowed him to use another of her personal possessions, a house called Bagshot Park, in Surrey, where he lived on quietly until his death. Statesmen consulted him about medicine, and doctors about statecraft. The real source of his medical authority had been not the Queen, for she was not scientifically minded, but her conscientious Germanic husband with whose aid Clark was usually able to carry his sanitary reforms, and it was an irony that neglect of common sanitation should have been the cause of the Prince's death. His royal collaboration was gone, but Sir James had still the reputation. He was more influential than the medical officials of Government Departments

in Whitehall. A walk in the woods at Osborne, a picnic by the waters of the Dee, a talk in the library of Windsor Castle, these were the occasions when the Prince listened attentively to his private doctor and in due course wrote his logical memoranda for the rule-of-thumb statesmen who governed England.

Sir James Clark had this opportunity and used it well. In his younger days he had measured air temperatures, and in his old age he advocated sanitary reform. He sponsored it on innumerable boards and committees, and in private talk with the great men of his day, and he helped Florence Nightingale to realize her aims. We may remember this when we condemn him for the neglect of sanitation which allowed typhoid fever to enter Windsor Castle, and the indifference to sick nursing which permitted Prince Albert to die.

Now that scientific patron was gone, old Sir James lived on quietly, increasingly troubled by bronchitis. He had handed over the medical care of the Queen to Dr. William Jenner, and he could rest on the solemn pedestal he had made for himself, as one who belonged already to history. There was now a feeling that in the half-forgotten affair of the Lady Flora, Clark had taken on himself blame which belonged to others. But that was only a half truth. The fact was, Clark was now reaping the reward of those who live long and who keep a stoical face towards the changing and censorious world.

This ponderous man's personality had special attraction for really masterful women, and underneath his rocklike exterior, there was a secret deference for the female, a certain uxorious willingness to be dominated by their purposes, and this quality so unexpected in that grave and rugged man, was the source of his success with Queen Victoria and with Florence Nightingale. It had also been the cause of his blunder over Lady Flora Hastings, his readiness to be guided by *what the ladies think,* and

his unfortunate willingness to be the go-between in confronting Lady Flora with the malice of Lady Portman and Lady Tavistock, and thus be rushed into an elementary professional blunder. This temperamental acquiescence to strong men and dominant women is revealed in his preference for working behind the scenes and his unpopularity with men of his own level, men like the Fellows of the College of Physicians. It explains too the origin of that depreciation which began when Clark was buried in Kensal Green cemetery in 1870 and lives still in Lytton Strachey's subtle lines.

But there can be no mistake about it. Sir James Clark was one of the outstanding figures of Victorian medicine. He was negatively great, and eminently representative of that age between 1820 and 1860. His influence was vast as his mind was narrow. The man who had known John Keats and the Prince Consort had surely touched the opposite poles of his century, yet he was unaware of it. He served the greatest ruler since Queen Elizabeth, and it is a tragic pity that this man who was called a close and unimpassioned observer left no memoir, no line of history, no letters, no blink of illumination into the court life of that fascinating period.

His faculty of reticence was like that of a blind animal that thrives in darkness. Clark who had attended the very birth of modern hygiene was proud of his narrow idea of what the life of a doctor should be. He was portentously aware of his status, and nervous of losing it. We can forgive all his professional mistakes more readily than this timid refusal to understand the real greatness of the period in which he lived. His obituaries all dwell upon his caution, his discretion and his faithfulness. These are great qualities, let us not undervalue them. But Sir James Clark was cautious at the wrong moment, discreet where he should have been open minded, and he was faithful to matters

of small account. 'He was, in the fullest sense of the word, a faithful servant,' said one elogist; that was his strength and his weakness, to be a servant of courts rather than a master of medicine.

He was succeeded in the baronetcy by his son John F. Clark who lived at a place called Tillypronie in Aberdeenshire. What we know of his blameless obscure life is an illustration of the power of heredity, for in some ways he took after his father. Sir John F. Clark after a diplomatic career abroad, settled down in his property where he lived to be eighty-nine, entertained Henry James the novelist and became the 'Nestor of the Community' but totally undistinguished outside it. He was a favourite of Queen Victoria who remembered his share in the discovery of Balmoral. Sir John was 'averse to the limelight, handsome, dignified and refined.' As an example of his homely tastes and the power of an hereditary devotion to the female, we learn that, after his wife's death, he published his sole literary work, under the title of *The Guidwife of Tillypronie*. It was her cookery book.

SIR WILLIAM JENNER

With love exceeding a simple love of the things
  That glide in grasses and rubble of woody wreck:
Or change their perch on a beat of quivering wings
  From branch to branch, only restful to pipe and peck;
Or bristled, curl at a touch their snouts in a ball,
  Or cast their web between bramble and thorny nook;
The good physician Melampus, loving them all,
  Among them walked, as a scholar who reads a book.

Melampus dwelt among men; physician and sage
  He served them, loving them, healing them, sick or maimed
Or them that frenzied in some delirious rage
  Outran the measure, his juice of the woods reclaimed.
He played on men, as his master, Phoebus, on strings.
  Melodious: as the God did he drive and check,
Through love exceeding a simple love of the things
  That glide in grasses and rubble of woody wreck.

GEORGE MEREDITH, 'Melampus'

1. PHYSICIAN—NATURALIST

DR. JENNER'S contribution to the management of the Prince Consort's illness had been more than merely to attach to an obscure fever the adjective of typhoid. If conferring labels upon diseases were the whole of medicine, then the art of healing would be very much more advanced than it is, for there has never been any lack of names for human ills. But Jenner was more than a descriptive labeller. He was a scientific physician, the first of that breed to attend English royalty. Sir James Clark is remembered only as a Court doctor, and Sir William Knighton as a man of diplomacy but Jenner had a large practice, he left behind a fortune, and a reputation as a great teacher.

When persuaded by his future bride to appoint Jenner his personal physician, the Prince Consort had written to Uncle

Leopold: 'The name is classical.' It was indeed. Our William Jenner must not be confused with *Edward* Jenner who had discovered vaccination years before.

The illustrious Edward Jenner had made that name internationally famous at the beginning of the century. He was no ancestor of William Jenner. There was no family connection between them. But there was something quite as strong. Conceive of the magic power of a name. William Jenner, born in the year of the battle of Waterloo, hears throughout his boyhood that his own name is that of a famous doctor. This compulsion of a great name is an unrecognized fact in biography. The name was to be his fortune, for William Jenner had few other primary advantages except a tough mind, excellent health and long legs.

In later life Jenner used to tell his students that he had begun his professional life in a position which the humblest of them would decline. There is a story that Jenner served as a page boy in a rich man's house, where his master, impressed with his intelligence, had him educated. Later he ran an apothecary's shop in North London.

He was brought up in Kent, about thirty miles from London, in the same place and about the same time as Charles Dickens; he walked, or rode in a coach, to the capital to become a student at a medical school in Gower Street, afterwards to become University College Hospital, and there he was the pupil of a remarkable teacher named John Elliotson, who had been independent enough to forfeit his Chair of Medicine on account of a too zealous interest in mesmerism and psychological research; but William Jenner kept to the narrow path, and did not follow his professor into unorthodox speculations. Taking his Diploma at the Apothecaries Hall in the year of Queen Victoria's accession, he settled down to practise, choosing one of those genteel streets between the hospital and Regent's Park. He entered medicine by

the ordinary door, keen on its fascinating problems, with a strong generalized ambition to succeed, but no particular objectives, fashionable or otherwise. He had no money, therefore he was interested in money.

While Sir James Clark was smarting under ridicule aroused by Lady Flora's case, his successor as royal physician was measuring tinctures and winding bandages as an apprentice in a very mixed general practise. He remained a general practitioner until the age of twenty-nine.

Physicians and surgeons did not occupy a very exalted social position. In the 1840s, and many years later, they were not invited to dinner in Society, no more than stage actors were. The Church and the Law were then the only 'learned professions.' William Jenner was typical of the robust adventurers who were to raise the social status of their calling as well as its scientific acquirements. He managed to take his doctorate at London University, an attainment unusual among general practitioners, and about the same time, to get himself attached to another institution in the fields to the north of the streets around University College. This was the London Fever Hospital, and its primitive and overcrowded wards were to be the studio where William Jenner found the raw material of his great reputation. Here he learned that singular art of diagnosis which he was to use at the bedside in Windsor Castle.

When Jenner became assistant physician, the hospital had been going half a century, a period of unremitting warfare not only against infectious diseases, but with even more powerful foes. When its promoters embarked on their original lease of premises, a forty-six-pound-a-year house to take the first patients, the neighbours threatened to go to law. Even when the hospital was duly established, further troubles began. Charles Dickens wrote in the *Daily News:* 'The dread of infection worked within

its walls as well as outside.' The first apothecary, who was appointed at a salary of thirty pounds, declined to serve. The first matron died within a year, but not of fever. The first porter soon decamped. However, the institution survived and in 1804 a better hospital, called a 'House of Recovery,' was built, and the managers sucessfully agitated for a Government grant and were given three thousand pounds. With this they decided to build again, in a place appropriately called 'coldbath fields' near the site of a mineral spring. The local Vestry tried to stop this on the ground of risk to the parochial workhouse and house of correction, but the managers persevered, and the new hospital lasted for thirty years without molestation. But now an even more formidable antagonist appeared—the new Great Northern Railway which wanted to build its London terminus on the exact place where the hospital stood. The managers bargained, and the railway was mulcted of twenty-six thousand pounds. The old hospital was pulled down and King's Cross station erected. A new home was found for the fever patients, further out in the country, and a fine establishment, which Florence Nightingale pronounced 'the first in London for wholesomeness,' was opened in 1849.

The wards were full of horrors, a Dickensian nightmare of abandoned wretches sent there in panic rather than because their relatives thought that any real good might come out of hospital treatment. Jenner prepared for a hard struggle when he entered that place. But he was ambitious, and robust as an ox. Besides, there was inscribed in the fibre of his mind, the magic symbol of the name.

2. THE INFLUENCE OF A NAME

Once in a railway train I met an old man of benevolent aspect and, from his glances I saw he took an interest in what I was

reading. It happened to be a pocket edition of *Hamlet,* and presently, he bent over and asked rather shyly where one could buy that book. I said, almost anywhere, yes, in any bookshop, and he seemed pleased and satisfied. 'I have always wanted to read that book,' he said reminiscently. 'Yes, all my life. You see, my name happens to be Shakespeare—William Shakespeare,' he added modestly. He was so obviously proud of bearing that name, yet his curiosity had never been great enough to make him look into one of Shakespeare's works. With William Jenner the magic of his surname acted as a spur to fame.

His famous exemplar, Edward Jenner, was a Gloucester village practitioner who discovered vaccination against smallpox, the real beginning of preventive medicine, when he was forty-six years old. Thereafter womankind remained beautiful after the age of twenty-five, for no longer need they carry on their faces the disfiguring memories of smallpox. Edward Jenner was voted thirty thousand pounds by Parliament, and spent the rest of a leisured life interviewing the crowned heads of Europe.

What a model for young *William* Jenner! A man with the same name as his own had conquered the most widespread and terrible of the fevers: but, courage young physician—there are still fevers horrible enough. The London Fever Hospital was full of such cases, dirty, malodorous wretches with every sort of symptom, every kind of rash and eruption on the skin. Even when smallpox was separated, on account of the ease of its diagnosis, there were other feverous maladies in plenty, all with one feature in common, a warmth in the blood which the physician measured by placing the sensitive palm of his hand upon the sick man's overheated brow.

In addition to the main illnesses, others which we now call diphtheria, erysipelas, and measles were all herded in those wards. To use a fanciful, but not untruthful comparison, it was

as though all the furred animals of the Zoo, dogs, lions and foxes, were put in one cage in the charge of a blind keeper whose only means of identifying them was by touching. That was roughly the state of matters in fever hospitals when Jenner began his observations. 'Fever,' that is the high body temperature, was supposed to be the cause of the illness, instead of the result of the cause. There were two sorts of fever, the 'slow nervous' and the 'putrid' fevers, and it was believed that one might develop into the other.

William Jenner suspected that these dozens of cases, although called by one general name, must have different origins. Among them, there must be distinct breeds of illness, just like different kinds of animals. The high temperature was the feature they had in common, but the remainder of their characteristics were by no means similar; in fact, they were a mass of dissimilarities, and he bent his mind to the task of introducing order into this confusion. Once the various diseases could be properly labelled, each in its own identity, then it would be possible to treat them with more success. Jenner's talent was for watching, touching, smelling, hearing and laboriously collecting details, comparing notes of each case, eliminating the unessential, and preserving what was vitally necessary. Like Melampus, the good physician of Meredith's poem, he was at heart a naturalist. The fevers were his pets.

Picture this tall, ill-favoured man (for no one ever called Jenner an Adonis) in his long frock coat and elaborate waistcoat, followed by a Sarah Gamp in a poke bonnet, and leaning over some sweating patient, noting the rash on his skin, examining his chest with the stethoscope that his teacher John Elliotson had taught him to use. Through this instrument, a wooden tube with a hole bored down the centre, the physician heard the beating of the heart and the fluttering of the breath sounds.

But for his note-book and pencil it was Jenner's only professional tool. With these aids alone and his five senses, he made his clinical discoveries about the fundamental nature of 'fevers.'

At the risk of overstating the obvious, we can recall that Jenner knew nothing about germs or microbes. It is one of the most amazing facts in history that while micro organisms were first observed under the microscope by Leeuwenhook about 1675, it was two hundred years before anyone suspected that they might cause disease, and this came a quarter of a century after Jenner's observations on fever. Nor had he any idea that insects could be a means of transmitting infections from one person to another; there were no 'blood-tests,' no chemical analysis, no laboratory methods. He did not even have a thermometer to measure the temperature of the patient's blood, and he was unaware of what actual degree of heat was 'normal.' But with all these disadvantages, he had keen eyes and judgment, and his hand was almost as sensitive as a clinical thermometer. And the great name of Jenner was compelling him to make discoveries. By 1850 he had collected notes of one thousand cases of 'continued fever,' and he was able to publish his conclusions.

3. THE TWIN FEVERS

Even in the middle of the twentieth century, in isolated villages of Scotland and Ireland, one may measure the importance of William Jenner's work merely by mentioning the word 'fever' and noting the emotional reaction. Instantly the word produced uneasiness. People have heard of whole villages being swept over by a plague called fever, and horrible hereditary memories of something like the black death, sweeping from cottage to cottage, are evoked by that word itself. In Eastern Europe, each great war has been followed by a similar visitation. We read of 'fever'

spreading through armies and reducing them to impotence. We hear of 'jail fever' which attacked both prisoners and their keepers and was so dreaded even by His Majesty's Judges that they placed a bunch of flowers between themselves and the wretches before them, in the superstitious hope of warding off the dangerous miasma.

Dr. Jenner was a great reader of novels, and it is likely that he did not miss that superb Victorian thriller *The Woman in White* which appeared just when he had completed his observations upon fever. He must have been indignant at the novelist's insufficient grasp of technical matters. But to us, one of the best situations is an interesting and probably authentic representation of how mid-Victorian doctors and their patients thought of acute diseases.

Miss Halcome, one of the heroines of the book, has been lying on a roof to overhear the talk of the two conspirators, Sir Percival Glyde and Count Fosco who are plotting on the terrace below. What with the exposure to cold and her mental distress, she falls into a severe illness and is put to bed delirious. A local doctor is sent for and he prescribes a form of treatment composed of 'salines' which was *'lowering.'* Count Fosco, the omniscient and wicked Italian who claims to have studied medicine all over Europe takes the village doctor to task, and inquires whether he has ever heard of a newer method—that of *fortifying* the exhausted patient with brandy, wine, ammonia or quinine? But the doctor haughtily refuses to discuss the matter with the Count as he is not a professional man.

On the evening of the third day, a change takes place in Miss Halcome's condition; the doctor's face shows confusion and alarm. Disinfecting precautions are used in the sick room, and a London physician is sent for. The patient's eyes take on a

dreadful stare of terror. The clever Count Fosco, with a mere glance at the patient, pronounces it to be typhus fever, but the village doctor denies this and orders the Count out of the room. Fosco withdraws, but not without roundly asserting that it is the doctor's ignorance, and his insistence on following the 'lowering' treatment which has caused the illness to 'turn into' typhus. The Count's knowledge of medicine, it seems, is sound for when the consulting physician comes from London, he says 'typhus beyond all doubt,' and adds that the tenth day of the illness would probably be decisive.

But it was necessary for the development of the book that Miss Halcome should recover and, happily when this day came, the physician said she was out of danger and needed only careful nursing. Count Fosco continued to taunt the village doctor with his error which had turned this simple fever into the deadly typhus. Eventually, his interference become so intolerable that the doctor quits the case and sends in his bill.

Such was the medical situation in England of a hundred years ago. Some fevers are mild and comparatively harmless: if the patient's constitution is 'supported' by wines and ammonia and 'stimulating' treatment, all will go well. But if the opposite method is used, the 'lowering' treatment, then the case will pass into typhus or putrid fever which is 'catching.'

Microbes are far away. Serums, vaccines and penicillin are not dreamed of. But nevertheless Jenner now made the first step in a new direction.

Jenner was not entirely original in this idea that the two fevers were separate entities. A doctor Lombard in Geneva had expressed an opinion to that effect, but he had not demonstrated exactly what the real distinction was. Gerhard, a physician of Philadelphia, had described the typhus which he encountered

in that city as quite different from the slower and less infectious 'typhoid.' But Jenner had really put the question on a proper basis by not merely saying there was a difference, but describing how 'for two years, in distinguishing the two diseases by the eruption alone, not a single error had been made.'

Jenner then, in this practical way, demolished the ancient theory that 'slow nervous' fever, and 'putrid' fever were different degrees of the same feverous process. With Gerhard the American, he demonstrated that the one never developed into the other.

Whenever there is good hygiene and sanitation, typhus or putrid fever is, today, practically unknown. But if you gather together a hundred thousand people without enough food, and if they have no water for washing, and if to them are added continual reinforcements from other half-starved and filthy populations, then typhus will be likely. Call it 'jail' fever, or 'camp' fever, it is always the same, the assiduous understudy of famine, overcrowding and war, and always ready to step into the principal role of death-bringing horror. Russian and Balkan peasants know it as though by racial instinct. Napoleon met it on the Beresina River as a calamity greater than the Russian winter, and in the potato famine years peasants perished in Connemara and sent infected relatives to Liverpool and Glasgow.

The body louse which conveys the germ travels quickly from one person to another, and the traveller incubating the disease in his system conveyed it for miles in ever widening circles of panic. Dozens of London City dwellers in the middle of last century flocked into Jenner's Fever Hospital suffering from high temperature, backache, rash and often fatal accompaniments of 'typhus.' Jenner learned to recognize the peculiar musty odour of these patients, something like an old umbrella in the process of drying.

To add a modern note: Typhus is now known to be caused by

a living virus, much smaller than average disease microbes, which is placed in the patient's blood by the bite of a body louse which has sucked blood from another typhus patient. Hence, overcrowding and malnutrition, while they favour the spread of typhus, are not its essential cause. The bite of the insect, the transfer of virus from one person to another, these are the means of transmission. But to Jenner's generation which lived in innocence of microbes, the filth, overcrowding and lack of food were the obvious factors connected with typhus, and to explain what they did not know, but vaguely suspected, they invented a theory that fevers were caused by 'miasmas,' a sort of influence in the atmosphere, the essence behind a bad smell.

The bite of the body louse, and occasionally catching one upon their own persons, was so familiar to these physicians that they did not regard the phenomenon as important.

In the second World War, typhus was held in check merely by cleanliness and the use of a powder, D.D.T., which killed those lice that may have seemed to Sir William Jenner a harmless though irritating nuisance of his fever wards.

Among the crowds of patients under Jenner's care there were some which presented quite a different appearance from typhus, and like a great explorer Jenner learned to recognize this distinction. What he called 'typhoid,' a word meaning 'something like typhus,' was the 'slow nervous fever' of the ancients. The rash of spots which broke out on the skin was different. The spleen was enlarged. And the patient's expression, instead of being like that of a drunken man (as in typhus), was dull, dreamy and apathetic. Typhoid, which was what the Prince Consort died from, is an abdominal illness acquired through a germ conveyed from infected food or water. It is a disease of defective sanitation.

Even before William Jenner published his observations in London, a physician in Philadelphia, William Wood Gerhard, who was a follower of P. C. A. Louis of Paris, had about 1836 published the distinction between typhus and typhoid. But this work was not known in England, and Jenner proceeded to make the same discovery by a process of original observation.

Jenner had wrenched apart these twain, typhoid and typhus, and never more would any physician be able to join them together. Typhus caused by the louse's bite; typhoid originating in sewage-infected meat and drink, they were quite distinct and separate maladies. That was his conclusion, based on the thousand fever cases in his notebooks. Medicine had indeed travelled a long way since the days when Sir William Knighton chose 'putrid fever' as the theme of his academic thesis. Jenner's labour had been hard, and sometimes disgusting, and it had been dangerous, for twice Jenner himself fell victim to fever: twice he recovered and gained even greater insight into his enemy. Such heroic encounters with illness had toughtened his faith and made him scornful of those fireside philosophers who believed they could do it all in their heads. 'How complex questions such as arise in medicine are to be determined mentally, i.e. without the aid of figures—by ordinary men—I am at a loss to conceive. Yet physicians think to solve by mental reveries problems in comparison with which the most difficult that the most renowned calculators ever answered were mere child's play.'

But alas, Jenner's great discovery applied only to clinical diagnosis, and he had made no corresponding innovation in the treatment either of typhus, or typhoid. Take, for instance, his aphorism about the use of alcohol—when in doubt, give alcohol in typhus but withhold it in typhoid. That showed medicine to be not on a very high level. There was no serum, no drug, no

specific treatment at all. Even twenty years after the death of the Prince Consort, Jenner wrote that 'he had never known a case of typhoid fever cut short by any remedial agent—that is, cured.'

Treatment depended, as of old, upon the physician's flair, upon those simple things which long experience had taught him: how to keep the heart stimulated, how to ease pain and produce sleep, how to regulate the food, and keep up that indefinable encouragement of hope.

Although he could not introduce new treatment, William Jenner gave countenance to the forces of progress in the grim battle which was going on all around him in the field of sanitation, and which is described in the next chapter of this book. But Jenner was the authentic physician, that is a man devoted to the actual patient and to analysing how his illness differed from all other cases. Like Melampus, he believed in the daily vigil, keeping the honest record of every sound nature uttered, joining letter to letter, word to word, until he could at last spell out nature's meaning, and in words he used about the philosopher Lord Bacon: 'reach that rank which the great master of Induction tells us man may legitimately hope to attain, namely that of Nature's interpreter.' He recognized the truth for which sanitary reformers were contending, when he said that patients who died of cholera in East London were as certainly killed by the water they drank as though it had been poisoned with arsenic.

4. FASHIONABLE PHYSICIANS

Long before he was called to the royal bedside at Windsor Castle, Jenner had a very large practice, and in the wards of University College Hospital, no student ever forgot his terse dogmatic sentences and his mania for precision. His inspiration

came to him from the sick patient on whose case he was lecturing, and not from the audience around him, and even though he had been kept late for his demonstration and the students had departed for lunch, he talked as well to a handful as to the whole class. He was never slack, or lenient, or vague. As he spoke slowly, from notes made on the backs of envelopes, the students could write down everything; facts, not cobwebs of theory, facts only, but once Jenner had spoken they were memorized for ever.

On one occasion, when academic experts were arguing about the way to ventilate rooms, and had entangled themselves in a maze of theory about draughts and air currents, the rough voice of Sir William Jenner cut through the talk like a blast of cold air: 'If you want to ventilate the place efficiently, you must have holes large enough.' That is a good example of his robustness and lack of subtlety.

In fact, William Jenner had such a powerful and direct mind that we wonder how he became so successful in actual practice. For even in the greatest doctors there is an element of personal suggestion which at its best is healing magnetism, and at its worst is pure humbug. Jenner's way with his patients was the reverse of smooth. In bedside manner he was a great contrast to another mid-Victorian doctor named Sir William Gull. We shall have to call him into consultation later over a very important case and he had better be introduced now as we meet him in the fashionable quarters of London which were his hunting ground.

Gull was a real Napolean in appearance, thick set, brisk, magnetic. He dominated his patients, he spoke as one who knew all the secrets, who was never at a loss. Though not a grasping man, he made an immense fortune, over a quarter of a million pounds, out of his practice. He was opposed to ex-

cessive drugging and dosing. He treated the patient and not the disease, and instead of 'typhoid' he used the more accurate expression 'the typhoid man,' meaning that no two cases even of the same malady were alike. Once, when called in to see a young girl suffering from that disease, Gull said to her mother, 'Madam, I congratulate you. Your daughter will get well.' 'But you have not seen her yet,' said the mother.

'I saw her through the open door, and she is sitting up. That was quite enough for me. A patient with typhoid who sits up is certain to get better.'

Sir William Gull once declared, speaking to friends in an unbuttoned mood, that patients liked a little quackery in their doctors, in fact they demanded a certain amount of mild deception. A friend quoted the old Latin tag: *'Populus vult decipi.'*

'What does that mean?' inquired Sir William Gull with a knowing smile.

'People love to be *Gulled,'* and there was a general laugh because that was rather Gull's reputation.

But no one could say that of the rough, angular Jenner. He was a 'natural,' and he depended for clinical success upon common qualities and a certain high humanity that gave confidence.

After the passing of Sir James Clark in 1871, Jenner succeeded him in Queen Victoria's favour, and it was his fate to introduce the Queen to surgery.

Her Majesty had suffered from pain and swelling in her arm, and felt more ill than she had ever felt in her life since the time when she had typhoid fever in Ramsgate at the age of sixteen. Sir William Jenner had to be sent for, and advised sending for Professor Lister of Edinburgh. After some hesitation, natural in a lady of fifty-two when the word operation is mentioned, the Queen consented, and the future Lord Lister, who was working out his new system of surgery, came to Balmoral. He examined

the arm and decided it must be incised. Again Her Majesty demurred, being sure she would bear pain badly, but the doctors promised chloroform. The Queen asked that, in addition, the part be frozen, and this was done. An abscess of six inches in diameter was then opened by Lister, without causing any pain except at the last touch. The Queen was very relieved.

So was Lister, and many years afterwards, he described to a young doctor a certain step in his surgical technique for that operation which revealed that even in a Royal Palace a surgeon has to be a pioneer. Lister needed something to drain the abscess, and as he walked in the garden wondering what he should use, he remembered that he had brought with him a carbolic spray which had a length of rubber tube. He cut off a piece and soaked it all night in antiseptic, using a Balmoral soap-dish in his bedroom. Here was the perfect device for letting the matter away from the abscess. It worked well, and now, years after the Queen's operation, looking back over his own ingenuity, the serious Lord Lister permitted himself a joke. 'If ever you hear stories,' he said to the young doctor, 'about patients in hospital being experimented upon, you may think of that story, though you must not tell it.'

But hardly was Her Majesty well after this trying experience, when there came the shocking news that the Prince of Wales was ill at Sandringham with the dreaded typhoid. How vividly the Queen brought back to her mind each detail of her beloved Albert's illness, at this season of the year, too, and only eleven years before.

Sir William Jenner was soon at the bedside and he wired back that, though the Prince was certainly very ill, it was less alarming than had been expected. A few days later, the Queen herself went down to Sandringham which she saw for the first time, a newly finished Elizabethan building among fir trees in a wild,

flat country, and there was her eldest son Bertie lying flat on his bed and breathing rapidly and loudly. Sir William, his face looking heavier than usual, muttered that this was indeed a worse case than the Prince Consort's, and that no improvement could be expected before the twenty-first day.

But what changes those years had brought in the management of typhoid, mainly due to the influence of Jenner's teaching. In addition to the Princess of Wales, the future Queen Alexandra who was devoted to her husband, and a valet, there were now two female nurses; and the doctors spoke of degrees of temperature, and used a number to indicate the rapidity of the pulse. It was possible to chart from day to day the course of the illness for the clinical thermometer had come into regular use.

Whilst the Prince's relentless fever continued, the Queen had to return to her responsibilities at Windsor. Again she was summoned to the bedside by an anxious telegram from Jenner and Dr. William Gull, not yet knighted, who had now been called to assist in the case. The temperature was now 104 degrees, and there was Bertie, breathing very heavily, and as the doctors said, in a critical but not hopeless condition. The Queen stayed several days and was more than once summoned to the bedside when the patient had spasms of choking, and even when he recovered from these attacks, he talked incoherently and clutched at the bedclothes.

In other parts of the house the general anxiety took a comic turn. A new, though incomplete knowledge of hygiene had invaded even royal circles, and everyone at Sandringham was thinking of drains and looking for smells. The old Duke of Cambridge was particularly obsessed with the subject, and walked from room to room searching with his nose. The habit spread to other members of the Court, and soon everyone was jumping up, exclaiming: 'Drains—I won't sit in this room any

longer!' Eventually, a gas-pipe man was sent for, and the old Duke grasped him by the arm and said: 'My dear fellow—don't you smell it?' But the gas-pipe man remained obtuse. Sir William Jenner was called in to lecture him, but the gas-pipe man said he had nothing to do with drains, but only gas-pipes. Drains were searched and tested but eventually the cause of the odour was discovered to be an escape of gas, and hygienic confidence was restored. Upstairs in the sick room the Queen made her authority felt, and probably at Jenner's suggestion, she sent away from Sandringham the numerous relatives who were disturbing the invalid.

That dreadful anniversary—December 10th—the day of the Prince Consort's death—came round again, and in her heart the Queen was perfectly sure she would have to be present at another deathbed. But about that dreaded day, the Prince's breathing became stronger and easier. He rambled less, and was sleeping better. Then slowly the temperature began to come down, and although there was a serious relapse when the Queen had to return again, the Prince recovered from the disease which had killed his father.

Was it the two nurses which helped Jenner to perform this cure? Or had the Prince of Wales inherited his mother's natural immunity to typhoid, together with her will to live, rather than his father's poor resistance and want of desire to survive? The future Edward the Seventh had a profound vitality which was to lead him through a vigorous career.

If these royal people in their comfortable palaces could catch typhoid fever so readily, what was the condition of the poor in their slums and alleys? Sir William Jenner had plenty of opportunity to study this disease, and so had every other practitioner in the nineteenth century.

5. ROYAL FAVOURITE

The Queen had a profound trust in Jenner and loved to dispatch him, like a sort of extension of her royal prerogative, to her friends who were ill. She had even sent him to the bedside of her Gladstone, whom she did not love, though the illness turned out to be nothing serious. But there was one person who was especially dear to her, that inscrutable Jew who had been Prime Minister, and who had made her Empress of India. Towards Benjamin Disraeli, now Lord Beaconsfield, the Queen had feelings of more than tenderness, and when she heard that he was seriously ill she was most distressed.

He suffered from gout and bronchitis, and he was being attended not only by Dr. Richard Quain, a well-known and orthodox physician, but also by a certain Dr. Kidd who was a homoeopathist. That particular cult, the same as that 'globulism' which Sir James Clark had disowned in the *Lancet,* was bitterly opposed by the regular practitioners. It was known that Dr. Quain wanted Jenner's advice on Lord Beaconsfield's illness, but Jenner objected fiercely to homoeopathists and was disinclined to attend any case in which Dr. Kidd was mixed up.

Queen Victoria had no patience with such professional etiquette when it obstructed her will. To her the matter was very simple. Here was her dear Lord Beaconsfield very ill, and he must have the very best doctor, and of course, that meant Sir William Jenner. Taking her pen, she wrote one of her vigorous letters of unmistakable command. Her physician was a man she respected enough to be able to put her orders in the form of a request, and she well knew how choleric he was apt to be. The Queen, she wrote from Windsor, could not but think Sir William would gain much more by waiving a little professional difficulty than in refusing at such a moment, when one of the most valuable lives of the country as well as one of the most

valued friends of the Queen, is trembling in the balance between life and death. 'If Dr. Quain asks him to go and see Lord Beaconsfield she earnestly trusts he will go. Being the Queen's own physician, who so often used to go and see friends high and low, when the Queen asked him, and there being no journey to undertake, which would cause fatigue or risk, his not doing so, the Queen is sure, would be much felt by the country.'

The appeal is very adroit, and the Queen pleads with him to ignore his prejudice against Dr. Kidd since the whole country is looking to him, and expecting that he will put Lord Beaconsfield's life before his medical theories. There is one personal touch, almost as an afterthought. 'Sir William Jenner used always to be so kind to those who were dear or valuable to her, that she cannot think he will object further.' Could any doctor resist such persuasion from the Queen of England?

Queen Victoria was full of hope that Lord Beaconsfield might be her Prime Minister again. But he was seventy-seven and even the combined skill of Dr. Quain and Sir William failed to pull him round. For Jenner had swallowed his professional scruples and went three times to consult at Disraeli's deathbed.

Sir William Jenner was a most violent and outspoken Tory, and at times his views astonished even the Queen. He was good at repartee, and roared at his own successful replies, and was quite ready to use any means to win. Once when the Queen's private secretary had refuted an argument, Sir William roundly asserted that he had never said any such thing, and his eyes disappearing into his furze of eyebrows, and his voice dropping to dulcet professional calm, he said, 'I strongly advise you to consult the best ear specialist in London: there is something extraordinarily wrong with your hearing.' He would pour out his wrath even in the presence of the Queen, who on one oc-

casion became somewhat alarmed at his anti-Chamberlain views.

Ten years after the Prince Consort's death, the Lady of Windsor was still in the seclusion of her mourning and her Ministers tried to press her to undertake more public engagements; but the Queen declined. Then the family attempted persuasion through Jenner. But he said his concern was with the Queen's health and not with her actions. He stood as bulwark between the Queen and anyone who tried to make her do more. His opinion on her health became her standing excuse which no one could refute. Whenever she did not wish to leave Balmoral, there was always Sir William to say that it was good for her health that she should remain. He had some sharp exchanges with Lord Granville on the subject when the Ministers were obliged to travel to Balmoral for a Privy Council meeting. But the Queen and Jenner had their way, and a medical bulletin appeared in the *Lancet* explaining that Her Majesty remained in seclusion on medical grounds. As the Queen was now fifty-two years old, Sir William probably had good reason for this opinion.

He generally accompanied the Court abroad. At Milan, where the Queen had insisted on going under a pretence of being 'incognito,' there were no police to keep back the crowds, and Sir William was tumbled down the steps of the Cathedral, to his great fury. But sometimes he could sit still in the most majestic composure, as once when the Queen's private secretary called on the Duchess of Genoa to write the Queen's name in a visitor's book and found the Duchess and all her household waiting on the steps, obviously prepared to welcome the Queen herself. Sir Henry Ponsonby, the Queen's private secretary, dressed only in his travelling ulster, presented respects to the angry and disappointed Duchess, but Jenner remained unmoved and laughing in the carriage outside. This Sir Henry Ponsonby

was a great source of humour in others. With a calm unexpressive look, he could make the whole company, even the Queen, laugh until tears came down their cheeks. On one occasion, Jenner had been physician-in-waiting on a royal visit to Lucerne, and on a spare afternoon had gone on an excursion on horseback with a stout and not well-favoured German governess. Solemnly, Ponsonby asked Jenner what the guides thought of their relationship, and Jenner said, with one of his great laughs, that they had decided the governess was Madame, and had made them come down the hill in a chair. 'Both in the same chair?' asked Sir Henry, and the Queen laughed, and Jenner had to stuff his napkin into his mouth.

Such was the sort of simple humour they enjoyed at Court and no one liked it better than Sir William.

6. THE HEAD OF THE PROFESSION

Jenner's career was the triumph of robust commonplace, the exaltation of ordinary gifts and bulldog tenacity. He had not made the unique discovery of his namesake Edward Jenner, but he had a great name and worldly position, and the largest fortune hitherto known in the practice of medicine, surpassing even Sir William Gull's. It was largely through his personality. Sir James Clark yielded to Court atmosphere and deferred to the royal ladies, but Jenner never deferred to anyone. He bullied the Queen as he bullied all his patients, and they liked it.

When he reached the highest professional position to which an English doctor can attain, that of being annually chosen President of the Royal College of Physicians of London, between 1882 and 1888, Sir William ruled with a rod of iron. Magnificent in his black robe heavily encrusted with gold lace, he walked majestically behind the golden mace, more imposing

than the other Fellows, but they respected his character and feared his tongue. Today we can read his manuscript of his official addresses to the Fellows. Reports, obituaries, recommendations, they are written in clear but awkward script like his own honest features, some of them written obviously in haste on notepaper from Windsor Castle, and we can catch the straightforward tones, the speech of a man who had cut the knot of doubt, and put everything in order. Being himself of the average, he appealed to the average, and stood stoutly for the dignity of medicine, whatever the world might say. One of them wrote after his death: 'Conscious of the rectitude of his own motives, he was too disposed to attribute moral obliquity to those who had arrived at a different opinion.' What a lot that cautious obituary tells us of his government in the College! He treated the Fellows as King Stork treated the fishes, and when he was gone, they sighed for King Log to rule over them. On one occasion when he was determined to have his way, and the assembly of senior physicians proved to be unusually recalcitrant, the President announced from his throne that he would have the doors locked and would not give anyone permission to leave the Hall until the vote had been taken.

At last the time came for him to lay down the golden mace of office. His farewell was characteristic. He thanked the Fellows for the kindly way they had responded to his advice. 'Twice,' he said, 'fearing that the College might not respond in matters which in my judgment were essential for its honour and prosperity, I have had to my hand a letter resigning my position as President . . . and if, during the stormy times we have passed through I have seemed to fail in courtesy to any Fellow, I pray him to look gently on my apparent discourtesy—every word I have uttered, even if it has seemed discourteous, every sentiment I have expressed—every admonition, if what I have

said could be called an admonition, had for its object to promote the usefulness of the College to the profession and the public.'

He used to say a doctor had no time for hobbies, outside his enthralling profession, and he never wasted his leisure because, except when travelling to see a patient, he had none. After breakfast at 8:30, in his house at 63 Brook Street, London, he would make calls till 10, and from then until 2 o'clock, he interviewed the fashionable invalids who waited nervously, and went away impressed. A hurried lunch in his secretary's room, which was next to the library where he saw his patients, was the only pause in the calls of patients until dinner-time at 8 o'clock, though his servant brought him a cup of tea. After dinner, he would spend an hour with his secretary before going to bed at half-past ten. Next morning began again the inexorable routine which went on all the year except when he was with the Court at Balmoral.

Like all the Victorians, Jenner had one great privilege: he could read each one of the works of Charles Dickens fresh as they appeared. He was a great lover of those books and we can picture him in his carriage driving through English lanes, or on one of the new expresses gliding at forty miles an hour to Scotland, deep in *Bleak House,* or plumbing the mystery of *Edwin Drood.* He also liked the tales of Miss Braddon, and such escapist literature gave him restoration from the puzzling anxieties of a physician's life in which almost every case was a difficult one, since it had already passed through other hands and had been saved up for his consultant's judgment. In his practice there were very few aids to the clinician at the patient's bedside. When he was seventy, he was obliged to rely, just as he had done at twenty-five, upon the power of those searching eyes, the touch of that experienced hand, and that acute sense of

smell which had made discoveries in the typhus wards. Melampus had indeed learned his trade in the garden of humanity.

In actual practice, he was sometimes inclined to be over-confident. He had seen so much, and since disease tends to repeat itself, and the man who kept so many records in that boundless memory of his was sure to contain known similar cases. His critics said that sometimes Sir William Jenner made too favourable forecast of an illness, but that has been said of many great physicians and was perhaps a habit, due to his intuitive understanding of the power of hope. Often in a long and difficult illness, the doctor gets near the end of his resources; the patient makes no progress and the case seems hopelessly bogged. One remedy after another, he tries without avail. Such are the moments when he needs the help of an active, dynamic and overwhelming faith in himself, if that patient is to pull round. It was better to be wrong occasionally than to throw away the enormous benefit which encouragement can give to the exhausted human body, and Jenner's gruff optimism must often have carried him round a difficult corner.

This ungainly old man with the kind heart and infallible judgment, born in the year of the battle of Waterloo, lived until near the end of the century. To a large world, Jenner was what neither Knighton nor Clark ever became, the mascot and symbol of the Healing Art. The gruff Jenner, that dominating, dogmatic and ugly old man, was the greatest doctor of the three Royal Physicians, and for the first time, the monarch of England had a great man as guardian of her health.

7. EPITAPH FROM A QUEEN

Jenner's best memorial occurs in Queen Victoria's diary. His greatest patient was no expert in medical philosophy, but she was a very good judge of men, and she admired this robust and

independent doctor. 'Much grieved to hear that good old Sir William Jenner, who had been for so many years (from '61 to '93) my physician, had died this afternoon. He had been a most devoted and faithful servant of mine, a most able doctor, and a truly kind friend, to whom I could always speak frankly and confidentially. I have greatly missed him during the last five years, when he could no longer come to see me. He had been with me during the saddest moments of my life, having been most kind and attentive at this most terrible time, now thirty-seven years ago: again at Sandringham, during Bertie's most alarming illness in '71, and when dear Leopold was so dreadfully ill on two occasions, and Sir William, under Providence, really saved his life. On many other trying and sad occasions he showed much kindness, and was always full of sympathy, though naturally of rather an irascible temper. He gave up travelling with me after the year '79, never going any more either abroad or to Scotland. It is another link with the past gone, and I feel it very much.'

BOOK TWO

TWO PROPHETS

SIR EDWIN CHADWICK
THOMAS SOUTHWOOD SMITH

> The demands of this poor public are not reasonable, but they are quite simple. It dreads disease and desires to be protected against it. But it is poor and wants to be protected cheaply. Scientific measures are too hard to understand and too costly, too clearly tending towards a rise in the rates and more public interference with the insanitary because insufficiently financed private house. What the public wants, therefore, is a cheap magic charm to prevent, and a cheap pill or potion to cure all disease. It forces all such charms on the doctors.
>
> GEORGE BERNARD SHAW

1. TWO THINGS MISSING

IN THE 'Blue Bedroom' of Windsor Castle, His Royal Highness the Prince Albert lay ill with typhoid fever, surrounded with every comfort which the age could conceive; a group of the most reputedly skilled doctors, refinements of diet and all known medicines, an adoring wife and attentive servants. But two things he lacked, because in 1860 they were almost beyond human resources, and the Queen's husband in the royal Castle might command them no more than the humblest cottager on the Windsor Estate. The first was hygiene, and the second was nursing. Without them, the wisdom of the sagacious Jenner, and all the heartbreak and devotion of the Queen had no power to save. A sad irony that a man who really cared for science, who backed every proposal for sanitary reform, who helped Florence Nightingale to put over her idea, should have perished at the age of forty-two through lack of sanitation and want of nursing.

The individualistic art those royal physicians practised was paralysed through want of those two other sciences that were

really communal. The discovery of hygiene and the invention of sick nursing in England belong to two great Victorian characters who were not doctors, aided by a third who was more of an evangelist than a physician. If Edwin Chadwick and Florence Nightingale could have been born earlier, and if the silver tongue of Southwood Smith had exercised its persuasive sincerity in the Chapel of Windsor Castle instead of in Unitarian conventicles, then the gospel of hygiene and a power of healing greater than drugs might have prevailed against the materialism of Victoria's reign, and the lives of many promising men and women who died before their time, like the Prince Consort, might have been saved. The royal physicians had done their best for their patient, but the further development of medicine depended on those two features not practised in palaces, but which had to be studied among masses of men and women.

The achievements of Chadwick and Florence Nightingale, neither of them, by good fortune, trained in medicine, can be fully appreciated only as a religious movement. They were not healers by profession, they were self-taught innovators who created new vocations in the practice of healing. They fought tradition and overturned every accepted principle. They had to inspire fanaticism. Their task was not only to discover scientific laws, but to make masses of people believe, and for this they were both equipped with terrific wills. Edwin Chadwick and Florence Nightingale were natural forces like wind and water, and they chastened their fellow men because they loved them.

The Court doctors, Clark and Jenner, with their dignified manners, their stethoscopes and Latin prescriptions are like orthodox Bishops of the Health Establishment. The three outsiders we are now to put on the stage are rather to be thought

of as Salvation Army officers preaching hygienic salvation to an age which mocked and stoned them, but in the end was slowly converted.

2. THE FIRST BUREAUCRAT

Edwin Chadwick came of a family of craggy individualists in Lancashire when that was already lively with villages and small towns specializing in spinning and weaving cotton. His grandfather did not believe in saving money because of John Wesley's saying that a man who left behind him more than a hundred pounds, after payment of his debts, was a rogue. This man's son, and Edwin's father, had none of the qualifications for success in cotton. He had a variety of talents but no power of concentration. Revolutionaries appealed to him, and he even journeyed to Paris to see Consul Buonaparte review his troops. Eventually he landed in New York where he played the violoncello as a relaxation from editing a Radical newspaper.

Edwin Chadwick's father has one imperishable distinction. He had actually taught physics to John Dalton, the man who invented the atomic theory. That was rather like being the person who coached Beethoven in counterpoint, and the consequences for the world were so great that they throw some light upon the intellectual originality of these Chadwicks, and we must pause there to define who John Dalton was.

He had worked from the age of twelve as a weaver but the older Chadwick caught him and stimulated his interest in knowledge, and Dalton became a teacher of science and mathematics. But his real passion was the acquirement of new facts and the construction of fresh hypotheses. This unusual schoolmaster claimed that the *aurora borealis* was due to electricity in the atmosphere. He discovered colour-blindness. But his greatest achievement was his invention of the atomic theory

out of which has come the most significant scientific development of our own century. John Dalton taught that all the matter in the world was really composed of invisible particles called 'atoms,' and that each chemical element, such as carbon, iron and oxygen, differed only in containing a different number of atoms.

John Dalton's atomic theory, published to the world in 1808, did not include the possibility that the chemical atoms might themselves consist of an even more elementary thing—a mere charge of electricity, and that the atom might be split into parts, with prodigious and terrible consequences. That piece of knowledge was fated to be held back for another century.

We must leave Edwin Chadwick's father to his share of immortality in having helped the creator of the atomic theory to find his way in the twilight of the mind. But for the sake of completeness and due order we must here plant a germ which will develop in the last part of this book by saying that John Dalton in his schoolmaster days had one pupil named William Worrall Mayo who emigrated to America where his later career had some of the characteristics of atomic energy itself.

From these necessary digressions, we go back now to the life of Edwin Chadwick.

Of his mother, who died when he was a child, Edwin Chadwick had one especial memory, her passion for physical cleanliness. Many a boy has had the same tiresome recollection, but with Edwin Chadwick this memory became an instinct, an obsession. He became the master-cleanser of the English nation which disliked the process as much as any small child.

Education, at the hands of a Radical doctrinaire like Edwin's father, was apt to be irregular, and in a way the boy was never educated at all—by others. He was a man incapable of mental discipline except that he gave himself. He followed his instinct

for what was necessary knowledge, and grew up with the dogmatic confidence of the self-taught man. The world owes a lot to those hungry auto-didacts who are sometimes the great schoolmasters of their generation because their faculties have never been twisted by training, but have grown in natural profusion.

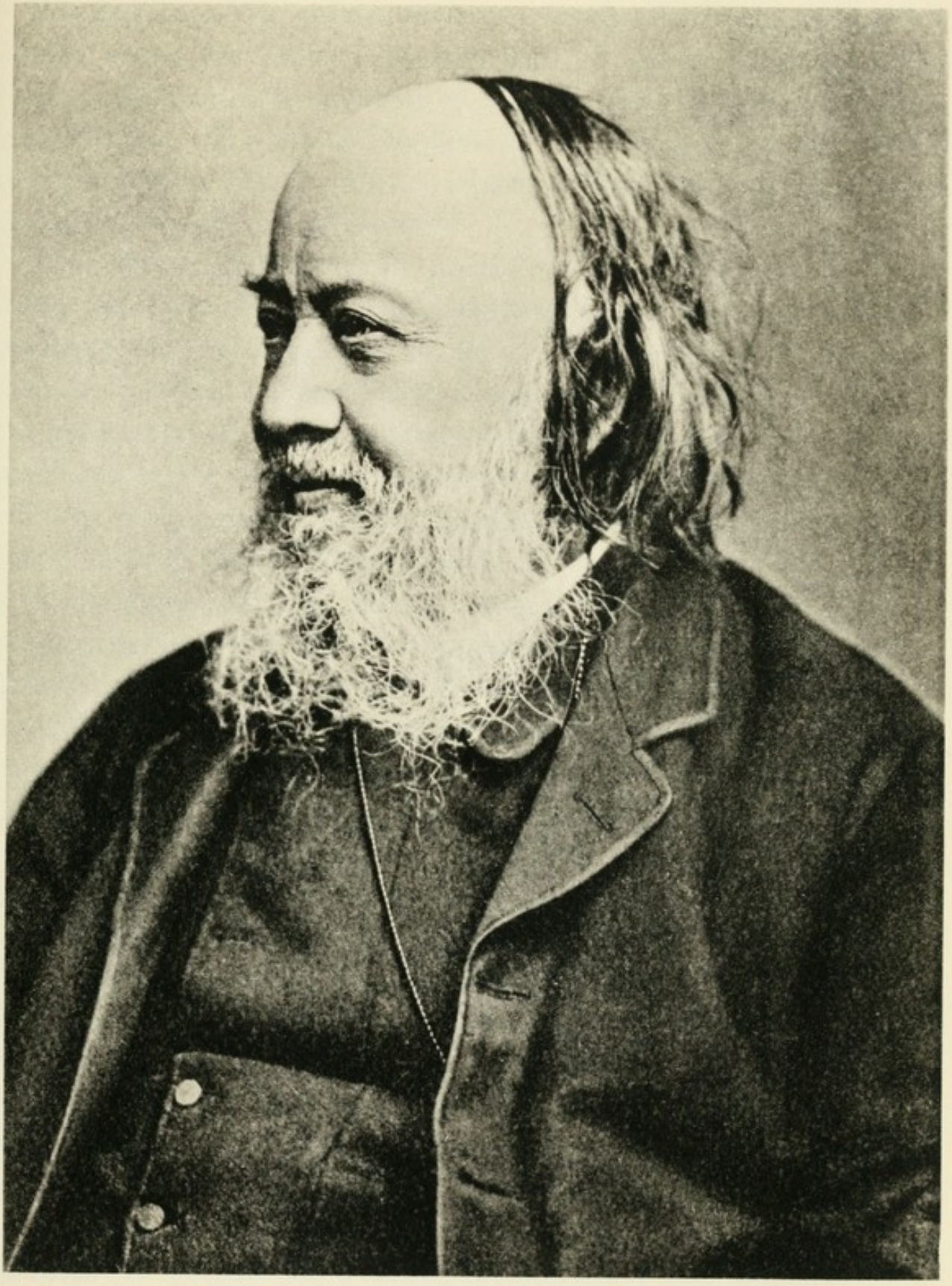
Edwin Chadwick decided to become a barrister, and he began his legal education in one of those brick squares of the Temple, called 'Inns of Court,' beside the river Thames where the lawyers live and study and interview their clients to the present day. The houses in those narrow lanes and tiny courts had been built before the great fire of London, and the English law was much the same, very old, very illogical, yet preserving a characteristically English idea of elemental freedom. The law which Chadwick learned was in a state of arrested development, and Chadwick was a natural born reformer and innovator. Yet his true sphere was not to be the English law, but the English practice of communal health which he caused to arise out of the law.

Chadwick's confident Lancashire voice, his love of scoring off his fellow men, his complete lack of self-mistrust, would have made him a good advocate. Around him his bustling brethren of the Bar were all ambitious to shine in the Courts at Westminster Hall, or in the House of Commons, to become Attorney-General, or to rise to be Judges of the Courts of Common Pleas. A few of them, the less successful ones, dreamed of poetry and literature, while they waited for clients who never came. Chadwick had no clients and his hobby was not poetry, but argumentative speculation. He made his bread and cheese out of newspaper articles, not of course the snappy paragraphs of modern journals, but learned summaries on philosophical questions, and this journalism brought him in touch with some remarkable friends. The leader of this group was a queer compound of

intellectual depth and emotional limitations, called Jeremy Bentham, usually known as the English Utilitarian, whose teaching is summed up in his immortal phrase 'the greatest good of the greatest number.' Chadwick worshipped Jeremy Bentham, absorbed his theories and worked them out in practical forms. And the more he became steeped in Benthamite philosophy, the less he relished the idea of practising law. Already he was becoming bored with legal ways and ideas, and new ideas, changes of method, fresh habits in ordinary living, these were more to his taste than the everlasting formulae which the lawyers copied out with their quill pens. At the age of twenty-eight, Edwin Chadwick wrote an essay on 'Preventive Police,' a true piece of Benthamism, but before we look at this ingenious essay in sociology, we shall have to digress for a little upon the personality of Jeremy Bentham himself from whom Chadwick gained the motive power which enabled him to create public hygiene.

3. BENTHAM IN PRISON

Ever since he went up to Oxford University at the age of twelve, Jeremy Bentham had been a mental prodigy, but now when Chadwick became a sort of secretary to him, Bentham was nearly eighty and lived an eccentric bachelor life in an old house in Westminster, London, surrounded by cats and books, devoted to his teapot and his wonderful harpsichord, theorizing, talking endlessly, completely out of touch with ordinary life, rewriting the English law on a basis of reason and utility. In his study he was as bold as a lion; outside in the world he was a timid sheep. When nearly sixty he proposed marriage by letter to a lady he had known thirty years, and tears came to his eyes at her refusal. That was his only sentimental adventure.



SIR EDWIN CHADWICK

But Bentham had indeed made one unusual journey—to South Russia where his younger brother Samuel carried on a factory. But he never learned anything of practical life, though this visit, and the fact that Samuel looked up to him gave the illusion that he really had a gift for doing things and carrying his extraordinary ideas into practice.

The central theory which buzzed in this self-centred man's mind was that all human actions are based on the pursuit of pleasure or the avoidance of pain. The only way to judge whether a thing was beneficial or evil was to ask how it served the greatest good of the greatest number of people. On this he built his rules, like a mathematician firmly basing every calculation on the secure foundation that two plus two equals four. Laws, morals, ethics, religion were all measured by this rule—how much good do they do, and to how many people? Bentham was ready to put every human faculty in a pigeon hole. He prided himself upon his lack of feeling. He used to boast that he could only tell the difference between prose and poetry by the fact that in the one all the lines in the book came to the margin, while in the other, the lines were unequal in length.

According to this utilitarian philosophy, the duty and destiny of man depended not on his dreams and desires, but on the consequences of his actions, and their effect on others. Everything was focused down to its practical value. Bentham's narrow creed, through its very narrowness, had wide results. Its hard light played on laws and morals and showed up the tawdriness of what passed for human welfare. It was a necessary stage in social philosophy, but how fateful were its consequences when prolonged past the time when it ceased to be valuable!

Like all abnormals, Jeremy Bentham was fascinated by prisons. He worked out a whole list of crimes and punishments. This gentle recluse, who loved the whole of creation and would

not even use mouse-traps to prevent the papers in his study from being nibbled away, devoted years of his life to inventing the ideal penitentiary. At last, he found the perfect model which he called the *Panopticon*—a place where the jailer could see everything that went on.

It was a circular building with the convicts housed in little cells around the walls, and a watchful guardian stationed at the centre. The prisoners would work under his supervision; work, of course, tending to produce greater good than idleness, and therefore naturally more congenial to the convict's mind. Bentham could see no flaws. He had a model of the *Panopticon* made in wood, and when the French Revolution broke out, he wrote to Paris cheerfully offering to take charge of a thousand prisoners. When this ingenuous overture was rejected by the realistic French, Bentham placed his idea before George the Third, and actually purchased land on the bank of the Thames where he intended to embark with his practical brother Samuel upon a commercial venture based on the work of the thousand prisoners whom he hoped the Government would let him have for his perfect *Panopticon*. Eventually, after much delay, the British Government wisely decided that this unworldly theorist was not the right person to manage a thousand criminals, and the scheme was dropped. But the philosopher received £23,000 in compensation for his outlay on the land and the loss of his commercial opportunity. Bentham was quite able to apply the theory of utility to his own financial welfare, and he had succeeded, though by an indirect method, in making crime pay.

Jeremy Bentham could make a perfect scheme for anything under the sun. His method was very simple: first of all this unpractical man who never ceased to believe in the omnipotence of reason, would sit down and draw up a complete plan, subdividing the matter into headings, each on a separate sheet of

paper; it did not matter whether he knew the details. They were to be discovered later, by his disciples and assistants, and filled in underneath the main divisions of the subject. For research work, young Mr. Chadwick was naturally born: he could invariably put his hand on the reference, or devise a method of inquiry to find out hitherto undiscovered details, and always those new facts led back to the old centre—the greatest good of the greatest number which was Bentham's mainspring.

Bentham was a universal mental solvent in which the old rigid ideas of the eighteenth century melted. When George Borrow was selling Bibles in Spain he met a man in a village who gave him reverence because he was a fellow countryman of 'the great Bentham, the most universal genius which the world ever produced; a Solon, a Plato, a Lope de Vega.' But George Borrow himself knew nothing of Bentham but his name.

The majority of English writers never thought much of this piece of disembodied mind. As Benjamin Disraeli in one of his novels (through the mouth of his Count of Medina Sidonia) said of him: 'Man is only truly great when he acts from his passions; never irresistible but when he appeals to the imagination. Even Mormon counts more victories than Bentham.'

Yes, indeed. The most illogical scheme will live when it possesses the power and energy of feeling. Such qualities were Edwin Chadwick's deficiency and his Benthamite background explains the early history of public health.

4. A POLICEMAN'S WORK

Chadwick's introduction to the philosopher had been through his essay on 'Preventive Police.' But he used this word not in the modern sense at all. The policeman's primary duty, he wrote, should be to extinguish fires, and every police station should

have fire-hoses and engines, and the whole of London should be served by a system of piped water with stop-cocks to which the police would have keys. While other lawyers were thinking of criminal justice, Chadwick was working out the loss caused each year by fires in the Metropolis. It was a novelty, a grotesque change in the police idea which had only just been born. That functionary with the tall silk hat and the truncheon who was called a 'Peeler' or a 'Bobby' after Sir Robert Peel the Home Secretary, had hardly passed the storm of indignation which followed his debut on the London Streets. To Chadwick, cleanliness and the prevention of waste were always the more important part of public order, and he hated to see the Police Force and the Fire Brigade as separate bodies. He allowed his imagination to roam over the advantages of making the constable a preventive fireman. He loved taking a stop watch and calculating the minutes required for the firemen to get their horse-drawn engines out into the streets, and the seconds needed to unroll the hosepipe. Gleefully he quotes the wonderful invention in Philadelphia, U.S.A., where by an 'electric telegraph' the horses were detached from their stalls, and drilled to turn round and put themselves into the shafts, where they were ready to start in half a minute. But in this, as in so much else, Chadwick was before his time. To the end of his life, Chadwick was left to lament the loss of money caused through fires due to what he called the 'dereliction of settled administrative principle,' exemplified in the deplorable separation of Police Force and the Fire Brigade.

Chadwick could produce ideas like this by the dozen. He was a sort of Thomas Edison of sociology who could always find a better way of making things work—on paper, and he could prove by figures that he was correct. His ideas were generally very sound, though he was less successful when he came

to deal with human ideas and feelings than with fire engines and mortality studies.

How characteristic of English eccentricity that this great father of hygiene should have been not a doctor, but a lawyer. In some ways it is a misfortune. Chadwick had the lawyer's mind, a tough, intellectual and methodical mind; he saw the problems of disease from the outside; to him illness was a faulty calculation in mathematics, and he approached the sick in the spirit of a policeman and a schoolmaster.

From the accident of nature that threw up a Chadwick in the very first year of the nineteenth century, the shape of English Public Health became rigidly fixed for the next hundred years. Public medicine was an illegitimate offspring of the law, and Edwin Chadwick, its proud parent, trained up the infant in those habits which he had learned in the Attorney's Chambers.

5. THOSE WHO ARE ALWAYS WITH US

That placid, well-meaning bachelor, in his Quaker-like brown coat, brown cashmere breeches and white stockings, who dreamed of systems, prisons and universal welfare as he trotted along with his stick on a methodical walk each day, who was so honourable, punctual and orderly, this intellectual giant who was an emotional dwarf, Jeremy Bentham is the authentic ancestor of Public Health.

Bentham's memory is that homely, practical and very English workaday idea of popular welfare. Though today we may think of his philosophy as rather a limited and narrow conception of man's destiny, it was at the beginning of the nineteenth century a ray of new dawn against the old darkness of private power and privilege. Bentham's monument is a prison, not indeed the *Panopticon,* but a certain narrowness, a denial of emotion, an

utter ignorance of poetry, nobleness or glory in life, nothing except the most common utility. The results of that utilitarian idea in practice showed its essential barrenness. Like his master, Edwin Chadwick became a man of a single idea, that physical environment, in other words, sanitation, was the greatest good. How then to give it to the greatest number? The answer to Chadwick was plain: he must make people healthier, and therefore better, by rules and codes of health laws. Regulate, guide and compel them to be clean, and like the imaginary prisoners in the never-materialized *Panopticon,* human beings in Victorian cities would of themselves want to obey, they would desire to be healthy and would therefore follow those well-meant regulations.

It had become altogether more exciting to put Bentham's brilliant ideas into practice than to follow the humdrum lawyer's business before the Judges of Westminster Hall, and Edwin Chadwick took a job in the Civil Service. That is putting it in such modern terms as to be an anachronism. At the time most public posts were sinecures given for political reasons; but the niche which Chadwick found for himself offered much hard and disagreeable work, and no chances of popularity or profit. The first reformed Parliament of 1832 had revolutionized the Poor Laws, and placed those unfortunates who might fall into the condition of being paupers under a new Board. Here Chadwick saw the opening in which to drive the Benthamite wedge. Here among the 'paupers,' that social subworld of untouchables who lived in a jungle of poverty, neglect, and exploitation, was his chance to test the grand principle of the greatest good and the greatest number. We shall have to take a look at the Poor Law. We cannot escape it. It forms a stopping place on the way to Public Health.

This Poor Law, that is the communal way of dealing with

those members of the community who cannot make their own living for themselves, goes back to Queen Elizabeth. The suppression of the monasteries by her father, Henry the Eighth, had been a great social calamity for England. No longer were there monks and nuns ready to take in strangers, and expert in looking after the sick and aged. No more was there a distinct class of men and women devoted for life to charity and poverty, and therefore endowed with intuitive knowledge of what the poor needed. These Benedictines, Cistercians, Black Friars, White Friars which Henry the Eighth abolished had their faults: no doubt they were becoming too rich and powerful; but certainly they alone understood the lives of the poor in the villages of England: they alone had studied and practised a rough sort of sociology which helped the common people in years of bad harvests, wars, and sickness.

When the monasteries were closed, a wandering army of poor labourers and their families clogged the life of each little community, and Parliament was obliged to pass an act making it compulsory for the magistrates in each parish to levy money from the landowners and farmers to support them. This was called the Poor Rate, and the magistrates engaged officials called overseers to look after its recipients who were named paupers. Poor Law had begun. So it continued for two hundred years. The local magistrates or justices of the peace who met regularly to try petty crime and perform such functions as managing highways, also considered the report of their parish overseer who told them how many persons there were on the pauper roll, persons who, for one reason or another, could not work: either because they were too old, or too young, or widowed, or sick. Then the magistrates levied the Poor Rate which was collected from landowners and paid out by the overseer in small doles called outdoor relief, to each pauper family.

Naturally the number of paupers varied from time to time and in different places. Some parishes were mean, others were generous in the outdoor relief they allowed. By the end of the eighteenth century, the price of corn was low, and farmers were unable to employ enough labourers, and slowly, but decisively, a big revolution came into Poor Law. The parishes began to pay poor relief to *able-bodied* men in distress because they could not find employment.

Formerly, it had been confined strictly to the sick and the aged; but now a healthy man who could not get a farmer to take him on could go to the parish overseer and ask for the parish dole. It had become in fact what we should now call 'Unemployment Benefit.' It was really a general contribution towards wages, and the pauper who did no work was as well off on poor relief as the man who did a full week's work, and there grew up a vicious system by which farmers hired gangs of paupers to do their work in the fields without wages. This injured the regular workers, because wages went down, while the number receiving relief increased alarmingly. Each parish had its army of 'paupers,' mostly able-bodied, and they were a burden upon both employers and their fellow labourers. Such was the state of the Poor Law when George the Third died in 1820.

It was a haphazard system which had grown up to meet local needs. It varied slightly in each parish, but at least it enabled the pauper to live in his own village more or less like others. There were a few 'workhouses' or 'almshouses,' but only the old people and children lived in them. It was cheaper for the parish to keep the paupers in their own homes upon outdoor relief. Probably the best thing which can be said about the system is that it (with the aid of John Wesley's missionizing) prevented revolution in England during the eighteenth century.

But now another form of alarm spread over those little social worlds of squires, parsons, labourers and paupers. This time it was not economic distress, but economic theory. A Cambridge clergyman, the Rev. Thomas Malthus, published a book which shocked and terrified everyone who could read. He laid it down as an inevitable law of life that the number of human beings must always increase faster than the food supply. He had persuaded himself that the human race grew in geometrical proportion, but the number of loaves of bread only in arithmetical ratio, and he pictured humankind gradually coming towards extinction through lack of food. It was a grim economic prophecy based on contemporary conditions.

Malthus pointed to the increasing number of paupers and the unprosperous condition of the farmers. He approved of war and pestilence as natural remedies for this diabolical tendency of this race to overmultiply, and he recommended 'moral restraint' and late marriage as desirable methods of birth control.

After our second World War the shortage of food and uncontrollable growth of population in Asia had brought Malthusian fears back into our minds. Perhaps, we say, there is something in this grim theory. We can understand therefore the extraordinary horror it caused in England a hundred and fifty years before.

Social observers began to notice the swollen state of the Poor Law, and the undeniable fact that in some places it was more profitable to be a pauper than a worker. The statesmen of England accepted his doctrines and woke up to realize that seven million pounds a year were being spent on poor relief. They determined on a drastic operation. The whole system which had grown up so irregularly must be cut out, as though with a knife. This piece of economic surgery was the Poor Law Act of 1834. Let us see what it did under the direction of men

who had read the Reverend and Learned Thomas Malthus on *Population.*

The Act set up new bodies called Boards of Poor Law *Guardians,* who were supposed to guard not only the paupers but the rates.

Outdoor relief, that is payment of parish doles, was abolished with a stroke of the pen. Anyone who required parish help, from whatever cause, had to come to live inside the parish workhouse. Imagine a farm labourer unable to get employment. Under the old system he would receive a weekly payment from the overseer, calculated according to the price of bread, and he would remain in his own cottage, working perhaps at harvest times as a subsidized 'hand' for a local farmer. It was a state of penury, but it was at least freedom. But now, after the Poor Law Act of 1834, he could not draw a penny of outdoor relief. If he could not support himself, he must come inside a grim building with a high wall called the workhouse. The old almshouses, intended for a few old people, were now too small. Several parishes had to combine together to build a 'union' workhouse, a hideous and unnatural structure of a new type. His wife must live in the female section of the building, separated from him by a high wall surmounted with iron spikes. No longer was he an impoverished member of a community. He was degraded as an indoor pauper, and he must either accept this, or starve outside. Those families who could not stand the pace of the Industrial Revolution and who fell by the wayside, were seized and clapped into the unions where the deliberate aim was to reduce them into a state of desiring never to become paupers again. The shocking part of this system was that official harshness was entirely according to the law.

This rough and ruthless measure certainly did reduce the number of paupers, and perhaps in the disturbed conditions of

the country some such method was necessary. But we are interested here in the Poor Law only because it was the beginning of English Public Health, and much of the bitterness, the repression and the harshness of pauper rule was passed on into the health system of the man who became the chief executant of the one and the other. This was Bentham's disciple, Edwin Chadwick.

He was appointed secretary to the Poor Law Commissioners, and thereby responsible for bringing in the new system. Under another man it might have failed; but Chadwick was too energetic and too masterful. He made the changeover as efficient as it could be made. All over the country, fifteen thousand independent parishes were amalgamated into more manageable Poor Law Unions, which were largely controlled from London by the Poor Law Commissioners. For the first time, England had a regular bureaucratic machine, driven by a determined and able administrator. Results began to appear. The paupers flocked inside the dark union workhouses: outdoor relief dried up: parish rates went down and the new practice of social administration, a science practically invented by Chadwick, was launched in a tradition of grimness and inhumanity.

Such was the end of the Elizabethan Poor Law, through an Act of Parliament which Gladstone called 'the greatest reform of the century.'

The Poor Law Board began to carry out the hard social change which its creators intended. It was, to use a later phrase, 'Revolution by Administration.' Chadwick signed the official orders that went out from London in the name of the Commissioners. In one year there were over four thousand such orders. Whenever a local Board of Guardians got into difficulty it wrote to Chadwick for advice, and the capable secretary had copious suggestions to make upon an inconceivable variety of

human problems. Take for instance the conduct of dissolute women in union workhouses. There was one very bad case—that insolent and refractory pauper Elvina Benneworth who had such a bad influence upon others and whose example would induce them to throw up their situations and return to the workhouse. There were others, wrote Chadwick, who 'finding the temperance, cleanliness and order of the workhouse irksome to them, wished to enjoy a short interval for riot and debauch.' Such cases caused the Commissioners much concern, and the Board regretfully admitted that when these dissolute paupers wanted to leave the shelter of the union workhouse for short periods, 'which are, it is feared, commonly employed by them for the purpose of disorder, drunkenness, prostitution and other malpractices,' there was no legal power to keep them against their will. All was far from well in that world of passion and squalor which Chadwick aspired to make clean. He was a victim of the Victorian obsession that anything undesirable must also be immoral.

The Guardians of the Boston Union in Lincolnshire asked what they should do with William Sherriff, who would come frequently to the workhouse and feed himself up, then decamp, taking with him his pauper suit, only to return after a time in a state of emaciation and disease. The Guardians had puzzled their brains, and had even considered putting this rebel from parish discipline into 'some remarkable dress' or 'having a badge put upon him.' Nervously, they asked Chadwick for advice.

Back came the answer promptly. Had the Poor Law Guardians considered putting William Sherriff into a lunatic asylum?

Edwin Chadwick had no patience with rebels.

In one of those union workhouses in the crowded district of north London, there was a workhouse master named Bumble

who was also the parish beadle, and he used memorable words which have defined for all time the policy of the Poor Law Commissioners in phrases that were much more definite than anything used by Edwin Chadwick. 'Outdoor relief,' quoth Mr. Bumble the beadle. 'Outdoor relief, properly managed, is the parochial safeguard. The greatest principle of outdoor relief is to give the paupers exactly what they don't want and then they get tired of coming.' That was the policy which Mr. Bumble had acquired from his masters the Poor Law Guardians. Most applications for relief were turned down, and the paupers turned away, but now and then, the Guardians had no option but to take someone inside. It happened that an immortal boy named Oliver Twist has given their procedures an infamous celebrity. When Oliver asked for more porridge, Mr. Bumble was astounded, dumbfounded, this not being in accord with the rules of the Poor Law Commissioners who had said that the condition of a boy inside the workhouse must be less eligible than that of a boy outside. By asking for a second helping of the thin gruel provided, he was committing a breach of the irrefutable law of utility. Oliver had, by his monstrous appetite, transgressed the rule of the greatest good of the greatest number, which was not at all the same thing as his personal good of which Oliver was selfishly thinking.

Charles Dickens expressed what sensitive Englishmen thought of the Boards of Guardians. But the principle of utility was too strong. Pauperdom had to be kept hideous, and so it remained until two Fabian socialists, Beatrice and Sidney Webb, attacked Poor Law before the first World War, and eventually succeeded in giving it a new heart ten years after that war was over.

Edwin Chadwick's personal connection with the Poor Law Commissioners was to be less lasting than his influence. He nagged at his colleagues, criticized them in public and private,

but eventually there was a scandal in the Poor Law, and they shifted the weight on to his shoulders. The authorities of the Andover Union workhouse went a bit too far in their repressive ideas. They had provided so little sustenance that the paupers were reduced to eating bones. There was an outburst of indignation, and the public demanded the bones of Chadwick. He replied by denouncing not only the Andover Guardians, but his own Poor Law Board. They both denounced him. *The Times* baptized him 'Sucking Solon of the Benthamite Creed.' The Poor Law was attacked in the House of Commons by Benjamin Disraeli, on the ground that it was irregular and arbitrary. 'Chadwick,' said the *Daily News,* 'stands alone, dark and terrible as Milton's hero confronting the whole three Commissioners who are waxing more and more vehement. It is not easy to conceive how the belligerents can be got to meet on terms of truce.' It was not indeed, when the indefatigable paid secretary had declared publicly that his Board were not efficient at their duties, Benjamin Disraeli's motion was carried, and the Poor Law Commission was dissolved. The system went on under other officials, but Edwin Chadwick departed for the sphere of Public Health. It was not the last time that the House of Commons was to register its disapproval of him and his ways.

6. THE SANITARY IDEA

In the course of his Poor Law inspecting, Chadwick realized that poverty was mixed up with illness, so that often they could not be separated. There had been an outbreak of obscure fever to the east of the City of London, and Chadwick was appalled to find congested streets, overgrown courts, heaps of filth, open drains and unguarded cesspools. The graveyards were shockingly neglected, and as the cholera grew worse and men, women and children died like flies, no one appeared to think the epidemic

might have anything to do with those stinking piles of garbage, or that parish pump in the centre of what had once been a village green but had now deteriorated into a filthy waste. The clergy recommended their parishioners to pray. The parish overseers tried to move the patients into workhouses, while the parish pump continued to pour out its infected libations both for those who prayed and those who drank themselves into oblivion on gin.

Disease was thought to be an explicable visitation of nature. Man's soul counted for everything, and his material body for nothing, since life in this world was only temporary and unimportant. Dirt and smells, cholera and typhus fever, those were evils to be borne patiently, and they could be averted only by prayer.

Nonsense, cried Chadwick, and he threw his whole energy into the effort to destroy those counsels of despair and obscurantism. If he had been trained as a physician, he might have had some traces of a personal loyalty towards the individual sick patient. But he knew none. He was a lawyer and the opponents must be attacked and demolished. He suspected nothing about germs, and even when they were discovered three decades later, he would obstinately ignore their importance. But he had a sound hunch that disease was caused by filth and smells: in his strong Lancashire voice he cried: 'Drive them away, use soap and water, and you will overcome the cholera.'

He was a man who saw the world with one eye, and it appeared a world cut in half. To him, physical environment was all important, and the individual person was merely the helpless victim of his surroundings. Soul and emotion, heredity, justice, incentive, if these notions came in they were very far down in the scale of Benthamite utility. To meet the horrors he saw around him everywhere, he had one magic symbol—the *Sanitary Idea*. Give men healthy places to live in, and they will live longer.

Millions of years can be added to the great sum of human existence. Thousands of hours can be deducted from the books of disease. Add all this up together, and the total must be—happiness—of the greatest number.

To Chadwick, it was all quite obvious that filth and smells produced disease, but to convince the public and to compel Parliament to do something, he needed that great refuge of English administration—a Royal Commission.

Chadwick took three years. In stage coaches his health inspectors went all over England, probing into privies, uncovering nuisances, hunting up death rates, interviewing coroners about deaths, questioning physicians on epidemics, meeting magistrates in their municipal parlours, holding their inquiries in the tap rooms of taverns, inspecting water supplies—all the time filling their notebooks with hygienic information. It was the most important investigation into the real life of England since the Doomsday Book was compiled in 1079. The results were edited and written up by Chadwick himself, and issued in his own name, since the other Commissioners were too nervous to be associated with such dangerous conclusions. Ten thousand copies of the report were distributed, and for the first time a book about health became popular reading.

At last, England was to have its first law dealing with Public Health. Parliament had been much occupied changing over from Protection to Free Trade, but now the heated controversy was over, and a comparatively tepid subject could be introduced in the atmosphere of interest which had followed Chadwick's revelations. It was a fit beginning for the criticism which was to last the next ten years, that the Public Health Bill should be moved in Parliament by a Minister called 'Commissioner of Woods and Forests.' It survived that introduction and was duly passed into law as the Public Health Act, 1848.

What the Act did was to give to any place that desired to use it, the power to set up a Board of Health, that is a sort of local committee of people who were supposed to be vigilant in seeking out nuisances and checking conditions likely to produce epidemics. How then were they to do their work, once created? These Boards could do nothing by themselves to deal with such nuisances: they could only make a complaint to the local magistrates; they were merely detectors and prosecutors of evildoers in the sphere of health. When we come to find out who these local Boards were we discover that they are very like our friends the Boards of Guardians whose chief duty was looking after paupers. Health became a side-line which they could now take up. The Guardians were local bodies ready-made, and the Public Health Act now gave them permission to function in a new activity.

But in addition to these potential nuisance-discoverers throughout the country, which might come to birth or not according to the degree of local enthusiasm, the new Act created a supervisory body called the General Board of Health which had its headquarters office in an old mansion in Whitehall called Gwydr House. The principle was that this permanent and active body at the centre would be the source of enlightenment and progress, and that its energy would be transmitted to the local Boards of Health. The General Board would be the guide, philosopher and friend to the local Boards, and they would do the work under its general supervision.

The General Board of Health consisted of three members: two of them members of the House of Lords, and the third was no other than Edwin Chadwick who had lost his place as secretary of the Poor Law Board and was now smarting under his reverse and thirsting for a chance to put his Benthamite ideas into practice once again. In practice everyone knew that Chad-

wick was the Board. The other two members were there only to give prestige and parliamentary protection. Note that not one of the three members was a physician or surgeon: two lords and a lawyer now began to give England her first taste of Public Health. After the horrible disclosures about cesspools, unburied corpses, cholera spread from village pumps which had shocked England, it might have been thought that the new idea would have been welcome; but the history of the next ten years is one of vehement opposition and eventual failure.

The best-known member of the General Board was the great Lord Shaftesbury, the man who had taken the children out of the factories and the women out of the coal-mines; the earnest reformer who had shortened hours, befriended the boy chimney sweeps and generally been responsible for more humane laws than any other man in England. He was now the chief figure-head of the new health machine, and the public gained confidence from that fact. But the real motive power came from Chadwick, and the sleeping partner of the Board was a skeleton in the cupboard, that of old Jeremy Bentham. His utilitarianism and Chadwick's fierce impatience prevailed against the calm benevolent vision of Lord Shaftesbury.

Chief among the Board's enemies were the attorneys.

These were the parliamentary agents, lawyers who were engaged in promoting private Bills. Nestling in offices around Westminster near the Houses of Parliament, they made a living out of making laws. If a town wanted a waterworks, or sewage scheme, it had to draw up a Bill in legal language, and bring it before one of the Houses of Parliament. This meant a huge expense, for counsel had to be briefed, witnesses brought from a distance, and every line of the new Bill had to be fought in fierce legal argument over rights of property and local privileges. A county personage might complain that his estate or his fish-

ing was injured by the contemplated waterworks. A landowner might claim compensation for the damage which the proposed sewage works would do to his pheasants or his deer. These leisurely proceedings with their witnesses, expenses and daily refreshers, were very lucrative for the parliamentary agents and barristers who specialized in that work. But among its powers the Public Health Act allowed a town to obtain its waterworks or sewage scheme by a simple and inexpensive legal process.

Boards of Health occasionally took drastic action in times of cholera. But this did not please the local doctors, and the Royal College of Physicians complained loudly that the Boards were infringing upon professional fields. Likewise Treasury officials, Town Councils, Boards of Guardians, Sewerage Commissioners, mayors, vestries, magistrates, Parochial Boards, landlords, Lords Lieutenant, everyone who had a vested interest in things as they were complained that Boards of Health were interfering with their prerogatives. Gradually it began to dawn upon them that the author of this wickedness was one man. Behind all this talk of nuisance, and the outrageous actions of these upstart Boards of Health, there was a crafty mind in Somerset House who governed them like a spider at the centre of a web. This evil monster was none other than that bureaucrat Chadwick who had made himself so unpopular over the Poor Law.

A new word was introduced, a word which has been used many times since—'centralization,' that is dictation from the central office in Whitehall. All this zeal for health reforms—it was invented, they believed of course, out of pure malice on Chadwick's part. He had made a perpetual Saturday night when Master John Bull was scrubbed and rubbed and small-tooth-combed till tears ran down his cheeks, his teeth chattered, and his fists were clenched with worry and pain.

But the real trouble was that neither the General Board, nor the local Boards of Health possessed sufficient legal power, and Chadwick had to make up for this by tremendous exertions on his own, for when the Board made a mistake, there was no proper Minister to defend it in Parliament. But never before or since has England possessed such a resourceful official. To Chadwick there was art and poetry in public administration, and he could compose regulations as easily as another man would write letters. He played upon a local Board as though he were trying out a new instrument. He showed them how to carry out their business, and even coached them in the proper way to write their minutes. He persuaded, prompted, soothed and encouraged, like a wise grandfather to wayward but well-intentioned children, and sometimes he found it necessary to chastise them in severe official letters, entirely, of course, for their own good.

Chadwick had a wonderful drive and power of inspiring his own staff. He made them keep diaries with pages divided into two, the one side for an account of their work, and on the other, their daily pay and expenses. He introduced coloured maps, with epidemic areas marked in blue, and sewers in red, and week by week he showed the advance or regression of typhus and cholera. He cleared away inhibitions. He saw Public Health realistically as an affair of smells and nuisances.

In the six years after 1848, Edwin Chadwick laid the foundations of modern sanitation upon sound Benthamite notions that what was for the greatest good of the greatest number must be carried into practice without delay.

His Boards of Health were tested severely by several epidemics of Asiatic cholera which passed over England in waves during the first part of the century, probably arriving overland from the East. Each outburst of the disease brought new instructions from Chadwick, and the Boards went through a temporary fit

of zeal for removing filth, and 'house to house' visitations to search out suspected cases. When the panic was past, their enthusiasm was apt to subside also.

When the General Board of Health was formed it consisted of two lords and a barrister. But even Chadwick saw that it would be helpful to have the support of a doctor in dealing with sanitary questions, and so parliamentary power was taken to add a medical man to the three members of the central department. There was no hope of getting another Public Health Act, but it so happened that a Bill dealing with public burials was being passed through the Commons, and in a corner of it was squeezed the extra clause for adding a doctor to the General Board of Health.

The joke was that, having used two lords and a barrister to look after the living, and with indifferent success, Parliament had now called in a doctor to bury the dead. This was not quite accurate. Nevertheless the first Public Health doctor was a remarkable person.

7. THE GENTLE PROPHET

The General Board of Health waited two years before acquiring a medical man, but when it did so, that man was the unique blend of doctor and priest, who practised both professions alternatively and simultaneously. He was Thomas Southwood Smith, born, in the West of England, to nonconformist parents of the stricter sort. His first adventures in life were spiritual ones and began when his father's view of his son's vocation caused him to be sent at the age of fourteen to a Baptist Missionary College at Bristol, where he had won a scholarship intended to lead him to the pulpit. But as the years of learning passed by, he saw the world as too large to be embraced by that narrow Calvinism taught by the professors, and he was obliged by his

conscience to go to the Principal to explain he had lost his faith; whereupon he was cast out of the College and disowned by his parents.

But Southwood Smith was throughout his life a man of charm, and in Bristol there was a merchant who had a daughter. We learn more of his change of heart by what followed. Perhaps the real cause of his supposed loss of faith was the emergence of healthy instincts of the normal man, for he gave up Calvinism and embraced the young lady, and for the next year or two lived a very happy, married life. Then tragedy came, it may have seemed as a punishment for his lapse from religion. His young wife died, leaving him with two little girls, and like many another man striken deeply in the heart, he decided to find solace in new work and change of scene. He would become a physician.

One little daughter remembered all her life that voyage by sea from the port of Bristol around the coast to Edinburgh in Scotland, in a storm of thunder and lightning. Her father was now a student again, but he could have found no city in the whole world where a combination of preaching the gospel with the pursuit of healing would have been more congenial than in the capital of Scotland. While he studied his anatomy, he conducted a mission. He acquired in the Old College a mass of learning called 'the Institutes of Medicine,' and practised it in the form of sermons to his willing hearers. From the start of his career as a doctor, Thomas Southwood Smith was an expositor. To him, a large part of medical practice was the art of teaching his patients how to look after themselves. In 1816, when he was medically qualified, the year after Dr. James Clark quitted the Edinburgh Medical School, Southwood Smith moved to London. 'My expectations,' he said, 'are not sanguine, but neither are my desires or ambitions.' He took life as it came, and it looked after him well.

Setting up in practice near the Tower of London, near the docks, he soon gained the experience that chases away theory. But the temperament of Southwood Smith was to fit life into a philosophy, and he never had difficulty in combining opposites. Most men of his time were worried by the conflict between revealed religion and science, but he had grown up in both, and to him the Creator's plan was perfectly plain. Anatomy and the functions of the human system were merely a proof of the Creator's omnipotent versatility, while religion, and a conscience that is perfectly at ease, made him very humane in his daily work, and more inclined than the average doctor of the time to search out the social causes of illness. Many years before Sir William Jenner, he was on the medical staff of the London Fever Hospital, and the more he probed into the lives of the patients there, the more he was forced to conclude the 'fever' had one very simple cause.

He was a scientific physician and he could write fluently. The title of his essay, 'The use of the dead for the living,' shows the journalistic instinct (acquired through long pulpit training), and it had much to do with the passing of the Anatomy Act which regulated anatomical dissection and prevented body-snatching. But Southwood Smith's real flair was for the communal side of medicine, then quite undeveloped. He loved an audience, he adored delivering a health lecture, he was adept at forming a society. People caught his contagious zeal, and when Southwood Smith initiated a league called the Health of Town Association, others started branches, and this movement of popular propagandism provided the steam which produced the Public Health Act of 1848.

Members of the Association who wished to probe more deeply into the philosophical side of the subject could read Dr. Southwood Smith's book called *The Divine Government,* whose theme

was that all mankind will be saved finally, and in the interim the endurance of pain is a wholesome and corrective process. This book was praised by William Wordsworth, and the Suffolk poet Thomas Crabbe was said to have it on his table constantly. For those who preferred the scientific rather than the religious approach, Dr. Southwood Smith had composed another work called *The Philosophy of Health*. This was really an account of anatomy and physiology such as is found today in every First Aid Manual, but to men like Tennyson and Browning it seemed a new revelation of science. All such interests may be expected from the dual training which Dr. Southwood Smith received as minister and doctor, but one passion of his life which is quite unexpected, was his worship of Jeremy Bentham.

During his early years in London, Southwood Smith came under the influence of the great sage. Those arid doctrines of utility appealed to the one half of Southwood Smith, but not the other. He had the sublime faculty of believing, and he was led to make a hero of that dry little man who had pressed out all feeling from his interpretation of life. Southwood Smith, the man of emotion, took a mysterious reassurance from the hard mind of that utilitarian philosopher who had taken the mechanism of English morality to pieces like an old clock, and who had a supreme contempt for religion.

As though to put his disciple to the test, and at the same time to demonstrate to the world his scorn for the sacred offices usually performed for the dead, Jeremy Bentham left in his will a peculiar command: 'This my will and special request I make, not out of affectation of singularity, but to the intent and with the desire that mankind may reap some small benefit by my decease, having hitherto had small opportunities to contribute thereto while living.'

Those words Bentham had first written down when he was an

immature youth of twenty-one. He repeated them when he was eighty-five, and to Southwood Smith they became a command.

In a room of the Webb Street School of Anatomy, London, a group of Bentham's disciples gathered, on June 9th, 1832, for a ceremony which was the only funeral service he had permitted. Under the skylight was a table and there, covered by a cloth, lay the mortal body of the utilitarian prophet. The eyes were closed, the silver hair was stiff and unreal, and the lips which had repeated so often that immortal phrase 'the greatest good of the greatest number,' were rigid with an immobility fitting the fixity of mind with which Bentham pursued his lifelong aim. Yet the features had not lost their placid benevolence towards the entire human race.

It was an awe-inspiring moment for the disciple. Even the heavens saluted Jeremy Bentham's corpse, for a growling of thunder was heard, and lightning flashed through the skylight upon his waxy jowl. Southwood Smith began his discourse of praise for the dead, and never in any Gothic Cathedral was there more reverence than in the minds of those sceptics who were the old man's intellectual sons. It was the triumph of the principle of utility.

Perhaps the thunder and lightning through the skylight was nature's protest that in Bentham's wisdom, something deep and powerful had been omitted, and the dead face which stared insentiently into the flashes from the sky, was symbolic of lifeless creed, and equally irresponsive to the grandeur of the human heart.

When Southwood Smith had finished his speech, he began the performance which had been commanded in Jeremy Bentham's last will and testament. Solemnly, in that round room with no windows, he dissected the body in the presence of the pupils. The master's heart was buried under the dome of the new Uni-

versity College building, but the skeleton, suitably prepared, was to have a different fate.

Thirty years Southwood Smith laboured to create the sanitary institutions of England. He attended his patients, wrote reports, caught fever and recovered. He worked twelve and sixteen hours a day, and sometimes through the night, in order that no child under the age of eight should labour in a factory. Still he worked because there were yet women and children toiling in coal-mines, dragging loaded trucks, half naked, with chains around their waists.

One great day in 1844, it was a day of revolution in the Victorian age, when Parliament had actually meddled so much with the unrestricted freedom of the individual as to pass the Act which prohibited any woman or any boy under ten from working in a coal-mine—Southwood Smith's little granddaughter tied blue ribbons on the bridles of his horses and exclaimed delightedly that the poor children would now be running over the green fields. Those were the Saints' days in his life.

Sometimes when he was fainthearted, or when his zeal failed against the enormous obstacles which had to be overcome, he would open a tall cupboard in the corner of his study in Finsbury Square and there reveal the form of a man, dressed in a blue coat and cashmere breeches. As he touched it, the figure gave a dry rattle, and underneath the large hat and oldfashioned garments, there was the face of a dried up skeleton. That macabre relic was still his inspiration. With his own instruments, Dr. Southwood Smith had dissected the flesh off those bones, he had removed the heart lovingly, and in such anatomical rites, laid on him strictly by the dead man's will, he had made himself heir of the dead man's philosophy, for the grinning face and the delicately preserved bones, the coat and cashmere breeches be-

longed to the sage Jeremy Bentham, and his skeleton inside the cupboard was the unseen partner at sessions of the General Board of Health, and attended silently, but without understanding, those fervid lectures about the Creator's purpose in designing man's physical body which Southwood Smith loved to give to an audience that were half sceptical and half amazed at his colossal daring. Never were two phenomena more different—Bentham's dry skeleton of the utilitarian theory, and Southwood Smith's warm belief. Chadwick gave the sanitary laws and Southwood Smith gave the sanitary inspiration. Their band was Bentham's skeleton.

Such was Thomas Southwood Smith who became the first medical man to be a member of the General Board of Health.

8. CHOLERA, PANIC AND PAROCHIAL HEALTH

Bursts of cholera occurred throughout the Victorian age like the irregular striking of a crazy clock, and this eldritch warning quickened the sense of urgency about health, and caused many laws to be passed under the stimulus of panic. We might almost say that Asiatic cholera was the secret ally of Edwin Chadwick. He warned the English people that unless they swallowed a dose of his sanitary medicine, the cholera would return, and behold it did return, and Chadwick had the power of a Black Magician. He knew nothing of microbes, or the deadly power of the cholera germ to thrive in water, in milk, or on infected vegetables, but he believed heartily that it was caused by 'contagion,' which was the result of filth, and in this he was fifty per cent correct. The medical method of dealing with actual epidemics was a system called quarantine. This meant the compulsory isolation of any person who came off an infected ship or from a place where the disease was raging. If the idea had been carried out intelligently, it would have been a useful preventive, but in practice, quaran-

tine had become a mechanical superstition operated by people who did not understand its essentials.

To give one illustration: Lord Jeffrey, the eminent Scottish lawyer, tried in one of these panics to get permission for his servant who was ill in London to travel to Scotland by ship. This was forbidden by the quarantine laws, yet there was no objection to travelling overland by stage coach, and even so influential a person as Jeffrey could not secure a relaxation of this absurd ban, though other travellers bribed their way out of the restrictions.

The Royal College of Physicians held fast to the theory of quarantine, but under Southwood Smith's prompting, the General Board of Health favoured an entirely different system, closure of all the quarantine establishments, and reliance upon sanitation and 'house to house' visitation to probe out suspected cases.

This was altogether a more modern conception of the way to handle infectious disease than the fumbling method of quarantine. But it set the medical profession by the ears and increased the unpopularity of the General Board of Health. The feeble beginnings of the science of epidemics were being made.

A certain Dr. John Snow, more famous later on as an anaesthetist, had investigated a sudden explosion of cholera which had occurred in the overcrowded Parish of St. James in the West End of London. He proved that the deaths were twenty-five times greater there than in any other parish records, and he traced the epidemic to the users of water from a certain parish pump in Broad Street. One lady conceived a high opinion of water from this particular source and had it sent some distance to her every day. When she and her family developed cholera, John Snow decided that water must be the agent of contagion. He proved it with a plan.

John Snow's map of the parish was interesting from the number of black marks representing the sixty-one deaths from cholera which were thickest around the pump in Broad Street. It so impressed the local Board of Guardians that they had the handle of the pump removed.

Gradually, supporting evidence accumulated. Water from this pump was used for mixing with spirits in all the local public houses, and for making tea and coffee, and in one shop was sold, with a teaspoonful of effervescing powder added, under the delicious name of sherbet. The Broad Street pump was very popular, exceptionally so for a London water supply, but in a brewery, also situated there, no cases of cholera had occurred, and Snow assumed this was due to the fact that the workmen never drank water, being well supplied with malt liquor. With the skill of a mathematician, this geographer of disease pored over his map of the Parish of St. James, and collected still more facts from the survivors of that sudden calamity. The pump water, it seemed, had contained sediment, it was full of whitish material which settled in the bottom of the glass, while every house had its cesspool beneath the foundations. John Snow was sceptical of the prevailing theory that cholera was due to morbid contagion floating about in the air. To him it seemed much more likely that the sediment of that turbid water from the Broad Street pump contained 'animalcules,' or something which had the power of self-reproduction like living seeds, was the cause of the cholera, and from the fact that the disease was more deadly in the summer months, he deduced that this was because people drank more water to quench their thirst.

John Snow theorized, and more than fifty thousand people died from cholera in a year. He was a prophet in the wilderness and that was all that came of a theory, proved by actual figures, which was a perfect anticipation of the real truth that cholera

is conveyed by a water supply infected by sewage contaminated from actual cholera patients. John Snow gave up his epidemiology and kept to his anaesthetic ether, and the cholera germ was not discovered until 1883.

William Jenner had not yet been at work, and fever was still a dark forest of disease, full of unclassified monsters. Even Southwood Smith could only say that the immediate and exciting cause of fever was 'the corruption or decomposition of organic matter,' and that 'vegetable and animal matter during the process of putrefaction' gave off a new compound which when applied to the human body produced the phenomena known as fever. More than this, he knew nothing, beyond its power to strike the human being down with sickness and death.

Without knowing the cause, physicians could do nothing to advance control over fevers except to classify the symptoms, and give Latin names to shades and distinctions which their acute eyes noticed between one patient and another. But that fevers were due to decaying organic matter, which through smells and 'effluvia' reached the body of the patient, Southwood Smith and Chadwick had no doubt. Louis Pasteur was a boy, and his idea unborn.

The cholera cast its huge shadow of panic. The Presbyterians of Edinburgh appealed to the Home Secretary to announce a general Religious Fast as a way of deflecting the Divine Vengeance. But the Home Secretary happened to be Lord Palmerston, and before issuing his reply to the Scottish Ministers, he consulted the Board of Health. Their opinion was so modern in its sentiment, yet we can picture the anxious consultations which went on at Gwydr House before it was submitted to the Home Secretary. We can detect the scruples of Lord Shaftesbury, the theological reasoning of Southwood Smith, and setting the keynote, Chadwick's powerful scepticism and his belief in cleanliness and sanitary administration.

The answer was duly published, and shocked the Presbytery. For Palmerston bluntly rejected the idea of a National Religious Fast. He said that the maker of the universe had established certain natural laws, on the observance or neglect of which depended the weal or woe of mankind. The best course which the country could follow to prevent the cholera was to use the interval before the next epidemic to carry out measures to remove sources of contagion, 'which if allowed to remain will infallibly breed pestilence and be fruitful in death, in spite of all the prayers and fastings of a united but inactive nation.' This extraordinary sermon in health administration ended with a phrase in Southwood Smith's best pulpit manner: 'When man has done his utmost for his own safety, then it is time to invoke the blessing of Heaven to give effect to his exertions.'

The General Board of Health under the guidance of strong common sense was indeed becoming a power in England. Its motive power belonged entirely to Chadwick, for without his ruthless energy all the goodwill of Southwood Smith would have been quite ineffective. But, unfortunately, the General Board could do nothing but inspire and teach others: all Chadwick's ingenuity could not remove a single nuisance or put out of action one dangerous water supply. All the actual work depended upon the local Boards of Health.

These local Boards of Health, which were only Poor Law Guardians under another name, were not health authorities in the modern sense. They themselves could not do anything at all. Their sole function was to complain to the Justices of the Peace. If a 'nuisance' occurred, such as a heap of rubbish or a contaminated well, the Board of Health would prosecute the offender in the local magistrate's court; and they might, or might not, persuade the Bench to order the nuisance to be removed. And quarrels between Justices of the Peace and Boards were frequent, especially when the local Boards received orders from

the General Board in London. Each step in sanitary administration therefore was a process of passing on responsibility for action: a circular letter from Chadwick went to some local notabilities meeting perhaps in a tavern. They started a case in the local police court and after numerous adjournments perhaps, a verdict would be given long after the danger was over and the damage was done.

We have to thank, or abuse, Edwin Chadwick for the name of an office which has become more and more important in the community each year. It was he who invented the term 'medical officer of health.' The Poor Law Guardians had over two thousand doctors attached to their unions throughout the country, and when local Boards of Health were set up, Chadwick pressed them to appoint paid doctors who would inspect houses and detect nuisances and even look after the health of children in schools. He quoted the navy, the army and the prisons as examples of services where doctors performed similar duties. The first medical officer of health was appointed by the City of Liverpool in 1847, followed by the City of London in 1848.

His General Board of Health was to have a brief existence, but his idea of a local health functionary who would take on the control of preventive medicine in each area, who would be responsible for the healthy environment, this conception has lasted, and today in England the medical officer of health is as much part of the local hierarchy of government as the vicar and the mayor.

Chadwick the lawyer had introduced a new professional idea to the doctors, the idea that one of their number should be responsible not to an individual patient, but to the whole community. The disturbing and revolutionary implications of this idea were not to be realized for a long time after Edwin Chadwick and his Board of Health had become part of history.

9. THE DEATH OF AN IDEA

The General Board of Health was one of those queer offshoots of English administration which come to possess life almost by accident. They are appointed, formed, given a name, an office to work in, a table to sit at, and without anyone knowing or caring much, they acquire a certain degree of personality. But the last thing they are meant to achieve is effective power. Their species is supposed to be as unobtrusive as the mole or the owl. They must perform their functions in obscurity without bothering people, without insisting too much. Anything purposeful, strong, efficient was quite foreign to the theory of English Government as it was understood in Chadwick's day a century ago.

The great wave of enthusiasm generated by Chadwick's reports and Southwood Smith's sermons which created the General Board of Health in 1846, now lost its momentum, and people saw Chadwick as a sinister destroyer of liberty, Southwood Smith as a dangerous doctrinaire, and Lord Shaftesbury as a pious but troublesome theorist. Everyone who had a grievance against a local Board condemned the General Board. Whenever a medical officer made a mistake over cholera, whenever a local nuisance inspector condemned a cowshed belonging to the Mayor of his town, whenever some zealous Board of Health tried to prevent the burial of a Lord of the Manor underneath the floor of the parish church, whenever any inconvenient action had to be taken in the name of hygiene, the whole blame and full unpopularity fell upon that quartette of officials in London. Parliament began to wake up to the fact that it had created a minor dictatorship, and the technique which Chadwick was accustomed to apply to local Boards had no power over the House of Commons.

Like a fierce eagle he hovered over Westminster, but he was unable to strike. That arrogant presence and those steely for-

ensic claws were powerless for, by an irony of his own foresight, the great Civil Servant had laid a trap for himself.

The General Board of Health had no member of the House of Commons, no Minister or champion to represent it, or ward off those arrows aimed at Chadwick. He had hoped to make his Board secure from those meddlers in the House. In drawing up the constitution of the Board, he had tried to make it independent of parliamentary control, and he had succeeded only too well, making the Board immune, but defenceless, and now, every one of those parliamentary arrows went straight home. Lord Palmerston, an adroit debater, should have been able to do the trick. He was an enlightened Minister, as the epistle to the Edinburgh Presbytery shows, and he even offered to take the Board under his own wing as a method of conciliating the angry Commons. But they were out for blood, and all the stemmed up prejudices of the frustrated engineers and parliamentary lawyers whom Chadwick had flouted, all the spleen of those offended bigwigs and insulted notabilities, now burst forth.

In vain did Lord John Russell, the Leader of the House, plead for fair play towards Chadwick. There were many persons, he said, 'who were pecuniarily interested that the plans of the Board should not be adopted, and it was very probable that Mr. Chadwick had not observed towards these classes of persons the most conciliatory tone possible.' And the honourable members who knew Chadwick's rolling eye, and who had felt as local magistrates the scorn of his letters and knew his way of overbearing opponents with unanswerable arguments, roared impatiently. On the fifth day of the debate, after an all night sitting, the division was taken, and by 74 votes to 65 the Commons refused to pass the Bill giving the General Board of Health a new lease of life.

As *The Times* put it so clearly next morning: 'The English

people preferred to take their chance of catching cholera rather than be bullied into health by Chadwick.'

It was indeed a victory for passion, prejudice and ignorance, and there was one man who knew what England had lost, and that was Prince Albert. In such matters he could see clearly into the future.

His omnivorous German intelligence, backed by a self-confidence that could show Mendelssohn how to play the organ, and Paxton how to build the Crystal Palace, had not overlooked the theory of sanitation. The Prince Consort worked behind the scenes to save Chadwick. But it was no use. The Commons were in a dangerous mood, and they had exercised their English privilege of getting rid of a tyrant.

Parliament now proceeded to pass a new Act keeping alive the Board of Health, but drawing its teeth. There was to be a Board indeed, but without any members. Lords Shaftesbury and Morpeth, Southwood Smith and Chadwick were removed and, after 1854, the functions of the Board were carried out by a single paid official acting alone and subject to strict parliamentary control.

The great pioneers of English health reform passed into the shadows. For Lord Shaftesbury, sanitation was only one interest in a many-sided life, and now that he was relieved of the routine work of the Board, he could give more time to his Ragged Schools, his plans for dwellings for the labouring classes, his humane reforms in lunatic asylums, and the betterment of factory life. Shaftesbury's austere religion was a perpetual light in his soul, and in prayer meetings at Exeter Hall, where all the nonconformists of England gathered to further good causes or protest against Sabbath amusements, he had plenty to occupy him when the Board of Health was no more. Southwood Smith had his philosophy, his happiness in pure comprehension of the divine purpose.

But to Chadwick, public service was life, and efficient administration was more vital than all the theory in the world. The terrible eagle of the public service flapped away from the place which he had dominated for so long, and occupied henceforth a lofty eerie from where, with long-sighted eyes, he brooded over lesser species fumbling where his faculties had made him the master.

A second time, he was driven from the public service; and this time was to be the last. He was only fifty-four and those faculties were at their best.

10. THE FALLEN EAGLE

His electric mind never ceased sparking ideas. They possessed brilliance without warmth. For Edwin Chadwick had never outgrown Jeremy Bentham. Here is a good sample of the utilitarian reasoning. As was natural in the disciple of the man who invented the *Panopticon,* Chadwick had investigated the duration of life and health among the inmates of prisons, and proved conclusively that prisoners were healthier than people outside. 'Epidemic poisons shut out, famine shut out, luxury shut out, idleness shut out, cold and wet shut out, the acute and more destructive kinds of mental worry shut out, the hungry strain for tomorrow's bed and board shut out, the baneful associations with criminal life at large shut out—what more natural than that, with the new addition of personal and environing cleanliness—sickness should be reduced to a low figure?' The natural conclusion from Chadwick's reasoning would be that everyone should go to prison, in order to live in a paradise of good health. That was not what Chadwick intended, but it would not be an illogical deduction.

Chadwick was enthusiastic for physical education, and believed that fit, intelligent and well-trained soldiers are more important

than machines. He scouted the old-fashioned military notion that God loved the big battalions; on the contrary, he said, 'the battle will be decided by science, skill and capital; in other words, by the New Education,' and he believed that proper drill at the school stage would give these recruits the efficiency of five.

From such practical matters, he could turn without any sense of incongruity to spelling reform, pointing out that Lord Derby and Sir Robert Peel frequently dropped the letter 'h' in their pronunciation, yet how much public money and time were spent in getting it inserted into the children's speech. Why not abolish this unnecessary aspirate? As for the efficient warming of schools: 'There are no means of applying warmth that are so economical as by applying it to the feet.' It was, in fact, the method of the Romans, and he believed that children should be persuaded to enjoy washing by giving them warm water, and he even advocated swimming baths in schools.

Chadwick was the originator of a well-known argument which we heard frequently before the second World War, but which has temporarily lost its validity—that the cost of armaments and military preparations, if translated into sanitation, would bring large dividends. We hear often that a particular health improvement would be less than 'the cost of a battleship.' Chadwick used that same illustration a hundred years ago. Health versus war was his swelling theme as he contrasted the large armies of the old Russia and the Bourbon Italy with the backward state of their sanitation, and he declared that the cost of one English battleship (in those happy days only one million pounds) would purchase a sewage scheme for over a quarter of a million people, and would save each year 1667 lives. The fortifications of France were the cause of her sanitary backwardness. St. Petersburg, ravaged by cholera, was provided with a sewage works through

English private enterprise, and engineered by Chadwick's own son, but the authorities had defaulted in payment! Alas, though a century has passed since his Board of Health, mankind has not yet learned to prefer health to guns.

Edwin Chadwick now attempted to get into Parliament. He offered himself as a candidate to Evesham, to Kilmarnock Burghs, and to the electors of London University. His election addresses were full of furious radical ideas, denouncing corruption, claiming not to spend much on his campaign. People came to hear this remarkable candidate.

When first he rose on the platform, he looked like a prophet, his presence was magnificent, his eyes compelling, but as soon as he opened his mouth, the orator disappeared. He bent forward, began to mumble in a low voice, started a train of argument, lost it, and finally threw his audience into a complete state of boredom.

His friend John Stuart Mill praised his mental power, but the University electors were blind to Chadwick's intellectual merit. Chadwick never became a Member of Parliament.

On leaving the General Board of Health, Chadwick was made a Commander of the Ancient Order of the Bath.

There is an almost burlesque humour that this distinction should be conferred on a man who had been so well washed as a child, and would have been happy to remain at his desk making rules for the cleansing of the British people. But now it was all over. The sanitary idea was at a discount. His true memorial remained unseen, in the bowels of every modern city, its sewerage and its water supply.

11. SOUTHWOOD SMITH

The gentle Southwood Smith had always lived several lives. We may think of him as the busy general practitioner among

the dock workers near the Tower of London, much trusted and greatly beloved, though his patients would have been shocked had they known of that macabre skelton in the cupboard, the mortal relic of Jeremy Bentham still clothed in his cashmere jacket. When he was finished with his regular work, he would drive home to a pleasant village named Kentish Town on the northern outskirts of London, and here he had some leisure to write his books on the philosophy of health.

Often for days he was away from his patients. Some inspection for the General Board of Health would be required. Or he would have to prepare evidence for a Royal Commission. The hand which had dissected Jeremy Bentham's flesh wrote paragraphs highly charged with sentiment and vision. And then there would be those endless sittings of the Board itself, with Mr. Chadwick growling over the misdemeanours of some nuisance inspector and urging that the dereliction be stopped at once. Southwood Smith must often have found those sessions a burden.

When he became sixty years old he 'retired'; but this did not mean idleness, only a change of scene. There were still reports to be composed, and Southwood Smith would rise early in the morning to concentrate upon them, sometimes as early as three o'clock, and he would have to revise new editions of his book on the philosophy of health. Then, frequently, he must descend from the Ivory Tower to attend a meeting. But London was only half an hour away in his fast Victoria, and he could be back home in time for dinner with the family, after which they would sit out in a summer house hung with roses and watch the sun setting.

Southwood Smith had many friends and men like Robert Browning and Hans Christian Andersen loved to come to his house and hear about the new and enchanting facts of human

physiology in which realm their erudite host was so much at home. And Southwood Smith was able to explain the mysteries of the human body so simply.

How well this earnest propagandist was able to preach. His health sermons drew the multitude. That art which had begun in the missionary pulpit in Edinburgh had now reached perfection. The Victorians loved their great men to preach, and here was one who had been a Minister, who could use religious language to make hygiene theological and therefore respectable. Southwood Smith was no infidel like Chadwick, and his Benthamism was hidden as a skeleton in the cupboard and was not part of his own flesh and blood.

His was a new, but still a very small voice in Victorian England. But what he failed to achieve in his own lifetime, Southwood Smith was to do by that mysterious railway along which ideas speed forward to their realization in the future.

His daughter Caroline shared in all his enthusiasms. Like him, she believed passionately in education and she had written for a journal called the *Monthly Repository,* and later became a governess with a family at Wimbledon. That chance article of hers led to romance and, far away in the future, a perpetuation of those precious principles that Caroline absorbed from her father.

A corn merchant of the eastern counties named James Hill was in a great difficulty. Widowed twice, and left with six children, he had before him a very practical problem in education. He searched for guidance, and his eye chanced to strike the name of Miss Caroline Southwood Smith, who wrote so confidently in the *Monthly Repository* on the subject of instructing the young. Suppose that clever young authoress would come and help him with the upbringing of his six motherless children. He

called on her and made the suggestion. She was pleased to do so, and before long the widower and governess were married at St. Botolph's Church, Bishopsgate, London. Thereafter she helped him not only with his children but with his public work in the little town of Wisbech where together they inaugurated a penny paper and started an infant school. Three more daughters were born, and soon Caroline Hill had nine children to look after. The eighth child was called Octavia Hill. We shall hear more of her later, for in her lifework, the inspiration of her grandfather Southwood Smith lived on into modern times.

Southwood Smith survived the eclipse of the General Board of Health only by six years, during which he lived on his pension of three hundred a year. Eventually the cold north wind carried him off while he was recuperating at Florence; he was buried there under a cypress tree not far from the grave of Mrs. Elizabeth Barrett Browning.

12. THE IMPENITENT BUREAUCRAT

Chadwick outlasted the death of his favourite administrative offspring, a resentful and formidable old man, by more than thirty years. He never changed. Germs and antiseptics, the discoveries of Pasteur and Lister, these passed over the intellect of this incorrigible Benthamite who held to his simple faith that the whole of sanitation was comprised in two ideas—smells and filth, the grand extensions in this powerful intelligence of the emotion which his own mother had placed there as she washed her burly child.

Abroad, Chadwick was more honoured than at home. When the Emperor Napoleon III, at the Tuileries, asked his opinion about the fair French capital, Chadwick had answered: 'Fair above, Sire, and Foul below.' That may have been the blunt Chadwickian form communicated to his friends at home, but

what he said in his perfect French to the Emperor was: 'Sire, they say that the Emperor Augustus found Rome a city of brick and left it a city of marble. If your Majesty, finding Paris fair above, will leave it sweet below, you will more than rival the first emperor of Rome.' The third Napoleon was drawn to the flattering notion, and the two of them talked sewerage and what was pleasing to a French mind, its application to the improvement of agriculture.

Edwin Chadwick was the supreme sanitary inspector of the Victorian age, but for the last forty years of his life that age did not want him and he was left alone, growling in his study. He cared nothing for spiritual or moral health; he never bothered about heredity or psychology. It was as though his independent faculties had been paralysed by Jeremy Bentham's pieces of paper ruled for the theoretical divisions of the subject. Chadwick's mind was like those sheets of paper; it was all ruled in utilitarian lines and waiting to be filled up with 'data' and 'evidence.'

But mankind had managed to survive without sanitation for many millenniums, and the human soul was seeking a fuller expression of its ideal than could be found in nuisance regulations. He was out of date in essentials even before the end of his ninety years. The trouble is that Edwin Chadwick has always been taken too seriously by earnest students. He took himself seriously, but to understand him, we need more than a dash of humour.

While Chadwick pored over documents at the General Board of Health, a very different person was studying statistics in the British Museum. He was a Jew from the German Rhineland, a scholar and monomaniac, who read everything about English social life and questioned working men about their conditions. Occasionally he would write an article for the *New York Tribune* criticizing the horrors of English industrial life. This industrious

refugee dreamed of one idea, a universal revolution by the proletariat, and in 1848, the year the General Board of Health began its short official life, he had issued a political manifesto which was to act as a time bomb slowly bursting throughout a whole century and disintegrating the life of Europe. His name was Karl Marx, and he remained unaffected by the practical work of Chadwick.

Could there be a greater contrast than these two scholars? The bearded, restless, philosophical Jew with his immense power of abstract thought bent on pulling down capitalistic society; and the pragmatical Englishman devoted to creating a social machine to produce the perfect environment.

Chadwick's real heir was a skilful administrator, Sir John Simon, who had become the first medical officer of health to the City of London in the year 1848. He was of French origin on both sides, and he had all Chadwick's cleanness of mind, and his conscientiousness, without fanaticism or arrogance. He carried out his work unobtrusively, piping the water, cleansing the sewers, and removing those horrible cesspools which were under every house and regarded as equally sacred with the wine-cellar. Regularly he predicted cholera, and regularly he was correct. He devised sanitary laws, created the rudiments of medical administration, and was moved to the Health Department of the Privy Council which took over the work of the General Board of Health. When his official life ended, he sat down to write, with temperate enthusiasm, the early history of Public Health. The cautious Simon, rather than the masterful Chadwick, is the patron of medical officers of health today.

13. THE EAGLE ON THE TRICYCLE

When he was well over seventy, Edwin Chadwick became a victim of the cycling craze. The two-wheeled velocipede had not

been invented, but the tricycle seemed to him one of the most wonderful things of the century, and he was soon finding a place for this ingenious toy. Why not use the tricycle for the prevention of crime? He dashed off an essay showing how thievery would decrease if every policeman rode one of these machines. Policemen, he pointed out, now patrolled their beats at the rate of three miles an hour, but ingenious lawbreakers calculated upon this, and could frequently outrun the officer of the law. But if two policemen on tricycles, armed with revolvers, were to patrol abreast, they could reach a speed of eight, and even, with extra bursts, eighteen miles an hour. Since the criminal was at heart a timid man, said Chadwick, the thought of policemen dashing along upon three-wheeled machines in the dark, and then flashing their lanterns' eyes upon a house threatened with burglars, would be a most powerful deterrent of crime.

Nearly eighty years old, Edwin Chadwick pedalled along on his machine, his head as full of notions of catching criminals as any boy of fifteen.

This is our last picture of Edwin Chadwick, a masterful old man in a broad-brimmed beaver, bent on outwitting the criminal classes, riding his tricycle, his hair flying beneath the brim of his hat, his eyes flashing, his brain dreaming of new ways to eliminate waste and filth. He was a sort of H. G. Wells long before the scientific age. How dearly he would have loved our modern police cars equipped with radio. He would have admitted that the twentieth century had improved upon his 'preventive police' grinding along on their tricycles, two abreast, at the perilous velocity of eighteen miles an hour in pursuit of some housebreaker of the Victorian age.

BOOK THREE

FLORENCE NIGHTINGALE

FLORENCE NIGHTINGALE

Alas, that love was not too strong
for maiden shame and manly pride!
Alas, that they delayed so long
the goal of mutual bliss beside.

Yet what no chance could then reveal,
and neither would be first to own,
Let fate and courage now conceal
when truth could bring remorse alone.

RICHARD MONCKTON MILNES, 'Shadows'

Lo! in that house of misery
a Lady with a lamp I see
Pass through the glimmering gloom
and flit from room to room.

And slow, as in a dream of bliss,
the speechless sufferer turns to kiss
Her shadow as it falls
upon the darkening walls.

As if a door in Heaven should be
opened and then closed suddenly
The vision came and went,
the light shone and was spent.

HENRY WADSWORTH LONGFELLOW, 'Santa Filomena'

A NURSE'S CREED

My half pint of porter satisfies: perwisin' Mrs. Harris that it is bought reg'lar, and draw'd mild. Whether I sicks or monthlies, ma'am, I hope I does my duty, but I am a poor woman, and I earns my living hard; therefore I *do* require it, which I makes confession, to be brought reg'lar and draw'd mild.

MRS. SARAH GAMP in *Martin Chuzzlewit*

FLORENCE NIGHTINGALE

1. AN ABERRANT GENTLEWOMAN

WHILE Edwin Chadwick was showering circulars upon local Boards of Health, unaware that the days of his power were nearly over, a group of amateur projectors had organized a nursing home or private hospital intended for indigent gentlefolk. They had secured premises in the superior residential district of Harley Street, Marylebone, London, and they had appointed their superintendent, a young woman in her thirties. She would live in the house, and supervise the arrangements for nursing, strictly of course under the orders of the executive committees, of which there happened to be two, one of ladies and one of gentlemen. What a capable person they had found. A wonderful manager. And, quite surprisingly, a lady. The results were excellent. Daily expenditure was kept down, new ways found to economize, a complete revolution in patients' dietary, and a tendency for spiritual flirtations between the curate and the nurses nipped in the bud. Her secret was simple and efficacious. The Lady Superintendent believed that when a thing was to be done, she could best do it herself, so she labelled mixtures in the drug cupboard, regulated the gas-stove, wrote cheerful letters to the patients' friends, she saw that the servants performed their duties, above all, she had managed the committees so well that, especially the gentlemen, they ate out of her hands.

She had a poor opinion of nurses. They were much given to gin and porter, and many of them could not be trusted even to administer the correct dose of a medicine without proper supervision. But doctors were different, and she always found it satisfactory to talk to them: for one thing, they were internationally broad-minded and lacking in that detestable self-consciousness of nationality which afflicted most Englishmen.

The whole routine of illness, the sounds and smells of a hospital were now in her blood.

Florence Nightingale had fought hard to be allowed to do this indescribably wonderful work. She had contended with the prejudice of gentility and she had metaphorically speaking renounced father and mother for the sake of those poor souls who needed her so badly, who needed her sympathy and efficient care.

She was always taking on still more work, throwing herself into further desperate responsibilities. While on a short holiday with her parents in Hampshire, she heard of a new outbreak of cholera in London: immediately she threw over her holiday and rushed back to help with the nursing: and when that epidemic was over, she returned to the humdrum fascination of her routine in Harley Street. What had let this strange demon into this very accomplished girl?

To her people, she was an enigma, for neither of her parents were exactly imbued with the spirit of self-sacrifice. Her father was the offshoot of wealthy merchants, who changed his name in order to inherit a further fortune. Her mother, though the daughter of a great-hearted Radical who had opposed the Slave Trade, lived entirely for a round of social amusements. Mr. Nightingale devoted his whole life to finding the really desirable country house: Mrs. Nightingale collected notabilities at her dinner table. Yet here was their daughter fascinated by a sordid routine. But she had in her blood both the energy of commerce and the fanaticism of reform. Mr. Nightingale at last found the perfect country house, near Romsey in Hampshire, a middle-sized pseudo-Elizabethan monstrosity such as the Victorians loved, and here these wealthy Nightingales, whose riches had come from trade, played the part of country ladies and gentlemen.

Mrs. Nightingale's husband was fond of foreign travel, and

a few years after Europe opened up following the victory over Napoleon, he was on the move in Italy, and this was where his second daughter had been born—in Florence, and named after it. Such associations and her father's passion for literature inspired her childhood, which was spent moving between various country houses, and Florence learned to express herself in several languages, she enjoyed music, especially Italian opera, she loved flirtations in the drawing-room, and she was splendidly equipped for the great day when some handsome cavalier with moustaches and a background of farms and fox hunting would ask for her hand in marriage, and would take her away to a fresh life, though not essentially different from her mother's, a life full of charm, and distinction, and good works to the poor.

Her father was intelligent, cultivated, well meaning, but he had not had to suffer, and he spent his life in trivial distractions with never enough to use his faculties. How happy he would have been, thought the observant daughter, if he had been put in charge of a factory, with two or three hundred men to look after. But he was quite content to be left alone. As for her mother, she was a social genius. She knew how to get intelligent people into her house, how to organize the lives of her inferiors in the kitchen and the parish. But even she, pondered Florence, was not happy. And the irony was that both parents, who had never properly realized their own natures, were now forcing her life upon their aimless, unsatisfied model.

Florence had really too much brain for housekeeping. She was now over thirty, without leaving her father's home, and as each year passed, she felt less and less content. She would ask herself such inconvenient questions as whether all that china, glass and those heaps of domestic possessions were really necessary, and sometimes, sickened by the thought of the over-

elaborate dinner to which she would have to sit down, among those tedious social celebrities whom her mother loved to invite to the house, she would steal away to the village and sit beside some old woman sick in a cottage. When she knelt on the floor of a cottage to receive the sacrament with one of the village women, she would be overcome with sudden penitential ecstasy. What was it that these humble people understood about the mystery of life which she, the educated Florence, had missed?

This very practical girl was by nature introspective and self-accusing, and always straining to be in touch with the spiritual world she felt to be all around her. Watching the moon upon the grass and the cornices of the house, and the beauty of light and shadow all so unsubstantial, she could only hope that one day a moon would rise upon her own soul and reveal everything clearly. This strong sense of sinfulness was the force that might one day lead her to perfection. She struggled to purify her soul, to give herself more of the love of God, and set her spirit free from wordliness.

How much she deplored the lack of opportunity open to women in the Church of England. Now if she had been born into the Church of Rome—it would have been easy to save her soul and carry on some sort of work for her fellow-creatures at the same time, by joining one of the Sisterhoods. In a nun's robe she might have found her peace.

In the 1840s all England was agitated by the religious question. The air was full of Newman's sermons, and in every parish people were wondering whether the vicar would take to the strange ideas of more candles, vestments and even incense. Florence Nightingale, the great individualist, was the child of her age. The tenor of her thoughts was profoundly and articulately religious.

As it was, she was kept at home crocheting, visiting the poor

in an amateur capacity, never able either to train properly herself for a noble calling, or to have the leisure from worldliness to achieve full spiritual satisfaction. There was the insufferable tedium of having to listen to her father reading aloud in the drawing-room, a practice to which he was much addicted. The life of the English gentry, their riding to hounds, endless discussions about tenants and politics, flirtations and the opera, constant needlework and intermittent religious fervours, seemed to her a trivial, an elegant slavery. Emancipation had an entirely different meaning for her from what it had for other love-sick maidens. She was born between two worlds. Sickness, hospitals, work for the frail, the dying and the abandoned, came to symbolize her revolt. From abroad she read of her sex doing wonderful work for the poor and the sick. In France there were Catholic Orders, in Germany, Protestant deaconesses, but in England a genteel girl must go on at home, living that perpetual torpid routine, watching with exasperation that look on her mother's face whenever an eligible gentleman walked into the room.

For Mrs. Edward Nightingale, like many mothers, was convinced that all this mooning with the poor, this obsession with good works, these religious tribulations would promptly come to an end once a very desirable event happened in her daughter's life.

There was a cousin who admired Florence, but she gave him no encouragement, and confiding to her diary she professed to be relieved when he cooled off in her arctic indifference. There was another and more dangerous suitor, who had both personality and talents, and to whom her friends married her off enthusiastically. He was Richard Monckton Milnes, a personality of unusual complexity, a wit, a social leader and politician.

He sympathized with higher things, was writing a life of John Keats at a time when the poet was hardly known, and he was constantly talked of for political office. Appreciating the talents of Florence, he would have been capable of sharing her intellectual life. In time, he might have been willing to concede to her in marriage some of that freedom that the more determined of Victorian wives demanded and obtained. Richard Milnes was brilliant, intellectual and sympathetic: he was devoted to literature and reform, and he enjoyed great minds.

She had examined her troubled heart, and asked herself why it was she liked him, why she was almost finding his presence a necessity. Her stern, scrutinizing self told her that his sympathy meant a great deal, but it was not his flattery or her self-love which made his visits welcome, nor even his proposal of marriage. Her intellect, certainly, would find satisfaction in him: her passionate nature too would be requited by his passion. That was something, it was a great deal. She tried to measure it calmly. But ah, there was one torturing void. Her active nature would not find an outlet in the sort of life she would be expected to lead as his wife. That would be only her present futile existence, much exaggerated—the household, the drawing-room, it would be a form of suicide to throw away in marriage her only chance of a rich life of her own.

Florence had no theoretical disbelief in marriage. It seemed to her to be the best way for the average man and woman to combine to carry out God's purpose. But God had clearly marked out some women to remain single, just as He had intended the majority to be wives. Marriage, she reasoned sternly, was too often an initiation into the meaning of the inexorable word Never. And solemnly, with a sense of true vocation, she made up her mind to put aside the thought of being a wife.

No intuition is needed to conclude that she was not in love.

She had every gift but this one gift which few girls have been without. She could think, and she possessed enormous power of sympathy. Florence knew mental pain, and she could lose herself in helping others: but in love she could not forget herself.

To her charming and persistent wooer, she said No. Again he asked her, but this time something in this girl's face warned him that it was the last time. Away then with adolescent things. No more agitation over love, no more vain imaginings over marriage. Now she must think of how to do the Lord's will.

What was to be this mission of hers? Florence had no hesitation that it was connected with nursing the sick, but, so far, there was little real chance of accomplishment. But, she had made her decision, and there was no danger of spiritual suicide, and from now onwards her resolve became firmer, and her will hardened. Her own individual life became transfigured and enlarged, as she asserted more and more a right for women in general, for her whole sex. By asserting her privilege to be different, she was extending the destiny of womankind as a whole, both the married and the unmarried. That was how it came to form in her mind.

The story of modern nursing begins in a spiritual and sexual struggle, and before Florence Nightingale could nurse others, she had undoubtedly learned to heal her own wounds.

2. ENTER THE HERO

Florence was spending a long winter in Rome. She enjoyed to the full both museums and churches, and the English society which was as prominent there as in the days when Dr. James Clark had looked after John Keats.

Michelangelo's gigantic men and women on the roof of the Sistine Chapel roused her fervour and she walked past the foun-

tains, along the piazzas, in and out of basilicas with fascinated exaltation. Those months at the age of twenty-eight were precious to her, and two great events happened inside her soul. There was a convent of ladies dedicated to the Sacred Heart, and Miss Nightingale made a friend of the Mother Abbess and even went into retreat for ten days with the Sisters. She was drawn to the mysteries and made notes of the precious secrets of spiritual discipline. The Reverend Mother, who had never in all her experience encountered a female soul comparable to this unconventional Miss from England, poured out her own thoughts in a way she could never have done to one of the professed nuns. In those few weeks the maternal authoritarian Florence was born. Never had she been so happy. The Catholic faith was not her faith; but the personality of that Lady Abbess impressed itself deeply upon her heart.

Among the English wintering in the Eternal City, there happened to be a young Englishman whose career in the House of Commons had temporarily come to an end through an unfortunate shift in the political barometer. She had known him slightly before, at her mother's dinner table, and now their friendship was renewed among the museums and picture galleries, and he seemed to her to possess every possible gift of understanding and sympathy. His name was Sydney Herbert. And his mother had been a Russian countess. For Florence Nightingale he had all the charm of the exotic, the European, all the mystery that in her eyes belonged to men who were not English. He was the sort of man whom she would allow to teach her, and whom in turn she could dominate, for he could no more help being bewitched by her than by Raphael's Madonna. But now, Sydney Herbert was married. In fact this visit to Rome was his honeymoon.

After Italy, Florence visited a sleepy old town named Kaisers-

werth on the river Rhine. The lessons she had learned from the Sacred Heart were longing to be accomplished in action. She was a dedicated woman, and if her eyes had wandered while she sauntered through the galleries, and if her heart had quickened by an altogether impossible and unholy desire, some relief could be found in austerity, and now she spent a few practical months with an Order of Protestant Deaconesses. Rome had given her its spiritual dynamics, but Rome had also brought its sensual distractions. In Kaiserswerth, among a group of devout women, she learned the routine discipline of nursing the sick. The principles of the organization were Poverty, Simplicity and Common Sense. It was concerned not only with sick people, but with children and discharged prisoners.

The pastor who founded the Order at Kaiserswerth had actually gained some of his ideas from England where he had come to seek funds to start his work and had come across a wonderful Quakeress named Mrs. Elizabeth Fry who had worked a spiritual revolution among the females of Newgate prison. Many of the ideas which he carried out in Germany were adaptations from England, but it was not the spiritual side of the pastor's work that chiefly interested Florence.

What a joy to her to get up at five in the morning and to live on rye bread and vegetable soup, to listen to Bible readings and the good pastor's sermons. It was, of course, the nursing which attracted her most, or rather the spirit in which the deaconesses approached their patients. Their methods were rather primitive, and the hygiene of the place was horrible, but here was a body of dedicated women, with spiritual discipline, and she wished for no other world, no other earth than this. She had learned to know the life which she loved. The past was dead for her, all that amusing but sterile life in the rose gardens and withdrawing-rooms. To her mother, she wrote enthusiastically, with lyrical

passionate joy, saying how she longed for the blessing and sympathy of her parents begging for their faith in her and their patience.

Mrs. Edward Nightingale could no more understand such spiritual transports than she could comprehend the solar system. But she reasoned according to her lights. Perhaps after all she had been wise to permit this visit to the deaconesses on the Rhine: Florence would get this craving out of her system, and would come back home in a more reasonable frame of mind. And Mrs. Nightingale was careful not to mention to her friends where Florence was. People would think all kinds of things, and so, like a worldly wise woman, she kept her daughter's doings to herself and hoped this morbid passion would pass. But her daughter's next adventure was less reassuring. After her sojourn among Protestant deaconesses, Florence now insisted on a very different sort of aberration, this time, to her mother's way of thinking, much more perilous. It involved sick visiting and washing babies in the company of members of a religious order. And the place was Paris.

Her mother was alarmed. Not only was such work beneath the dignity of a gentlewoman, but there was a distinct moral danger. Did not Florence know that in Paris the nurses were invariably kept as mistresses by the medical students? It was a foolish argument to use upon such a girl as her own daughter who had remained cold to the charms of young Englishmen at home, and seemed quite happy among nuns and deaconesses abroad. What Mrs. Nightingale did not understand was the fact that Florence had a severe intellectual concept behind her continental vagaries. She was training herself for a 'profession,' but that would have been as grotesque a notion as though she had become an explorer. For the professional nurse did not exist and the very idea was unfamiliar and slightly repulsive.

Florence greatly enjoyed Paris. It pleased her to go out visiting with the nuns, into the schools and infirmaries, and while her hands and feet were busy with the most menial services, her eager mind was gathering facts and figures, and before she left, she had collected all that was to be known about the hospital arrangements.

Once she had swallowed the camel, Mrs. Nightingale could not now strain at the gnat, and having allowed the visits to Kaiserswerth and Paris she was obliged to agree when Florence proposed to become matron of the nursing establishment in Harley Street. Monckton Milnes was now married, other desirable gentlemen were affianced and settled down, and here was Florence at the age of thirty-three, nothing but a paid nurse.

3. THE SUMMONS

The administration of the establishment for gentlewomen during illness was outwardly tranquil, but this was due to the calm management which Miss Nightingale had learned at Kaiserswerth and from convents. When her committee tried to keep out all Catholic and Jewish patients, she confronted them with the inevitability of her resignation, and thereafter priests, rabbis and other unusual varieties of ministers were welcomed.

Florence made a virtuous resolve never to intrigue with the committee, but soon she discovered that such a policy was Utopian. To achieve anything, she had to intrigue, and the talent for psychological manipulation which had been fostered under the Mother Superior in Rome now worked to perfection. Henceforth she managed men and women with faultless technique. Unscrupulously, yet with the poise of a born grand dame, this girl in the thirties used every weapon, her eyes with the men, her sense with the women, and with the committee as a

whole, her relentless persistence backed up by the dreaded though unmentioned possibility of her resignation.

Their Lady Superintendent laid before them her most satisfactory report of progress, awaited their instructions (inspired by herself), and the institution possessed the outward calm of a most worthy amateur enterprise in the year that followed the Great Exhibition. But fate was incubating a great adventure.

The France of Napoleon the Third had joined with England in a sportive expedition to smite the snout of the Russian bear. A force of the Queen's soldiers had passed up the Aegean and through the Dardanelles, and a further four hundred miles across the Black Sea, where they were disembarked to lay siege to the Russian fortress of Sebastopol. Having won a battle at Alma against the unprepared army of the Czar, twenty-five thousand sat down to besiege the arsenal itself, after the much poetized battle of Balaclava, and the fight at Inkerman. Suddenly winter descended, and it seemed that the British Army Command had never heard of storms and blizzard and snow.

The Times was opened eagerly in every English home that possessed the ability to read and the fourpence to pay. And between the glorious bulletins from the British Commander-in-Chief, they read a more sober story from William Howard Russell, the first of the great special correspondents. No American newshound of the second World War ever produced a bigger sensation.

In plain language, *The Times* declared that not only was the campaign being mismanaged, but the arrangements for the wounded were shocking. An old Turkish hospital at Scutari, four hundred miles from the war, was full of suffering, dying, neglected men, who had survived the sea passage in a foetid transport, and whose injuries were dressed with rags by old and incompetent Chelsea Pensioners, and remained unexamined

by the surgeon before they perished from haemorrhage or wound fever. 'Are there no devoted women amongst us?' asked Howard Russell with a new and passionate authority which he had given to a journalist's message. 'Are none of the daughters of mercy ready at this extreme hour for a work of mercy?'

The readers of *The Times* felt embarrassed when told by Russell that the French army, which every Englishman regarded with contempt, was greatly superior in nursing organization, chiefly owing to the work of Catholic Sisters. An appeal was launched to provide 'comforts' for the suffering British soldiers, whom their war leaders were treating so abominably. A cheque for two hundred pounds from Sir Robert Peel opened it.

'Comforts' in the comfortable language of the English parlour, signified such delicacies as beef tea and calves-foot jelly, with some arrowroot perhaps, and torn-up sheets for bandages. These store-room elegancies were to enter those appalling stone halls of death at Scutari and perform magic upon festering wounds. Such was the comfortable theory.

But where to emulate what the French had done so finely, were the English Sisters of Charity? There were none. England had no corresponding organization.

Here we see the strange dramatic creativeness of fate. The story is so well known, but will never grow stale. Sydney Herbert, now a politician again, was at the centre of the war machine, and he remembered Rome. What he recalled now was not merely the talks with Florence, not only the strange and magnetic call she had made to his feelings, but another fact. She was unique as an Englishwoman who had trained herself as a nurse. Only a man so gifted as Sydney Herbert, only a highly emotional man would have translated that troubled and unfulfilled experience into an answer to immediate necessity.

He was back in Parliament, and now holding office as Secre-

tary-at-War. The connecting word *at* should be noted, for it denoted a whole world of separation from any real responsibility. Sydney Herbert held only a mere administrative post connected with accounts, but now he acted unusually for a merely departmental official. Stung with shame over Scutari he brought to mind that girl of the picture galleries, so full of determination. Here was the necessary angel to bring order into that Hades which held the victims of Alma and the War Office for which he felt an unpleasant sense of personal responsibility. Between the two of them there passed a current of telepathy. While Sydney Herbert, searching for a plan to retrieve an official blunder, thought of the one woman he knew with the necessary gift, Florence Nightingale had ready in her mind a plan to send female nurses to the Crimea. The idea flashed in the ether between them: his memory of what she had told him of her inexplicable passion for sick nursing, and her knowledge of what Sydney Herbert needed. Her letter of offer crossed in the post his letter of proposal to do the same thing.

For once, amateur organization, semi-official backing and newspaper philanthropy acted with lightning rapidity. Sir James Clark medically examined the women Miss Nightingale had chosen. The hustle of her vibrating energy swept obstacles away, and only one week after the appeal for funds, Florence Nightingale set out for Scutari with forty women, the pioneers of secular hospital nursing, and two weeks later, they were healing the wounds of those who had survived the charge of the six hundred, in a large, yellow building with square stone towers, overlooking the sea of Marmora.

At home, the Queen, her daughters and her ladies-in-waiting made woollen comforters, mittens and other warm coverings. The women of England had knitted a new word into the English language and *Balaclava* helmets became symbolic of protec-

tion from the Russian cold, while the Prince Consort sent to the officers of the Brigade of Guards fur great-coats, and a liberal supply of tobacco for the men. Somehow a new idea had been woven into the harshness of war, the idea of welfare.

4. THE LADY SUPERINTENDENT

There had been the greatest difficulty in getting together even forty nurses to go to the Crimea. Miss Nightingale's friends who helped her by interviewing candidates were shocked at the quality of some of those who offered themselves. Money seemed to be the main inducement. We have to recognize that these pioneers were not missionaries bent on founding a new Order of women, but escapists from unsatisfactory situations at home. In this they enjoyed with their Superintendent a reciprocal understanding. Like them, she too was a woman who had learned her true vocation by evading the ordinary responsibilities of home, marriage and children.

Their great virtue was that they worshipped her, and as they travelled through France, where porters, chambermaids and waiters pressed unpaid services upon them, they tasted the thrill of being heroines. Florence Nightingale had long outgrown so romantic a view of her calling. 'The strongest will be needed at the washtub,' she said realistically. The little party reached the Golden Horn on November 4th, 1854.

The uniform of the nurses had been hastily composed by her as a compromise between utility and decorum. Grey tweed wrappers, worsted jackets with caps and short woollen cloaks, and a scarf of brown holland, embroidered in red with the name 'Scutari Hospital.' The nurses were forbidden to wear flowers or ribbons except such as were sanctioned by the Lady Superintendent.

Her first problem was to inculcate into this band of untrained volunteers a sense of discipline. To keep her chickens safe in this wild world of soldiers at war, the mother hen was obliged to set up the primmest standard of conduct for her sex that has ever been known. It was an accident that sick nursing should be the offspring of war: and in the stern service of Mars, she had to protect her subordinates against the more subtle dangers of Venus.

The barrack hospitals looked imposing, and they had been described so often in official reports that the authorities at home had come to regard them as palaces. In reality, they were antiquated, evil smelling, impossible places, and the wretched frostbitten veterans from Alma and Inkerman lay in draughty halls, overrun with rats from the open sewers, with candles placed in beer bottles as the only means of lighting. The men were exhausted after seven days crossing the Black Sea during which seventy-four out of every thousand perished, and they lay upon sheets that were so rough that they cried out for blankets, and their unclean and verminous condition made erysipelas, fever and gangrene common even in mild injuries. The butter was filthy; the meat tasted more like leather than food. Miss Nightingale faced these miseries with calm, as though she had foreseen everything and gauged horror to the depths. She gave her orders, organized her little force of women without raising her voice. Less than half her nurses were really efficient, and it was necessary in that soldier-infested locality to keep a careful eye upon a few of them, and to issue a command that no nurse was to walk out except with the housekeeper, or a party of at least three. There were not nurses enough to undertake night duty, and a rule was made that none of the women must remain in the wards later than 8 p.m. After that hour, the nursing was done by male orderlies under Miss Nightingale's personal super-

vision. Out of this necessity arose the legend of the Lady of the Lamp. No one knew at what hour she might glide along the rows of beds, with her keys and her papers and her reassuring still-young face. But every wounded soldier knew that she was in the building, and in their fevered dreams she and her lamp formed the image of hope, comfort and encouragement.

Her new art of nursing, founded on common sense out of hints from deaconesses and practical teaching from nuns, began in elementary cleanliness. Linen, for instance, was washed in cold water, and often more verminous after the laundry than before. She arranged for some soldiers' wives to take charge. She reformed the cooking arrangements. When the English Ambassador at Constantinople announced that the army needed nothing in the shape of stores and necessities, and proposed to build an Anglican church out of the money collected by *The Times,* Miss Nightingale deflected the benevolence of the British public in the direction of a store where comforts could be bought. If all her difficulties, obstacles, shortages and disappointments at Scutari could have been added up, they would certainly have been less heartbreaking than her troubles from the powers in England, both military and civil.

The Lady of the Lamp had to endure every form of misunderstanding which those who work far from the seat of authority suffer at the minds of officials cloistered at home. Sydney Herbert sent her more nurses unasked, and, unfortunately, some of them were given the impression they were not to work under the Lady Superintendent, but under someone else. Like locusts, the new recruits descended on the Scutari hospital before she had even made arrangements to house and feed them.

It was so easy to be calm and statesmanlike at a distance, she reflected bitterly, as she sat up until two in the morning writing letters, checking her stores, dropping pearls of comfort

to the mother of some poor fellow who had just breathed his last after an agonized struggle with gangrene. Worse than wounds, there was the persistent nightmare of the religious question. When recruiting the nurses, no one at home had asked whether they were competent to dress wounds; but everyone was concerned whether they were Romanists, or Puseyites, Low Church or Evangelicals. Miss Nightingale herself had shown sympathy towards Catholic nursing orders which stood for some of the principles she was trying to establish in her as yet unborn secular profession. There was the Reverend Mother of a Catholic Convent in London who had come out with some of her Sisters, and Florence wrote humbly that she was far above her both in worldly talent as an administrator, and far more in the spiritual qualifications which God values.

But the Low Church people accused her of being a Puseyite, and the Catholics said she favoured the Protestants.

It was hard for the Lady Superintendent; what she needed in her rat-ridden hospital was not more ladies, or more Catholics, or Protestants. What she needed was more nurses, and unfortunately there was no way of finding them, except by trial and error. For the certificated trained nurse did not exist.

Against a background of struggle for bandages, scissors, arrowroot and elementary stores, in the gust of passions roused by the Tractarians and the Evangelicals, the real surgery of war went on, but it fades too into that background, for its science had not been born. Chloroform could be used to deaden the worst of the pain, but the antiseptic, that other pain-preventer, was a yet undiscovered miracle of the future. Joseph Lister was then a young house surgeon, learning his craft in Edinburgh, his mind as yet unvisited by any gleam of his life's work. But it was this particular war that unexpectedly set him on the path which led

to his greatness, for a Scottish hospital surgeon named Mackenzie had died of cholera in the Crimea, leaving open for the young Lister a place on the Edinburgh Infirmary staff, and the ten years of preliminary training that made him a surgeon.

It might be said paradoxically that Mackenzie's death and Lister's opportunity were the only contributions which this Crimean war made to the science of surgery.

As that terrible winter of 1854-55 passed, Miss Nightingale saw results as the pressure of new cases relaxed, the wards became cleaner and better equipped, and the number of deaths dropped to one twentieth. She decided to take a look at the British hospitals on the other side of the Black Sea, and there, as she enjoyed herself on horseback inspecting the soldiers' quarters near the battle front, she wondered not that the army had suffered so much, but that there was any army left at all. It was exciting, and it was also depressing. The men gave her cheers and salvos; but the military powers obstructed her as much as possible on the ground that she had no authority over the Crimean hospitals, but was merely the matron of Scutari.

At times discouragement would come over her. Official obstructionism, religious controversies, the perpetual fight for hospital linen and invalid foods, the long distances of misunderstanding between her, immersed in her work, and the authorities at home, abruptly the burden crushed her. The army was shocked to learn that their adored lady had been struck down with Crimean fever, one of the aliases of that louse-borne typhus which Sir William Jenner had distinguished from typhoid.

Now she was to have the better part of every nurse's education, to pass through a serious illness. She came within range of a martyr's crown. One contemporary wrote: 'The popular instinct was not mistaken which, when she set out from England on her

errand of mercy, hailed her as a heroine; I trust she may not earn her title to a higher though sadder appellation.'

But typhus fever spares the young, and Florence was not of the stuff that yields. As she made her slow recovery and could take exercise once again under the oleanders of the Crimean shore, she realized from the sensational wave of anxiety over her illness which passed over England, that her edifice of nursing was well and truly founded. She was urged to go back to England for a holiday, but the most she would consent to was a voyage across the Black Sea in a steam yacht, followed by a few weeks' convalescence in the British Ambassador's summer villa. As long as there were soldiers who needed nursing she felt like a criminal stealing herself from them. Meanwhile, her friends at home held public meetings and collected money to start a memorial to commemorate her work; she continued at Scutari her incessant conflict with military routine, her management of stores, her schemes for the soldiers' welfare. Give them schools, she reasoned, lectures, books, games and amusements, and they will leave off drinking, which to her counted as one of the minor horrors of war. She had not only invented nursing, but Army Welfare as well. Edwin Chadwick had seen the utilitarian connection of health and cleanliness; Florence Nightingale now perceived that welfare was a prelude to morality, and if she had eliminated the intemperate nurse, could not the army eliminate the drunken guardsman? The British soldier she idealized. The common soldiers entrusted her with golden sovereigns because their money was safer in her hands than in the bottomless accounts of the Army Purveyor. Under her control were the exercise books, diagrams, copies of *Macbeth,* and a magic lantern required for her army educational service, all the results of subscriptions in England, and in the reading-huts which she had established, she proved that the British soldier could be well-

behaved if he were given the chance. Her black merino, trimmed with black velvet, linen collar and cuffs, and white cap with black handkerchief tied over it was seen at each centre of difficulty. Soldiers stopped swearing at the approach of her figure and their talk was that if only the Lady-in-Chief were Commander-in-Chief, the allies would be inside Sebastopol inside a month. Raw salt pork, biscuit sprinkled with rum in those trenches before the forts, somehow tasted better for her feminine inspiration.

Although she had laid down the most positive rule for her nurses that they must never question the doctor's orders, she herself had a very acute sense of the limitations of military medicine and surgery.

'We have lost the finest opportunity for advancing the cause of medicine and erecting it into a science that will ever be afforded.' The nurses might remain passive instruments, but she herself was too intelligent not to see that this war had shown up the deficiencies of the old medicine, and that its practitioners, instead of grasping this opportunity to learn something new, were groping blindly along the old ways. And now, having introduced nursing and welfare into army routine, she laid the foundations of an army medical school, there behind the lines. In fact she had become a personal sanitary and educational authority on her own. An officer wrote to England from Scutari that he had met only two real *men* in the near East—Omar Pasha, the Turkish Commander, and Miss Nightingale. No wonder those hospital quartermasters and army purveyors hated her.

They would have burned her like Joan of Arc but for the fact that the people of England were behind her. Her will had triumphed. She had accomplished the first purpose, the most

difficult, for anyone who introduces a fresh idea into medicine: she had proved its necessity.

At last the war came to an end, bringing like the end of every war a mixture of unspeakable relief and some regret for its lost excitements. The Lady-in-Chief was back at her father's home, trying to escape publicity, making plans for the future, cherishing the Queen's gift of a brooch set in diamonds and a bunch of flowers picked on the field of Inkerman from sacred ground 'watered by our men's blood.' Sydney Herbert in a speech said exultantly that now and for as long as she lived, Miss Nightingale's work was marked out for her. It was true indeed. But there was a converse, equally true. She had a plan of action for her dear friend which was to last him unto death, a plan to change those grim lessons of Scutari into a permanent code of hygiene.

Already people were making her a Saint. Excursions were arranged for the public to view her parents' home in Derbyshire, that place where she had been so miserable, and sightseers were professing to find in the surrounding scenery the source of the noblest aspirations which had guided her life. Her legend had now acquired a local habitation; henceforth her shadow was to perform miracles.

5. ARMY REFORMER

Florence had been brought up in a sphere of society where to get anything one wanted in the world it was only necessary to speak to influential friends. Her mother's social genius was useful to her now and her family circle intersected wider circles, and drew her naturally into the most exalted of all.

The Lady of the Lamp was staying at Birkhall in Aberdeenshire, where among purple heather she recuperated at the pleasant Deeside shooting-lodge occupied by the royal physi-

cian, Sir James Clark. Then came the great moment when she was driven to Balmoral and presented. Even she must have been nervous when she thought how much depended on this occasion. She wanted no honour, but she cared very much for her plan. The Queen had been so interested in the work for the soldiers, and the Prince listened attentively to her great theme, the permanent reform of military hospitals. A few days later, the idea was developed further when the Queen and Albert drove to Birkhall, and over the tea-cups the conception of an army medical school and modern hospital came to life. 'She put before us,' wrote the Prince, 'all the defects of our present military hospital system and the reforms that are needed. We are much pleased with her; she is extremely modest.'

Yes, but her aims were not modest, nor were her methods. For, more autocratic than royalty, she would have had Her Majesty wave the sceptre and command it to be done. But Albert smiled. He knew from bitter experience of English ways, that what the smallest German princeling could do with impunity was forbidden to the constitutional monarchs of England. To make real progress, they must tarry until the Minister for War, Lord Panmure, whom everyone called 'the Bison' on account of his oxlike stupidity, came to pay his official visit to the castle. In due course, Florence was introduced to him.

Her tales of Scutari fascinated the Bison like an adventure story, and his stern eye did not miss the fact that she was a most personable young woman, far more attractive than he had expected. He even grasped her idea of an army medical school and promised to let her see the plans for his proposed military hospital before it was built. The royal prerogative had not been able to create changes, but it had at least created the favourable atmosphere for Miss Nightingale to impress the Queen's War Minister.

To establish an army medical school there must first of all be a Royal Commission: no reform in England could occur without that indispensable preliminary, and after further talk at Sir James Clark's house, and endless letter-writing, Florence Nightingale drafted not only the terms of reference to the Commission, but even the names of the Commissioners. After lowering his head and browsing dully for six months, the Bison actually agreed both to appoint the Commission and to act upon its recommendations afterwards. That was the way the royal prerogative operated. But an even greater force was at work. Florence had made up her mind that she would not only nominate the Commissioners and settle their terms of reference, but that she would write their report herself. And then, by holding over Lord Panmure's head her immense personal prestige, she would compel him to take action upon it. Her talent for intrigue was now manifested. The Bison himself was merely the War Minister, that is to say, the figure-head and spokesman of a department. Behind him were the serried desks of permanent officials. There were Army doctors of an even more exalted rank than those whom she had circumvented on the Bosporus, and in Whitehall they could be just as obstructive. She hurled her memoranda at the Army medical chief, who in her opinion needed a court martial for his incompetence in the Crimea, but who now sat at the War Office, a permanent barrier to reform. The Royal Commission with Sydney Herbert as chairman laboured, and in due course reported, and no line of its recommendations was adopted without her, though she never attended a single session, but gave in writing her answers to questions which she herself had drawn up.

It was demonstrated that, apart from battle, the chances of death in the peacetime army were five times that of the worst slum parishes. The Queen's soldiers were being wasted. The

Guardsmen in red coats and fur caps were in a perilous occupation even when England was at peace. This was the result of pure sanitary neglect. She had proved the need for army hygiene. She was two years home before she achieved this modest goal, and those years had been more gruelling than Scutari.

At the moment of success, when the determined lady surveyed this substantial embodiment of her promises made to the dead Guardsmen of the fields of Inkerman and Balaclava, there came a reverse, and for once, official inertia was more powerful than her will. The huge army hospital at Netley which Lord Panmure's department was building had assumed a horrid shape. According to his promise at Balmoral, the plans had been shown to her, but they revealed a monstrosity, a large carcass of a building such as Inigo Jones or Christopher Wren might have designed in years long anterior to the dawn of sanitation; whereas all her own experience in the Crimean war had proved that to keep off disease contagion a hospital must be divided up into smaller blocks or pavilions. Florence registered decided disapproval. She even managed to get herself invited to stay the night at the country house of Lord Palmerston then Prime Minister, who happened to be a neighbour of her father and mother. She coaxed him round to her pavilion style. But either because he was too busy, or because he did not really consider the shape of a hospital a matter of first class importance, Palmerston eventually allowed the Bison to have his way. Seventy thousand pounds already spent on the building constituted seventy thousand reasons why it should go on in the solid oblong she hated and, in the end, Florence Nightingale was obliged to be content with some minor changes to secure better ventilation. The Lady of Scutari had been worsted in her first campaign; but she was soon to have her revenge.

There was one collaborator whose devotion never wavered. The sensitive Sydney Herbert had come under her spell in the Picture Galleries of Rome, and ever since then he had been her most efficient instrument, and she had played upon his heart and manipulated his sympathies as a woman can bend the will of a man in love. She melted before his dear winning smile, his playful, almost pretty, way of saying things. She was in love with this man, and she used him for her own purposes and discarded him for all else as remorselessly as the female of certain primitive animals exploit their males for a single aim and then destroy them. The formidable Miss Nightingale was woman enough to understand her essential sex limitations: she could prepare and intuitively imagine, but to execute her purpose she needed a man. Ever since that mutual inspiration which caused the sending of nurses to the Crimea, he had been her faithful executant. It was Sydney Herbert who presided over the Army Health Commission; he who carried out army welfare and introduced those model barracks and the schoolmaster sergeants she was so fond of. He was her chivalrous defender, always prepared to take up the cause that seemed weak and unspectacular but cherished by him because she believed in it. He was an ideal helper because of his sympathy, and his Russian blood, though it made him unpopular when England was at war with Russia, warmed him to a woman who was European in her outlook and more realistic and less hypocritical than the English.

He made it a rule to mark each wedding anniversary with some work of altruism, and often these benevolences were prompted by Miss Nightingale. She achieved the difficult task of being Mrs. Herbert's friend throughout; the wife's loyalty saw how much his health was locked up in this effort of collaboration with another woman, and swallowed for his sake any natural jealousy.

Florence chose to deceive herself into believing that their relationship was like that of two men, like Sydney Herbert and Gladstone, but that was not how he thought of it.

He had indeed been the most progressive reformer who ever came into the War Office, but his will was not his own, and his body was being consumed by this frightful feminine intensity. Also, Sydney Herbert was suffering from Bright's disease.

It would have been better for him to retire from that strenuous activity, as his doctors advised, but he had to face her inexorable pressure. How well she knew how to get the last ounce out of her helpers. She never spared herself, and her tongue could be ruthless in pointing out that there were higher necessities greater than comfort, greater than one's individual life. Men were dying by inches in the peacetime army, dying of neglect in their noisome barracks as certainly, though less dramatically, than on the battlefield, perishing in their unreformed hospitals, and he and she were the only ones who both cared and had the power, and when he wavered, she did not scruple to put the most subtle appeal of all. It was their *joint* work, it was something they had made together, reform was the child of their intimacy.

The poor man was not made for pressure of this kind. Only a complete masculine detachment greater than her feline will could have resisted. He went on with the army reforms, he was moved to the House of Lords where the strain would be easier, and every month, almost every second, of his working day he braced himself for one more effort to do her will, but now his own vigour had waned and his energy to go on was drawn from her. Sometimes he was so weak that he would have to lie on a sofa drinking gulps of brandy until he had strength enough to crawl into his carriage and go to the War Office, where the clerks saw a dying man wrestling with their inconceivably ancient

routine and its unchangeable rigidity grow stronger with his increasing weakness. It was arduous to have to face Mr. Gladstone, the Chancellor of the Exchequer, to extract money for the reforms; hard to make the struggle over the appointment of a chief nurse for the army. But to answer notes from Florence, that was often beyond his strength altogether, and, when he failed to move the mountain, he had to meet the sting of her disappointment. She who first revealed herself to him full of liveliness and intelligence was now a dominating incubus. A few years only had done that, a few years and a war, and yet the tender emotion was as strong in him as at the beginning. The hardness which had come over the behaviour of Florence for her dear friend was perhaps the bitterness of her regret that she could not admit to herself, and now that they were engaged together in this noble work for the soldiers, she could punish him for that mischance of destiny which kept him married to another woman.

Sydney Herbert died, worn out, and his last words were only of pity for her disappointment, and not of congratulation for the much he had achieved. 'Poor Florence, our joint work unfinished.'

Not far from Piccadilly Circus, London, they are still standing together side by side—in bronze—she holding a vestal lamp of the symbolic design that would have bothered every practical nurse to distraction, he with a roll of papers, earnest, noble looking, half turned towards her. And there, opposite them, are the Army and Navy Club, headquarters of service opinion, and the Athenaeum Club, nerve center of the ruling powers in British public life. The pair of reformers stand steadily looking towards the scenes of their triumph, and to the Houses of Parliament beyond.

6. WOMAN EMANCIPATED

In each new art practised as an enduring human activity, there must be a permanent element of illusion. Florence Nightingale knew this when she created her cult of sick nursing out of the homely business of housecraft. In her day, cleanliness and good housekeeping were common virtues, and many a lady of the manor practised unobtrusively, on a small scale, the sort of thing which made the Lady-in-Chief so remarkable at Scutari. The basis of it was the natural female instinct, and those village patronesses understood how to arrange sick beds, prepare invalid foods, and make bandages from torn-up sheets. Such gifts were not the exclusive discovery of Florence Nightingale. Her unique achievement was to create out of this feminine raw material a science and a status. And to do this, she had to develop the illusion.

The notion of something distinct in the art of nursing, as contrasted with mere menial service, that there was in fact an influence in these routine administrations wholly beyond the effect of drugs had not dawned upon medical men. Florence Nightingale's quick success in the Crimea created this refined science, but she had not yet succeeded in putting across her idea as a permanent necessity of peace. After a war, the British public loves to relax, and those generous people who gave their money for the Nightingale memorial and said her work must never die, then prepared to treat it as nothing but a quaint heroism of wartime, desirable indeed in Scutari, but superfluous in Victorian home life. To counter this indifference Florence Nightingale had to professionalize her calling, making her standards stricter, her routine more inexorable, and casting over her new vocation a romantic illusion and some of that sacred glamour of the celibacy of the convent. She changed nursing out of a

humble domestic cult into a grand art; and now she had to raise the nurse from a despised performer of bodily services into a trained and admired vestal.

Her greatest mission, then, was not to found the art of nursing. No one woman, not even she, could have invented what was very traditional. Her main business was with the woman more than with the science. To form an army of women not only faithful, but technically trained in a method that would never fail, and inspired with selflessness. In Catholic convents this essentially Protestant woman had found a great deal to admire. She liked the leadership of the Mother Superior, she loved the simple organization of that narrow and devoted life. Florence Nightingale adopted this sisterhood ideal and resolved that her nurses were not mere trained automatons, they were to put into their work all the resources of their womanhood. She would have preferred to found sisterhoods, but she had really made a new profession for women.

She made an angel of purity and efficiency, and never allowed it to lapse, and if her nurses married, they fell out of her favour. They were chaperoned in hospital, expected to go out in twos, and forbidden to exchange light conversation with medical students and doctors. The natural conventions of Queen Victoria's reign helped her to perpetuate this celibate ideal.

It was a great victory. She had set women free from the tyranny of their drawing-rooms, and she had proved that into those evil-smelling places where sick people were sent, a great healing peace could be brought by their skill. She had proved that this magic could work only when the nurses had been disciplined by vows to their profession and made themselves to appear sex-less angels. That was the great illusion she had created.

She had made it possible for a woman to have the chance of two lives, the one of home, husband and children, and the other of worldly competition, and by breaking the domestic spell she had made it inevitable that in future a great number of her sex would be compelled to lead those two lives at the same time, would be obliged through sheer economic necessity both to work in their homes and bear their children, and at other hours of a strenuous day to go out to work in an office or a factory. By making them equal with men, she had proved woman's latent capacity, and others would wake up to find that woman's work was also cheap. Woman, who had once been man's superior, now became his equal.

How many women today are weary of this burden of this double life which she laid upon them, and would willingly leave all work outside the home to the male sex if they could concentrate once again upon those undisputed prerogatives of husband and children which seemed to Florence Nightingale so shallow and unworthy?

There was another woman who possessed the secret of combining both lives into a singularly free and untroubled existence.

7. THE QUAKER ANGEL

Just about the time that Florence Nightingale had completed her life-work, for after the Crimea, the remainder of her activities were to be repetition, that other great Englishwoman came to the end of a long career of selflessness; she is the only one of the century to be compared properly to the heroine of Scutari. Mrs. Elizabeth Fry, the Quakeress, was forty years old when Florence Nightingale was born. Their careers intersect, their inspirations intertwine, for it was Mrs. Fry who had given the creative seed to the pastor of Kaiserswerth who had handed it on to Florence.

Mrs. Fry was a Gurney, one of those Quaker families of the city of Norwich who have survived through centuries of English history like giant oak trees from a primeval forest. Before the age of eighteen she became spiritually converted to the Quaker rule of existence, and though she was apt to regard her previous upbringing as lax, it can have been no struggle to Miss Gurney to accept the scriptural way of life, the narrow code of conduct, and the routine of good works which made the Quakers outstanding. At twenty, she married a Quaker merchant banker named Joseph Fry, and thereafter lived a domesticated life in a manor house in the Eastern Counties, or in a London banker's dwelling, and she had eleven children.

Mrs. Fry was thirty-three when she was taken by some Quaker friends to pay a visit to Newgate Prison in London. It arose spontaneously out of general practice in good works. Until then her life had been regular and uneventful. Her knowledge of evil came solely from her own imagination, with perhaps her worst experience of depths of human nature from the feckless behaviour of cottagers on her husband's property. But now the Divine Power that inspired her existence guided her into the nearest thing to hell which could exist upon free English soil at the beginning of the nineteenth century.

She came to the place to visit some female felons about to be executed. With them, herded indiscriminately, were thieves waiting to be sent to Australia, women on remand, prostitutes, forgers, women on the threshold of conviction, awaiting sentence. But those about to be hanged were in a state of particular misery. Judicial hanging was the practically universal punishment for all sorts of crimes and offences. On an average, four executions took place each day in Britain, one hundred per annum coming from the Old Bailey alone.

The female prisoners, tried and untried, innocent and guilty,

were crammed, three hundred of them, into four small rooms, where they stayed day and night, sleeping only in tiers of hammocks, where they slept and cooked and looked after their children, without beds or bedding, without sanitation, in the most bestial squalor, under the charge of a keeper and his son. They raved and shouted and got drunk on liquor officially permitted. The stench, the noise, the infinite degradation on the faces of the prisoners was beyond any of the pathetic horror described in literature by those who had dramatized the lives of the highwaymen in the men's part of the prison. These female felons terrified the keepers. The Governor himself was nervous about venturing into that portion of the jail, even the turnkeys entered in pairs and they begged the visitors to leave behind their watches.

Mrs. Fry allowed her watch to remain pinned to her bosom, and entered that inferno with perfect self-possession: the noise ceased, and the waves of bestiality fell back. Something that was decent, and feminine, and beautiful had come inside this cage.

Elizabeth Fry's casual descent into hell was the opening of a new sphere in Quakerish well-doing. Mrs. Fry began regular visits to Newgate, she began Bible readings, supplied the prisoners with clothes, and initiated a school and the rudiments of child-welfare.

The prison was under the control of the London City magistrates, but they had long given up all idea of maintaining discipline. Like the Governor, they were afraid of the creatures they had turned into wild beasts. Their only method of control was to lock the doors and leave those inside to their desperate fate. The magistrates, the Governor and the turnkeys considered themselves experienced in handling wickedness, and smiled at these earnest ladies, but gave them permission to pay regular visits and do what they could in this fearful sink of corruption

which they knew was beyond the range of all masculine authority.

Quietly, those Quaker linen caps and the clothes that were part of the Quaker self-control, got to work and brought transfiguration. Mrs. Fry read the Bible, she preached repentance, she helped the women with clothes and food, she comforted and soothed, but what produced the most tranquillizing effect was the radiation of her own personality. Here was a force that was not a mere religious theory, it was the actual embodiment of a good woman in flesh and blood, in Quaker dress. The female side at Newgate became calm. Those tortured women saw a kind of peace in this leader of their sex. The magistrates were approached. Mrs. Fry was the daughter of Gurney, one famous city banker, and wife to another, and she was given permission to make further social experiments. A female matron was appointed, rules drawn up, needlework given out, and by a system of dividing the prisoners into groups of twelve, each with a 'monitor,' a sort of self-exercised authority was arranged, and the female side of Newgate became a new place. A school and a laundry were started, and it became a fashion for wealthy young ladies to go to Newgate to enjoy the sensation and to hear Mrs. Fry reading the Bible. She favoured this fashionable publicity for it gave her support. The prisoners listened, then asked to be taught to read themselves, and now the worst punishment that could be imposed on them was to be reported to Mrs. Fry.

The Lord Mayor and sheriffs visited the prison and were astonished. They agreed to whatever the ladies proposed. The magistrates themselves could never have produced this miraculous reformation, and now they readily assented to dismissing the soldiers who guarded the female prisoners who in future were to be guarded only by women, and setting aside a special cell for the temporary confinement of the troublesome, a resource that Mrs. Fry proved to be required only occasionally.

Once again in English history a private person had done the one simple thing which had proved quite impossible for the elected representatives to do; but once she had shown them the way, they could imitate her.

She was surrounded by Quakers and Evangelicals, Gurneys, Hoares, Macaulays, Buxtons, all of them bent on criminal law reform and the emancipation of the slaves. The men put forward these causes in Parliament but Mrs. Fry went on quietly with the more profound and creative side of the work.

She now visited prisons all over England. She toured Europe, inspecting a prison in each place. When she went on the Continent it was to talk prisons with the Queen of Prussia and the Empress of Russia. She busied herself with convict ships on which even women were dispatched to Botany Bay in Australia. All these forty years she lived the tranquil life of a practical and kindly housewife; she looked after her cupboards, read the Scriptures to family and servants, married her daughters, wrote letters to aunts and nieces, paid visits to the network of Quakers all over England.

Her husband, Joseph Fry the merchant banker, suffered financial misfortune and was expelled from the Society of Friends. She lost some of her eleven children, she saw others happily settled. People criticized her public work, and said she would have been better employed attending to her home. But Mrs. Fry's serene temperament enabled her to combine opposites, and her family never suffered through her concern over the women of Newgate. She gave evidence on prison reform before the House of Commons Committee. Her practical wisdom went further than all the plans of the reformers. In this very full and satisfying life, there was religious exaltation, religious depression, religious routine, but that full and ordered rhythm among grandchildren and friends left no place for despair. She was one of

those good women who are perfectly on terms with evil, and who do not need to recoil or draw back from it, because they themselves are so firmly rooted in good.

That long life of practical religion proved that a woman can achieve a great philanthropic work even when she was married and had eleven children. It showed that devotion to an ideal can fill a very normal and regular life.

Mrs. Fry's ideal enriched human nature, yet it passed into the general current of human experience and, as one woman's achievement, it was lost. Nowadays, married women do not go into prisons to read the gospel. An enlarged humanity has made society seek to reform criminals in other ways. But the work of Florence Nightingale has lasted through its fierce vocational appeal as a cult of healing. How she managed to fabricate that passionate celibacy of hers into a great professional institution is an interesting chapter in spiritual dynamics.

8. FOUNDING HER ORDER

The twin bronzes of Sydney Herbert and Florence Nightingale look everlastingly in the direction of the Houses of Parliament opposite the Gothic pinnacles of which there rises on the south bank of the river Thames, a line of seven square blocks each identical in red brick. That row of buildings is St. Thomas's hospital and it symbolizes not only Florence Nightingale's victory for the separate pavilion style of hospital construction. Those pavilions with the breezes of the Thames circulating between to banish the contagion she feared, were laid down according to her ideas, and inside, nurses in red capes like those worn at Scutari followed the sacred routine which was to outlast even those brick walls. A hospital lives not in the design of its brick pavilions, but in the soul of those who work there.

Hitherto, the final goal of her work had been the health of

those admired soldiers whom she was leading away from disease and drunkenness, the means of achieving her reforms was through the greater perfection of womanhood. Ah, those women in Scutari, those creatures of dubious idealism who came out to nurse soldiers not from nobility but the blind feminine instinct, they had developed devotion equal to that of any Protestant deaconess or Catholic nun. By discipline and method, she had suppressed the weaker female traits and brought out the finer qualities in that bunch of very average women. She had produced the germ of her system, and now it was to be made to flower perennially, each year producing new blossoms. She was besieged with clamorous letters from girls who wished to become like those heroines of the Crimea, and in Florence Nightingale's eyes, knowing the abyss of her own nature, there was only one way to make them perfect, and that was by denial of sex, by self-forgetfulness and utter devotion.

When fifty thousand pounds was collected from her well wishers all over the country, and she was asked what she would wish to be done with it, she decided for a school of nursing to be founded in St. Thomas's hospital.

The money poured in and the trustees of the Nightingale Fund waited respectfully for her to signify when she was ready to take charge of a new batch of nurse postulants as she had done at Scutari. The trustees waited and with one excuse after another, the Lady-in-Chief put them off. First, it was her health that was not good. Then it was her army work which needed all her attention. Finally she capitulated, but hardly as her admirers anticipated. She decided that she would not become matron herself, but would manage the School of Nursing by remote control.

A widow of forty-two, who had never had hospital training, was appointed the first head of the nurses in the Nightingale

school. Her name was Mrs. Wardroper. Florence wrote a strange and vivid character sketch of the lady whom she had met in the Crimea. 'Her whole life and strength were in the work. She talked a good deal, but never wasted herself in talking. She knew what she wanted and she did it. She was a strict disciplinarian; very kind, often affectionate rather than loving.'

These few sentences reveal what she looked for in her matron. Between them they drew up the first rules for the first secular hospital nurses in England.

The world ought to have taken notice on that May morning in 1860 when advertisements in *The Times* proclaimed that young women to be called 'probationers' would be admitted to the sick wards of St. Thomas's hospital.

The probationers must be between twenty and twenty-five years of age, and if their testimonials of character were satisfactory, they would be admitted to work under Mrs. Wardroper, as assistant nurses, receiving their lodging, board (which included tea and sugar), their washing and 'a certain quantity of outer clothing.' For twelve months they remained on probation, receiving as a sort of gratuity £2 in the first quarter, £2 10s. in the second and third, and £3 in the last quarter, after which they were expected to enter into service as hospital nurses in such situations as might be found for them.

The fifteen young women who came forward in answer to the advertisement became the first professional nurses in the world. Three were dismissed during their first year, two were appointed as extra nurses to the hospital and one retired owing to ill health. Vacancies in the ranks were filled, and thirteen finally completed the course, became qualified, trained and indelibly stamped with the moral hallmark of Miss Nightingale and Mrs. Wardroper.

Their training was formidable indeed. Not that the actual

nursing work was probably any more laborious than they expected; but their life was assuredly more austere. Miss Nightingale had learned in Convents the proper way to handle the soft impressionable stuff of which her own sex was composed.

They had to be SOBER, HONEST, TRUSTFUL, TRUSTWORTHY, PUNCTUAL, QUIET and ORDERLY, CLEAN and NEAT. Such qualities they were supposed to possess by nature; but in the course of the probationary period they had to become skilful in dressings, enemas, bandaging, washing patients and the meticulous recording of symptoms. In each department, they were to be tested, proved and supervised. Once a month Mrs. Wardroper filled up for each of her postulants a report on 'Personal Character and Acquirements,' made up of two parts: firstly a moral record—arranged under punctuality, quietness, trustworthiness, personal neatness and cleanliness, and ward management; then a technical record with fourteen headings. Each month the sister handed the reports to the matron, and the matron to Miss Nightingale, who read them over and noted the frequency of *good, moderate, imperfect* or *zero* in each girl's dossier. There was no escape; not even their souls were exempt from this searching supervision, worthy almost of some Jesuit House under the military discipline of Loyola himself.

What was it that Florence was afraid of? For in these preposterous precautions there seems an element of fear, as though she had no real confidence that the compulsion of mere goodness would be strong enough to keep her nurses in the straight path.

Her fear arose out of the grotesque horrors of the every day hospital life. Strong nerves were needed to keep one's heart and soul intact in such places as the operation room, where a patient struggles under an anaesthetic, with men dressed like butchers, bowls of blood, vomit, heartrending sounds. Those old opera-

tions were horrible indeed, and the sights and sounds of the wards were hardly less so. Human misery was exalted to a dramatic pitch in hospitals of 1860. Like a sound psychologist, Miss Nightingale believed that innocence was the best defence against such sordid experiences. She must protect her probationers by giving them a mighty charm.

Of course the nurses lived in the hospital under the matron's eye, and heard addresses twice a week from the chaplain. They must be armed spiritually and trained technically, for how otherwise would they withstand the digust of physical conditions and the temptations of a medical student's wandering fancy? Miss Nightingale would read over the dossiers, and then she would talk over the nurses with Mrs. Wardroper. These two middle-aged women measured how those budding flowers of their sex came near, or fell away from, their unnatural standards. Miss Nightingale knew convents and Mrs. Wardroper knew war, and both exaggerated the ideal of womanly purity.

'She uses her eyes unpleasantly,' wrote the matron to Miss Nightingale about one of the probationers: 'as her years increase this failing, an unfortunate one, may possibly decrease.'

Reprehensible, indeed, for a nurse to be aware of her sex appeal in a ward full of pain and misery. But had Mrs. Wardroper no knowledge of the power for healing latent in the truly feminine personality? Who would care to be nursed by a woman unable to use her eyes?

For a nurse to be seen walking out with medical students was a terrible crime, and light conversation in the corridors if detected, would mean a black mark upon the inexorable dossier. As for a nurse being married, that was the final and deplorable finish to her nursing career, signifying her choice of the lower instead of the higher female alternative. Not all Mrs. Fry's Bible reading could ever be so religious as this. But Florence Night-

ingale had to over-emphasize each characteristic she wished to see in her nurses. Because the old Sarah Gamps were often beer-sodden bullies who robbed a corpse as part of their perquisites, she had to make the new nurse superhuman. She had delivered the nurses from the unsavoury companionship of Mrs. Gamp, only to place them under the rule of the starched Mrs. Grundy.

It is ironical indeed that one of the influences which Miss Nightingale believed so harmful to her delicate probationers is now considered to be a definite attraction in drawing young nurses to particular hospitals. Those medical students to whom they were not supposed to speak in the corridors have become for their successors a magnet of natural feminine interest. Of course, no hospital matron would put such a crude notion into words, but it would be true nevertheless to say that the natural affinity which nurses have for young men who are studying medicine is not discouraged by the authorities, and today if the ghost of Mrs. Wardroper should ever visit a hospital she would find her protests coldly received in the matron's office.

Yet in spite of the rules which these two patronesses laid down for their charges, nursing has become a superb vocation. That vestal idea consecrated the postulants. By a denial of sex, the nurses became reconciled to self-sacrifice, and to endure long hours and tiresome duties, and when they grew old, they had often reached infallible experience, and could prophesy which patients in their wards would die and which were likely to recover. In the course of years, too, those of the eager pupils of Mrs. Wardroper, who became matrons themselves, would exercise over other young aspirants the same repressive discipline that had formed their own characters, and each fresh generation of nurses would deplore the laxity of its successor, as the good old days when Miss Nightingale and Mrs. Wardroper had their intimate consultations over the character of Nurse Jones and

Sister Ethel retreated further and further away. Their rules for moral excellence came to seem more stuffy and Victorian, and their passionate ideal of permanent vocational celibacy was at last to appear nothing but the abnormality of two unnatural women in whose brains the power of their sex to inspire beauty and love and children appeared only a troubled dream.

Miss Nightingale and Mrs. Wardroper were not only concerned with moral excellence in their nurses. They were interested in the technique of nursing. They taught that there is a way of removing a bandage, a way of giving a medicine, a way of turning aside a desperate question, a way of giving hope—and each of these methods is better than the way by which the untaught person tries to achieve the same thing. Nurses acquired a new craft of doing what appeared very simple, but was in reality hard and complex. Like every art, its principles were revealed only in the doing.

Florence Nightingale laid down her rules in a little book called *Notes on Nursing: what it is, and what it is not.* It deserves to be honoured as one of the great books of healing. This was the book whose teaching might have saved the Prince Consort if it could have been studied in Windsor Castle. It was addressed to women, and it is an exceedingly feminine production. Every one of them, she taught, would one day have the care of someone's health, therefore every woman was potentially a nurse. God would not work a miracle, i.e. break one of His own laws merely to relieve one of us of our responsibility. Therefore, we must put the human body under the conditions necessary for healing. She meant to shock Englishwomen, make them see what was under their noses. Begin with that sacred preserve, where the Englishwoman was queen, where her will was law—the Victorian home.

We think of those large Victorian bedrooms and we picture them hung with heavy curtains, warmed with crackling fires, made up of solid comfort as described by Charles Dickens, with pots of freshly made tea, muffins and glasses of port.

Then, in Miss Nightingale's *Notes,* an entirely different representation comes into view, and we perceive the sordid and seamy side of the Victorian home: the stuffiness, the absence of bathrooms, water carried up four flights of stairs in tin receptacles, the smells, the fears, the superstitions, the cesspools, black fogs, the inconvenient clothing, children imprisoned in the nursery, domestics in the basement. Outside these grand mansions, perhaps only a few yards away, were hovels where typhus fever was sure to visit every few years, and where diphtheria and scarlet fever were as regular as the seasons. In the candlelight of those genteel bedrooms we shrink from the misery of the patient with erysipelas, or moaning with pneumonia, restless and uncomfortable through lack of air, want of attention to the sweating skin, unsuitably fed upon pieces of beefsteak and glasses of wine. We sigh for a clearheaded woman to bring sense into all this baleful discomfort. That is where Florence Nightingale succeeds. Her great prestige secures her admission to the home. She bustles into the room, quietens the sobbing mama, orders about the awkward servants, clears away hangings, opens the windows—and she does all this by divine right. She knows what to do from practical experience, through bits of teaching from Kaiserswerth, a hint from sisters in the Paris slums, some minor calamity at Scutari averted by a happy improvisation now standardized, and she can carry out a system because her glance is irresistible.

Her little book was meant for ladies. She knows it, and she can use a tone of superior familiarity, and even condescend to rebuke them for the indecency of bending forward when wearing a crinoline. Like Mrs. Siddons the actress who caused a shop-

girl to faint by the intensity with which she asked for a pair of gloves, Florence Nightingale makes her sex listen to her tones of hypnotic command. She knows what she is doing, and presently the patient will prove that her theories are sound. He smiles, he sighs and sleeps, and wakes refreshed. Magic has entered that room and it hushes everyone with the sense of a miracle.

Searching for the cause of this power and practical art, we trace it to the only place where moral authority belongs, the human heart. She was really a contemplative whose only relief lies in a dominating activity. To the very end, she was a prey to doubts and lapses of faith. Florence Nightingale was one of those suffering souls who long to be spiritually nursed and comforted, and that need of her nature could be assuaged in the act of caring for the bodies of others.

With lofty scorn she dismisses the common notion that it required only a disappointment in love to turn a woman into a good nurse: that reminded her of a village story of a man who was put to be a schoolmaster because he was 'past keeping pigs.'

The teachings of that little schoolbook, *Notes on Nursing: what it is, and what it is not,* have been so absorbed into modern consciousness that it is hard to think back to a time when Miss Nightingale had to be both emphatic and arrogant to drive anything at all into the narrow understanding of Victorian men and women. What she taught fiercely as a dogma is nowadays part of the mental equipment of every nurse and most intelligent women. That is the Nightingale revolution. Modern medicine has altered the technique of treating an illness, but no modern knowledge has altered nursing. Behind all the new sciences of medicine, the fundamental problem remains of the sick person's misery, and it brings a moral question, which we suspect Florence Nightingale's age was more fitted to answer than ours.

Our medicine is becoming preventive, our outlook upon sick

nursing is more positive and curative. But what becomes of those patients whose maladies medicine has failed to prevent, and is still powerless to cure? What about irremediable cancer, paralysis, mental degenerative changes, hopeless kidney disease? What of the blind, the aged, the senile, the demented, the bed-ridden? Do they not all need nursing, conceivably of a higher type than the average cases of passing illness accompanied by exciting operations and buoyed up by the prospect of cure?

Who are to nurse the hopeless? Who are to give balm to the chronics and the helpless? We need, evidently, something more than a 'technique,' we need a bracing moral reassurance which is near a religious faith. What has become of Florence Nightingale's fundamental ideal of sick nursing? Does it live today? Can the trained nurse preserve that ethical standard in the face of the competition of modern sciences?

She had thrown around the nurse the glamour of self-sacrifice, a motive which strongly appeals to women, and she had also given them a practical technique. Sick nursing is always tedious, risky and often disgusting; yet for a woman it can be the most satisfying work in the world. No one has ever fathomed the psychological power of a good nurse, but all have experienced it. Perhaps after all, there was something profound in Florence Nightingale's belief that her mental influence over the patient could be attained only through self-discipline based upon self-denial. Can it be that in spite of all discoveries in pharmacology, the power of healing through the spirit is still the most powerful drug known to medicine?

Today, we know these things, we realize the mind's unfathomable influence, yet we are obliged to follow the materialism of chemistry and pathology as far as they will go, and if today Florence Nightingale were with us, she would be a passionate student of the new advances of medicine, and would be able, by

the synthesis of her intelligence, to unite those two warring opposites: she would make her highly spiritual nurses into well educated users of every scientific weapon. Yet in her private mind she would have doubted.

When she was an old lady, the great Mohammedan ruler the Aga Khan came to see her. He was interested in her work for India, and curious to know what sort of woman she was. She explained at length her theories of hygiene—fresh air, sanitation and nutrition. But the Indian Prince seemed not to understand. 'Do you think you are improving?' he asked.

Miss Nightingale understood better. She knew that the Aga Khan meant spiritual improvement. To him, such things as sanitation were unreal, superstitious. To him religion and spirituality were the only real and permanent influences in life.

Miss Nightingale understood, and perhaps secretly she agreed with him.

Florence lived on more than fifty years after the Crimean War, an active old maid among her pussy cats, one of whom was named Tom after St. Thomas's, and another Bart, after St. Bartholomew's hospital. She was happy among blue books, though she had her dark moments, and in these years her masterfulness grew to be a passion, and she was the real motive power behind many of those health reforms that slowly broke up the habits of the Victorian era. She wrote letters that speak like a paradoxical character in one of Bernard Shaw's plays.

Her main preoccupation and her chief target was still in the War Office. Soldiers were always her heroes, and after the Indian Mutiny she compelled the Secretary of State to appoint a Sanitary Commission just as she had done after the Crimea, and she steeped herself in Indian knowledge. 'If the facilities for washing were as great in our Indian Army as those for drink, it

would be the cleanest body of men in the world,' she wrote tartly. She had become to the War Office a standing advisory committee of one, and progressive under-secretaries wrote to her asking for suitable answers to send to their shell-backed permanent officials, and now she took India under her wing. A great Indian administrator wrote to her that the Indian people would bless her long after English Viceroys and dynasties were things of the past.

She hardly belonged to her own day. Impatiently, she had brushed aside its notion of a woman's function, leaving out all subordination to man. If she had lived today, she would be not a sick nurse, but a great administrator; and tomorrow, she would be something greater still, a new species of stateswoman, a leader, a ruler of masses.

As the mid-century moved towards the end of the Victorian age, her dictatorial habits were fixed, but her control over her body had relaxed, and she now passed large parts of the day in bed surrounded by reports and papers.

We have to think of this great health reformer as a permanent invalid, seldom taking exercise, writing incessantly, hardly ever able to visit those hospitals she knew so well on paper, and her sole experience of the great healing power of nature the glimpse of sunshine coming through her bedroom curtains, the occasional trip to take waters among the invalids of Malvern or the bunches of flowers on her table. She had many helpers, male and female, who kept her accounts, wrote her letters and collected her books, and from her bedroom the most alarming notes came to them, keeping them up to the mark, expressing with a masculine tone in her voice her surprise or her scorn, and now and then a touch of praise. 'The more zeal I feel—the more indifferent you.' 'Can you answer a plain question?' 'You told me positively there was nothing to be done.'

She always feared she would not last long, and meanwhile for the life that remained, there was so much to be done. What was the nature of this illness which kept her imprisoned to her bedroom, yet left her so much energy? It was to spare her existence until she was ninety years of age. It was no ordinary sickness, surely.

Can we doubt that the malady of Florence Nightingale was in her spirit, and was connected in the deep recesses of her unconscious mind with her deliberate choice to exchange love for self-sacrifice and to mortify every instinct of a woman? As she grew older, the energy of love became changed into the dynamic force of power. She could concentrate upon what pleased her and not waste her days in sociability. Just as she had turned her back on the drawing-room as a girl, she now renounced the pleasures of society. She made her bedroom a cloister in which she was ruling abbess, and skillfully used her illness to bring the leaders of the country to the steps of her throne.

She was now a legend, and those who had succeeded in gaining an audience found a white room, full of flowers, and a large woman with a massive head covered with parted silver hair, a head that reminded them indeed of Mr. Gladstone's, and like all achievers, she was a vivacious talker.

Princesses would ask to be allowed to see her, for even royal ladies have feminine curiosity, and Florence Nightingale was interesting as a woman who had enlarged the boundaries of what a woman can do. She would receive these great ladies without etiquette except the supremely impressive ceremonial of her throne room of a sick chamber, but only if they had proved a personal interest in hospitals or nursing. Her intuition would probe into the recesses of their souls, test pressure here and there, discover just how much they could be used to further her crusades. Whether men or women, she judged them by the degree

of allegiance they were capable of giving to her ideas, and behind her ready conversation and bright smile, there was mystical penetration they could hardly resist. Young nurses admitted fluttering into the presence, would be questioned by the slangy old lady about the hospital, their religious views, and even their flirtations, for outwardly she was a little more tolerant now. 'God meant me for a reformer,' she said, 'but I have turned out a detective!'

She had always revered the military sex. To her the soldiers were supermen, but they were also impractical children. She was unable to accept them as partners or equals, but she could always mother them and repair their stupidities. In her heart, her strongest feeling for men was pity without deference, like that of a foster mother for a stepchild. In her eyes, men were the incompetent sex, the dear bunglers, constantly trying to do things beyond their capacity, such as managing hospitals and drawing up regulations for nurses. Man lacked woman's divine ruthlessness. Her sharp sense cut through their elephantine capers, and with the realism of the woman with no prejudices, she would put her finger on their blunders made chiefly because they were perpetually chasing something which had nothing to do with the matter in hand.

But if she pitied the male sex, she had for females a definite scorn. Their qualities made them good, practical nurses, but they had no power of organizing either themselves or others. 'Women are unable to see that it requires wisdom as well as self-denial to establish a great work,' she said tartly. Those dear things could work themselves to the bone, but they were quite incapable of a little self-control over their emotions, their spites and resentments.

9. THE DANGERS OF FASHION

Having founded her order, Florence Nightingale was faced with the problem which has perplexed every leader in history who has organized a new faith. Who was to be her successor? and how were the rules she had discovered to be preserved? Deep heart searchings and prayer made her invest each act which concerned her nurses with a deeply religious meaning. Possessing none of the evangelical composure of Mrs. Elizabeth Fry, Florence was tortured by doubts. She had no children of her own, and so all her nurses were her children always. A new superintendent had to be found for the Nightingale School at St. Thomas's for the estimable Mrs. Wardroper, though many years younger than Florence, was considered too old to remain in charge. Her successor, duly consecrated from those trained in the Nightingale tradition, committed the grave indiscretion of joining the Roman Catholic Church. Naturally, she had to go. There was no room for another faith, and Florence was faced again with the agony of choosing the right shepherd of her flock.

Not only the choice of the shepherd, but the lore of the flock. How were those principles of hers to be perpetuated? The nurses' healing touch—how was she to learn it? Florence Nightingale scorned the routine minds who tried to make nursing a mere routine of practical rules, for no living thing can lend itself less to a formula than nursing.

The gentle Saint Francis of Assisi for whom every living thing, bird, beast and flower, was full of reciprocal tenderness and understanding, lived to see the beginnings of discord in the order of the monks he called his little brothers, and even before his death, a most unholy and decidedly un-Franciscan series of disputes broke out among disciples who were vowed perpetually to mutual love and humble obedience. Spiritual ideas it seems have the power of living only in a spiritual medium, and what-

ever might be its practical expression in hospital routine, Florence Nightingale had always insisted that nursing required spiritual preparation in those who followed her.

It was her fate to live to see her personal creation split from top to bottom. She was a middle-aged woman when there broke out a wordy and most unspiritual argument not as to how nurses should be trained, but how they were to be organized. No one would have questioned her authority upon the daily work of a nurse, but there were actually people who wanted nurses to be professionalized. 'We are becoming the fashion,' she said, 'we must be on our guard.' It had been all right in the early days when nursing was adventure. In the heroic first Canto of the Saga, its recruits came forward from the right motives, and they were prepared for self-dedication. But now becoming a nurse was respectable, it was orthodox, and nurses were seeking for an established position, rather than for perilous excitement. A body called the British Nurses Association (formed on the model of the doctors' body, the British Medical Association) began to agitate for a register of all nurses. Florence Nightingale was horrified.

How was any register to certify a nurse's moral qualifications? Nurses could not be registered and examined any more than mothers. She had not created the calling out of zeal for examination standards, but out of love for self-sacrifice. Those pioneers of hers had not followed her to Scutari because they would be learning a profession with fixed hours and salaries, but from much simpler motives—excitement, devotion and the glamour of war. Because nursing was started in a war, did it mean those native emotional qualities were dead in peacetime? Certainly not, said the old lady who no more cared to be thwarted than Queen Victoria herself.

The pro-registrationists were very strong. But Miss Nightingale

was very influential. She appealed to a primitive force deep in womanhood, a dislike of being caught in a mould. She knew female instincts to be as unchangeable as life itself, and they were crying out that the craft of nursing should continue to develop by its own mysterious laws, that it should remain a calling to which girls were drawn by an impulse within themselves, rather than by rules or any register of names kept in an office.

The registrationists tore these arguments to shreds. Scornfully they proclaimed that nursing was a technical profession needing standards, scales and status to prevent human goodwill from being exploited, and to curb imitation and fraud.

Florence Nightingale prayed against such blasphemies; she searched her heart for mistakes she might have made and which might have led to this disastrous change in her dear calling. A strong sense of guilt was in this woman's nature, and now she bitterly reproached herself with failure. Perhaps she had been an unprofitable servant, and the responsibility for this division in the ranks of her beloved nurses was to be blamed upon her own shortcomings. Old memories of struggles with conscience returned. Behind the serene exterior of that talkative old lady in a sick room filled with flowers and blue books, there was a self-tormenting saint who still mortified her spirit as harshly as in days gone by she had starved her flesh and turned her back upon balls and parties in order to bend over the bed of a sick pauper. Was the secret of failure, perhaps, that she was not a whole woman, but one compelled to do her creative work out of frustration?

The hours which the bright old lady spent in bed grew longer, and as the twentieth century brought female emancipation nearer, the great gladiator for the right of the woman to devote herself to a calling of her choice, sank quietly into a second child-

hood. She was ninety years old and everything she desired was so far away. The Crimean War was almost as fabulous as the *Iliad*. Gladstone and Palmerston were embedded in history and dear Lord Herbert was romance departed. Monckton Milnes, the poetical statesman, and political poet who had wished to marry her, had pursued that great career in which Florence had feared to become entangled. He had written a biography of Keats, he had helped to launch the poet Swinburne, he had visited America, had married, become a peer of the realm. Perhaps his poem 'Shadows' quoted at the beginning of this chapter, was the only memorial of his first love for her which had hardly been shared.

The old lady nodded among her blue books and her memories, while even more militant but less inspired women took up the cause of feminine freedom. When the Order of Merit was given to her by King Edward the Seventh, she hardly realized her triumph.

10. OCTAVIA HILL—THE GENIUS OF HOMES

Florence Nightingale believed in hospitals, Edwin Chadwick dealt in workhouses. But it was fortunate that a few people bent on reform still took notice of the centre of the family, the house and home. In all this healing of the sick, and preventing disease, the planning of good houses, and their grouping into healthy towns and cities had almost been forgotten in the Victorian age. John Ruskin preached beauty as a principle, and William Morris taught that no household utensil was really beautiful unless it were fitted for its purpose. But who had shown how dwellings must be built, to be both beautiful and healthy? Chadwick and his friends had not done it. We have not solved that problem even yet.

We go back to that eighth child of the Wisbech corn merchant who had married his children's governess, the learned daughter

of Dr. Southwood Smith. Octavia was brought up by him, her grandfather, and absorbed the singular sweetness and wisdom of that health reformer. She burned to do something to cure the evil and misery in the world.

She had vague artistic talents, but her real gift was human sympathy, and she became involved in welfare work among girls employed in a toy factory. But to Octavia Hill the greatest man in the world was John Ruskin. Through her grandfather's influence she came to know him, she read all his books as they appeared, and his love of God and his zeal that life should be beautiful on earth became her gospel. Octavia grew to be an artist who worked with lives.

Her interest in the lives of the working girls drew her into the question of the sordid places where they lived, or as later ages would call it, the problem of the slums. In spite of Edwin Chadwick and his boards of health, both general and local, the great majority of English people in cities lived like beasts, overcrowded, dirty and without sanitation. Octavia sighed for money to become a landlord and to provide really good accommodation for the poor! She took her troubles to John Ruskin, who quite agreed that if some socially minded person were to own the houses, enormous good could be done. 'But what about you?' inquired Octavia, and the great dreamer winced. He had not time to attend to such affairs himself, but if Miss Octavia would look after the houses, well—he would lend her the money. The interest on the loan would be five per cent: not that he cared for money, but if the thing were put on a business footing, others would follow. Octavia could not fathom the psychology of those who would help people only on a basis of five per cent, but if Mr. Ruskin said so, it must be correct.

This was the beginning of a great housing experiment. Cautiously Octavia bought one tenement, white-washed and painted

the rooms, arranged the stables for her tenants to have their social parties. This girl whose father's commercial life had not been exactly crowned with success became a shrewd business woman, clever at persuading rich men, even intellectual rich men like Ruskin, to let her handle their money, and wise at investing it in leases and freeholds. Her talent for managing house property would have made millions for an Investment Trust. As the years went on she had her 'estates' all over London, and was obliged to train a corps of assistants. They spent their days seeing about leaking cisterns and defective roofs. They worried themselves over unreasonable tenants. They spent themselves entirely in the family problems of those slum wards, and they had their human satisfactions.

Octavia Hill was not thinking of abstract environment; she was thinking of lives; and soon the lives of her tenants came to be more important to Octavia than her own. She never forgot that 'the poor' were not looking for uplift, but they valued pleasure, gaiety, friendliness, and so she always made provision in her estates for social gatherings, dances and beanfeasts. Her inspiration came from Ruskin and William Morris, but her days were passed in a world they could not conceive except through a romantic glow, a world of crowds and brawls, bedrooms and washhouses, children and poverty, with the pub and police court as its opposite pillars.

Not content only with clean bedrooms and parlours, she arranged open spaces near the houses. Mr. Ruskin was so impressed by that that he even sent his gardner to plant the trees. She founded a society to preserve the few bits of open land left in the metropolis and to prevent energetic speculators from running up houses on them.

As her work extended, so did the problems. 'My difficulty is always to secure the small graciousness by the thoroughness of

the out-of-sight detail.' This exquisite thoroughness alone seemed to make her work true, but such women are tiresome to the worldly administrative mind. There came a moment when even the testy prophet Ruskin began to doubt her work, and he wrote ponderously, like the Isaiah he was: 'My question, a very vital one, is whether it really never enters your mind at all that all measures of amelioration in great cities . . . may in reality be only encouragements to the great evil doers in their daily accumulating sin.'

But Octavia Hill did not allow herself to be too upset by Mr. Ruskin's preoccupation with evil, for she herself was one of the angels of light. In dealing with her tenants, she had the human touch. 'Neither punishment, nor reward, nor rule, is what we hope most from, but *supervision,* a glance, a look, a bringing things to light.'

How she loved the very poor man in one of her houses who could play the violin. How much she worried over the French polisher at number 33. She could pass lightly from a dispute over a public house to a wonderful party given for three hundred costermongers. She was thrilled by the truly dramatic occasion, as when one of the women in her tenements suddenly cried out that her baby was dying. Its eyes were glazing over, and indeed it looked half dead, and Octavia called out, 'A warm bath at once.' While someone fetched the doctor, the baby was put in the bath, Octavia filling the kettles, procuring a tub and managing everything. The baby revived miraculously, and when the doctor came, he said they had done the right thing. How happy she was.

She favoured 'the amelioration of the poor without almsgiving,' yet she was always giving herself, her own personality, her own essence. She hated officialism, she despised State and municipal management of housing estates.

She loved taking over a wilderness of bricks, a space covered with rubbish and abandoned to neglect, an unpromising wilderness in the centre of slums. Then, deliberately, like a potter fashioning clay, she would burn up the rubbish, build a railing, plant trees, grass, make a playground, and behold an oasis was created. If we want to find a quality which is the very opposite of Chadwick's statistical conception of human existence, we can take Octavia Hill's belief in human values and wish that she had been given Chadwick's opportunity.

A woman immersed in this experience seemed to have no time for a personal life. Yet her sensibilities were sharp, she loved drawing and painting, was fresh to new aesthetic experience, and was anything but the lonely recluse that Florence Nightingale became. 'We are bound,' wrote Octavia, 'to use all power of enjoyment as much as we can, provided no duty is left undone.' Her faith never failed. She was content to serve, and her methods were those of the artist and never of the organizer. Her knowledge of the way the poor worked out their lives gave her ideas that have become the code of social workers today. She was all for spontaneous work as against hard routine. 'My only notion of reform is that of living side by side with people, till all that one believes becomes livingly clear to them.'

She gave an impression of great force and energy, yet was an unobtrusive, plainly dressed little woman, everlastingly knitting, with hair parted in the centre, and a face suggesting great sweetness.

Octavia Hill was essentially one of those compact Victorian women who worked their wonders because they never had any doubts that the deity was the centre of their cosmos. She wrote outside one of her houses: 'Every house is builded by some man; but He that built all things is God.' Yet the same woman knew exactly how zinc gutters should be constructed to prevent the rain coming in through the roof.

Thomas Carlyle wrote of her: 'I never heard of another like this one. The clear mind and perfect attention, meaning nothing but good to the people, and taking infinite care to tell them no lies.'

Time came when vestries and parish councils almost begged her to take over unsatisfactory houses. Just as the magistrates of the City of London begged Mrs. Fry to take charge of the female prisoners in Newgate, the authorities of London who simply could not manage their tenants, implored Octivia Hill to remove the burden from their shoulders. Once she was telling a sanitary inspector that she might be willing to purchase a group of dreadful houses. But would the parish allow her to have a small open space beside them? 'Madam, I speak unofficially,' he replied, 'but it's my belief that the parish would let you do anything you like if only you would buy those houses.'

When Octavia Hill died, a few years before the first World War, an old lady in her seventies, she had done something to correct the arid bias of Edwin Chadwick, she had humanized health and welfare. In her, the gentle spirit of her grandfather, Southwood Smith, had lived like a warm glow, lighting up all her work, making goodness attractive, bending human environment to the shape of human life.

She was a healer of social misery, a physician of the environment, an ameliorator, an improver of conditions, rather than a great reformer or prophet such as Florence Nightingale. Octavia Hill's genius lay nearer the equable spirit of Mrs. Elizabeth Fry, both of them threw their mental energy into those they loved and wished to help, and both of them were largely incomprehensible to the masculine mind.

Great wars have passed. No one has discovered the way to produce houses beautifully on a large scale. But Octavia Hill came nearer than anyone to showing the secret behind housing reform.

She used no medicines, studied no diseases, but she understood that homes are more vital than hospitals. It is part of the blindness of physicians not to have succeeded in teaching that humble lesson.

11. A NEW WORKSHOP

The great century rolled on and the pioneers in the art of healing saw victories taking shape. Joseph Lister, the newest prophet, was subduing that great cause of pain, the burning inflammation of the human tissues caused by microbes. Surgeons had put away their Prince Albert frock coats in which needles and sutures for sewing up the human organs were threaded like hooks in a fly-fisher's jacket, and everywhere the old art of healing was being penetrated by science. Chemistry and bacteriology were to prove that human bodies are simply machines, and that to heal them means understanding their laws.

Florence Nightingale's pavilion system for building hospitals was accepted everywhere, even when her theories on which it was based became entirely exploded.

Today the pavilion plan is out of date, and hospitals are built in straight blocks of several stories. Tomorrow, who knows what will be the scientific architecture? Each of these modern hospitals has a place which was unknown in Scutari, and would have seemed unnecessary to Edwin Chadwick, though Florence Nightingale might have given it her cautious approval. It had the curious Latin name meaning a workshop—a *laboratory*—and those Victorian pioneers would have raised their eyebrows at the complex functions carried on there, and with a complacent wag of their bearded chins, they would have dismissed cultures and chemistry and microscopes as forming a mere side road leading nowhere. And if they had been told that in order to relieve the sufferings of human beings it was necessary to keep small animals

in cages and dose them with microbes, these confident Victorian giants would have said this was not medicine but madness.

Today we take for granted that there is a pure science of healing which can be cultivated apart from actual sick people, in rooms where microbes are grown like vegetables, where new drugs are made out of old poisons, where viruses unseen by any eye are measured, where a drop of your blood or a tiny speck of your liver can be examined like the core of an apple, and the secret malady of an individual patient may be measured in milligrams. This is all commonplace today. But the beginnings of scientific medicine were very different, and we can follow them in the career of a complex and fascinating person for whom biology was a religion just as nursing was to Florence Nightingale.

BOOK FOUR

CHARLES EDOUARD BROWN-SÉQUARD

CHARLES EDOUARD BROWN-SÉQUARD

How dull it is to pause, to make an end,
To rust unburnished, not to shine in use!
As tho' to breathe were life. Life piled on life
Were all too little, and of one to me
Little remains: but every hour is saved
From that eternal silence, something more,
A bringer of new things: and vile it were
For some three suns to store and hoard myself,
And this gray spirit yearning in desire,
Beyond the utmost bound of human thought.

TENNYSON, 'Ulysses'

1. THE ULYSSES OF BIOLOGY

CHARLES EDOUARD BROWN-SÉQUARD—read those names over slowly and think of them as symbols. How much they convey to us of the strange pedigree and unusual personal background of this man's life. Charles Edouard Brown-Séquard, it is not a name so much as a descriptive label; a compromise between French and English; it challenges us to penetrate to the heart of this man's fantastic individuality as he shoots zigzag over the scientific cosmos of last century, never staying anywhere for long, restless, creative, eager. To what race did he belong? Where was his springboard into life? What is the biological history of this Ulysses of Biology?

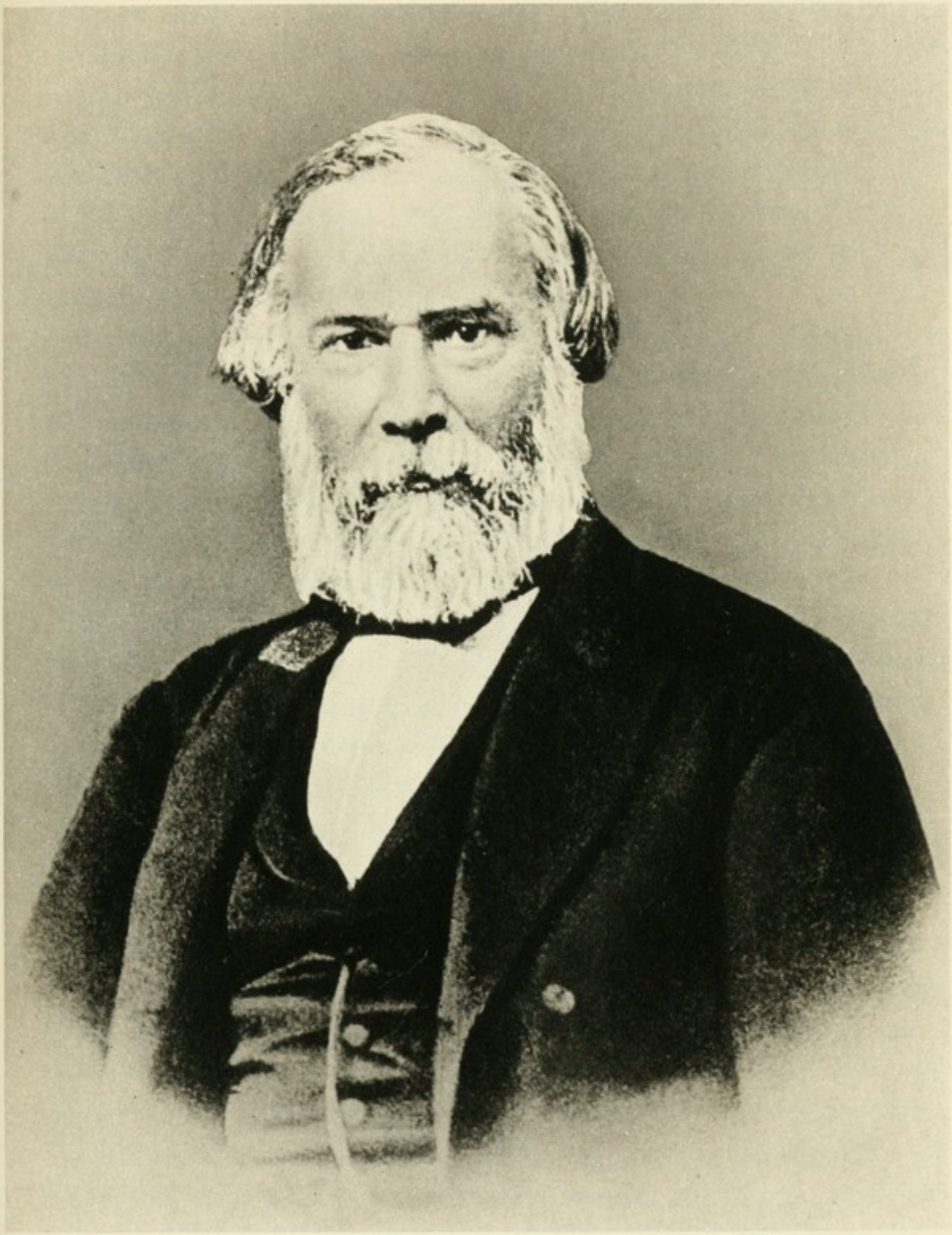
This wandering Ulysses of the early scientific age was born, not in one of the Homeric isles of Greece, but on an island in the Indian Ocean, twenty degrees south of the Equator and near the Tropic of Capricorn, the island of Mauritius. Apart from a few rocks in the ocean, its nearest land neighbour is Madagascar, five hundred miles away; and Durban in South Africa is fifteen

hundred miles distant. In Mauritius, a tableland of volcanic peaks two thousand feet high with a fringe of coral, our Brown-Séquard was born in the year 1820.

Mauritius, the Pearl of the Indian Ocean, had been colonized by Portuguese and Dutch sailors before the French came on the colonial scene, and Dutch its name remains; after the French came the British, and here the British stayed. In the veins of our scientific Ulysses born in this paradise of sugar and spice, flowed the lymph of many wandering peoples. He came from several races, and to which he belonged he never quite knew.

His mother, the *Dame* Henriette Charlotte Pelerine Séquard, was born in the neighbouring French island of Réunion, of which her mother was a native, though she had moved later to Mauritius and married Monsieur Pierre Paul Séquard, a true Frenchman born in Provence. The mother of our hero therefore shared two streams of blood, the one of Colonial French, the other a purer source from the soil of France itself, going back to the great days of the Bourbon monarchs. These people of Mauritius spoke their old patois, belonging to Louis the Sixteenth, and their chief town was called Port Louis. They were ultra-French, mannered and feudal, and even when Napoleon had passed away like a dead meteor, these exiles lived on in a French Colony as though a Bonaparte had never been, and even when the British declared the island a permanent part of the British Empire, the people of Mauritius remained French in language and spirit.

Old decayed towns in tropical harbours have power to excite the temperate blood of the white races, as can be felt in Joseph Conrad's story *A Smile of Fortune,* written about Mauritius. In the last year of French rule, a skipper from Philadelphia had guided his ship into the haven of Port Louis, and the magic of that place cast a spell over him. This sailor from



CHARLES EDOUARD BROWN-SÉQUARD

Philadelphia though American born, came really from the West of Ireland, from Galway. The skipper's name was Edward Brown, and he fell in love with the Demoiselle Charlotte Séquard who was beautiful and twenty-three. They were married by the Registrar in Port Louis according to the rites and formulas, not of the Catholic Church, but of the Code Napoleon. The expatriate sea captain now made his home in Mauritius, and returned to Port Louis after each voyage.

In 1817 famine occurred in the island, and he set out to Bombay 2500 miles away to pick up a cargo of rice, and when he had secured this precious relief he set sail homeward to Mauritius. Madame Brown waited for this homecoming and prepared a special welcome, for now after three years of marriage she had something very exciting to tell him. Weeks and months passed, but no sign came of Captain Brown's ship.

Was it a cyclone, or pirates of the Indian Ocean? No one ever knew for certain. But the ship never sailed into the harbour of Port Louis. And it was under the tragic shadow of his father's unexplained disappearance that the little boy was born in a street of the old town, known as the Rue de Shakespeare.

Here again we run across the power of a name to excite the imagination. Like William Jenner he has the compulsion of a symbol. Surely an imaginative boy born in Shakespeare Street will want to be a poet. He was brought up by the Séquards, his mother's people, those patois-speaking French Colonials. When Charles Edouard was a child, a devastating fire swept over the town and his mother just managed to carry him away to safety. After this they moved out to a more salubrious quarter, on the hill outside the town. Mauritius became, after the Treaty of Paris, in 1816, a British possession, so that now they must all swear a new allegiance, this time to King George the Third, and one more complication is added to the already complicated

heredity of Charles Edouard. He has now become of British nationality. In the year when Napoleon died, on another tropical island, Charles Edouard was already finished with his school days spent at a boarding-establishment just outside Port Louis. Grandfather Séquard had helped with his education, but the family was not well off, and to increase her income, Madame Séquard sold needlework through an old negress servant who acted as her go-between among the ladies of Port Louis.

When Charles Edouard was fifteen, there was no point in his staying at school any longer, and since in Mauritius there was no college, library or any range of cultural opportunity, he became one of a group of clerks in one of the importing houses on the waterfront and kept account books for everything, from bales of cloth and bags of sugar, to novels and hairpins. In their sweltering warehouses these young French Colonials had one perfectly satisfying resource—conversation—and they talked not of sport, but of art, literature and Paris. They spent days comparing verses and acting plays. Their mental food was the three-months-old gossip of the salons of the Fauberg St. Honoré, and the echoes of those new experiments which Victor Hugo and Alexandre Dumas were making on the French stage. Among these victims of the artistic passion, the most fervent was the boy who had been born in Shakespeare Street. Charles Edouard's verses were outstanding, his friends considered; he had the true inspiration, everyone agreed, and they acclaimed him a poet and decided that at all costs he must go to Paris, the world centre of culture. It will be noted here that they thought of Paris and not of London.

There is indeed a psychology of the island born, just as there is of exiles. What can be more ardent, more nostalgic than the passion of those ambitious Colonial youths who fear they will

never share the delights of the centre, never taste opportunities which every urchin in the capital takes for granted? There is something, too, in the passion of mixed blood to be drawn towards the place where its prestige comes and where it fixes the more lofty and more acceptable side of its nature. In the brilliant capital of France, mixed origins were no disadvantage. Compared to them, our Charles Edouard's blood had decidedly more of the pure French. But he possessed the island psychology, and to the youth of that age there was one illustrious exemplar of what might be done by an adventurer not born in France. Was not Napoleon the supreme case of such a conquest by the island outsider?

Charles Edouard had no difficulty in persuading his mother that he must go to Paris to realize himself in blank verse, and after weeks in a sailing ship they reached Nantes in 1838. He has begun his career of a wandering nomad, both in space and in psychology.

Henceforward, Brown will be always chasing Séquard. In his arteries, his nerves and glands, the skipper from Philadelphia argues against shrill tropical French, and the speculative dreamer fights the logician. He will never manage to reconcile the two personalities inside himself. For the next forty years he will never quite make up his mind whether he is French, American or English, or a stateless wanderer in the realm of science.

2. LATIN QUARTER TO WHIRLWIND

In the Rue Ferou, a narrow alley leading to the square of St. Sulpice, the colonial lady from Mauritius takes up housekeeping and opens a pension where she soon has her rooms full of boarders from the tropic isles. Her son, already twenty-one,

haunts cafés and literary circles. He has managed to get an introduction to a celebrity of the period called Charles Nodier who was the patron of an exclusive artistic group known as the *Cenacle,* named probably with irony, after one of those religious devotions which centre around the commemoration of the Last Supper. Before this loquacious set of literary enthusiasts, Charles Edouard was in due course permitted to read his tragedies in blank verse.

The boy from the warehouses of Port Louis who was born in the Rue de Shakespeare declaimed his lines before the pontiffs of that college of critics, and Charles Nodier, the Pope of Art, himself pronounced the verdict. His criticisms were severe, and his authority unquestioned.

Not long before this date, another youth named Claude Bernard, who had come up to Paris from the district of Burgundy, had also submitted to experts a play in blank verse of his own composition. The judgment had been negative and Claude Bernard was recommended to put poetry out of his head and take to some other manner of livelihood. This particular advice turned out to produce magnificent results in the intellectual life of France, and we shall meet Claude Bernard later in these pages.

Once again, Charles Nodier felt obliged to give sentence of literary extinction, this time upon the hopes of the would-be Shakespeare from the Indian Ocean. We can imagine the tropical storm of anguish that swept over him as he realized that those wonderful poems and splendid imagined characters which had so charmed the boys of Port Louis, entirely failed to register any favourable impression upon the devotees of the *Cenacle.* The poetical ambitions of Mauritius vanished like the tropical mist, and the boy faced the hard truth that he must find some other way to distinction. Claude Bernard had turned from the drama to another form of creative activity that seemed even more daring,

and now, Charles Edouard took the same course and became intoxicated with science. In 1840, *La Science* was thought capable of all miracles; it promised wonders to the whole of mankind. It was a new sort of poetry, its laws were omnipotent, its authority infallible, and Charles Edouard deflected his enthusiasm away from the literary dream into the certitudes of exact knowledge. He became a student of medicine.

We can pass quickly through the hard times which were enough to test his fibre and restore his self-belief. A boy who has had no education except in a Colonial boarding-school finds it hard at the age of twenty-one to pass tests which the city-schooled youth of fifteen surmounts with ease. Feverish late-beginners like Charles Edouard see the whole world rushing past, while they themselves seem to be standing still. They must hurry or they are lost, and Charles Edouard began the drama of his second vocation with theatrical precipitancy. Mentally, he was more mature than his rivals, and he started a routine of impetuous concentration. A few streets away, also in the Latin quarter of Paris, Honoré de Balzac was writing furiously all the night through. And now Charles Edouard began the habit of rising from bed early, when the streets are cool and the only part of the universe that seemed fresh and alive was his own brain. While dissecting a dead body, he pricked his finger. Sepsis entering through an invisible puncture in the skin swept over his fatigued body like a cataract. Fate had taken notice of this presumptuous youth who challenged her rule that intellectual accomplishment comes only with the aid of time.

In weeks of blood-poisoning he was lucky not to lose his life or his arm. But fate, having taken the trouble to fetch him half across the world from Mauritius, and given him a desperate sense of vocation, did not mean to destroy him, but only to administer a lesson. Madame Brown nurses him back to health

in her pension in the Rue Ferou, and feebly he resumes his University courses and his austere routine of early rising and ferocious concentration.

Already he had the faculty of gathering intellectual disciples. That power was natural to him, and it grew each year. His group of personal admirers, now on the waterfront in Port Louis, later in the Latin Quarter, became an everwidening circle in three capitals of the world, and wherever scientific journals were read, Brown-Séquard's voice would be heard with respect. His power to arouse fascination for his personality and ideas was his unique asset. He recovered from the blood poisoning and was well on the way to graduation.

But with Charles Edouard no line is ever a straight line. Just when he is fairly launched upon a settled course towards his aim, some major or minor disaster was sure to present an insuperable obstacle; when he most of all needed to be shielded and protected so that he might finish his medical studies, he lost his mother.

It might have been better for him to lose his arm, for she was the goddess, the fixed centre of his emotional life, and now at her death all he had believed in and hoped to achieve passed away like a dream. Life had lost all savour, and he cared no more for *La Science*. Dramatically announcing that he was finished for ever with the Latin Quarter, that for him the intellectual life was over, he left France by ship for the one place on earth where he was really at home, and which can remind him of his mother's protective care and provide him with a substitute for her love.

Yet as the sailing ship rolled around the Cape of Good Hope and drew near the Indian Ocean, Charles Edouard found his inspiration return. Science, after all, was his life, and it happened that chance on this voyage away from science gave him a sudden practical opportunity of making a laboratory experiment,

for the ship was overtaken by a cyclone. The one naturally scientific person on the ship kept his head, and made accurate observations, noting just how the wind struck the rigging with gathering force, and how, after the period of ominous calm, it reversed itself with furious unwinding of atmospheric power. Even the typhoon was friendly to such a temperament as his. He has found by intuition the correct way to look upon science: not a collection of dogmas kept up by a priesthood; but precise use of the senses and the mind, leading to grand laws of causation. His father, the Philadelphia skipper, had perished through some such natural cyclone in those very seas, and now perhaps a parental ghost gave him the eyes and ears of Hamlet, and led him to study the cause of his father's undoing. That was another interesting mental characteristic of Charles Edouard. The whirlwind was the most appropriate symbol for his emotions, but in the most exciting combination of new experiments and original ideas, this mercurial person could keep his brain perfectly calm.

And now the wanderer who had turned his back for ever upon Paris, who had promised himself a life free from intellectual exertions, sailed into Port Louis and read his first scientific paper before a learned assembly. It was the Société Royale des Arts et des Sciences. His subject was 'The Whirlwind.'

3. THE BALZAC OF SCIENCE

In intellectual Paris of the mid-century, the outstanding personality in the Science of Biology was now that would-be writer of tragedies, Claude Bernard. The man from Burgundy had swallowed his disappointment and taken up medicine and become assistant to the great physiologist of the previous generation, François Magendie, who had said to him: 'The medicine I am teaching you is a science in the making.' That revolutionary

thought Claude Bernard always remembered: for at the time when he was beginning his work, medicine was very far from scientific, but he was to help to make it more so.

'A science in the making.' Was the ancient art of healing sickness then to become a pure science, like chemistry or geology? Was it to be possible to reduce the treatment of human pains to a precise formula which could be learned? This indeed was the fundamental faith that Claude Bernard acquired from Magendie, and his whole subsequent career was a strenuous effort to realize it in his laboratory and his lecture room.

To the men in the 1850s, science was the new faith, science was a whole philosophy of existence. And medicine was a part of science, just as prayer was a part of religion. In fact the scientists had merely dethroned religion in order to set up a church of their own, and men like Claude Bernard were composing the theology and inventing the myths. One day, they whispered to their intimates, science would have the power to create life. Biology would then be omnipotent; but first let its rules be discovered through experiment upon animals, after which the knowledge could be transferred to man. His exaltitude, man, lord of creation, possessed heart, liver, intestines, composed of the same materials which functioned in the same way as the organs of rabbits, guinea-pigs, mice. Laws which applied to the one applied to the other, and these laws belonged to the new chemistry and physiology rather than to old traditional lore of the physicians and chirurgeons.

Claude Bernard, the child of vineyards in Burgundy, had been educated by Jesuits, apprenticed to a village apothecary, and entered the Medical School of Paris at twenty-one, and there he had transferred the hero-worship which had so come to grief at the hands of Charles Nodier to his professor in the Faculty—François Magendie to whom he now became laboratory assistant.

Claude Bernard was a purely scientific man, and never bothered himself with sick patients. He had thrown himself into the poetry of science as a revenge for his lost literary ambition, and now began a life of working himself slowly to death in a miserable underground room near the Boulevard St. Michael. The actual neighbourhood had a tradition of biological experiment, though of quite a different kind, for there had lived that notorious Dr. Joseph Ignace Guillotin who, in the days of the Revolutionary Terror, had invented his sinister appliance for decapitating unwanted citizens of France which has given him horrible immortality, and tried it out first upon the necks of sheep.

After many experiments in his dank laboratory, Claude Bernard was to find that the liver had the power to store up sugar for later use, and that this hidden sugar could be mobilized quickly and brought into use from the liver when the body needed it. This storage in the liver was the most beautiful chemical process, and one of exceeding simplicity. Sugar and starch are taken as food. The body breaks it up, converts it into a slightly different chemical substance called Glycogen which is then hoarded in the liver. When the muscles need energy for a sudden spurt of activity, the Glycogen is quickly brought back into service and converted into sugar once more. The alternating mechanism of storage and use is so practical that we almost feel we might have invented it ourselves. Such is the power over the mind of a great law of physiology once it becomes established. But when Claude Bernard discovered this sugar-strong faculty of the liver it was a blinding light in the darkness of centuries and out of the work done in that dark cellar of Dr. Guillotin's house has come the modern knowledge of diabetes.

While he was making his way so calmly from one physiological

law to another, an erratic exile from the schools was burning with impatience in Port Louis.

Echoes of Claude Bernard's fame in Paris passed over the seas to Mauritius, where Charles Edouard was already becoming tired of that programme of idleness which he had laid down for himself. Smells of the laboratory, animals in cages, the thunderclaps of scientific discoveries, all such distant memories roused his desire to be back again among his pupils, and made him deeply regret his decision to forsake the intellectual life. Then, impulsively as always, he took a ship back to Europe, and was once more in his old haunts near the Luxembourg Gardens, where much refreshed, he renewed his old prodigious efforts of concentration and managed in due course to graduate.

As a tribute to his mother's memory he now expanded his name to Brown-Séquard, thus emphasizing his twin personality of two characters awkwardly joined into one. He was no longer an amateur researcher; he was now an experienced worker in physiology, burning to make discoveries, as fanatically devoted to his biological experiments as a priest to his devotions. Charles Edouard had his laboratory, or at least that was the name he gave the room where he lived and slept among his animals. Around him in cages were guinea-pigs and rabbits, on his table were apparatus, papers and scientific journals. We remember that chloroform, even for human surgery, did not come in until 1847, and the majority of these early animal experiments, and many of the later ones, were done quite without anaesthesia. The horrors of such a private laboratory might have sickened a sensitive man. But not so Brown-Séquard. Impervious to the disorder, the sounds and smells of the room, here he worked, ate, slept and dreamed, spending as little money as possible on food, drinking water instead of wine. Often one of those rabbits which had been a victim to science during the early morning would form the scientist's supper that same evening, so that he literally de-

voured his experiments, and they devoured him. Occasionally from this squalid room he would venture forth to the hospital or to lectures. Yet he was not exclusively a laboratory worker as Claude Bernard was. When cholera came to Paris, Brown-Séquard threw himself into the adventure, made in the Groscaillaux Hospital observations on the epidemic, just as coolly as he had done on the whirlwind. Here he developed his theory that opium to soothe the stricken victim of cholera was more valuable than bleeding the patient which was then the fashionable treatment.

He had now become a hermit of that novel science of biology which Claude Bernard was helping to create. This new universe was the physical functioning of the human body, and the laws about it that were known were indeed few and paltry compared with the surrounding void of the unknown into which Brown-Séquard, like Claude Bernard, burned to adventure with all his gifts and all his life's energy. He locked himself into his laboratory, impervious to all distractions, never frequenting the café or the opera, but keeping near his working-table.

The year of Balzac's funeral, 1850, is indeed a landmark of a new age in the history of human experience. The old way, Balzac's way, was to build up great conceptions, to evoke life on a classical model, to see events and their causes as part of a continuous process of tradition. But now science was to take the lead; and the science of the nineteenth century was concerned with detail, with breaking down and analysing those great ideas and grandiose formulas of the past. Every phenomenon had to be examined, proved over again by experiment, and nothing was accepted on tradition. The scientists laughed at the romantic notion that human life was controlled by such a thing as a soul. Why, human life was nothing but chemistry, nerves, sugar in the liver, blood in the arteries. Balzac, worn out at fifty-one by his nocturnal labours to create the grand pattern of the human comedy, Balzac the hermit of his writing, had made a great epic

of the life of France as a whole. His human art was external, and conceived on a grand scale. Now Balzac had died of the ten thousand cups of coffee which he took to keep his nerves alive through his creative vigils, and it seemed that physiology was to concentrate, so to speak, upon the nerves and the coffee, leaving out of account courage, imagination, vision, soul.

Brown-Séquard used his Balzacian fury for work to prove that man was less human than had been believed, and he proclaimed that a different version of the *comédie humaine* must be produced, a work of science, made up of facts on nerve impulses, data about secreting glands, units of electricity, grammes of salts and nuclei of body cells. Francois Magendie had said: 'When I experiment I have only eyes and ears, but no brain.' That was the guiding spirit behind Brown-Séquard's work in that foetid room where he discovered universal laws out of the writhing bodies of his experimental animals.

At twenty-nine, he made his first original discovery. By cutting certain nerve fibres in the spinal cord of an animal and noting the effect, he found something quite unexpected. The bodily sensations which pass along the nerves like an electrical current along a copper wire, came to a place in the spinal cord where they crossed over to the other side before reaching the brain; so that nerve messages from the right paw of the dog arrived eventually at the left side of the brain. Later this crossing of nerve fibres from one side to the other was found to occur not only in animals but in man also, and today that is a fact found in every text-book. But in the 1850s, like Claude Bernard's discovery of sugar in the liver, it was something of a revolution. Brown-Séquard had found a primary law in the working of the nervous system which was the real origin of a whole new department of medicine, that of neurology, the study of the physical nervous system.

He tried experiments to revive the dead. The cadaver of a murderer who had suffered by Dr. Guillotin's efficient invention, was brought to the laboratory, and Brown-Séquard injected into the veins fresh blood from his own arm. Within three-quarters of an hour the phenomena of life seemed to return to the dead body. Muscles flickered and certain tissues showed signs of vitality, proving that when we die, all the organs do not die at once, but that some remain alive for hours and perhaps longer. Even death, it seemed, was not so simple a process as had been believed. What a theme for physiology, to revive the dead, to bring back movement and function to living things by reversing the apparently irreversible processes of decay. The corpse of the murderer lay still, but the light of life flickered in Brown-Séquard's brain, and he was sure there were no limits to the achievements of the physiological method. He had shown certainly that the grim transition between life and nothingness was not an abrupt change as humans had always believed, but a series of small deaths, like lamps going out one by one. He could not arrest the process, though he could study it, and he concluded that before he might bring the dead back to life he must know more about the body when it was living. Brown-Séquard moved to another field and this idea of resuscitating the dead itself remained dead for nearly a hundred years, when Soviet scientists revived it, and carried experiments even further, but without yet reaching the final secret.

But now a new fact was felt in the scientific speculations of the Latin Quarter. Politics began to lay its hand upon science. France passed through one more governmental crisis as Louis Napoleon seized power, became President, then Emperor Napoleon III. Brown-Séquard began to feel uncomfortable. Though contemptuous of public affairs, he was, emotionally, a Republican and an individualist, and like other intellectuals of the cafés

of the left bank of the Seine, he disliked the tyranny of the Second Empire. The Emperor's police were too active. The Emperor's taste menaced literature, and his grasp seemed to threaten science. These workers in the laboratories were becoming known all over Paris and their work was eagerly discussed. They had now to face that danger which always lies in wait for original minds when arbitrary power claims sovereignty over the intellect.

These exciting discoveries made in the workrooms of the biologists were no longer kept secret or accumulated in private descriptions meant to be read by future ages. Science had become immediate and contemporary, and so much interest was aroused that the results of experiments had to be debated and discussed. A new instrument was coming into vogue; it reproduced all the chief melodies of the French genius, love of talk, passion for logical analysis, their belief in the efficiency of proof through argument. This means of expression was the scientific society, with its companion instrument the scientific journal. Throughout his long life, until the very end, Brown-Séquard was a zealous attender of societies, and a marvellous begetter of journals, and his literary instinct helped him to write papers that were clear and readable. With some admiring friends, he now formed the Société de Biologie and its meetings became a new outlet for his gregarious enthusiasm for science.

In spite of his increasing command over his technique and his growing reputation, he was not happy, and he blamed Napoleon the Third. This new upstart Emperor was the sort of man to think that science, art and academic affairs were questions for his imperial prerogative, and Brown-Séquard became vigilant and ultra sensitive. Perhaps he was a victim of exaggeration. Napoleon was inquisitive about scientific work and did indeed show friendliness both to Claude Bernard and Louis Pasteur. But in a deeper sense, our uneasy scientist was correct. The

French Emperor's influence was fundamentally opposed to intellectual freedom in France.

But Brown-Séquard could not help his apprehensions. Once again there was a crisis in his blood, and Brown came into collision with Séquard. On the previous occasion it had been Séquard who took him back to Mauritius: now it was the ghost of Edward Brown the Irish American which took command.

Like countless others who had gone to the new world to find spiritual freedom, Brown-Séquard sailed for America.

4. TRAVELS

His laboratory was closed, those inseparable companions, his guinea-pigs, dispersed, his place in the councils of the Société de Biologie given up. Anew, on a fresh experimenter's bench, he would begin his gamble for scientific honours, or perhaps, in the new world, he might even practise medicine. He knew hardly a word of his father's language, but as the sailing packet crossed towards Philadelphia, his father's birthplace, he picked it up as though by instinct, and soon spoke tolerable English. He plunged into the crude life of the American metropolis in the 1850s, bewildered by its indifference. People were more interested in railroads and stocks than in scientific medicine, and at first he found it hard to make a living. He attended midwifery cases at five dollars a time, and was even reduced to giving French lessons.

But Brown-Séquard was always a most convincing propagandist of his own merits, and before long he had gathered around him a few medical pupils, and his lectures on medicine were published in the *Philadelphia Medical Examiner*. He even wrote, in English, a text-book of midwifery which was afterwards translated into French, and which gave rather novel advice based on physiological principles upon how to revive a new-born child

which failed to breathe. He lectured in New York and Boston. But soon, Séquard began to quarrel with Brown, and during one of those phases of intense frustration and loneliness to which he was subject, he happened to meet a Miss Helen Fletcher of Boston (a connection by marriage of the Democratic statesman Daniel Webster) and at the age of thirty-six he married her.

They set up house in New York City, and Brown-Séquard threw himself into the effort to build up a medical practice. But the fervent materialism of America had the contrary effect in him of bringing out all his most European characteristics, and no sooner had he taken this irrevocable step than the desire for Europe became uncontrollable. He persuaded his wife to pack up and leave for Paris. No sooner had he arrived there than he decided that his real vocation in life was to practise doctoring on a sugar plantation in Mauritius; there was to be found bliss and freedom; there he would have leisure for endless experiments, without the jealousies of the city and the fatigues of civilization. So back to the Indian Ocean they set sail in 1854.

Charles Edouard usually managed to plunge into some unusual circumstance; the last visit to Mauritius had led him through the typhoon. This time, there was an epidemic of cholera. In Port Louis, people were sick and dying in every house, and those as yet unaffected were rushing away from the town to the higher ground.

We do not know what the feelings of the American-born Madame Brown-Séquard were, but her husband was perhaps the only person in Mauritius who regarded the situation with enthusiasm. Here was his chance to prove conclusively his personal theories about the treatment of cholera which he had maintained against the physicians in Paris a few years before. His offer of medical services to the bewildered authorities was received with deferential gratitude, and acting with his usual

whirlwind methods, he set up his hospital in partnership with a physician of Scottish origin named MacPherson, and between them they cared for some two hundred of the eight thousand cases which occurred in this epidemic.

We shudder at the squalor and misery of the humid town swept by this devastating plague of which no one understood the cause. Fear of the disease and desperation at their powerlessness to treat it, produced a kind of ruthlessness in medical treatment. Dr. MacPherson believed in drastic bleeding of the patient, with cold douches 'to support the circulation.' But Brown-Séquard followed the rule he had learned from François Magendie, a method founded upon sedatives and rest. He believed in opium to quieten the patient, to soothe his pain, to allow his body time to overcome the infection, and he argued with his good friend Dr. MacPherson that all this bleeding and douching was incorrect.

One day, on the floor of the doctors' room in the hospital, one of the sisters of charity who provided the nursing discovered Dr. Brown-Séquard lying comatose. It was soon discovered that he was suffering from opium poisoning. After heroic remedies, such as walking him up and down the room, and strong coffee, he was brought round, and a report was spread throughout Port Louis that he had tried to commit suicide. It is more likely that he was experimenting upon himself, and trying the effect of a still larger dose of opium. Or he may have felt some early symptoms of illness, and fearing that he too was struck down with cholera, decided to take prompt measures with the opium in which he trusted.

He recovered, however, and continued his observations upon the epidemic and persevered in teaching his medical colleagues. They must have found him a fascinating enigma, and he, accustomed to the tough medical dialectics of Paris and New York,

may have deceived himself that they accepted his ideas whereas, with tropical inertia, they merely acquiesced. When the epidemic had abated, the Governor of the Colony appointed Brown-Séquard and three other doctors to hold an inquiry into the cause of the visitation. They collected all the known facts, and made generalizations from them. But they could hardly come near the truth, for knowledge of the microbe causes of such a disease was to remain hidden until Robert Koch uncovered it in 1883.

Once the excitement of the cholera was over, Brown-Séquard had leisure to think of his future. He had come to Mauritius with the intention of settling down permanently, but now the prospect of living on a sugar estate, dosing Indian labourers, fighting tropical laziness in its protean forms, all this leisured existence which he had planned before leaving New York, now seemed unthinkable. Probably Madame Brown-Séquard realized even more clearly than her husband that this was not the sort of life suited to his gifts and temperament and that his idea of scientific experiments in such a place was an illusion. A worker in a far off isle of the Indian Ocean would hardly achieve the sort of renown he was looking for, however fine his achievement. Once more his passion for research took him by the throat, and he knew that he could be happy only in one place, the centre of the world's scientific culture, on the left bank of that river which ran through the capital of France.

His fellow Mauritians were sorry to see him depart. On the eve of his sailing for Europe there was a grand public reception attended by the leading personalities of the colony. A wonderful oration upon the future of research in physiology was delivered by the guest of the evening. He was presented with a silver bowl, and Madame Brown-Séquard with an island shawl. With plaudits from his brother islemen ringing in his ears, this citizen of the

world of science set his compass once again for the northern hemisphere.

5. THE GREAT DISCOVERY

Back again in his old haunts around the Boulevard St. Michael, Brown-Séquard set to work with the expectation of resuming his scientific career as though there had never been any interruption. He had overlooked the fact that while he was in New York, and fighting cholera in Port Louis, other men had kept close to their workrooms and lecture halls and had made considerable worldly progress during his absence. His friend Claude Bernard, only four years his senior, was now professor at the Collège de France and had become the acknowledged successor to Magendie, and (Brown-Séquard could not help a sense of envious resentment) others with a quarter of his knowledge were in positions of authority, and wore the ribbon of the Legion of Honour prominently on their jackets. Once more he felt the impulse to move, to wander, to explore, and his American wife reminded him that the United States is the land of opportunity. There he would be appreciated at his true worth. There he could found his own school of physiological research if only he will escape from this sordid Latin Quarter. Escape, ah yes, escape, this was always a strong motive with him.

With a bound, Brown-Séquard crossed the Atlantic once more and landed at the Hampden Sidney College, Richmond, Virginia. He began a course of experimental physiology, consisting of lectures and practical demonstrations. Charles Edouard Brown-Séquard was now a short, stocky man of thirty-seven, with long wavy hair turning grey, wearing a neat black frock coat. His personality bubbled and sparkled and was never at rest; as soon as he came into the room he was immediately preparing to leave. His college lectures were hardly models of clarity. One listener

said that to hear him was like being witness of an attack of spasmodic asthma. The majority of his students did not appreciate him any more than he understood them. They regarded this volatile Frenchman as a sort of stage conjurer, but they helpfully provided him with a small menagerie of animals which were housed in the basement of the college where, however, their howling was a disturbance to other lecturers.

Nevertheless, the scientific immigrant from intellectual Europe, this half-American Frenchman, did make an impression. He published a book *Researches on Physiology and Pathology* which caused certain academic people in New York to think of him later in connection with a professorship at the Cooper Union. But his relations with the other professors at the Hampden Sidney College were not satisfactory. Brown-Séquard was totally unfitted for a gregarious existence. He was naive and tactless, as one observer put it, 'displayed a surplus of honesty.' He insisted on talking all the time about medical research, whereas his professorial colleagues were more interested in other matters such as the state of the Union, their own salaries, and the ever important question of who was to be the next President. But Brown-Séquard was quite indifferent to such things. On one occasion, his wife had invited all the professors and faculty wives to a grand evening reception. When the guests arrived, it was found that the host was missing. He had gone to bed at his usual early hour in order to be up betimes to work next day, and all his wife's persuasions were in vain. Point-blank he refused to leave his bed for any such frivolous purpose as a campus soirée.

But there was one insurmountable barrier between Brown-Séquard and the students and teachers of the college.

These were the days just before the Civil War, and Negro slavery was still a legal institution in the Commonwealth of

Virginia. That quality of guilelessness which a friendly critic had termed 'surplus of honesty' impelled Brown-Séquard to speak out his mind on the subject. As one expecting to have his argument treated as an intellectual proposition, he pointed out to his American colleagues the theoretical objections to slavery, adding that, in point of fact, the British, of which nation he, Brown-Séquard, was a citizen by virtue of his birth in the British Colony of Mauritius, had already abolished Negro servitude for more than thirty years.

It can be imagined that such ideas, delivered with a large 'surplus of honesty,' caused an explosion among the pre-war Virginians. The result was that certain features of the little professor's physiognomy were noted with even closer attention, those large dark eyes, his bronzed skin and excitable gesticulations. Born in Mauritius, was he, thought these suspicious Americans, and they decided privately that by no means all the ancestors of this questionable stranger had been of the white race.

Abruptly and passionately Brown-Séquard broke off his course of lectures and sailed back to France. With all his talent for investigation, Brown-Séquard had not learned to know himself.

After the adventures in Mauritius and America, it was easier for him now to stomach professional competition on the left bank of the Seine. Here at least he was intellectually free. Unusual theories and their free expression were regarded as the natural right of a scientific man and a French citizen. Ideas were respected, and conversation was appreciated, there were journals, and scientific meetings; the Parisians did not share the colour prejudices of Anglo-Saxon people and it was taken for granted that a scientific man and a research worker must be eccentric, and that it was perfectly allowable for him to go to bed early and reverse the course of nature by working before dawn. Once

more Brown-Séquard settled down, and to the laboratory which he opened near the School of Medicine, students of physiology began to gather from all over Europe.

In his workroom in the Rue St. Jacques, he was now on the threshold of his greatest discovery. If he had achieved nothing else, this piece of work would be enough to make his name immortal in physiology.

He had happened to read a paper written in English by a certain Doctor Thomas Addison, a physician to Guy's Hospital, London, who in his practice had come across several examples of a peculiar disease which had not been described before by any of the classical physicians.

Its very rarity was fascinating to the scientific doctor, for after careful observation over six years, Addison had been able to meet only eleven cases. But all those eleven patients had the same features. Each of them took on a strange colour, dark brown, due to discoloration of the skin, and they suffered distressing symptoms, and since the malady was usually fatal, Addison was able to examine the bodies after death. The post-mortem examinations showed that they all had one feature in common. In every one of his eleven cases he found disease in a pair of tiny organs perched on top of the two kidneys. These insignificant organs had almost escaped notice, and no one had any idea what their function was. Since the Latin name for the kidney was *ren,* these small and quite independent organs were named the supra-renals, or sometimes adrenals.

At one of his early morning vigils Brown-Séquard had read Thomas Addison's essay, and its findings were at once transferred to scraps of paper and stored in an envelope as was his custom. The facts themselves fermented in his mind. Addison's description of the 'bronzed' disease, so called because of the

brown colour of the patients' faces, accompanied by disturbances in the adrenal bodies, was no more than a brilliant intuition; so far, the connection between the symptoms and the diseased organs had not been proved. It might be no more than a coincidence of nature. In a flash of his biological genius Brown-Séquard saw the exact way in which such a theory could be tested by an animal experiment.

He had soared into the scientific empyrean and found a most revolutionary conception. Perhaps the adrenal bodies, so long ignored and despised, possessed the power of sending into the blood and through its means to the whole body, a fluid substance which was profoundly necessary to life and health. What if lack of this purely imaginary substance, due to something being wrong with the adrenals, might be the real cause of Addison's 'bronzed' disease? That, at least, was a plausible theory.

In his usual decisive and ruthless style, Brown-Séquard gathered a menagerie of fifty-one rabbits, eleven dogs, cats, mice, pigs—using this wide variety in order to make his proof absolutely certain. From each one of them he carefully removed the 'adrenal' gland and waited for the result. If Addison were correct, and a connection really existed between damage to the adrenal body and the 'bronzed' disease, then all these animals should develop the symptoms of Addison's 'bronzed' disease.

He watched his wretched menagerie as though they had been a hospital full of patients.

There was no doubt about the result. It was decisive, it was final. These animals perished with symptoms as though they had been human victims of Addison's disease in the wards of Guy's Hospital, London. Something in the adrenal organ was necessary for health. Its absence produced Addison's disease.

No medical thinker before him had ever conceived just this idea of a particular organ of the body producing its own par-

ticular substance which acted upon the system as a whole. This juice was as yet quite imaginary. No one had ever seen it, or measured it, but Brown-Séquard had logically demonstrated that it ought to exist. But so far, the actual secretion had never been observed. There was no way of proving its existence except by argument from the observed facts. The adrenal secretion claimed existence only in Brown-Séquard's brain.

It is perfectly true that later scientists have criticized this crucial experiment of his, and said that those guinea-pigs, rabbits and pigs died, not from lack of adrenal secretion, but from the mere shock of the operation. That was perhaps correct, but it has not taken away the glory of his prophetic achievement and its extraordinary consequences in medicine.

Those first vivid observations were like the scraps of seaweed which Christopher Columbus saw floating in the sea off the Bahamas, and which proved that he was near a new continent.

6. LONDON

Brown-Séquard's unique personal reputation for an esoteric knowledge of the nervous system and its maladies had become a legend among the physicians of Paris, and he was often called in consultation over obscure cases. Scientific pupils from all over Europe and even from America, including the famous Dr. Weir Mitchell of Philadelphia, came to his laboratory to learn what they could learn nowhere else. In Brown-Séquard's lecture-room, those who could get over his excited way of speaking and who could keep up with the rapid torrent of his ideas had their minds enlarged to the potentialities of medicine. Here was a bold and very original thinker.

Yet all this successful accomplishment and the prospect of further distinction aroused in Brown-Séquard's nature deep perversity. Success awakened that slumbering nomad of the seas

who hated settling down. His fame spread in England following the publication of the adrenal article, and now, on an impulse, he crossed the Channel.

At once he leapt into popularity as a lecturer in the Royal Colleges of Physicians and Surgeons. He much enjoyed his reputation, talked brilliantly, and the next thing we hear is that he has decided to settle in London, and has taken a house at 81 Wimpole Street among the fashionable fraternity of doctors. The foreign medical man has always been welcome in London, and Brown-Séquard found himself at home with both doctors and patients. He was especially popular as a consultant in nervous diseases, and he was one of the first to use bromides in the treatment of epilepsy, a method which held the field for more than half a century until the crude bromide salts were replaced by more modern drugs.

Brown-Séquard possessed the temperament necessary for a medical consultant; he was encouraging and resourceful, but he had one marked idiosyncrasy; whatever the disease, he was certain to recommend the patient to give up smoking. Horror of its supposed evil effects was his obsession.

A lady suffering from paralysis had given money to start in Queen's Square, London, a new hospital 'for the paralysed and epileptic,' and Brown-Séquard was one of its first physicians. This institution was to become a world famous centre of research and teaching. A new kind of medical specialist, called a neurologist, was called into being by the new fashion which Brown-Séquard initiated about this time and he himself was its most prominent representative.

What a contrast his unbounded optimism makes with the melancholy career of the man who gave his name to Addison's disease. Brown-Séquard's outlook on life, though variegated with startling shadows, was the brilliant vision of exuberant vitality.

Thomas Addison was a victim of congenital melancholy. True, his struggles to establish himself in practice had been successful. After graduating in medicine at Edinburgh University in 1815, he had come to London and was soon making seven hundred a year from his teaching, against severe competition. Addison was an original lecturer, severe in his outlook, dogmatic perhaps, and he brought up his students to use such things as the newfangled stethoscope, and to employ weak electric currents for improving muscle tone in their patients. Outwardly, he was the thriving professional man, but inwardly he was tormented by doubt and anxiety. That heavy determined face, with the firm mouth, side-board whiskers, and frame of white hair became fixed as the years went on into an expression of dominant sadness. To be rid of his depression he would walk for hours and hours through the streets at night. He walked and walked to escape from his thoughts or to cheat them by bodily fatigue. Sometimes, he would run into friends on these nocturnal marches, and the report spread that the key to Dr. Addison's mysterious life was the pursuit of women of the streets. But they did not understand his melancholy which was not of the nature to be appeased by chance loves. He walked in order to forget. Next day, with the dawn, his spirits improved and he would be able to work hard in the hospital where he had now become a staff physician, and in the post-mortem room patiently verifying the sort of observations such as those which led him to the discovery of his 'bronzed' disease. For six years, that information about the eleven cases had lain unused in Dr. Addison's desk, so unaware was he of the significance of what he had done, and it had been only the urging of a friend, Dr. Samuel Wilks, which persuaded him to publish the account which made the name of Addison famous in medicine and led Brown-Séquard to the discovery of the endocrine secretions.

It all worked back to the gloomy temper of Addison's mind. With the years of his success, his personal anxiety grew blacker. He was so kind to others, but so unjustly severe with himself. How often in those long nightly walks upon which his friends placed such a scandalous construction, when pressured by his own phantoms like a character in Edgar Allan Poe's stories, must he have called silently out for help from his brother physicians, and known with certainty that none of them could heal him.

In Guy's Hospital he was now a senior physician, but younger men were coming along as they always will, and Addison began to foresee the day when they would supplant him with their fresh ideas as he had replaced others, forty years before. It must always be so. Those resentments which he felt to be in the air whenever he met his junior colleagues weighed upon Thomas Addison of the adrenal gland, and in his troubled fancy he heard the envious whispers growing louder until, at last, they warned him that his day was over.

Yet he was only just past sixty. His industrious career had brought him a fortune of over sixty thousand pounds, as well as an honoured name. In a thousand ways he might have enjoyed his fame and added to the dignity of medicine. But he lacked the eternal youthful resilience of Brown-Séquard. His fears became delusions, and at length he was driven to retire altogether from practice, and that life of achievement ended in tragic suicide.

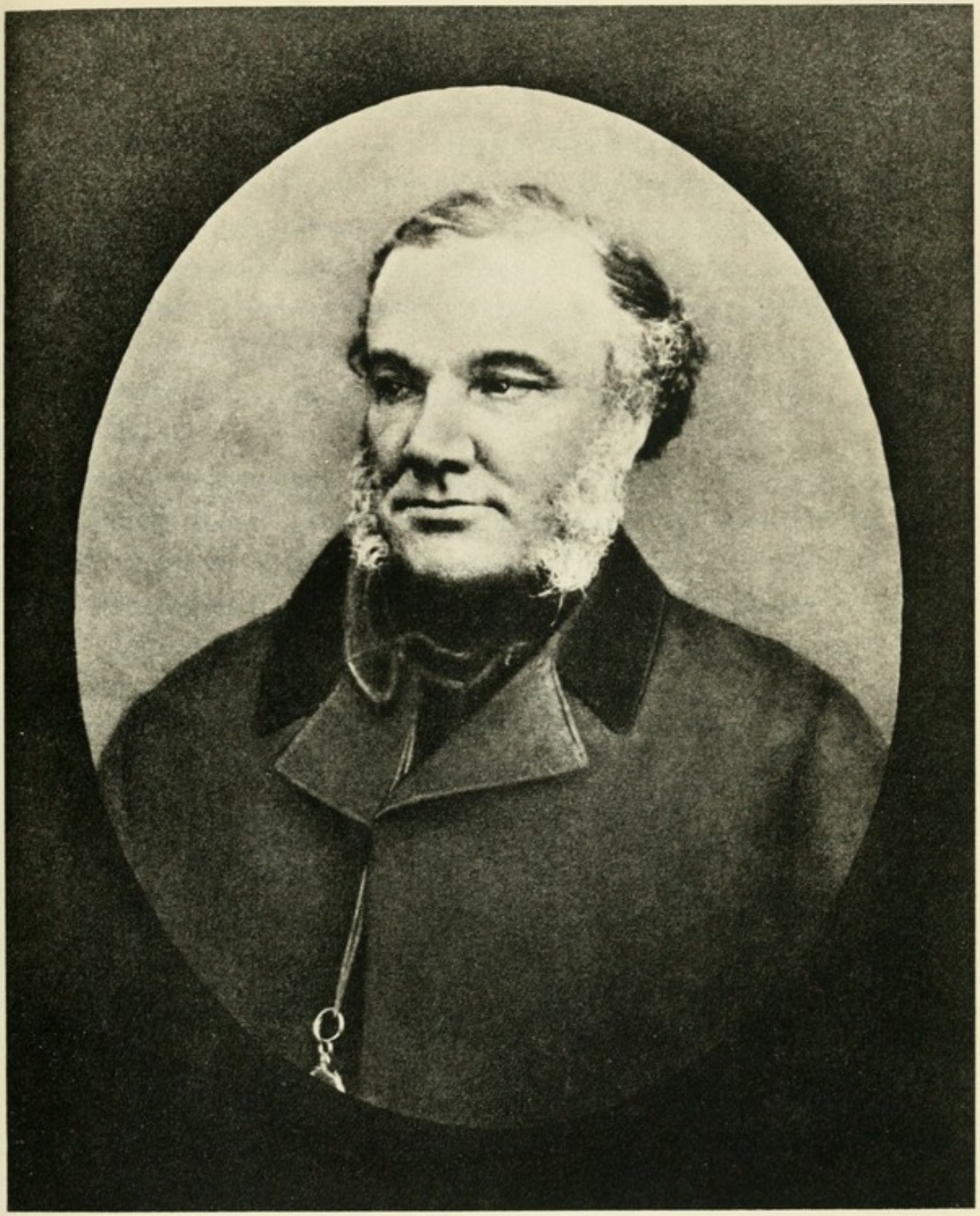
Charles Edouard Brown-Séquard was also a man of temperament, but his ill humour evaporated more rapidly, he was less imprisoned in his fears, and his frequent hurricanes of optimism blew away from his mind all vestige of the dark thoughts. In those hours when Thomas Addison was roaming

the London streets, Brown-Séquard would be fast asleep, but long before dawn next day, he would be up and reading scientific papers. He allowed himself no social life whatever.

One young doctor who helped him in his London experiments, and who was sent to purchase animals in the side streets off Tottenham Court Road, has left us an impression of him as he was in the 1860s. The young assistant happened to be engaged to the daughter of the *chef d'orchestre* at Covent Garden Opera, and not unnaturally spent his evenings in that congenial place where he could enjoy both the music and his young lady. One day, Brown-Séquard came to hear of this recreation, and he was shocked, inexpressibly shocked. The junior colleague received a severe curtain lecture upon his neglect of science, his frivolity, his waste of time. 'Look at me,' said the professor, 'while you are idling away your time at the opera, I am reading papers, but that does not prevent my going to bed early so that I may be fresh tomorrow morning and ready to finish off my experiments. To succeed, one must work, not waste time—at the opera!'

As Professor Olmsted puts the matter, it might have been wiser had Brown-Séquard gone to the opera occasionally. Music would have corrected the balance of his monomania and given him wider sympathy. But we never hear of a fanatic becoming a moderate, and there is no use in regretting that he was not a different man. Brown-Séquard's methods, his influence over the leading doctors of his time, his mesmeric power of persuading a medical audience that his dream was the vision of the new medicine, his exactitude and his logic, these qualities made him a resounding professional success in London, elected him a Fellow of the Royal College of Physicians, Fellow of the Royal Society, and a notable, even sensational, lecturer in the Faculties of Edinburgh, Glasgow and Dublin.

Brown-Séquard was not only a herald of the new medicine,



DR. THOMAS ADDISON

he was a ferment, breaking up established ideas, destroying the academic outlook, attacking sterile tradition. He was doing for medical art what Cézanne, Monet and Degas were achieving at the same moment in France for the art of painting: breaking up colour into its artistic elements, analysing light, seeing the world afresh, revealing an entirely novel manner of presenting the subject. Brown-Séquard's dogma was that medicine is only applied physiology, and that treatment of the patient begins in an experiment upon a guinea-pig, or the twitching of the nerve in a frog.

The strange aspect of his life is that he was so successful as a physician, that he inspired so much faith. Doctors liked to have him solve their difficult clinical problems because he pleased the patient and generally had some useful suggestion to make. He could remember a similar case in previous experience, and he was able to go to one of his little slips of paper for some scrap of scientific observation he had made ten years ago, or some special method of treatment recalled from a medical journal, and he possessed that saving quality, so unusual in a scientist, of never being afflicted by nihilism or want of faith.

He was flourishing as a consultant, and beginning to make a large income in the West End. There outside his consulting rooms he saw daily a queue of carriages, and each of them contained a patient who would hang on his words. But was this science? his conscience whispered.

Nausea of achievement overcame him, and just at the moment when London was prepared to endow him with substantial rewards, as she had already handed him the laurel of fame, he threw in his hand. Easy triumph was unbearable. To him it was scientific mortification. He was unnerved by success as others are by failure. Knowing Brown-Séquard we are not surprised by the consequence of this mood which now dominated him once more.

The house in Wimpole Street was closed, and the guinea-pigs of Tottenham Court Road abandoned. Before his wealthy patients knew, Brown-Séquard had crossed the Atlantic once more. In the new world his name was now well known, and this time there was no need for him to practise five-dollar midwifery in New York, or give French language lessons. At Harvard College, there was a great biologist, Louis Agassiz who had read Brown-Séquard's papers in the scientific journals, and now he persuaded the faculty to create a professorship of experimental medicine especially for this brilliant foreign virtuoso. And so it came to pass that, for four happy years, Brown-Séquard taught in Cambridge, Massachusetts, and enjoyed the company of men like Oliver Wendell Holmes and Henry Wadsworth Longfellow. He taught his American students to experiment for themselves, telling them it was not so difficult to make discoveries. He looked after the health of his friend Agassiz and sternly commanded him to give up cigars, this being a fundamental feature of Brown-Séquard's clinical treatment, whatever the nature of the disease. Happy and honoured these four years in America's leading University, admired by students and faculty—surely here is the perverse signal for him to perform another of his lightning flights away from an ordered and comfortable success. So fate ordained it; the swell of his oceanic temperament forbids him to be still. But this time, the immediate cause was not within his volition. His American wife who had been at his side in Mauritius, in France and England died unexpectedly, and he went through a mental crisis like that which had followed the loss of his mother years before. Only movement could assuage his grief. Harvard could hold him no more. He flew back to Paris where at last a Faculty Chair was found for him, and he became Professor of Comparative Medicine in succession to an old friend and colleague named Rayer. This man had been

personal physician to Napoleon III but there had been a sort of taboo on the professorship, on account of the political hostility of the students who booed him so that he could hardly be heard, and Rayer had given no lectures for years. But now the atmosphere was changed. Brown-Séquard began his first demonstration in profound and attentive silence. His name as a scientist, and his repute as a Republican had gone before him, and the students were enraptured. The demand for experimental animals that year was unprecedented. The exposition of the short-bearded man with his absence of rhetoric was a new experience for the *jeunesse des écoles*. Brown-Séquard had found his perfect audience.

The brilliance of Napoleon's Court, the social smile of Imperial Paris, the intellectual values of the faculty, the preeminence of the Institut de France which had been created two hundred years before by Cardinal Mazarin, the integrity of French life was broken when the Prussians began the first of their modern invasions, and the French Emperor was defeated at Sedan in 1870. Historical circumstances, it seemed, as well as personal experience, was always ready to cause one more revolution in the Janus-like changes of Brown-Séquard's personality. He had last left America through the loss of his first wife, now he was to quit France when she lost her Emperor, and a fresh chapter opened in the life of this essentially homeless man who was at home anywhere, yet nowhere.

Back in America, he married again, Miss Carlyle of Cincinnati, but in two years he was to have once again the shock of being a widower once more.

It was a phase of despair. The optimism of Brown seemed to have run out, and the faith of Séquard was temporarily in abeyance. The journal he founded in New York, as some assuagement for his creative necessities and called *Archives of Scientific*

and Practical Medicine was hardly a success. He suffered from indigestion and became embarrassed for money, probably because, since his heart lay in experiments, he could no longer give his mind to the routine of medical consultations. One greater failure weighed upon him.

A son of his first marriage, now grown up, was turning out a disappointment. His father had tried to make him a scientist, but had failed. The boy, it seemed, had inherited the nomadic strain of Brown, but not the talents of Séquard, and would not settle to anything.

Was it to be expected that a well-balanced child could be produced from such loins? Genius nourishes itself at the expense of family, and the restless, passionate worker in Brown-Séquard was the last person in the world to be a good father to a boy. This son of such a fanatical parent inspires our sympathy. He went to the bad and eventually disappeared, leaving his father uncomprehending and miserable; and then to complete her Job's schedule of misfortune, Madame Brown-Séquard, his second wife, died.

He crossed the channel to England once more. On the sea coast at Brighton he tried to find relief, and then hearing that Agassiz was organizing a large Research Institute in New York he hurried back to take his place among its professors. But the malignant law of his inevitable frustration acts again. Agassiz died unexpectedly and the whole scheme dissolved in air. For the time, Brown-Séquard worked in a small cottage laboratory on the sea coast of Massachusetts and there performed some experiments that in a few years' time would give him world-wide fame. But the significance of what he was doing did not yet penetrate his anxiety-stricken mind. These crucial tests were only one more piece of work tossed about on the ocean of his dissatisfaction. The ceaseless rhythm of his life seems to have ended in agitated melan-

cholia. Glasgow, London and Geneva called him to professorial chairs. Like the abbé Liszt, his name had become cosmopolitan, but he could not decide where to fix himself, and he accepted an appointment, then immediately threw it up.

There was one fixed point in his wandering heart, his little girl Charlotte, the daughter of his second marriage. Perhaps it was she and her needs that led him to choose wisely the way out of his temporary frustration.

He married for the third time, the English widow of a French painter, and when he was just over sixty, the wheel started to spin less violently, it jerked, slowed down, and then came gradually to rest in a phase of mental calm.

7. ULYSSES FINDS HIS HOME

Old Claude Bernard, Professor in the Collège de France, had for thirty years been constitutional monarch of the French experimental physiologists. Looking like a man out of a tomb, with long grey hair, wearing his well-known muffler, and his pince-nez spectacles hanging on his breast, he had passed a lifetime in that gloomy cellar of the Collège de France, only kept alive by regular vacations in his native district of Burgundy, where each season he was to be found helping the peasants to plant out the vines, talking local patois and immensely excited in September, when the wine poured from the presses. Through all that laborious and equable life, he had never once travelled across the frontiers of France. What a contrast with the flashing intuitions and perpetual mobility of Brown-Séquard, with his flights across the Atlantic on some sixty occasions! There was another fundamental difference between them. Claude Bernard was a pure scientist, a physiologist in the narrow sense who, although legally qualified as a doctor, had never practised medicine and felt ill at ease

among physicians. One day at the Académie de Médicine he had dropped the cynical remark: 'Have you ever noticed, when a doctor enters the room, he always seems to say "Look at me. I have just saved the life of a fellow creature." '

To Claude Bernard, medicine was the science of sickness, or probably not a science at all; whereas the knowledge that he painfully acquired from his dogs, that was the science of life, and in it he believed with the fervour of religion. One strange and profound irony haunted the great physiologist: Madame Bernard, a pious and bigoted Catholic, had a horror of vivisection, and while he pursued his daily animal experiments at the Collège de France, she and her two daughters pursued runaway dogs, subscribed to homes for stray animals so that they might not fall into laboratories like that of her own husband. A grim nemesis, one would say, for a man who trusted in the religion of science.

But now Claude Bernard was dead; and no students would gather any more around his table to watch this science of life in the making.

Back from the United States, Brown-Séquard hurried, and made his candidature known. Here was the one opportunity of which he had dreamed, a chance to be the successor of Magendie, to follow Claude Bernard, to carry on the tradition of French scientific culture. An era of intellectual and artistic ferment had begun in France with the coming of the Third Republic. Charles Edouard had first come to Paris when Balzac, Dumas and Victor Hugo were the leaders of new thought: now, more than thirty years later, he himself was a professor, an honoured leader of French culture in a world upon which the new Impressionist painters, men like Cézanne and Monet, had created a new epoch and he himself fully lived up to its sensational atmosphere. His eagle swoop into Claude Bernard's chair had not been without obstacles. Secretly, he had rather resented Claude Bernard's fame.

To his appointment as professor there were certain objections. His colleagues in Paris felt privately that this torrential talker of the French language was somehow not genuine, not a Frenchman, or even a French colonial. Was he not half an American, both by blood and by subsequent residence? He had never been really naturalized in Paris any more than in London, or for that matter in Richmond (Va.) or New York. In each city he was always the talented outsider, a man both homeless and stateless, a spiritually posthumous child without a fatherland.

Having been born in Mauritius after the annexation by George the Third, Brown-Séquard was legally a British subject, and while in London he had often referred enthusiastically to his British allegiance. But now, to become a French professor, he needed to be a Frenchman. Ministers were approached, dossiers circulated in their departments. The necessary miracle took place, and Charles Edouard Brown-Séquard was admitted a citizen of France by the President of the Republic. Once more worldly circumstances had bowed to the progress of this temperamentally volatile creature who was so capable of adapting his environment to his wishes. His wanderings across the world might be erratic, but his devotion to science was a fixed star; not even Louis Pasteur himself worked more selflessly.

At last he had 'arrived.' The scientific Ulysses had come home to Ithaca; not the tropical island of the Indian ocean, but his intellectual home by the Seine. In 1886, he achieved the great distinction of being elected a member of the Institut, that assembly of the immortals in literature, art and science, but perhaps the elevation he valued more was becoming President of the Société de Biologie, which made him a sort of Pope in the world of experimental science.

Scientific honours of France and England were now heaped upon him, yet he lived on the edge of financial embarrassment, owing to his robust contempt for money. When a rich American

woman offered ten thousand francs (in the days of the gold standard) as her fee for consulting him about an ailing child, he refused to take any interest, and when the anxious mother changed her offer from ten thousand francs to ten thousand pounds, all he did was to reply naming another physician who was nearer to hand. A lady from Liverpool wired urgently begging him to go there for a consultation and naming hundreds of pounds as her fee. But all the unworldly man did was to say he was passing through Liverpool next week and would charge only five guineas. This was not heroics, there was no sense of pose or of lofty detachment. It was simply that the commercial instinct had been left out of him.

At the age of sixty-one his life and habits were now fixed. Each Christmas he would be found in Nice, where for a few months he would escape the fogs and dust of Paris, returning to his laboratory in April, and then spending the hot months on the coast of Normandy. But his labours went on incessantly. Each dawn or earlier, whether in Paris, the Mediterranean or Normandy, he rose to read the journals and make his endless notes on hoarded scraps of paper just as he had done in the early days in the Latin Quarter. One of his pupils, Roger, who later became Dean of the Faculty of Medicine in Paris, tells a story of meeting the great professor to ask his advice upon some scientific work connected with the behaviour of nervous energy. One Sunday the young man took the morning train from Paris to Havre where the professor was in summer quarters. Nervously, in the study overlooking the harbour and the blue line of the sea, the pupil faced Brown-Séquard as, talking incessantly, he searched among envelopes for half-sheets of paper on which precious scraps of knowledge were treasured. The hours passed, and he explored this difficult subject until, at six o'clock, they descended to the dining-room. But Brown-Séquard did not be-

lieve in wasting his time over food, and after nothing more than a plateful of soup, he was impatient to resume the discussion, and the young man was hustled back to the study where the intimate session continued. The talk came to an end at ten o'clock, but only so that the professor could retire to bed early in order to rise before daylight. Quite fatigued after nine hours of mental stimulation by this man of seventy, the pupil made his way to the train, and long before he reached Paris his mentor genius of physiology had already lit his lamp in the room overlooking the harbour and was at work on the great theme that dominated the last years of his life.

It was a brilliant idea which had come to him in that cottage laboratory on the sea coast of Massachusetts in those dark months after the death of his second wife. It was a subject full of fascination to an ageing man; it was no less than the restoration of youth and bringing back of lost vitality.

8. THE HUMOURS

Two thousand years back, at the dawn of medicine, began the doctrine of the 'humours.' It has always been a fascinating pursuit to divide human beings into different groups and categories. The Greek physicians did it, and modern psychologists have followed them. The most ancient and long enduring of these classifications of mankind was based upon the humours. These humours were the basis of man's understanding of his own organization. They were bodily forces supposed to influence health and temperament, four of them in number, the blood, phlegm, yellow bile and black bile, and it was believed that particular types of people were specially charged with excess of one or other humour. Thus, stout and optimistic people were 'sanguine' because they were supposed to have an excessive amount of *sanguis*

or blood, and this meaning indeed has been preserved in our modern use of the word. Gloomy and nervous people were hypochondriacal and believed to suffer from too much black bile which is the secretion of the liver, and indeed the word hypochondriacal means literally 'under the ribs.' Phlegmatic people had too much phlegm, and so on.

This idea of linking a person's illness and temperament with one of the body fluids hung over medical thought right until the nineteenth century. We shall see in a later chapter of this book how a celebrated professor at Berlin, Rudolf Virchow, opposed this conception, and made body cells the foundation of health and disease. The idea of the humours was ridiculed by Virchow and his pupils all over Europe. But Brown-Séquard revived it. In place of these imaginary humours which the Greeks and the Arabians loved but which were nothing but fantastic conceptions of the human mind, he substituted the 'endocrines,' that is the 'internal secretions' of organs such as the adrenals. In fact he believed that many organs of the body possessed their own special internal secretions which passed directly into the blood stream, dominating life and health, action and emotion, and he taught that excessive functioning of one of them can truly form a special character or temperament. This was to be Brown-Séquard's great contribution to medical thought, a belief in the power of minute amounts of chemical substances specially manufactured by particular organs and glands. The theory had a certain resemblance to the Greek idea of the humours, and it came to be called 'neohumoralism,' or the new humoral doctrine.

Brown-Séquard was now to introduce this theory to the world in a spectacular fashion.

It is obvious that there are many bodily powers which belong to the adult male in addition to the power to reproduce offspring with the aid of the female egg. There is, for example, the growth

of the beard on the face, the masculine pitch of the voice, the greater physical strength, to say nothing of the different mental and emotional characteristics of a man contrasted with a woman. Brown-Séquard announced that all these 'secondary' qualities of maleness were due to the 'internal secretion' from the male gland.

As a matter of strict chronological fact, Brown-Séquard was anticipated in this observation by a professor named Bertold in the German University of Göttingen who, in the year 1849, had proved that the growth of the cock's comb, that aggressive organ of its masculine pride, was connected with the male gland of the bird, and that to remove the gland caused the comb to disappear; while if another gland were afterwards grafted in the place of the one which had been removed, Bertold demonstrated by actually doing it, the comb grew again in all its rubicund glory. This experiment seemed to prove that the male gland did yield an influence which somehow circulated inside the cock's system and endowed the bird with the special markings of its sex.

Now Brown-Séquard was to perform his usual feat of staking all these theories and experimental observations into one throw of the scientific game. Early in the 1880s, after settling into his chair at the Collège de France, Brown-Séquard began experiments with the male sex gland or testis. By pulping the gland of a guinea-pig he extracted a fluid and used it, twice weekly, as an injection. Apparently it had the most astounding results.

Of course, the actual sperm which issues as a living jelly from the male sex gland consists of millions of active and moving organisms each with power to fertilize the female egg. But Brown-Séquard was not thinking of the sperm in that obvious and primary function. His theory was that in addition to this power of producing male sperms, the testis could form an entirely

different and separate secretion, which passed not outwards but inwards, was in fact gathered up constantly by the blood stream. It was indeed an 'internal or invisible secretion,' similar to that still hypothetical substance which was produced from the adrenal gland. It was quite imaginary, so far. It could not be separated from the sperms, its reality could not be proved by chemical tests. This fluid internal secretion from the testis (if indeed there were any such thing) had to be judged by its effects.

But Bertold's observation had been forgotten until many years later. It was Brown-Séquard who forced this new theory upon the world in such a manner that the world listened and believed. Once on the scent of a biological idea, he was never at a loss for a suitable experiment. He first formed his fantastic hypotheses, then proved or disproved them. Taking the testis from many dead guinea-pigs, he reduced the glands to pulp, extracted their essence in water, and produced a fluid which he then injected into his most convenient experimental animal. It was one which had passed through the fire of many experiments. It had survived the dose of opium in Mauritius, it had resisted cholera germs, it had been watched and tested for half a century. For this particular theory of neohumoralism, it was indeed the perfect subject for observation, always at hand, never inconvenient, and it would live as long as the experiment itself. This superior scientific guinea-pig was, of course, himself.

In this willingness to experiment upon his own body, he had always shown a sort of masochistic restlessness. Once he had varnished his skin all over and was found by a student in a state of collapse in the basement of the laboratory.

With the razor-sharp faculty of old, Brown-Séquard scrutinized his sensations, observed his bodily functions, estimated his muscular strength, treated that ageing body as though it had been a

bunch of organs and nerves belonging to an animal on the bench. He divided himself into two persons: the one suffered, and the other measured his sufferings. This time it was not Brown against Séquard, it was a personified idea pitched against a body that endured.

Before the test began, he was in fairly good health, except for some muscular rheumatism, but he took no exercise, and his body had become slack and feeble at seventy, so that after working for an hour standing at his laboratory table he was forced to sit down and take a rest. When he reached home after a day's work, he was obliged to go early to bed, but even then he could not fall to sleep for hours. Now, after the injections of the testicular fluid, he was a new man. He could stand upright in his laboratory all day, and in the evening was able to write up his notes after dinner. Bounding upstairs, two at a time, had been his pride as a younger man, and now this foible became possible once more. Using a spring instrument to test the muscular strength of his arms, he discovered that his score went up during the period when he was having the injections. As for his mental powers, they had enormously improved during the period of test in the sense that he could now do brain work for a longer spell without fatigue.

Was it not probable, he asked himself, that the waning power of the testis, and its consequent failure in old men to produce enough of this internal secretion, was the true cause of senility? Was not the difference between youth and age only a few drops of fluid from the male gland? Substitute fresh extract from a young and healthy gland, thereby giving the body what it needs, and every tissue and every single organ is touched once again with the magic wand of new vitality through the circulation of this powerful humour.

If it was true, it was a human revolution great enough to inspire mankind for abounding achievement. But was it true?

Such a discovery was not to be kept secret. It was not in Brown-Séquard's nature to lock a scientific fact in his own breast. His intellectual possessions must be shared with the world, and his communicative, impetuous, childlike nature, in which much credulity was mixed with scientific scepticism, demanded that his experiments should be preached abroad. That moreover was the custom of the period. Those early medical scientists, the pioneers of last century, who were prophets of modern materialism, unconsciously imitated the churches. They believed their scientific faith could save souls, and they had no doubt that their millennium was coming. Therefore it was their duty to spread their doctrine far beyond the narrow circles of men of science. The laboratory became their pulpit and the world was their congregation.

The *Méthode Séquardienne,* as this testicular injection was named, now spread widely in France, and soon all over Europe, advocated by physicians who could read French, and could understand the enormous claims which Brown-Séquard made. It was the consequence of his extraordinary reputation. He affirmed that the male fluid had a generally stimulating effect on the whole nervous system, that it caused the growth of new and healthy body cells, which was beneficial in certain disease. Victims of cancer were supposed to be relieved, tuberculosis was alleged to be arrested, locomotor ataxy (a disease of the nervous system, now known to be due to syphilis) was claimed to be cured. There seemed to be no malady of the aged which did not react to this wonder-working remedy. This strict man of science had inspired a prodigious credulity which passed over the medical profession like a religious revival.

Critics began to say it was all a form of auto-suggestion. These cures were due to belief, and to that alone. Brown-Séquard professed to be aware of this fallacy, but alas, there is no scientific instrument which can measure faith. His name had prepared the world for wonders; and behold, the wonders came.

Below the surface of this sensation which was evoked in the medical world by Brown-Séquard's discovery, we may trace something more human and fundamental than science. We turn away from the laboratories and the scientific journals. Ordinary people thought of these things from a different point of view. Brown-Séquard became a music hall joke. Listen at the café concerts on the boulevards of Paris, hear the jests of the clowns, and catch the echo which the name Brown-Séquard aroused in men's clubs and smoking rooms. The average man saw the method chiefly as the prolongation of the years of sex and an increase in potency. To him, the method of injection symbolized perpetual youthfulness and endless enjoyment. Could these doctors guarantee that? It seemed they could, and echoes and hints of Brown-Séquard's experiments upon himself were grotesquely exaggerated. Here was an old man of seventy who had produced wonders in a few weeks. Imagination supplied details such as he had not described in his scientific paper. All over Paris the word 'injection' delivered by the comedian with a knowing wink, was sure to raise a laugh. The average man who heard of the Séquardian extract thought of it in terms of stout female bosoms, pleasant company and extra pleasure available to an advanced age. It was the Elixir of Delight.

Those who credited this fantasy of perpetual vitality might have done well to read a book called *Gulliver's Travels*. There, the fertile author Jonathan Swift had invented a grotesque place named Laputa, where his hero Gulliver ran across some terrible

creatures called 'struldbrugs' who had been condemned to everlasting life. Their fate might have been a warning.

Though struldbrugs, says Jonathan Swift, behave like normal people until they are about thirty, at fourscore they feel depressed, for they have not only the follies and infirmities of other men, but many more which arise from the dreadful prospect of never dying. Envy and impotent desires are their prevailing passions, and whenever they see a funeral, they lament that others are gone to a harbour of rest which they can never hope to reach. At eighty they are dead in law, and have no distinction of taste but eat and drink without appetite. 'They were a most mortifying sight,' continues Gulliver, 'the women more horrible than the men. My keen appetite for the continuation of life was much abated and I grew heartily ashamed of the pleasing visions I had formed.'

Such is a logical reaction to the idea of the perpetuation of human life. The whole meaning of Jonathan Swift's irony, is that perpetual life here on earth is a poor thing without health and power. Immortality with youthfulness may be a wonderful dream, but immortality plus senility is the most appalling horror the mind can conceive.

The philosophy of history shows that every feature of human evolution is accompanied by human illusion, and in fact the progress seems quicker and advance greater in proportion to the depth and vitality of the illusion for which mankind has such a powerful inclination. To urge us and lead us, and above all to give us courage, we need the great spell-binders. We have to judge the power of every piece of knowledge, every act of science, every event, by its mixture of profound truth and wonder-working magic; the truth we must grasp with clear heads, but the spell of the magic is what makes our hearts beat and gives us hope in the fatigues of the journey, 'beyond the utmost bond of human thought,' as Tennyson's Ulysses aspired to travel.

A new complication of the old professor's existence now began. The extract of the testicular fluid was made in his own laboratory under the supervision of his careful assistant d'Arsonval, and it was issued free of charge to doctors with the label of the Collège de France as a sort of guarantee of purity and efficacy. Soon the demand grew to be so enormous that no one laboratory could supply what was needed, and quacks and charlatans rushed in with manufactured imitations. Brown-Séquard was obliged to write sixty or eighty letters a day with his own hand, advising physicians on how they should use the extracts, and the physicians wrote back describing their cures. It was a one-man enterprise.

Testicular extract indeed had become his obsession. To prepare it by pounding the gland, and add the glycerine was not difficult except for the precautions needed to keep out germs, and while his faithful d'Arsonval supervised the production of each ampoule of fluid, Brown-Séquard paid the expenses, dreamed of further endocrine discoveries, and pulled wires to obtain a University Chair for his assistant. Only three years after the first announcement, 1,200 doctors were using the extract.

Gradually the sensation caused by testicular extracts expired. Old men ceased to hear of it, and therefore to demand it. Even the scientific world became sceptical of 'organ extracts' and began to see Brown-Séquard's work merely as the pathetic effort of an old man to escape senility. One scientific writer dismissed endocrinology as having been deformed at birth. The great reaction set in, and Brown-Séquard's emotional propaganda was stifled in discreet laughs and squeamish whispers. Thyroid gland might be used; pituitary extract, that most revolutionary substance in medicine, became orthodox; the extract of the adrenals was a boon to doctors and patients; insulin from the pancreatic gland was to be employed to cure diabetes. But the sexual gland came under the taboo of respectability.

Was it all a hoax? Were Brown-Séquard's experiments nothing but the delusions of senility?

That question can be fully answered only when we know fully how the endocrines work, but Brown-Séquard went to his grave certain that he had proved by the strictest method of science the lore that primitive man believed, namely that his glands contain the secret of regeneration. The savage would kill his foe and devour his vital organs, hoping to gain thereby the dead man's strength, his spirit, his potency. By the ways of the laboratory Brown-Séquard had given to this ancient human instinct a modern significance.

He anticipated present-day ideas about the gonads or sexual tissues present not only in the male and female organs of sex, but in the pituitary gland and elsewhere. He came to these conceptions when he was old and in a hurry, and his mercurial temperament caused him to exaggerate. There was in his many-sided nature a poetical excess and erratic violence. Yet he is the father of the great science of endocrinology as securely as Pasteur is the father of bacteriology.

Understanding the intricacies of the nervous system as few men of his time did, he divined that among those delicate fibres, those cells and ganglions of the brain and spinal cord, there played the eternal rivers of the circulating blood which brought chemicals to stimulate or to soothe the sensitive nerves. He discovered, or confirmed a secret which many before him had guessed; namely, that we move our limbs, live our emotions, and think our thoughts through a complex but very beautiful mechanism that lies between nerve tendrils so fine as to be invisible, and fluid secretions that are powerful yet beyond the reach of chemistry. We are only beginning to fathom the subtleties of this relationship.

Fifty years after Brown-Séquard's inspired guess, men were only beginning to understand the endocrines. A hundred years

after, much can be done with these secretions to abolish disease. Another hundred years, and the endocrine secrets will be commonplaces of our organic existence.

In 1894 Brown-Séquard made his final, though this time involuntary experiment, and with his own hand wrote out the notes of his observations, according to his precise and invariable custom. It was to be his last series of observations. A case of arterial disease of the brain.

He suffered a 'stroke' due to the bleeding of an artery, and in a letter to one of his old colleagues in London, he described, with minute exactitude, his own symptoms, the loss of vision, the temporary failure of memory. As yet there was no paralysis, but this, he added grimly to his friend, was to be expected later. Now, at last, he had come to the end of his magnificent capital, his energy of mind and body.

He lost his third wife and suffered once more from that insupportable loneliness which can be cured perhaps when a man is young and healthy, but to the aged is a sentence of death. Even his much publicized testicular extract failed to restore his strength. 'I can no longer work; all is finished,' he wrote.

9. ONE EXPERIMENT MORE

Presently came the day when his clinical anticipations were fulfilled, when the hand which had transcribed so many case histories on small pieces of paper could indeed write no longer. In his wandering mind, the later events of that hectic life had become indistinct, and with the blunting of his faculties, only the earlier life was remembered, those voyages to Mauritius through cyclones, the cholera patients in their miserable huts, animals in the cellar at Richmond, Virginia; the College of Physicians in London with its golden mace, and even sweeter recollections of

Paris and the Latin Quarter, Claude Bernard with his sleeves rolled back, echoes of Magendie's voice prophesying the newer medicine. Then that spectacular manifestation of the life force which was Brown-Séquard failed, and remained only an inspiration for the future.

When his death was announced at the International Medical Congress in Rome, tears came to the eyes of many who had known this sincere and diligent man, whose career was an incredible adventure in biology like a story in Jules Verne. But his wild dreams, the bizarre creations of his biological fancy, were to be the sober actualities of the twentieth century.

What estimate can we make of this nineteenth-century Ulysses of science? No conventional memory, but something theatrical; a short smiling figure of incredible vivacity, in a neat frock-coat, whose apple cheeks and white hairs are the credentials of a healthy old man; whose black eyes suggest temperament of warmer blood and warmer seas.

Saying goodbye, we leave him with his little pieces of paper, leave him rushing through his meals in order to work, shaming his wife and her company of evening guests because he will not spoil his next day's work. We hear the echo of his eager voice exclaiming against tobacco, rebuking his only son because he is not a slave to science, reminiscently professing to have foreseen every new discovery thirty years ago; we think of him counting his own white hairs and measuring the grip of his muscles and weighing his excretions for the good of science.

And now, the mist clears, and the age of scientific healing is seen to have begun. We have no need any more for the spell-binders who foretold its coming out of that earlier darkness. In America the new medicine comes almost before the old, and the ideas of Claude Bernard and Brown-Séquard catch up quickly on the traditional ideas which they opposed so strenuously.

BOOK FIVE

A NEW WORLD OF MEDICINE

A NEW WORLD OF MEDICINE

Who dreamed that living air poisoned our surgery coating
All our sheeny weapons with germs of invisible death,
Till he saw the sterile steel work with immunity, and save
Quickly as its warring scimitars of victory had slain.

Tho' *MEDICINE* makes not so plain an appeal to the vulgar,
Yet she lags not a whit; her pregnant theory touches
Deeper discoveries, her more complete revolution
Gives promise of wider benefits in larger abundance
Where she nam'd the disease she now separates the bacillus:
Sees the atoms of offence, those blind and sickly bloodeaters,
Neath lens and daylight, forcing their foul propagations,
Which had ever prosper'd in dark impunity unquest,
Now to behave in sight, deliver their poisonous extract,
And their strange self-brewed, self-slaying juice to be handled,
Experimented upon, set aside, and stor'd to oppose them.

Grant us an hundred years, and man shall hold in abeyance
These foul distempers, and with this world's benefactors,
Shall *PASTEUR* obtain the reward of saintly devotion
His crown heroic, who fought not destiny in vain.

ROBERT BRIDGES (1903)

1. AN ATOMIC PERSONALITY

ALL THROUGH the nineteenth century we watch the progress of medicine with a feeling of impatience. Why cannot the doctors achieve more? True, much of the crudity and horror have been taken away from illness: anaesthetics and antiseptics have lessened the amount of necessary pain, and common cleanliness has reduced the recurring plagues of infectious diseases. None the less, the physician's science is narrow, and his ingenious art is employed more in exploiting the patient's own healing resources than in contributing positive cures. We sigh for new methods, more treatments, more decisive results. Men like Brown-Séquard have made us dream dreams of what shall be, and we

want to see them realized in the healing of flesh and blood. It is all very well to be told of promising animal experiments. But when are these theories to be translated into the cure of cancer and the relief of human heart disease? We long for the physician to be able to live up to his role of omnipotence.

Map-makers are often doubtful as to where the exact source of a river shall be marked, and sometimes there are rival claimants for the honour of being the main stream. New rivers of medicine are even more difficult to trace back to their beginnings. Mountains provide their head-waters, they dive underground, they pass through forests and marshes until their course is hopelessly lost, and what we have always thought a main tributary may turn out to be a derivative and unimportant branch; but we can be safe in placing one primary source of modern surgery in a small Lancashire village near Manchester, where in 1819 (the year before Florence Nightingale was born) there burst into the world a certain William Worrall Mayo. His main quality was his impatient hunger for experiences. At twenty-five he was one of those restless, discontented and ambitious folk who impulsively crossed the Atlantic to try his luck in the new world. Before leaving the old country he had studied medicine at the Manchester Royal Infirmary, and had even gone as far as Glasgow to fortify his knowledge. More significant still, he had learned some smattering of chemistry at first hand from that austere Quaker genius John Dalton. The dilemma of the modern world over the power of the divided atom really goes back to this man, for it was he who classified the chemical elements according to the number of their essential molecules and invented the atom. He also divined the meaning of 'colour blindness.' John Dalton himself had been coached by the father of Edwin Chadwick.

Never was an Englishman more fitted by temperament for the

untraditional life of America during those expanding years immediately before the Civil War. He threw himself into the stream, gloried in changing both occupation and location. After some medical study at Bellevue Hospital, New York, he migrated several hundred miles west to Indiana, where he practised—as a tailor! Then he went back to doctoring, and sampled several other medical schools of the frontier type after which he pushed further westward, as though no state could hold him. His was that divine and impulsive restlessness which created the far west. In a covered wagon, or on the back of a horse this enterprising man moved to Illinois, to Wisconsin, to the territory of Minnesota, then only a trackless waste of forest and hills, full of wandering tribes of Indians, and three hundred miles north-west of the growing settlement of Chicago.

Here in Minnesota, which they were to call the North Star State, some organic touch of sympathy with the atmosphere and life of the wilderness gave William Worrall Mayo the signal to stop. After a year or two in the city of St. Paul on the Mississippi, he wandered to a tiny village called Rochester where, so far as this restless creature was capable of doing so, he settled down. In the course of his wanderings he had married a Scots-woman from New York State, and his family began to arrive.

Life in those parts was never quite secure. There were battles with Sioux Indians who burst out now and then, raiding the settlements. Panics over cholera devastated the north-west America just as the London of Edwin Chadwick's day. Most exciting of all, the political conflict over the abolition of slavery then was just reaching its zenith—the little Doctor Mayo was deep in them all, as befitted a patriot and a turbulent member of the Democratic Party. He still continued to dabble in many trades, as frontier life demanded. He sold wood, kept horses for hire,

carried out a census of the territory, but gradually when he was over forty, his extraneous activities became canalized in the practice of family medicine, conducted on horseback among the trappers and farmers of Olmsted County in which the small settlement of Rochester stood, which was only the name for a parallelogram of country in the unmapped wilderness.

What a stern and beautiful land it was. In summer, a paradise of green prairie, studded with lakes and speckled with the rich flowers of a virgin soil, with majestic trees lining the banks of slow streams that flowed towards the Mississippi. In winter, a snow-covered waste, with violent blizzards and an occasional hurricane. Never a mild or soulless country this territory of Minnesota: visited by appalling droughts, forest fires, plagues of grasshoppers, yet seeming to evoke in those who had chosen it for their home, a reckless energy and unlimited resourcefulness. In 1858, the territory became one of the United States. But life was still full of the wild and unexpected.

The wife of Doctor Mayo of Rochester was the typical partner of the pioneer. She baked her corn bread on a small stove, she made clothes, brought up a family single-handed, and if patients came to the door when the doctor was fifty miles away, she could mix them a bottle of medicine or put on a temporary dressing. She knew well how to look after herself and her babies in the wilderness. Once, when the menfolk were away and some wandering Indian braves appeared opposite the stockade where she was left unprotected, she dressed the women in trousers and made them parade up and down holding broomsticks to look like rifles, and the Indians held off. It was taken as a matter of course that the doctor's wife should help him in an emergency, and when the two boys, William and Charles, grew up, they entered medical apprenticeship. Besides being handy with the sporting rifle, and able to milk cows when there were no logs to saw, they learned to roll pills and make splints, and to help their father

by giving chloroform. The little doctor had the pioneer's hunger for new gadgets that would save time and give the sense of being in touch with civilization. He mortgaged his home to buy that new scientific toy the microscope and thereby give his sons the notion that country practice could have more in it than mere routine in snow-covered farmhouses. William Worrall Mayo indeed had the instinct of a born teacher. His wandering life, his hunger for different experiences had shown him how much there was to learn. Practically all he knew of medicine, he had taught himself, and now he taught the boys. But more potent than mere information, he communicated to them his mental restlessness, his urge to experiment and find out a new and better way of doing things. They might learn their anatomy from the skeleton of a giant Red Indian who had been hanged in Rochester for murder and rebellion; but their unique contribution to the tradition of medicine they acquired from their father whose wisdom had begun in the spirit of John Dalton, and matured by self-nurture in those creative and lively years of the American frontier.

Well aware of his own medical limitation, Dr. Mayo decided that William and Charles must have the finest professional education that was possible, a training, in fact, twenty-five years better than that experimental and irregular instruction he had himself passed through in raw prairie colleges. He chose the best medical schools that were available. William went east, to Ann Arbor in Michigan, then a new and comparatively unorganized academy which was to grow into one of the great medical establishments of the world. Charles Mayo, the younger of the boys, attended the Chicago Medical School, afterwards the North-Western, which was the first in the city to offer its students something like a complete curriculum. William graduated in 1883, and Charles in 1888.

Of those who aspired to practise medicine, only an ambitious minority went to college, and even they spent only the winter months in study, returning to their homes for the summer, and three years was considered enough to make them into doctors. From September to April they sat in the amphitheatre and stared at a blackboard, watching the professors outbid one another in eloquent descriptions of diseases. Medical students hardly ever handled patients for themselves; by modern ideas it was not medical education at all, save by the quality of inspiration those professors could give. Charles and William Mayo had their real background of practical medicine in the farmhouses around Rochester, where their best teacher was their father himself. Now, professionally qualified with the letters M.D. after their names, they went home to begin the most natural partnership in the world, that of a self-taught elder and two academically trained sons humble enough to see they needed post-graduate experience.

In surgery, the moment was historic. Lord Lister's methods of keeping wounds free from infection with germs had spread from the eastern medical schools of America and been accepted in the north-west, and the Mayo brothers belonged to the first generation of craftsmen who saw before them the entire human body ready to yield up its secrets to those who were prepared to explore it with the new technique which had made operations safe. All around them, pioneers were discovering the riches of America—gold, silver, timber and oil. They had only to put forth their hands to do the same in surgery.

The family practice which thus began in Rochester, Minnesota, grew quickly, but if anyone had prophesied that this prairie practice of father and sons was to become in fifty years one of the greatest medical schools of the world, even Dr. William Worrall Mayo would have looked on him suspiciously as a candidate for the Olmsted County Mental Hospital.

2. THE PRAIRIE DOCTORS

This country practice was based on certain moral ideas which were unusual in the north-western states during the last century.

To William Worrall Mayo, a physician was a dedicated person who must put the welfare of his patients before his own private gain. He and his sons were there not to accumulate money, but to help people to be healed. His own wanderings, his excursions into tailoring, land surveying and politics, had given him insight into people's minds. He perceived that to produce satisfactory results a physician had to have a high personal authority over his patients. They must have trust in him, believe he was different from themselves, otherwise he could not do them good. Now one of the most important ways in which he could be superior was to rise above money values. Everyone on the frontier was busy accumulating property, and worldly success was the sign of social pre-eminence. In such an atmosphere a man who had the reputation of seeking a different standard became in the minds of these pioneers an exceptional man. Farmers who struggled to be rich, real estate brokers whose only standard of achievement was in millions of dollars, lawyers running for office, and all the commercial thrusters of Rochester developed an awe of this family, who though undoubtedly successful in their profession, did not accumulate a fortune. They were adequately paid for their services, but the interest of their work seemed to satisfy the larger hunger. Placing personal character above personal possessions was the first lesson which Doctor Mayo taught his sons. In Europe, such unworldly notions might have turned the sons into a pair of dilettantes, but in the bracing mental atmosphere of the north-west, it was possible to switch over the energy which most men applied to dollar-making into the pursuit of professional efficiency. And the second fundamental example which the father gave his sons was the necessity to continue

both to learn and to teach, these being two-way activities essential for mental growth. The Mayos formed a perfect example of the phrase 'communicative learners.' They never stopped acquiring new knowledge, and they did not feel secure in what they had learnt until they had passed on its spirit to others. They kept up their father's habit of sending round word to other medical practitioners in the district whenever some unusual operation had to be performed. And once they settled in Rochester, the Mayo brothers formed the habit of weekly visits to the hospitals of Chicago three hundred miles away, where they would absorb the latest teaching from the surgical masters. Such open sharing of knowledge and experience is today so much a part of professional custom that we forget the conditions of half a century ago, when doctors inherited from the quack drug vendors and market-place charlatans the idea that really powerful remedies must be kept private. A successful physician built up his reputation on personal secrets and made mystery his working capital. Dr. Mayo and his sons started practice upon the notion that their first duty was to make themselves as competent as possible, and their second obligation to improve the professional standard of their city.

The elder of the sons, William, had fair hair, embarrassingly frank blue eyes in his square face: Charles, the younger, was dark and Latin—more like the father. Their minds worked in perfect harmony, seeming to function independently in a common role. No one would ever be able to answer the question whether William or Charles were the greater surgeon of the twain. Possibly William was more solid, systematic and more enterprising, more Scottish like his mother; but Charles was more brilliant, more of an artist by temperament, more of a plunger like the father from Lancashire. They both developed slowly, helping the

older man in a mixed general practice which included everything from measles to midwifery, and any surgical operations that had to be done. They compounded medicines for themselves, drove their horses as far as the snow drifts and walked the rest of the way to the patient's home, and all their work was duly chronicled in the local newspaper, especially the operations. It was impossible for a physician to keep anything back from the gossipy interest of the people of Rochester. The Mayos of Rochester could no more conceal their failures than they could hide their successes.

In a farmhouse near Rochester there happened to live a woman with an enormous abdominal swelling which must have weighed an incredible number of pounds. Such masses of tissue grew from a diseased ovary, and by their very bulk and weight often become inconvenient and even dangerous. Daring operations were beginning to venture to remove them. A village doctor named Ephraim MacDowell in Danville, Kentucky, had been the first to perform such a feat successfully.

Dr. William Worrall Mayo arranged to meet a few of his fellow practitioners at the farmhouse one Sunday morning, and he proposed to tackle this unfortunate woman's truly prodigious growth. According to custom no fewer than fifteen other doctors from the neighbourhood had gathered to watch the performance in the farmer's parlour.

Unfortunately, the train bringing Dr. Mayo was delayed, and it was not until some hours later that, full of impatience to get busy with the operation, and with apologies to his medical colleagues for keeping them, he reached the farmhouse. There on the doorstep was his elder son William, who shyly informed his father that he had thought it best to get on with the job, with the help of his brother Charles: that in fact he had removed the

tumour and there it was in the family washtub, and the patient was safely in bed, with a calm pulse.

The colleague who was to help the old doctor Mayo sat on the doorstep and laughed till tears came, and the dynamic Dr. Mayo had to swallow his indignation at being baulked of his surgery.

He realized that his sons' talent had flowered: William and Charles were independent craftsmen. They had learned all he could teach them, and had gained self-confidence from those visits to Chicago to watch the specialists.

Manual operations were coming to be an important feature of the Mayo country practice, but it was rather inconvenient to have to carry out so many of them in distant farmhouses where patients had to be visited several times in twenty-four hours, and sometimes all the difference between success and failure lay in the after-care. The Mayos required a surgical centre where the new wonders could be performed with more convenience. A natural event in the perverse climatology of Minnesota was to give the Mayos their opportunity.

A summer storm began in the hills: it grew to a tempest, then a hurricane, and finally developed into a tornado of violent and destructive power which swept over Rochester, carrying away more than a hundred wooden houses, and leaving a trail of dead and wounded to be cared for in an improvised first-aid station. The community woke up to the fact that it had no hospital.

In one corner of the town there happened to be a little community of Franciscan nuns and, in this emergency, and as a work of charity and mercy, they offered to build a small hospital provided Dr. Mayo and his sons would attend the patients. Since he was not a Roman Catholic, this proposal was a compliment to his professional standing, and before long, Rochester had its

infirmary of forty beds with the nuns as nurses. Henceforth there was no need to send round word for other doctors to watch them at work in a farmhouse kitchen. Every morning, the two brothers would undertake several operations in a special room set aside for the purpose, and doctors were welcome to watch them. A new era in postgraduate teaching had begun in this small prairie town.

The old doctor turned seventy. He had lived a strenuous life and now he proposed to enjoy himself, but to him retirement did not mean repose. He proposed to give himself leisure for his two hobbies—travel and Democratic politics. His boys were now both turned thirty: they could carry on the active part of the practice.

The long career in common which was to lead them to joint world renown had opened in the wards of St. Mary's Hospital, Rochester, where William and Charles started their regular surgical work helped by robed sisters of charity. They were still just a couple of country doctors, and the big doctors in Chicago and Minneapolis who belonged to medical faculties and taught students were ready to look down upon them, especially as William and Charles, when they came to town for their weekly visits to the clinics, always gave the impression of men willing to learn. The brothers were, in fact, for the time overshadowed by the established University teachers, many of whom were much their inferiors. Chicago, in particular, now the queen of the middle-west, was an academic centre with several medical schools and some very distinguished teachers. We must look at some of them, not indeed in so detailed a way as to distract us from the career of William and Charles Mayo, but in order to show that in this period of brilliant personal enterprise at the beginning of the present century, the two brothers of Rochester emerged into

fame through the purest merit of their own individuality, and against the background of some formidable reputations in surgery.

3. AUTHORITATIVE TEACHERS— COMMUNICATIVE LEARNERS

A cultivated Dane from Schleswig-Holstein had studied medicine at the University clinics of Copenhagen. He had been a Danish surgeon in the war when Germany fought for Schleswig-Holstein, and again in the Franco-Prussian War, then repairing for post-graduate study to Vienna, the most famous medical school in Europe. After which he returned to his own country where he graduated M.D., expecting in due course to become a professor at the University of Copenhagen. Somehow local and academic jealousies barred his progress; the ruling powers said he was unfit to be a medical teacher because of his hesitating stammering speech. In disgust, he left Denmark, left Europe, and started work in Cairo where this brilliant surgeon soon had the best surgical practice in his hands. His name was Christian Fenger.

Once again an impediment of mental outlook that went deeper than a mere defect of speech—a sort of ruthless honesty and preference for the science of medicine rather than its practice—stood in the way of his complete success. He became tired of Egypt, and took a ship for the new world, and like so many Scandinavians, Christian Fenger landed eventually in the north-west of the U.S.A. and in 1877 started life again in Chicago. He attached himself to the Rush Medical College, as a teacher of pathology. It was characteristic of him that the first professional opening he sought was a post on the staff of the Cook County Hospital where he paid a thousand dollars for the privilege of being allowed to attend the poor patients without fees. Attached

to this position was the opportunity of doing post-mortem examinations. Most young doctors of the period would have regarded this part of the work as a disagreeable extra duty, but to Christian Fenger the studies carried out in the dead house were the basis of a surgeon's education.

To him, the science was supremely important, but the art was less interesting, and though he came to be revered in Chicago as a great teacher, this surgeon to the Cook County Hospital was not very popular in actual practice. His mumbling, excited speech, his oaths in three languages, his passionate excitement over a new problem rather hindered his relationship with the sick man or woman; yet this unselfish man who drove through Chicago in a shabby old buggy, and was never more lively than when grunting and coughing over the dead organs of the patient he had failed to cure, was reverenced by all doctors of the true faith. Each Thursday afternoon, a band of disciples would come to watch him operate, and their respect for his craft would be mixed with pity for the great man's limitations, as they saw him so blindly absorbed in his work as to forget that under his hands and instruments there lay an unconscious patient who had suffered.

Christian Fenger's Nordic passion for precision, his dominating desire for abstract knowledge about the forces of life were necessary obsessions when surgery was young. Around him were the slick practitioners who cared only for easy success, and were stupidly ignorant of science, and foolishly unaware of their ignorance. Christian Fenger may have exaggerated the scientific aspect of surgery in the cure of the individual, but he represented the clear light of truth in the oppressive gloom which surrounded medicine and surgery when the Mayo brothers were learning their craft. Fenger brought into the crude outlook of the middle-west a gleam of the culture and scientific enlightenment of the Universities of Europe. William and Charles, just off the train from Rochester, found a refreshing poetry in the broken and

guttural accents of Christian Fenger, and when the clinic was over on those Thursday afternoons, they would follow him to his house and, over glasses of Danish beer, go on discussing surgery as it was practised in Berlin and Vienna.

The second city of the United States was proliferating like a piece of youthful bodily tissue. Chicago was beginning to think of herself as potentially the liveliest metropolis of America and even of the whole world. The population was growing, new suburbs were pushing along the lake shore and out into the prairie. Chicago had become the point where the old and sophisticated east joined up with the raw and developing west, where the railroads of the continent were tied together in a gigantic knot. At this crossroads of America the traffic was so swift that leisured contemplation was at a discount. Medicine and surgery became infected with this unrestrained competition.

Among the outstanding gladiators to whose lectures the Mayo brothers listened, was Nicolas Senn, born in Switzerland and medically trained in Germany. He had been a military surgeon during the American Civil War; his researches upon the cause of peritonitis had given him a reputation in Europe. As was necessary in the days when anaesthetics were new and badly administered, he was a lightning operator who could finish off a difficult procedure in about half the time taken by the ruminative Christian Fenger, though it was said that Nicolas Senn was more bold than careful. Such knowledge was unique in Chicago and it made Nicolas Senn a fiercely dogmatic and intolerant lecturer who was rather feared in the medical world. This man was a pathfinder, who started his own school and his own clinic, and wherever he was, he raised the mental temperature, and demanded keenness and subservience from his assistants.

Nearer to the Mayo brothers in age, but quite different in temperament was the prodigy of Chicago surgery; his name, John Benjamin Murphy. He was an Irishman with a red beard

who magnetized and scandalized the medical profession. He had all the spectacular brilliance which the Mayos never sought, and wherever there was a medical fight the Hibernian Murphy was in it.

John Benjamin Murphy came to the city from Appleton, Wisconsin (a little town which has harboured such diverse personalities as Harry Houdini the conjurer, and Edna Ferber the authoress), but his parents had been born on the banks of the Shannon in the old sod of Limerick, Ireland. He educated himself at Chicago medical schools, married a socialite from the city's residential area, and through the influence of Christian Fenger who wanted his help, he became surgeon to the Mercy Hospital (managed by a Catholic body) and entered on a brilliant surgical career, teaching students at the North Western Hospital, and when Christian Fenger retired, John B. Murphy succeeded him.

This spectacular Irishman was a careful operator and a consummate craftsman who had studied at the leading clinics of Europe, with Theodor Billroth at the Allgemeines Krankenhaus in Vienna and in Heidelberg, and he could make a speech in German as well as in English.

All through his career, Murphy hunted for novelties in every branch of his craft, always anxious for priority. He claimed to have been the first to collapse the lung of a patient suffering from pulmonary tuberculosis, though others believed the credit was due to an Italian, Forlanini. But Murphy's most notorious invention was a contrivance he called Murphy's button, which was used to join severed ends of the human intestine, and which, though rarely used today, did influence the growth of abdominal operating. He was a hard worker, and in spite of his liking for publicity, a sound operator. Another Irishman, Lord Moynihan, the surgeon from Leeds, wrote of him: 'Murphy was of the true faith. He believed in

safe and thorough work rather than in specious and hazardous brilliance. He was infinitely careful in preparation, and compared with many, inclined to be slow; but every step in every operation was completed deliberately, accurately, once and for all. It led inevitably to the next step, without pause and without haste: that step completed, another followed, and so when the end came, a review of the operation showed no false move, no part incomplete, no chance of disaster. All was honest, safe and simple: it was modest, rather brilliant.'

To his contemporaries in Chicago, he was a perpetual thorn in the flesh. They suspected his red beard, and the self-confidence behind that heel click and stiff bow which he had learned in Germany. They accused him of unethical advertising, of fee-splitting, and other forms of professional misconduct.

An example of his swift methods will help to show what the profession were thinking of. Ex-President Theodore Roosevelt was running for President on his 'Bull Moose' campaign against Woodrow Wilson, when a madman shot at him in Milwaukee as he was on his way to speak. The bullet encountered the manuscript in Roosevelt's breast pocket: he insisted on going on with his speech, and blood was seen on his shirt front.

Meanwhile everyone took on the management of the ex-President's illness. Well-meaning political admirers telephoned surgeons they knew, and Roosevelt himself responded favourably when J. B. Murphy's name was mentioned to him by a friend. He did not wish to be mauled about by too many doctors. 'I don't want to have the experience that McKinley and Garfield had,' said Roosevelt, remembering grim tales of two American Presidents who had been assassinated. Finally it was arranged that the ex-President should take the train for Chicago, and that four well-known surgeons from the city should meet him in the railroad station at eight o'clock next morning.

Somehow J. B. Murphy got there much the first, boarded the train at 5 a.m., persuaded Roosevelt who was giving an exhibition of sang-froid by standing up to shave, to get back to bed. 'All right, doctor. I guess you are the boss,' answered T. R. and before the other eminent surgeons who had been invited had arrived, Murphy had bundled Roosevelt into an ambulance and placed him under his care in the Mercy Hospital. He took an x-ray photograph, but left the bullet alone. In due course, the newspaper bulletins describing the patient's progress appeared, signed by one name only, that of John B. Murphy. He had called in one of the three surgical colleagues who were supposed to meet him at the railroad station, but the other two he never informed that he had been asked to take sole charge of the case.

Theodore Roosevelt was well handled from the surgical point of view, but the medical profession never forgave John B. Murphy, and continued to believe that he had jumped ahead of his colleagues in his usual hotheaded, individualistic and unethical way. Perhaps they judged him too harshly. Could complete regularity be expected from an Irishman with a red beard?

That careful craftsman whom Lord Moynihan admired was an example, in his professional relations, which made a deep impression upon William and Charles Mayo, a bad example of a great surgeon with a large gap in the qualities which his profession required in the doctor as a man.

The two village doctors whose own operating was done in the quieter atmosphere of St. Mary's Hospital, Rochester, felt rather provincial in the cosmopolis of Chicago, but at least they could view this strenuous marathon for success with a feeling of detachment. It was possible to learn much from Christian Fenger without being chilled by the inhumanity of his manner towards humanity; Nicolas Senn could give them the vigorous impulse of

his experimental intellect without making them intolerant. The two brothers selected the best from each man's teaching. They were young Americans of the north-west, and they had in their blood the spirit of pioneers.

As young Charles and William Mayo listened soberly to the high-pitched eloquence of John B. Murphy, the precision of Nicolas Senn and the guttural tones of Christian Fenger they must often have envied such qualities. Could they in time operate with such boldness, and expound with such brilliance and clarity?

Privately, they looked for attributes of perfection and selflessness which none of their authoritative teachers possessed; something quieter and more human, a professional attitude that was more sincere and less spectacular, and which had some of the intimacy of Rochester's quieter streets and part of the healing peace of the prairies.

4. NEW CURES BRING NEW DISEASES

Wherever there are doctors, there will always be diseases. The first results of the revolution which William and Charles Mayo helped to introduce into surgery was a paradox. The final aim and end of medicine must be the elimination of ill-health, yet the early period of any new development always brings out new conditions which people never knew they suffered from. The fact that a surgeon was available produced more cases for him to treat. As soon as there was an eye trained to see them, fresh surgical territories came into view. This is only another way of stating that when there is no treatment, people suffer and even die in silence, but a new method brings them flocking to the hospital with fresh hope.

The pressure of their opportunity was deflecting the Mayos from general practice, forcing them to concentrate upon surgery,

where almost everything they touched was new and the chances of self-development were enormous. In after years when their work had become world-famous, they would say that their success was due only to the fact that they had been born at a particular moment when the whole of modern surgery was new, and that modest statement is an important part of the truth. It was indeed the golden age of exploration.

A disease called perityphlitis was being much noticed by the lively younger surgeons in England and America though older practitioners would say they had never heard of it. On the right-hand side of the abdomen a swelling would develop accompanied by severe pain and high temperature, going on even to the death of the patient. The more daring surgeons would open such an abscess and release the dangerous fluid matter, with good results. But the reason why that particular part of the abdomen was so favourite a place for these abscesses was quite unknown, and the abdomen itself was rather feared as a risky place to work in.

There was a doctor in Boston named Reginald Heber Fitz. After graduating at Harvard, he took a post-graduate year in Vienna, but not finding there exactly what he wanted, he went to Berlin where the illustrious Rudolf Virchow was laying down laws in the whole field of medicine. Fitz grasped the spirit of this man's decisive teaching, and came home to Massachusetts to reproduce it in the Harvard Medical School. He was over forty when he published a paper on the drama of the lower abdomen, which caused a revolution in surgery. From 250 cases of perityphlitis which he had watched and analysed, he induced the cause of the disease, and laid down rules for its treatment. Three years later, in 1889, he described a second series of seventy-two cases. According to Fitz, the cause of perityphlitis was infection from microbes originating in a small projection from the intestine, a wormlike thing hanging from the bowel. From this tiny,

and apparently useless, tube the inflammation might spread quickly to the lining of the abdomen, with fatal results. On the other hand, the mischief might settle down. A third possibility was now open to the daring surgeon—to operate and let out the infected matter. Like other surgeons, William and Charles Mayo opened these abscesses to cure perityphlitis, and as they saw more of such cases, they realized that it would be better to tackle the disease while the inflammatory process was confined to the small and useless projection. In fact the ideal would be to operate even before the abscess had started to form. Why not remove that wormlike tube altogether?

William Mayo read a paper based on twenty operations done by himself and his brother. They were by no means in favour of operating in all cases. Since the basic cause of the inflammation was an infection of the worm-shaped projection from the bowel, and since this was named in anatomy books the vermiform appendix, the Mayos insisted that the proper name for perityphlitis was really appendicitis.

It was not only a new episode in surgery, but a fresh epoch in the life of surgeons. Today, when operations for appendicitis are so common, we can hardly realize the fumbling steps which were made to what has now become a safe operation. The idea had to grow that it was not absolutely deadly for the surgeon to put his knife into the abdomen, a place hitherto considered sacred. Then there was controversy over the wisdom of removing the appendix at all. Perhaps this tube was no mere vestigial remnant, but a highly important organ, with a specialized function of its own in the body. If so, removal would be unwise and even dangerous. On the other hand, reasoned the advocates of removal, this tiny worm of bowel was nothing but a memento of an earlier phase in human development and otherwise quite meaningless today, like the few bones at the bottom end of the spine which

represent the monkey's tail. Finally, in the treatment of appendicitis, there were the undoubted risks of the operation itself. Some cases were much better left alone to recover by themselves by the slower but safer courses of nature. It needed sound judgment to decide what was the best way to proceed, and the caution shown by the Mayos was quite justified.

The progressive surgeon who knew the dangers of advanced perityphlitis would naturally hope to catch his patient at a much earlier stage, when the inflammation was only slight, and operation was likely to be both safe and successful.

But from the patient's point of view, this early beginning was just the moment when he was least inclined to submit to an operation. Why should he undergo that unpleasant experience when he hardly felt ill? He was all for putting off the evil day, and probably in the early years of surgery his relatives would agree. It was these diabolical surgeons once more, always too ready with the knife, bold and over-confident, and caring more for their new-fangled operation than for the life of the patient. The villains had invented a new disease—being smart enough to call it appendicitis whereas everyone knew it was only perityphlitis and thereby they were lining their pockets with a new source of professional fees.

That controversy went on for ten or twenty years. But it was not all ignorance and prejudice: behind the excited clamour among the less well-balanced surgeons and the natural fears of patients, there was the mysterious background of this inflammation itself. In the effort to prevent the serious consequences of perityphlitis, careful surgeons like William and Charles Mayo realized that masterly inactivity might be the best policy. Judgment would need time to mature.

In the summer of 1902 the whole of England was waiting for

the sumptuous ceremonies of the Coronation of Queen Victoria's son. Westminster Abbey was prepared for an event which had not taken place for over sixty years, and tiers of seats were fully sold all along the route of the procession through the London streets. Kings and Emperors and an enormous gathering of overseas visitors were expected for this, the greatest royal occasion since the late Queen's Jubilee. Suddenly, it was announced that the Prince of Wales was taken ill, and the most gloomy assertions were made as to the cause. When a man above middle age has an abdominal illness, there is one possibility more dreaded than all others.

It was thirty years since the severe attack of typhoid fever at Sandringham. Queen Victoria's reign had come to an end, Sir William Jenner had departed too, and King Edward VII was now a vigorous man of sixty-one. Abdominal symptoms naturally suggested the sinister possibility of cancer, and it was almost with a sense of relief that people heard the word 'perityphlitis.'

On June 14th the King had indeed complained of abdominal discomfort, but insisted nevertheless on carrying out an engagement at Aldershot. That same evening the pain returned, and another physician was called in. On June 15th there was a fit of shivering, but the next day the King had recovered sufficiently to drive to Windsor. On June 18th there was a swelling on the right side of the abdomen, without doubt an abscess. On June 21st the temperature had fallen and been normal for two and a half days, and in every way the King was better. The presence of an abdominal abscess was not confirmed until the 24th when more doctors, this time members of the surgical branch of the profession, were called in, among them Lord Lister.

A heavy responsibility rested upon them. Not merely were they dealing with a potentially dangerous disease, perityphlitis, but there was also another phase of the illness, always significant to

doctors but not generally so important as in this case—the patient's occupation. As they palpated that swelling, considered its nature and measured the gravity and the chances of a surgical operation, those surgeons were in the presence of millions of unseen critics all over the world. The Coronation was due to take place on June 26th, and now the doctors must decide whether their patient could be allowed to take the risk of that prolonged ordeal.

There was no real dubiety in the matter. The surgeons knew enough about abdominal abscesses to make them extremely cautious. They decided that the Coronation Ceremony must be postponed in favour of a surgical ceremony to release that dangerous collection of infected matter. Although Lord Lister was present at the bedside, the real responsibility for this unheard of performance inside the walls of Buckingham Palace—a surgical operation—was to fall upon a much younger man, Sir Frederick Treves. He was forty-nine but he had come to his maturity at an early age. He qualified from the London Hospital as a member of the Royal College of Surgeons when only twenty-two, and married at the age of twenty-four and retired to a country practice in Derbyshire. Twelve months of general practice was enough, and he returned to his old hospital to become Surgical Registrar—a junior appointment generally given to a man in training to be a full surgeon.

Before long he had a very large practice, was the author of several text-books and had rather specialized in the new abdominal surgery. Of course, he accepted the teaching of Fitz and had gained much experience in the treatment of this malady, but he did not care for the name appendicitis which he thought clumsy, although he admitted there was 'a bold aggressive modernness about the name suited to a modern disease.'

In the King's case there was no doubt that something had to be

done at once. The pagent and sacrament of the Coronation had to be postponed, while inside the palace a strange sort of shrine was set up where a ceremony quite as mysterious as any ritual anointing with oil was to be carried through upon the royal person by Sir Frederick Treves.

The abdominal abscess was opened, drained with tubes, and packed with iodoform. The King made a rapid convalescence and a little more than two weeks later was able to receive Lord Salisbury on his retirement from the office of Prime Minister and to give the seals to Mr. A. J. Balfour. On July 15th the King left London for Portsmouth for a cruise in his yacht. The Coronation took place on August 4th. His complete recovery established the operative treatment of appendicitis.

Treves became a Baronet, Sir Frederick Treves of Dorchester, from a handsome town in the West of England where he was born. In due course, he retired from surgery, and became a great traveller and writer-up of his experiences. He loved swimming and bicycling, and even held a master mariner's certificate. Each day he rose at six in the morning to write his books on Dorset, travels in Uganda and Palestine, and elaborate on the topography of Robert Browning's poem 'The Ring and the Book.' He was a man whom success had never spoiled.

5. THE PARTNERS

General medical practice in Rochester began to fade into the background. The Mayo brothers were too busy to attend midwifery cases and be called out to patients with diphtheria. To become a surgical craftsman demanded a man's whole energy and having passed through the fire of general emergencies, they could devote themselves to becoming specialists without being cranky or one-sided. There were many reliable practitioners in the neighbourhood. They could carry on the general work, and from even before the beginning of this century, the Mayos came to spend

their time almost exclusively inside the walls of St. Mary's Hospital. There the original nucleus containing forty beds which the Franciscan sisters had started for their father had become quite inadequate, and St. Mary's had never stopped growing; a new wing here, a larger section there, and additional operating theatres, but soon even those excellent facilities were not enough for the patients who came from the surrounding counties and cities, St. Paul, Chicago and presently from the whole of the middle-west. Private hospitals and hotels which catered exclusively for surgical patients grew up in Rochester. Consulting rooms were connected by passages, surgical hotels joined by bridges and covered ways, until the treatment of illness had taken on the status of a major industry in this city of five thousand souls which now handled more invalids than farmers. The cab drivers who met the trains at the railroad station would ask automatically of each arriving passenger: 'Are you doctor or patient?' In 1893, less than five hundred surgical operations were performed; by the year 1900, this figure had been multiplied by ten, while in 1910, more than eight thousand patients passed through the operating theatres.

This had grown beyond two pairs of Mayo hands, and one by one, new assistants were engaged and trained, and the original partnership of two brothers and a semi-retired father, changed its nature. William and Charles were obliged to give up their habit of helping one another at operations, and now they worked in adjacent theatres, while one by one, fresh partners joined them. Their team had become a group of specialized collaborators which was continually enlarged to meet the extraordinary expansion in the number of patients who flocked to Rochester as Roman Catholics to Lourdes.

These patients came to Rochester with an objective different from any which had inspired a place of healing in the world before. Until then, surgery meant danger and inescapable ur-

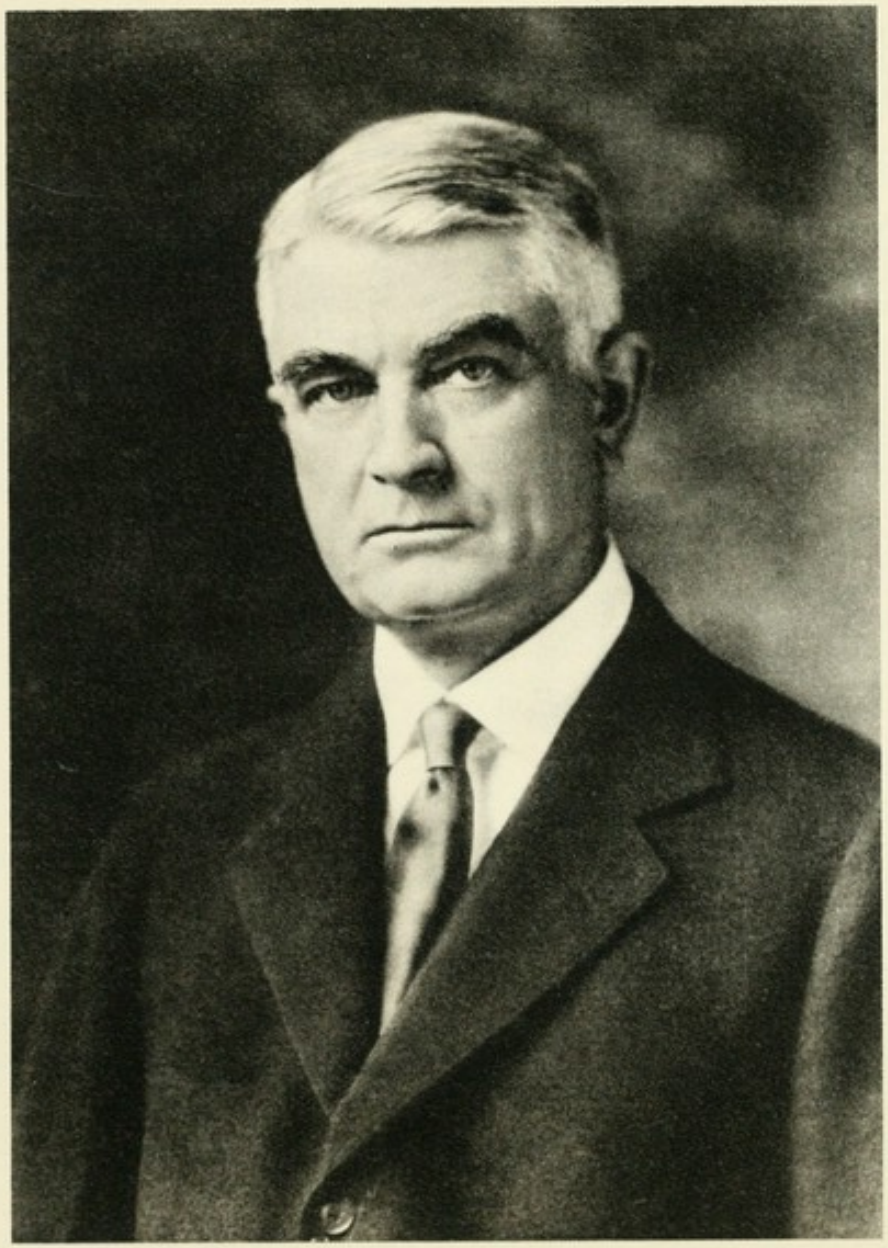
gency. The surgeon was called in only where everything else had failed, to amputate a limb, or perform some heroic feat when no other treatment was possible. He would set broken bones, amputate a hopelessly injured limb, tie up bleeding blood vessels, and put stitches in lacerated wounds. The understanding was that the surgeon was called in only for the calamity, or the disease that had resisted cure.

But now surgery took an entirely novel path; operations were used for diseases not absolutely dangerous to life. The aim was to restore health and prevent further symptoms. Those who came into hospital for 'alterations and repairs' were as many as those who came because they were desperately ill.

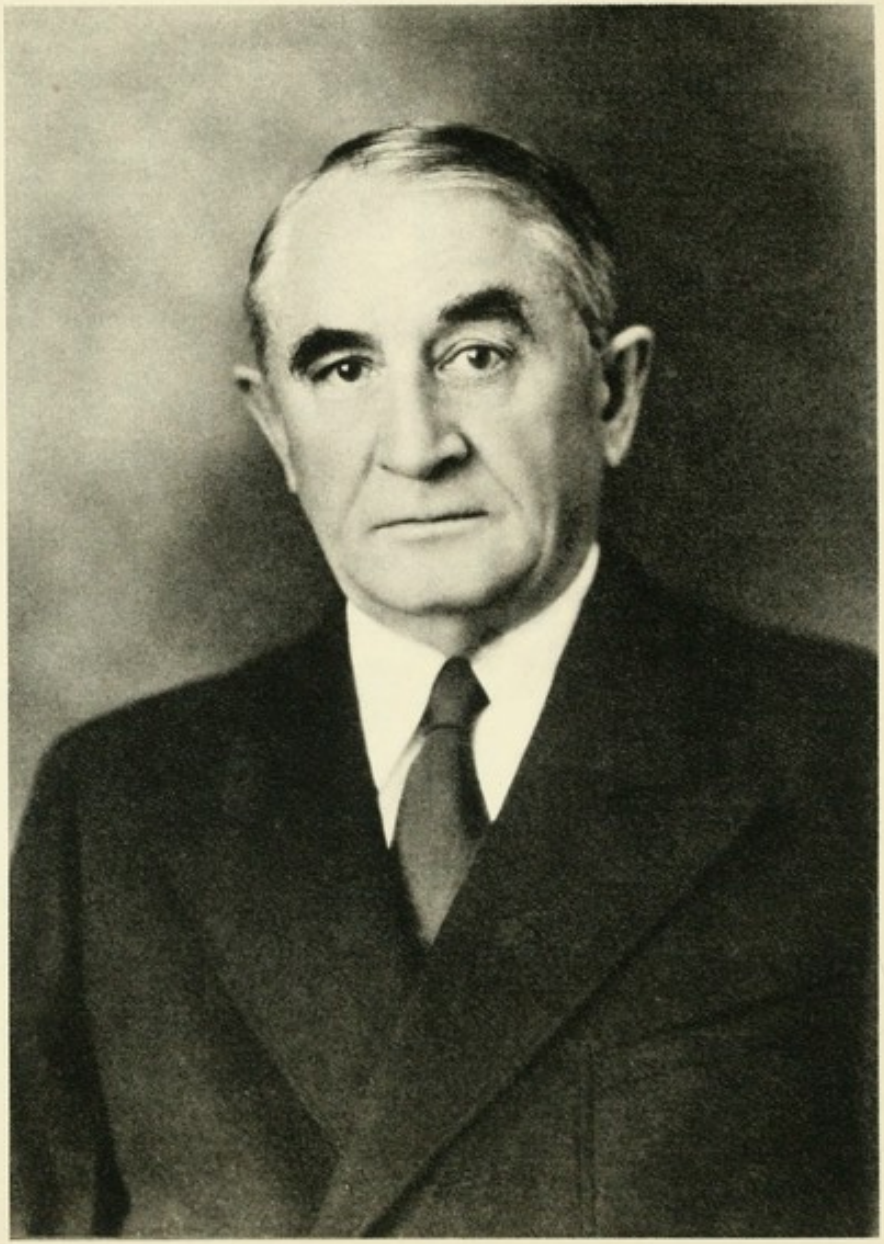
The man with the hernia was prepared to take the chance, almost a certainty, of being rid of it for ever. Gallstones were removed, tumours taken out, and that vestigial piece of trouble, the vermiform appendix was eliminated as soon as it gave any signs of its presence. Before long, even patients with cancer were prepared to submit to operation in order to be cured.

A revolution had come over the popular estimate of what surgery could achieve. Its old frontiers were disappearing. Those hidden organs, the ovaries and womb, the stomach and kidneys, could be handled as easily as though they were on the surface of the body. It was the golden age when almost every exploration was new, and the prospect of a rapid cure by surgery was more popular than long treatment by medicines. It had become quicker, and cheaper, to take the train over to Rochester and have Dr. Charles Mayo remove stones from the gall-bladder than to stay at home for discomfort, dieting and drugs. The Mayo brothers began to specialize: William doing abdominal cases while Charles preferred the head and neck.

Leaving the Pullman car which had travelled overnight from



DR. WILLIAM J. MAYO



DR. CHARLES H. MAYO

Chicago, the pilgrim for health would take a horse and buggy and drive through the broad streets of Rochester lined with flat-topped frame buildings, until he reached the Masonic Temple, a hideous red brick building in the centre of the town, and there he would look for Dr. Mayo's office. The practice of the Mayo brothers had nothing to do with Freemasonry, but it happened that they rented their first floor from that fraternity which had its headquarters on the street level. In a plain set of rooms characteristic of country practice, in surroundings like thousands of rural doctors all over America, they examined their patients who were herded in the central corridor. The clerical records and case reports were kept in large old-fashioned ledgers, all mixed up with the accounts. A privileged and eccentric janitor named Jay marshalled the patients in and out of the small consulting rooms where William and Charles, or one of their assistants, examined them on plain couches. Jay was a faithful henchman of the Mayos, and with the passage of years he became more possessive and dictatorial. Always chewing either a plug of tobacco or an onion, he ordered everyone about, behaving in proprietary fashion towards William and Charles with whom he had grown up. If he disliked a patient, or it was a self-important person from the city who came at wrong hours and tried to put on airs, Jay would wave him off, saying with contemptuous superiority: 'We've got all the patients we can handle.' Indeed, having enough work to do and no worries about the money side of the practice was to be the pleasant predicament of the Mayo brothers to the end of their days. Their local reputation was vast, and was becoming regional, yet still they were in one sense only small town doctors and they acted still as medical officers to the railroad and a score of Rochester organizations, and their practice shared the ups and downs of farm prosperity in Olmstead County. When prices for corn and hogs were good, their clients could afford to be ill, and

the waiting-rooms were thronged. When drought parched the land, or a hurricane swept away the corn, people were ill just the same, but they could not afford one of those fancy operations, so they stayed at home till the real emergency came.

A local doctor named Plummer had called out Dr. Will Mayo in consultation over a very obscure case of blood disease; it puzzled even him, because at the time, not very much was known on the subject. On the way home from the patient, the doctor explained that his son Henry was very much interested in the blood and its problems, and soon Henry had taken out his microscope and was demonstrating to Dr. Will the peculiar forms of blood cell which he had found in this particular patient, and comparing them to normal cells in his own blood. Dr. Will was bewitched by this boy's quite exceptional knowledge.

One of the factors in William Mayo's success was his power to recognize an unusual man. He decided that young Henry Plummer, still only a medical student, must be drawn into the Mayo orbit, and in due course the young man became a collaborator whose extraordinary intelligence enriched the power of the Mayo clinic and gave an entirely new twist to its activities. It was said, and both brothers admitted it: 'Henry Plummer was the only genius who came into the Mayo clinic.'

Henry Plummer had an incisive wit, and he was soon to point out to the surgical brothers that their actual operation was only a part of the treatment of each case, and perhaps with more knowledge of body chemistry, it might become in the future a less important part, and in the more distant future, surgery might even disappear altogether. In other words, the aim of the new sciences of medicine might be to abolish the hard-won craft of the surgeons.

Being men of intellectual integrity, William and Charles Mayo

agreed that this was a correct diagnosis of the medical situation. The more they specialized in surgery, the more they realized that in the long run pure surgery was not enough, and that the sciences of medicine were to be developed as a whole.

Henry Plummer's sardonic laugh would echo through the corridor of the Masonic Temple in Rochester whenever he had occasion to speak on the subject of surgeons. To him, these virtuosi who held the spotlight so successfully, were merely technicians; their far-famed manual dexterity with knife and forceps was nothing but one rather crude branch of the healing art. Henry Plummer agreed with the sentiment of the poet Robert Bridges (himself a physician), whose lines are quoted at the beginning of this section of the book, that although internal medicine makes not such an appeal to the vulgar, her real value lags not a whit behind surgery. To Plummer the cultivation of medicine was an austere intellectual process, and its instrument was logic based upon deep comprehension of the patient's bodily reactions. Test tubes, chemical stains, sections of tissue and films of blood seen under the microscope, these were the weapons of the scientist of medicine, and the ideal was to cure the patient through understanding his organic processes and correcting their aberrations, rather than by crude manipulative skill.

Henry Plummer was a good talker and a profound thinker. As he waved his cigar and poured out his theories he influenced William and Charles Mayo in a subtle way, and to their credit, they accepted his evidence and ideals. Other surgeons who prided themselves on being 'practical' would have dismissed Plummer's work as a mere sideline to the real craft of surgery. But they had the intuition that fundamentally Henry Plummer was correct.

It was not a sudden decision. There was no instantaneous reversal in the Mayo policy. The change came gradually over ten years, during which the diagnostic activities of the Mayo partnership became stronger, and more time was given to the investiga-

tion of the patient. The nature and outline of the service necessary to be offered to the sick person who came inside the doors of the Masonic Temple was becoming more clear. William Worrall Mayo had taught his sons that they must give only their best. And now it was becoming obvious that this transcendent offering, the greatest that any profession on earth is called on to give to its clients, the gift of the restoration of life and health, was much bigger than even the most devoted personal skill and service. Patients who came to Rochester were entitled to enjoy the benefit of the whole science of medicine, and the collective faculties of every member of the staff. That wretched ailing man, or woman, who waited nervously in the corridor above the Masonic Temple, was entitled to the full reward of his faith. Of course, he did not understand the investigations which Henry Plummer practised like so many spells in the basement. But by the fact that he consulted William and Charles Mayo, he was to have every possible advantage in that the new knowledge and the skill of each of the collaborators was his. This was what the Mayo brothers had learned, by a process of contraries, from Nicolas Senn and John B. Murphy, those great individualists, and from their father the greatest individualist of them all.

Without deliberately planning such a departure into collective medicine William and Charles Mayo had achieved something that was to be more important than any of the operations which they practised so deftly, which is only an illustration of the divine law that the pioneer's greatest discoveries are those which he makes without conscious intention, and that if he follows his clear stars, fate leads him into the unknown.

6. THE MAYO CLINIC IS PLANNED

Old Doctor Mayo had never believed in keeping a good thing to himself. Naturally expansive, a born expositor, he was never

more at home than when demonstrating a new idea to a group of his fellow practitioners. And, of course, the patients enjoyed it too; they loved being the centre of attention, and the intense discussion that followed these informal seminars in St. Mary's Hospital, Rochester, was good for medicine. The critical eyes of his fellow doctors, sharpened to detect any flaw in his methods, kept the operator vigilant. Getting the local physicians together prevented those jealousies that arise between members of the same craft, for there is something in honest work and free discussion which lowers the human temperature and minimizes professional friction. The Mayo sons kept up this fraternal custom of their father's, and they were never without visitors—from Minnesota, Illinois, New York and presently from Europe. Stands were erected in the operating theatre so that surgical guests might watch every detail of the Mayo technique, and as their hands moved effortlessly among their instruments—cutting, sewing, feeling and replacing—William and Charles talked quietly and continuously, explaining each step in the operation. Hearing them, a shallow observer might have had the impression that the Mayo brothers took all their ideas secondhand. William Mayo would say casually: 'I learned this method from Dr. . . . of New York.' Or, 'Dr. Murphy of Chicago was the first to introduce this improvement.' A foolish visitor might have suspected a certain lack of originality, and both Mayos spoke calmly of their failures as well as their successes. But this manner was deliberate. It was policy, not modesty.

It was all very different from the bombast which they themselves had listened to from the great men in the Chicago clinics. The Mayo brothers had been obliged, through force of circumstances, to give up the pretense that they were small town surgeons worshipping the giants of the cities. Now they had developed their own attitude to the world, and this apparent

modesty was the expression of a new mode of thought towards the evaluation of medical treatment.

A new and more deadly instrument had come into use—the method of statistics, and it was employed by the Mayos with telling effect. Failure or success—they had now to be chronicled in the language of figures, which no one could misunderstand. No longer was it permissible to say: 'My operation is a splendid advance. Its results put the older methods to shame and indelibly stamp those who use them with the brand of the reactionary.' Oratory and dialectics were out of fashion in writings on surgery. Discriminating readers wanted to know exactly how many good results there were, and how they compared with other allegedly bad results. It was necessary for the writer of an article on surgery to use language something like this: 'In a total of 543 cases, the immediate operation mortality was 3.6 per cent, while twelve months later, 80 per cent were free from symptoms.' What William Farr had done with epidemics, the progressive surgeons were now doing with their cases.

Yet it is obvious that the whole value of such figures depends on the honesty of the person who makes them. False statements in numbers may tell lies a hundred times more dangerous than even the most absurd generalizations. Another source of ludicrous mistakes was to offer figures too small to be of any use. If walking along the street you meet two people, one with red hair and one with black, it will not do to base on these two observations a pseudo-scientific survey of the inhabitants and on that evidence to report that fifty per cent are red-haired and fifty per cent black. The result might be very different if one were to note the hair colouring of a thousand people. Reliable statistics can be produced only by honest observers who understand the laws of numbers. Part of their prestige among the surgical profession was built up by the Mayo brothers upon a mastery of statistics

which appealed to the realistic American mind. The percentages of successful operations were bandied about like baseball results. The surgeons themselves loved to acclaim the man who held the nation's best record say for gallbladder excision. This prestige was built as much on the moral values behind the figures as on the surgery itself.

William and Charles Mayo had this sort of personal integrity, and their wide reputation throughout the U.S.A. made it certain that in practically every disease they would have seen cases enough to make up a tale of figures that the most cautious mathematician would accept. Others surgeons might feebly generalize from cases in dozens, but the Mayo partnership could count their patients by the hundred. The superior patronage which European doctors were wont to extend towards American surgery was changed to awe as they realized that for gallbladder diseases and other abdominal operations, the Mayo records were far more extensive than those of most European clinics. Professors in Paris and Berlin had achieved gigantic reputations on the strength of experience that was narrow and restricted in comparison with the work of these youthful-seeming brothers in their small town in the wilderness several hundred miles beyond Chicago.

By the year 1910, William and Charles Mayo could give forth to the surgical world their figures for one thousand operations for the treatment of goitre. These results were better than those of any other clinic except that of Professor Kocher of Berne in Switzerland, who had been the first surgeon in the world to undertake this treatment.

Similar proofs of the efficiency of the Mayo partnership were given in other diseases. These sober and convincing statements, with dry reports of operations, frank admission of failures, were read by every surgeon in the world, and they came to see for themselves this clinic in the cornfields. Stopping off at New York,

the English or German surgeon would give a hasty glance at the hospitals there, and inquire eagerly for Rochester, Minnesota, but no one had ever heard of it. Rochester—the eastern surgeons might exclaim—it's in the wilds. You can see everything worth seeing right here in New York. The great clinicians of the Atlantic coast might speak slightingly of those mid-western brothers somewhere in Minnesota, but the foreign surgeon was impatient to see what he had read about. One medical wit said the Mayo brothers' most successful operation was to make Chicago merely a stopping place between New York and Rochester.

From half-past seven in the morning when they entered the operating theatres, the two brothers worked like joint halves of the same individuality. The ego of each was very strong, but they spoke of their methods and results as something shared together. It was always 'my brother and I have found this—.' They pooled their experience in different fields of surgery. They worked like the perfectly functioning cylinders of a twin engine, and their individual ambitions were fused in the desire to make the reputation of Mayo surgery superlative in its excellence. Yet in personality, William and Charles Mayo were very different men, though they lived amicably in houses next door to one another with a speaking tube between. William, the elder, tall, spare and blond, with a handsome square face and blue wistful eyes, the type of reliable American male, suggesting decency and fundamental kindliness. William Mayo was an American leading citizen, a prominent person, solid and cautious, always well prepared when he spoke, and with true middle-western drive, efficiency and ambition. It was William and not Charles of whom the story is told that when he graduated in medicine a friend had said, with well meant conventionality: 'Well, I suppose you will be going to practise in one of the cities—in Chicago, or Minneapolis.'

'No,' answered William firmly. 'I plan to stay here in Rochester and become the greatest surgeon in the world.'

And yet when they had both become national figures, and received the inevitable accolade of American publicity—that of being talked of for the Presidency of the United States—it was not the efficient Dr. Will, but the popular Dr. Charlie who was mentioned.

By contrast with the Scottish reliability which William derived from his mother, Charles Mayo had a greater share of attractive human weaknesses. Even his good points were cloaked with humorous self-depreciation, and the countless funny tales told about him were invented by himself, and caused his orthodox elder brother many an uncomfortable half hour. The nurses were rather scared of Dr. Will and would have hesitated to help him on with his overcoat; there was the instinctive feeling that he would probably do it better by himself. But Dr. Charlie was different. He never could be counted upon to set his necktie straight, and when giving a clinical lecture he was sure to break off his thread of thought to bring in an amusing story. The jokes which fell from the lips of William Mayo were measured and appropriate, and always in the right setting; but Charlie's humour was spontaneous, and his jests kept the audience in a state of lively expectation.

Charles Mayo had a consuming hobby which he followed diligently in the hours when he was not in the hospital. This pursuit was farming, and the reports of what went on in Dr. Charlie's establishment provided a permanent source of humour for the wits of Rochester. His poultry, it was said, were so highly bred that whenever one of his hens laid an egg, all the neighbours came in to marvel. Dr. Charlie had purchased at great expense a number of aristocratic geese, but one day they took it into their heads to join up with a flock of wild geese and disappeared, carry-

ing Charlie's dollars into thin air. When challenged with his unsatisfactory performance on the farm, the owner would insist in his mock-serious drawl which reminded one of Will Rogers: 'I am not a farmer but an agriculturalist.' And when pressed to explain the distinction, he coined this epigram: 'A farmer makes his money in the country and spends it in town: whereas an agriculturalist spends on his farm what he makes in town.' People admired Dr. Will, but they loved Dr. Charlie.

With all their strong personal ambitions and desire for the prestige of their partnership, they had to a quite unusual degree the power of inspiring collaborators and giving them their freedom. Unlike Nicolas Senn who was likely to force any unduly brilliant man out of his clinic, and John B. Murphy whose fierce desire to hold the spotlight would never allow his juniors to be more than pliable executants of his own will, the Mayos attracted good men and encouraged them to develop themselves.

The brothers lived in handsome houses just outside Rochester and at heart their sympathies were rural. They understood the distractions of the cosmopolis, and shrewdly saw that part of the distinction of their service was the fact that it lay at a distance, and that the mysterious appeal of its remoteness added psychological value.

But what of old Doctor Mayo? That dynamic little gentleman, always original, had made his retirement from practice a door to new occupations. William and Charlie were doing well in the ways wherein he had set their hands, and now the senior partner could afford to enjoy himself. Some men when they retire have no further interest in life, but not so with Dr. Mayo. At sixty, his life had only just begun. What fun it was to be appointed Surgeon to the Minnesota Exhibit at the World's Fair in Chicago! Every four years the old man would be born again as in the

hurly-burly of state and national Conventions, he campaigned for a Democratic Governor or a Democratic President, and he would joyfully serve on committees and delegations, overflowing with eloquence directed against those terrible Republicans. Get him on the subject of American railroads and you would see the sparks fly. He was always ready with an emphatic drumfire of opinions, stamping his cane firmly on the ground, orating loudly upon tariffs, on senatorial wickedness, on free silver, or some other national controversy. There were no doubts or half-truths in little Doctor Mayo. He loved his country, he loved Rochester, he loved his profession, and never bothered whether his opinions were popular.

Then there was the world to be explored, and Dr. Mayo penetrated to California, Florida, the West Indies, always observing, learning. His eighty-fifth birthday he spent while sailing to Japan and China. With the undiminished curiosity of that ambitious youngster who had set out from Manchester at the age of twenty-five, he sped like a divided atom across the American Continent. Travellers who ran across the talkative little American soon learned that he was the father of the two well-known Mayo brothers, those clever surgeons, somewhere in Minnesota, and thinking to please the old man, they would say: 'Dr. Mayo, you must be very proud of your wonderful sons.' Then he would draw himself up, and his voice became indignant: 'No *Sir*. I think my sons have every reason to be proud of me.' Though he had the good sense not to interfere in his boys' surgical practice, he liked the world to know that he was *the* Dr. Mayo, and that he possessed the indubitable right to exercise his paternal privileges now and then, when it seemed good to him. In the early days of motoring, Dr. Mayo's auto broke down and had to be hauled back to Rochester with a team of horses. The little

doctor was furiously indignant, and he burst into his elder son's office shouting: 'I want to see Will.' It was explained that Dr. Will was examining a patient, and would be along presently. But that did not satisfy the old man; he roared that he must see Will NOW. When his son appeared, the father faced him with the unspeakable degradation of the fact that his own father had been obliged to watch his own automobile dragged through the town by horses. 'I want a new auto,' he exclaimed peremptorily. Dr. Will said they would have to see about getting one, but such temporizing only exacerbated the old man's humour, and with his eyes flashing he shouted: 'I want a new one NOW!'

That impatience had been the dynamics of his character. Certainly William Worrall Mayo was an original whom only the American frontier could have bred. His red-hot eagerness and enterprise had cooled and moulded in the achievement of his two sons, but for himself, the old egotist continued to the end, choleric, visionary, gloriously open-minded, and tiresomely experimental, until when over ninety he caught his hand in a machine used for chopping vegetables. The amputation which became necessary was too much even for his vitality, and the ebullient old man left the scenes where he had been so much at home at the age of ninety-two.

The mother of William and Charles Mayo lived on a few years longer, into a green and serene old age, and was able to see the opening of the new Mayo Clinic.

Certainly it was true, as one of the brothers said: 'The most successful thing we ever did was to choose our parents.' Somehow their father and mother had taught them how to reconcile a strong sense of individualism with a powerful desire for co-operation.

The waiting-rooms above the Masonic Temple were crowded

to inconvenience. Offices and hospitals all over Rochester bristled with Mayo collaborators and assistants. Jay, the outspoken caretaker, had a hard job directing patients here and there to see particular doctors, and presently messengers had to be employed to route the invalids among the various units of this complicated organization of laboratories and x-ray rooms scattered through the town. The physicians still entered the patient's name in the large ledger, with the diagnosis in one column, and the fee in another. The automobile had supplanted the horse and buggy, yet the business side of medical practice went on in its immemorial way. It had probably dawned upon the organizing brain of William Mayo that the method needed to be overhauled, but the detailed scheme came from the brain of that philosopher of medicine Henry Plummer.

After several plans had been drawn and altered, after explorations into architecture and business management, with endless conferences, a large 'modern' office building rose and dwarfed the nearby Masonic Temple, and it was named the Mayo Clinic. There, everything was American and efficient: telephones, coloured signal lights, record systems, conveyor belts for patients' cards—the machine had been designed by the practical men who would have to work there, and had learned through all the inconveniences of old-time practice what was needed to save labour through a working day. A statue of William Worrall Mayo had been put up in the Rochester Park, but this building was his true memorial.

From a marble-walled elaborate lounge, resembling the public lobby of a grand hotel, where the patients assembled on the ground floor up through five storeys to the animal house on the roof, every feature was functionalized to ease the consultation between the various doctors, and give the patient the same un-

varying range of the best opinions. No other medical centre had been conceived like it, because in 1912 the notion of 'group practice' was new, and now the Mayo brothers had made in marble and steel a home where their conception might flourish.

The physician or surgeon at the Mayo Clinic was able to study a particular disease at his leisure. He could get to understand his patient, why the pain came at certain times, how his whole life history had contributed to this particular illness.

American patients liked the system, for nothing pleases an invalid so much as the doctor's deep interest in him, and they were prepared to go through with long and even painful examinations to help the physician to get at the truth about themselves. And should cure finally prove beyond human art, they were consoled by the thought that everything possible had been done. They had enjoyed the care of one of the senior doctors: yet each patient also had the experience of all the doctors of the Clinic.

All this was done on a basis of fees and not upon charity. The fact that their clinic combined first-class surgery and competent administration only made the American patient respect it the more.

The Mayo Clinic was, of course, only a centre for consultation and diagnosis, and those who needed treatment were passed over to St. Mary's Hospital, still under the Franciscan nuns, or one of the several hospital-hotels.

The Franciscan sisters of charity still owned and managed St. Mary's Hospital just as they had done when old Dr. Mayo took over the medical work in 1889. Several times the place had been enlarged and modernized, but the sisters performed the nursing work. They kept themselves up to date, opened a school of nursing, and one of them always assisted Dr. Will and Dr. Charles at the operating table. As we think of the nursing ideals and achievements of the ladies of St. Francis in Rochester, the fancy goes back to the great leader of nurses.

Far away in a tall house in the centre of London's West End, another event connected with nursing was taking place, as an old lady nearing ninety, whose eyesight had failed, lay in bed calmly meditating upon things which none of her friends knew, and as they watched her serene and gentle face, they guessed she was happy. This was Florence Nightingale, petted by a nurse, though she had at first been outraged at the idea of needing any such person to look after her, and when she had been tucked up in bed, she would promptly get up and go to tuck up the nurse in the next room. She lay thinking of thirty, forty, fifty years before, sometimes of God and the future state which she believed would be not peaceful but lively and energetic, and she dreamed of the days when she had scrubbed the linen at Scutari, and how the stores department was compelled to disgorge the arrowroot, and then her mind would pass into her greater days when she managed the Indian Army and bullied the British War Office with long memoranda written in her beautiful script. But the centrepiece of those active but cloistered years were her nurses, her beloved nurses. She had clearly in her fancy the picture of the angel nurse; one who would go away in private and put her apron over her head and weep when her patient died. That was the real secret—the power of feeling, that wonderful transcendent ability to suffer with others, and in that sharing to enter their hearts and help them to cure themselves, and now, when eighty-five years were past, she was not lonely, because she had taken many into her own heart, and in that ideal she had given her heart and her mind to nurses in England and America, and all over the world. She died in 1908.

She belonged to the same vintage year as William Worrall Mayo, and his surgical sons relied upon her spiritual daughters. Nowhere would Florence have been more at home than in that prairie hospital in Minnesota.

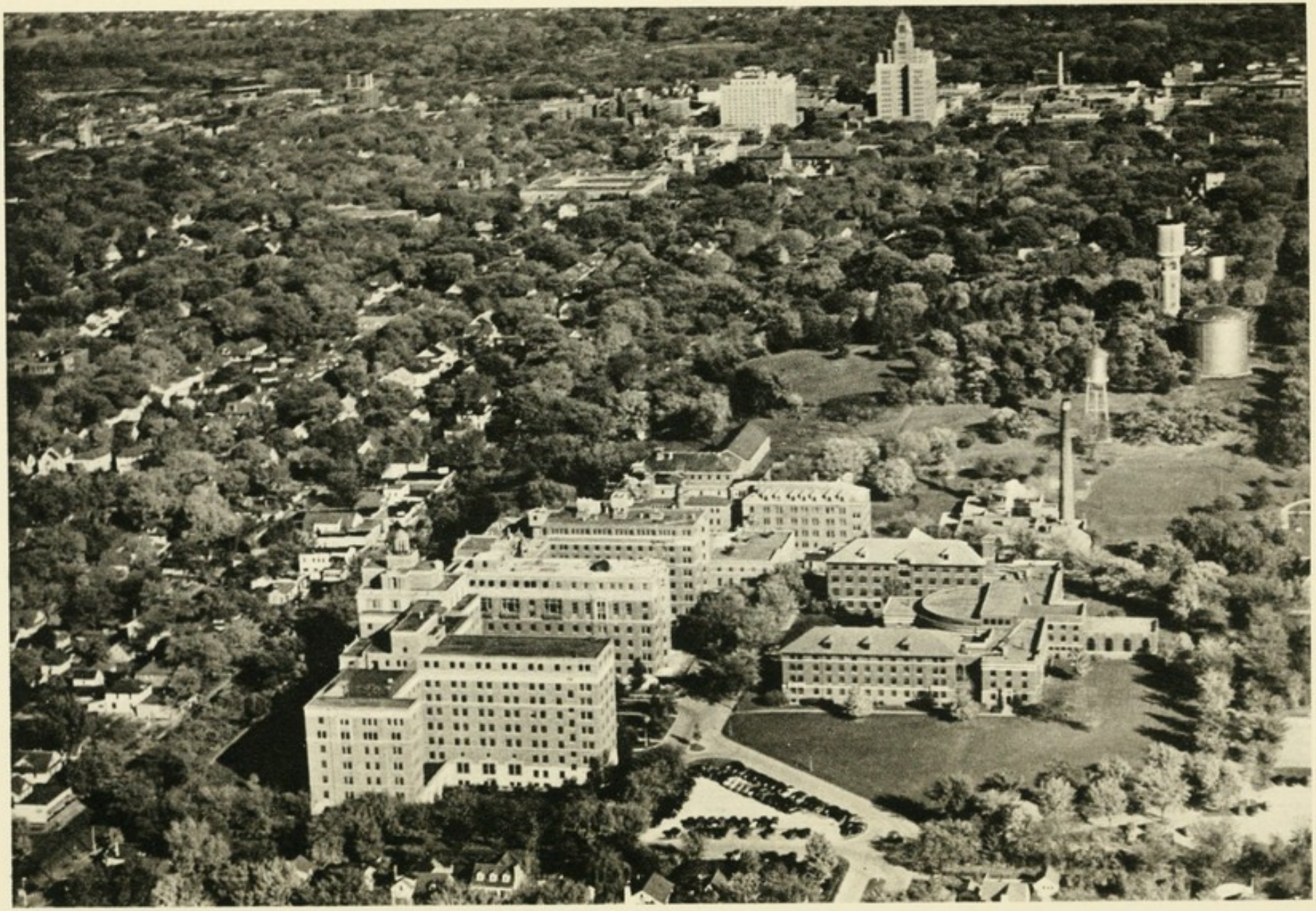
The Franciscan sisters of St. Mary's Hospital in Rochester

possessed the spirit of sacrifice from their daily devotions, but now they had added a further string to their instrument of altruistic service of which Miss Nightingale would heartily have approved. Not only were they nuns, but they had become trained surgical assistants. Without them the work of the Mayos would not have been as perfect as it was.

7. MEDICINE IN AN EASTERN CITY

It is necessary at this point to perform a surgical operation upon the reader's attention. We must cut and divide, and we hope the temporary pain will be forgiven in return for greater illumination. We now go east, away from those prairie boys in the north-west, towards the older, more settled and more sophisticated regions of America. For it has to be admitted that some good surgery was being carried on among millions and in places which had never heard of Dr. Mayo's brilliant sons. America is rich in seats of learning, hospitals and surgical craftsmen, and a thousand miles away from the middle-west, back nearer Europe, we find that medical arrangements are not less exciting than they were in Chicago under Nicolas Senn and J. B. Murphy.

We travel to Baltimore, Maryland, where a remarkable medical university was to be planned after the lawyers had opened the will of a prominent citizen named Johns Hopkins, a Quaker commission merchant and grocer. Starting with nothing, he had made a large fortune, and he had the immense respect for academic learning which comes over a man who has educated himself. Johns Hopkins lived a singular, almost eccentric existence in Baltimore in the first part of the nineteenth century. All his life he was in love with a cousin, but never married, and apart from business, the same indecision affected his entire life, for though he was fond of travel and planned many journeys, he



GENERAL VIEW OF ROCHESTER, MINNESOTA

never ventured more than a few miles out of Baltimore. But in that city he was a prominent person, well-known for his habit of using neither carriage nor overcoat. When making his will, he remembered his own lack of schooling, and the unpreparedness of the city in outbreaks of cholera and yellow fever. Two testamentary objects formed in his mind, and he bequeathed seven million dollars between them: 'a college because there will always be young men to teach, and a hospital, since there are always sick to heal.' No one has ever expressed philanthropic ideals better.

The trustees responsible for carrying out the will did not fritter away the Hopkins fortune by rushing prematurely into bricks and mortar. They surveyed the best hospitals, slowly matured their plans, and it was twelve years before the place was finished, in red brick, in the pavilion style that was then the latest architectural fashion. Even more remarkable was the Faculty of Teachers. Most medical schools grow slowly to their eminence, but the truest university is a group of inspiring men, and the Johns Hopkins Medical School was great from the beginning. As we are dealing here mainly with the progress of surgery, we shall concentrate upon only two of the professors, William Henry Welch and William Stewart Halsted, and through these two figures will lead up to the personality of a third, Harvey Cushing, the greatest surgeon to come out of Baltimore. Regretfully we have to leave out the most romantic figure of them all, Sir William Osler, afterwards professor at Oxford: he was a physician, and we have told the story of his life in another book. Nor is there space here to describe Miss Louisa Parsons who was head of the nursing department, a handsome woman with the striking appearance of a gipsy and great personal charm.

Johns Hopkins Hospital was organized in departments or units,

each under the command of a single chief who chose his own assistants. William Henry Welch was head of the department of pathology, and William Stewart Halsted that of surgery.

Welch, though born of four generations of Connecticut doctors, came from New York State, and while plans were being made at Baltimore, spent the first year of his professorship in visiting the European Continent where he was very much at home. Previously he had worked in Germany under Robert Koch who discovered the bacillus of tuberculosis. But Welch himself made independent discoveries too. He was the first to demonstrate a common microbe which grows on the surface of the skin and which can infect wounds. He called it the white staphylococcus. He also discovered a strange organism which has the power of producing gas, and it is still named the *bacillus aerogenes capsulatus* of Welch. This particular microbe will be encountered again as we meet the adventurous surgeons of the first World War. Its identification was enough to make the reputation of a lesser man than William Henry Welch, but he did so much in the later part of his life, and lived so long, that these early scientific discoveries are overlooked.

Welch was a short man with a square beard, later trimmed to a point, and without seeming to work, he knew the answer to everything. This gregarious bachelor lived in two rooms crowded with books, and took his meals mostly at a club. He loved sunbathing, and he adored conversation, and he was the most humorous, wise, childlike Buddha of a creature who ever watched over a medical school where, for some reason, he was known as Popsy, and remained perpetually young. For a man methodically trained in Germany, he had some strange habits. Papers, books and letters would lie on his writing table, and when the pile became unmanageable, he would gently lay a newspaper on top,

and commence a second storey of further objects meant to be looked at one day, followed by another layer of newspaper, until his desk was high with layers of untouched material. Eventually, the great clearance could not be postponed.

Harvey Cushing tells a story of Popsy's remarkable power of mental concentration. They were travelling together from Baltimore to Boston where the following day Welch was to read an address to commemorate the introduction of anaesthetic ether. Now this was by no means an easy subject. In fact the very mention of the discovery of ether to an American medical audience was as explosive and inflammable as the substance itself, for the credit was claimed for a private practitioner in Georgia, a Connecticut dentist, and a Boston surgeon. No one knew more intimately than Dr. Welch the intrinsic dangers of his theme. When the train was near Philadelphia, well on in the evening, Cushing was horrified to learn that Dr. Welch had not even started to compose his speech which was to be read next day. But Popsy was imperturbable, and taking some yellow paper and a handful of cigars, he began to write while still joining in the talk in a crowded dining-car. He used small sheets of paper, each holding matter enough to occupy a minute and a half in the reading. When the job was done and the night was well advanced, there were forty sheets, with hardly a correction. Next day the speech on the discovery of ether was delivered, and lasted exactly one hour as the forty sheets had foretold. Welch had not consulted a single reference; yet that oration poured balm upon the inflamed partisanship over priority. That speech became in fact a sort of Supreme Court Judgment upon the ether controversy. Yet the complete range of facts and wisdom to interpret them had been inside Dr. Welch's head and had been transferred effortlessly to paper in the Pullman car.

Welch became the Grand Lama of Johns Hopkins, and his personal discoveries and contributions to medicine, though they would have formed the reputation of smaller men, were merged into the reputation of the school. He was the architect of its greatness, and during the years when the Mayos were building up their clinic at Rochester, Popsy Welch and his group were making a different sort of medical history at Baltimore.

Their success in this eastern city of America was based upon European tradition. The brothers Mayo had developed their school the other way round. They began with clinical work among patients and then followed their noses into the practical necessities of chemistry and pathology. Research and the teaching of post-graduates came almost as an afterthought to Rochester.

But Dr. Welch based the organization of Johns Hopkins upon the fundamental sciences in the style of the great universities and clinics of Europe. A brief survey of this continental tradition will help us to understand William Henry Welch and his aims.

This European outlook was rooted in the old universities, especially in Germany, Switzerland and Vienna. Leaders of medical thought in the various faculties of medicine were the professors, each of whom had reached his position only after years of preparation and fierce competition with well-qualified rivals. First of all, a clever medical graduate might become assistant to the professor; after some years, with much research and many published papers, he would rise to be a *dozent,* or teacher. In due course, when acknowledged as a master of his craft, he would be promoted to the final altitude of academic preferment—to be a professor *ordinarius.* This was reached through ability, but also through favour and a large element of luck. The only further elevations were the purely honourable distinctions of *geheimrat*

and *hofrat,* corresponding in prestige to knighthoods in Great Britain.

The Herr Professor *ordinarius* was indeed a commanding personage, worshipped or feared by his students, and he and the Frau Professor were envied figures in social life. In the university clinic the teacher was just as supreme as in his lecture room. He appointed his assistants, he gathered the fees of his students, directed their research, and frequently took credit for the results, for in his own department he was overlord. To attain one of these posts of academic dignity often tended to bring out the best in a man, and even a mediocrity could hardly fail to make some sort of impression on the numbers of students who passed under his influence. As for the patients in that official infirmary or clinic, they who had nowhere else to go, the Burgerspital and the Allgemeines Krankenhaus official institution were sufficient for the medical needs of the community. There was a ministry in supreme charge of the organization, and the physicians and surgeons had to secure their equipment and staff 'through the usual channels.' On the European continent there were fewer of those private foundations and voluntary hospitals which are so characteristic of England and America.

Among these university kinglets there were some who ruled because they happened to hold a particular post. The professor of surgery at Berlin or Paris was always famous from the lustre that surrounded his university. There were others who governed by divine right of natural originality and inborn genius. Often it happened that an unimportant universary would harbour an intellectual giant, and its narrow medieval streets and beer gardens would be thronged by scientific pilgrims from the whole world. But in medicine, Berlin and Vienna tended to attract the greatest names. During the last half of the nineteenth century,

when William Henry Welch was learning his wisdom, the academic poles of Europe were Rudolf Virchow of Berlin, and Theodor Billroth of Vienna. A look at their careers will help us to focus in proper proportion the lives of the Americans who took their teaching and transformed it into the new lore of the twentieth century.

It is an odd fact that both Virchow and Billroth were born (in 1820 and 1829 respectively) in that Baltic island of Rügen which lies off the north coast of Germany. They were both Pomeranians, yet Virchow must have had some Polish blood, while Billroth was certainly of Swedish origin, and both men were Protestants. Each of them, racially speaking, was a stranger in his own adopted land; and like other intellectual outsiders, as we have noticed in the chapters on Brown-Séquard, both Virchow and Billroth were born on an island. Their careers diverge, but they both attained unusual eminence.

Rudolf Virchow was of the pedantic, truly professorial type, who loved collecting, and in the course of his fifty or sixty years of teaching, mostly at the Charité Hospital, Berlin, he gathered twenty-three thousand specimens of tissues and organs, all bottled and labelled by himself. He was the supreme classifier of symptoms, changes and organic aberrations, and he used the microscope with genius. After years of post-mortem examinations and searching among magnified tissues for the cause of disease, he announced the doctrine which he called cellular pathology in 1858, the year before another significant book, *The Origin of Species,* was put forth by Charles Darwin. Virchow's idea was briefly expressed in the Latin phrase: *Omnis cellula e cellula;* each cell comes from another cell. The human body, yes, and the body of every animal in the living world, is made up of a honeycomb of microscopic cells, each an essentially separate unit, with its own cell economy, its need for food and its power of energy. And the organs are nothing but kingdoms and republics of cells,

each of them a characteristic size and shape. Liver cells work differently from bone cells, yet they have in common certain basic processes of growth and function, and each could be recognized under the lens of the microscope. Virchow studied cells for fifty years. He was the first to compare the changes that disease produced in these cells, and made from them a philosophy of disease. He taught his students to recognize the difference between a normal and healthy cell, and one affected by cancer or by inflammation. To him such differences summed up nearly all that was worth knowing about medicine.

This pedantic and formal professor, a martinet for the correct usage of words, a severe taskmaster to his assistants because he himself could do practically with half the amount of sleep generally considered necessary, had been trained at Berlin, and after seven years of semi-exile at the old University of Würzburg, went back to Berlin as professor *ordinarius,* and taught his cellular theory. It became holy writ, the unquestioned formula for medical research. Today, ninety years after, its influence remains, and the power of the cell and the study of its metamorphosis is still the basis of scientific medicine, though the modern world admits that although everything in life begins in an egg, it does not necessarily end in a cell.

Yet even when he was as much overlord of the continental medical professors as Frederick Barbarossa was over the Germanic princes in the Middle Ages, Rudolf Virchow's influence was always tempered by the rising science of bacteriology under Louis Pasteur and Robert Koch, who taught that microbes are the cause of disease, and that identifying and killing them is the main object of medicine. It would not be true to say that Rudolf Virchow overlooked microbes; but certainly he never wavered from his belief that the cell and the tissue of cells embodied the fundamental of disease. W. H. Welch stated that Virchow's conception of cellular pathology was the greatest advance which scientific

medicine had made since its beginning. Another of the pupils from across the Atlantic who studied under Virchow and mastered his method was Reginald Heber Fitz who went home to America to write his classic paper on appendicitis, and incidentally to reproduce in his manner of work two features of the master in Berlin: a dogmatic way of speaking such as annoyed his elder colleagues in Boston, and a fondness for clear expression and logical deduction when describing a medical condition.

We may say that Rudolf Virchow annihilated the humours which had been circulating through men's minds for two thousand years. He was not merely a professor *ordinarius,* he was a public figure, a member of the lower house of the Reichstag and leader of the Radical Party there, vehemently opposed to Prince Bismarck. During the Revolution of 1848, the young Virchow was in such bad odour with the authorities that for seven years he was sequestered in the old town of Würzburg where he held a less conspicuous chair and worked at his theories. But such a force could not be kept down. Rudolf Virchow returned to the capital, became a power in the Reichstag, *hofrat,* leader of the Left, promoter of reform. He was a member of the Berlin Municipal Council also, and designed the sewage plan of the city. Virchow planned hospitals, measured skulls, reformed medical education, organized medical services in the Franco-Prussian War. Whenever an opinion had to be given upon a matter even remotely touching upon medical science, the definitive tones of the small bearded professor would be heard, and a hush would fall over the Continent of Europe. Virchow could kill a theory with a frown, and all the German respect for authority and desire to obey was concentrated in the field of theoretical medicine upon him. As he grew older, he became a fragile dwarf, the fires of the one-time revolutionary of 1848 cooled, and his views became fixed. He was not the first firebrand to become a reactionary.

At the opposite pole from Berlin, as a medical centre, was Vienna. There could hardly be a greater contrast with the newly developed, raw and sprawling capital of North Germany than the Imperial City of Vienna, founded by the Romans, called lovingly the Reichs Hauptstadt, der Residenz Stadt, die Kaiserstadt on the Danube, which had its university and its Allgemeines Krankenhaus or general hospital, where the head of every department was a celebrity. Here came the intellectual pilgrims from the whole of Europe, for the motto of the Austrian capital was *Vindabona docet*—Vienna is the teacher. American medical visitors had always been welcomed, and as early as 1871, they had a dining-club, which was accompanied by a regular curriculum given in the English language. Popsy Welch attended many clinics at Vienna.

Here at the centre of cultural Europe, Virchow's fellow Protestant from the isle of Rügen, Theodor Billroth, was undisputed potentate of surgery in the Catholic city, where he too had arrived, via Berlin and Zürich. He was pre-eminent by character and personality, as much as by his learning. His textbook on general surgical pathology and therapeutics went through eight editions in the author's lifetime. Billroth had volunteered for the Franco-Prussian War, and was one of the first to recognize that ambulance and hospital services were part of army organization. In the Catholic capital of Austria, the Emperor Franz Joseph made this Protestant professor a *hofrat,* member of the Upper Chamber of Parliament. Billroth was a great favourite too of the neurotic Crown Prince Karl Rudolf whose suicide pact at Moedling was the first act in the ultimate break-up of the Austrian Empire. In his memory Billroth inaugurated the Rudolphinum where nurses were trained for war service.

Although a bold and resourceful operator, who kept serene in moments of difficulty and danger (John B. Murphy of Chicago

visited Billroth's clinic while on a post-graduate tour, and said the operating he saw was like a man carving jade), Billroth was not an impressive lecturer and his classes were half empty. He was most at home in music, and in the salon of his country retreat, the Villa Billroth, on Lake Wolfgang in the Tyrol, he loved to listen, or to play the violin in a string quartette. His fellow north German, the composer Johannes Brahms, was his friend for many years.

Billroth was fascinated with the scientific side of music and wrote a book upon the physiological basis of rhythm and melody which, though hardly so popular as his work on surgical pathology, was equally original and penetrating. Billroth was an artist, who led men to follow him through a sort of inborn aristocracy. But his health was not good; he suffered all his life from asthma, and eventually died at sixty-four, and left so little of his fortune amassed in surgical practice that the Emperor Franz Joseph was petitioned to provide a pension for the widow.

But the wiry tenacious Virchow, who was a professor to the very inside of his own body cells, who must have dreamed pathology even in his brief hours of sleep, lived on until eighty-two. His usual method of travelling from his home to the university was by a *Droschke II Klasse,* that is one of the less elegant forms of horse conveyance provided by the city of Berlin. The students' quip was that the austere Herr Professor used a cab of the second class, only because there was no third class. But on one occasion, Virchow did not even engage a cab; he took a street tramway, and he slipped, and after suffering from a broken thigh, perished of pneumonia like many another old gentleman, as though to prove that he was orthodox in his death as in life.

Such were the leading teachers of medicine in the European continent when William Henry Welch frequented Berlin and

Vienna towards the end of the last century. Generations of culture, ancient traditions and secure organization had produced a certain arrogance and lack of originality. American visitors at those well-organized clinics, with their rows of eager students and ranks of submissive patients, caught a vision of how medical teaching ought to be carried on, and brought it back to the United States. Welch promised himself he would make Johns Hopkins something such as had never been seen either in Europe or America.

Johns Hopkins, the name was to become quickly famous and young doctors came to specialize there from all the medical schools of the U.S.A. Yet Baltimore itself remained a tranquil southern city of cobbled streets bordered by gracious houses where a famed hospitality of terrapin and old wines was carried on by courtly gentlemen, and ladies whose silk-clad bosoms reflected in polished silver and mahogany surfaces. There was no haste or bustle, for everyone knew everyone else, and the leading doctors and college professors were celebrities in each shaded street as they descended from their cabs, appropriately dressed, for professional calls that were in themselves part of life's ceremony. The money which Johns Hopkins bequeathed for teaching and research was now about to begin its work, and William Henry Welch could not, in the whole of Europe, have lived in a city more suited to be the centre of medical culture. He had now to find his teachers.

8. WILLIAM STEWART HALSTED: THE RECLUSE

Among those whom Popsy Welch gathered around him was the greatest of the early American surgeons, a curious personality, William Stewart Halsted. He was an exception to almost every rule. To begin with, he was a self-centred man, an introvert,

whereas most surgeons live in full sympathy with the world around them. Halsted was a lonely and retiring person, as touchy and sharp tongued as an old maid, and his success was due to qualities of precision, gentleness and patience such as one associates with crocheting or *petit point*. The increasing pace and publicity of American life and the showmanship of other surgeons drove him more and more into himself. His mania was concentrating upon the minute details of the operation such as his bustling colleagues of the 'eighties and 'nineties had no time to achieve.

Although ether and chloroform were used they had not been studied with any great care, and Halsted came across an entirely new anaesthetic which had been discovered by a Viennese eye specialist, Koller. A drop of this substance in solution had a remarkable deadening effect upon sensory nerves. It could be injected under the skin, and thereafter, the surgeon could use his knife without the patient's feeling anything. It was called cocaine and was in fact a narcotic drug of local influence and great power, and Halsted began to explore its possibilities. Cocaine could be injected around the nerves of an injured finger, and after it had time to work, the finger could be amputated without sensation. Teeth could be extracted painlessly. This extraordinary drug seemed to promise a new era in surgery.

Cocaine is obtained from the leaf of a plant which some South American natives chew and which gives them a mildly pleasant sensation of forgetfulness. Other people seized on this, and the use of cocaine became a common habit, like chewing tobacco, but its effects were much more powerful. The cocaine user would get accustomed to it and would increase the dose. His temporary forgetfulness would grow to coma, and presently, he could not give it up, and would spend his whole days and all his money pursuing that fatal stupefaction which a few grains of the

drug could provide when snuffed up the nose. The wonder-working cocaine had produced a new disease, that of drug-addiction, a species of drunkenness which was much more horrible in its results than any slavery to alcohol.

Of course, it was not cocaine alone which could cause this terrible deterioration in the human personality. It was always some deficiency within the person himself, some need of escape, some neurotic weakness that obliged him to become a slave of the numbness of feeling which cocaine produced. Among the numbers of people who used cocaine, its addicts were few, though many of them were doctors. It was fated in the make-up of his personality that William Stewart Halsted should have been one of these victims. For a time, the use of cocaine overflowed from his surgery, and wrecked his whole life. No one ever knew the mental anguish he suffered through its deadly influence which began in simple experiments and went on to undermine his whole character. For a time, this brilliant man's life was under a cloud.

He was rescued by Dean Welch, that kindly and cunning Popsy, who saw so far below the surface, and recognized Halsted's real gift, and brought him to Baltimore, first to work in the laboratory, then to take charge of the department of surgery in the new hospital. For a time, Halsted lived in Dr. Welch's own house, and the moral influence of this wise person helped him well over the crisis.

The struggle was past, and the genius of Halsted gained equipoise. We can admire him the more for this temporary eclipse, and everyone who has been spared physical suffering through an injection of cocaine has reason to be grateful for his tragic and triumphant conflict.

Henceforth, all Halsted asked from life was opportunity to avoid his fellow men, and absorb himself in his monomania, of what might be accomplished in surgery when its exponents

possessed control over bleeding, infection with microbes, and other mischances of the operation. His encounter with cocaine had been almost disastrous, but one of his other experiments in surgical technique brought Halsted to great happiness. It happened that the head nurse in his operating room, a high-spirited girl named Caroline Hampton, who had been put in that situation where she could work on her own and where her vigorous personality need not come into collision with the female authorities of the hospital, suffered from a troublesome irritation of the skin, caused by the antiseptics which were used to sterilize the instruments. Halsted made her a present of a pair of gloves: not an ordinary gift, but rubber gloves with gauntlets to protect her hands and arms. Then he began to use them himself, and soon, he would never operate without them; for rubber could be sterilized more perfectly than the skin of the surgeon's hand. The manufacturers began to produce gloves of thinner material which was less clumsy in use, and soon most surgeons would not think of operating with naked hands.

But it is ordained that a bachelor may not present a pair of gloves, even surgical gloves, to a young woman without far-reaching consequences, and one day in the year 1890, a friend went to the doctor's study to have coffee. Halsted's room was furnished with heavy Victorian furniture and there was a picture of the Sistine Madonna. On this occasion the friend was surprised to see Miss Hampton, the theatre nurse, and it was quite obvious to the friend that something unusual was going on as they drank their very black Turkish coffee which Halsted loved.

When William Stewart Halsted married Caroline Hampton his voyage in the unknown was over. Henceforth, he was settled and a surgeon, the most expert craftsman in that line which the American continent had produced.

To Halsted, the essentials of surgery were first, perfect cleanliness, then infinite gentleness and infinite patience in the common manoeuvres that formed every operation. He abominated haste and carelessness, and would spend a long time sewing up the various layers of the body, never hurting the tissues needlessly, never allowing blood to flow where it could be avoided, disturbing the organs as little as possible.

Every neurotic person has his private religion, and Halsted's secret may be stated in religious terms. His cult was reverence for the human body and its amazing power to recuperate. The surgeon must so develop his sense of touch that the tissues would react like a friendly animal in pain, and allow him to do what was necessary to heal them. Even more than craftsmanship, it was an affair of the heart. His operations were prolonged; but it was noted that his patients recovered more quickly after two hours of his careful work than from half the time under the hands of a nimbler but inferior surgeon. Halsted finally abolished the fetish of speed which was a hangover from the days before anaesthesia, when slickness in getting the half-drunken patient out of the operating room was more vital than finish.

He had proved, through experiments with animals, that the human tissues in a healthy state could conquer bacteria and eliminate their poisons; whereas those same tissues when damaged, or bruised, lost their power of defense. His whole preoccupation was how to produce a wound that would heal promptly. What elaborate preliminaries were necessary in those early years. The surgeon scrubbed his hands and forearms with green soap, doused them in permanganate of potash, hot oxalic acid and finally in corrosive sublimate. Then the rubber gloves with gauntlets were drawn on, and rubber in those days was not thin. No wonder the surgeon's skin broke out in pimples and

boils as Miss Hampton's had done. Yet these rigours were part of man's pilgrimage towards safer surgery.

With this perfect gentleness and prodigious patience, with the rubber gloves and new methods, Halsted extended the range of his operations. He removed cancer of the breast with much greater permanent success than had ever been achieved before. He repaired hernias, and those repairs lasted until the end of the patient's life. He had a special fascination for aneurysms, those balloon-like swellings which grow upon large arteries, caused by weakness in the layers of its wall which pulsates with each beat of the heart, and are filled with a tiny whirlpool of blood and which may burst and cause rapid death. Halsted invented new ways of tying them off and causing the aneurysm to disappear.

Once, in the middle of the night and without assistance, he operated upon his own mother for gallstones, and prolonged her life by two years. That was surely a test for a man and a surgeon, and like every other operation that he performed, it engaged his organized faculties and roused the love that lay in the very touch of his fingers.

This perfectionist in the operating theatre, this neurotic in his social life loved to direct and discipline the careers of his pupils, to evoke their potentialities and rouse in them pure devotion to the science of surgery, making it almost a religious cult. 'We wish to have men who have learned to work for truth's sake, who find in work and the search for truth their greatest reward,' he said. Posterity honours Halsted, but those who worked near him had mixed feelings towards their inscrutable chief. They dreaded the sidelong squint of his myopic blue eyes, the soft silky voice which conveyed blistering sarcasm. His personality seemed to be surrounded by a dense vacuum. He would peer at people like a wary animal. Deliberately, he would take out a cigarette, but never offer one, and then light it slowly without speaking, as though giving himself time to sharpen his claws.

His large, old house in Baltimore was full of antique furniture and rugs beautifully arranged, and he would permit no form of heating except wood fires made up of white oak logs of specified dimensions. When guests came for dinner, they were treated to the ritual of his coffee-making which consisted of the picking out with surgical forceps the most likely beans, and culminating in a brew which his friends said kept them awake for days and nights following. His need for private ceremonial became so oppressive that dinner parties were finally abandoned, and the doctor and his wife lived each a self-centred life in their large mansion, she on the third floor, he on the second, and they rarely visited friends. Whenever they could, they went to a country place among the mountains of North Carolina where Mrs. Halsted loved to ride and grow flowers under the tall trees, and there her husband could relax too as was impossible for him in the city.

Dr. Halsted was most particular about his silk hat, his suits tailored in London. His boots had to be made only out of leather from a particular portion of the animal's hide, and Halsted would inspect every new pair with his usual myopic concentration, and very often the boots would be sent back to the maker because they failed to reach his requirements. No washerwoman in Baltimore was good enough to launder his shirts, and he sent them regularly to Paris where he felt artistic satisfaction could be guaranteed though the Parisian *blanchisseuses* probably washed those precious shirts in the waters of the Seine.

William Stewart Halsted is an unusual example of the egomaniac temperament who achieved supreme success in an art which usually demands that its exponents shall be openhearted and forgetful of themselves. His pupil, Harvey Cushing, wrote that he had few of the qualities supposed to accompany what the world regards as a successsful surgeon. He was shy, a recluse, an aristocrat in his breeding, over-modest about his work, having little interest in private practice, who spent his life avoiding

patients and working out problems of clinical surgery. He was one of the few American surgeons, says Cushing, who established a school comparable to that of Billroth in Vienna.

This same Cushing, who lived and worked at Johns Hopkins for thirteen years, became Halsted's greatest successor, as a surgeon, though as a man he was opposite in every way. Harvey Cushing brings us right into modern times.

9. HARVEY CUSHING: THE BELOVED GENIUS

A short, lively man, with a blade of a nose, and the keen eye of a Red Indian, Harvey Cushing was full of restless energy which came from a background of stern Puritans from New England. His forebears had been doctors for generations, and from them this tenth child inherited physical endurance and obstinate intellectual curiosity, which was pleasingly concealed under his companionable, human and kindly exterior. When he went to Baltimore to be assistant to William Stewart Halsted, at the age of twenty-seven, he had been well trained at Yale and Harvard, and was more than initiated into surgical craft.

Harvey Cushing was one of those superior types whose intelligence continually overflows from the work they are doing. Leonardo da Vinci was such a man. Their own calling seems too limited to contain them. The great artist of Florence not only painted canvases, but designed fortifications and projected winged chariots in the air. Harvey Cushing collected first editions and wrote them up, wrote an outstanding biography of his friend William Osler, and was brilliant at talking, tennis and dancing. He sketched fluently. He made a good speech, whether after dinner or after operation. He was a sort of Admirable Crichton among the prosaic surgeons of his time. He had tremendous ambition and a certain very human liking for prominence.

When he was a young surgeon one of the students remembered a dramatic occasion when a patient in the hospital had suddenly stopped breathing. Harvey Cushing sprang in like a tiger, and his dynamic resourcefulness saved the situation. Another day, when a tube in a patient's throat became blocked, Harvey Cushing promptly put his mouth to the end of the tube and sucked out the mucus which was the cause of the trouble. Then he calmly washed out his own mouth.

Some thirteen years of unremitting work at Baltimore made Harvey Cushing into a competent, then a great surgeon, a status not achieved without a prodigious development of the intellectual qualities. To him the temptation to be merely a smart virtuoso and gather in money by doing easy repetitive work, can never have been strong. It is impossible to think of such a lively person ever settling in a professional groove. But in his early thirties, Harvey Cushing did meet a challenge, one of the greatest that ever came to a surgeon; it was one big enough to demand all his mental resources, yet its fulfillment was to be of such a nature that instead of making him a narrow specialist, it enabled his mind and judgment to expand in every direction.

This turning-point was an interest in the surgery of the brain. While on his first post-graduate excursion to Europe, he had researched upon the behaviour of the blood vessels of the brain, a problem which the great Theodor Kocher himself had suggested.

A Scotsman, Sir William Macewen, and an Englishman, Sir Victor Horsley, were really the first surgical explorers of the brain, and around the year 1902, Harvey Cushing began to give more and more of his attention to the inside of the skull, and he gathered around him at Baltimore a team of trained assistants.

Study of tumours inside the skull led Cushing into strange

company. In a circus there was a female exhibit known as the 'ugliest woman in the world' because of her coarse features, enormous jaw and frightening appearance. Visiting her in a railroad coach which was her only home, he found her surrounded by pictures of her children whom she was bravely trying to educate out of the fees paid by those who came only to laugh at her. Harvey Cushing was moved to pity at the tragedy behind the life of this creature who lived to entertain. In the course of this humiliating existence, she suffered horribly from headaches, and she was nearly blind. The cause was a small tumour at the base of her skull in an organ known as the pituitary gland. Although Brown-Séquard had studied the adrenal gland and proved its connection with Addison's disease, the pituitary gland's endocrine secretion was hardly understood, until a Frenchman, Pierre Marie, had described the bizarre results of malfunction of the gland in 1886. This was the sort of disease which had caused the tragedy of 'the ugliest woman in the world': a thickening and grotesque deformity of the bones of the face and skull.

This pituitary gland absorbed much of his energy. No mind had ever really fathomed its mystery. The gland is really three distinct organs folded into one piece and situated at the base of the brain, behind the top of the nose, deep inside the skull.

The pituitary gives out several internal secretions, it is really several glands in one, and probably acts as the president of the whole endocrine system. We have indeed travelled a long way from Claude Bernard and Brown-Séquard, and an even further distance in knowledge from the Roman physician Galen who taught the strange theory that the pituitary collects phlegm from the brain and discharges it into the throat. The pituitary is known to be an exceedingly complex body which controls body growth, so that its malfunction can produce a dwarf or a giant. It influences the sex glands, it affects the amount of sugar

in the blood. It is concerned with the growth of fat and the secretion of milk. It has results upon the contraction of the womb, and the pressure of blood in the circulation. There is hardly any function of the body in which this remarkable gland has no part. All this has been discovered by the patient researches of men like Harvey Cushing, but more remains to be found.

The notable success achieved by Popsy Welch and his colleagues at Baltimore had put ideas into the heads of other academic authorities, and a similar development began at Boston, Massachusetts, where another thrifty merchant had bequeathed his fortune to found a hospital. Here again there was an interval between the testamentary purpose and the tangible result.

This Boston will, made by Peter Bent Brigham, directed that his money was to accumulate for twenty-five years, and by the time the trustees were able to build, they had before them the working model at Baltimore, both hospital and faculty, ready to be improved upon. They chose to be their surgeon-in-chief, Harvey Cushing, and at the age of forty-one, he returned to Boston ripe in experience, full of new ideas.

With increasing experience, his technique improved. The great bugbear of brain operations is bleeding—from the skin of the scalp, from the bones of the skull, and from hundreds of minute blood vessels in the brain. Harvey Cushing was the first to use electro-surgery, a technique of coagulating the flow of blood with a tiny electrical current. As an operator, he liked to do everything himself and visitors from abroad were sometimes astonished that he took on only one brain case in a day, or at the most two, whereas most surgeons did several through delegating the beginning and end of each operation to an assistant and keeping themselves only for the climax—the actual work upon the brain tissue. The working programme of a surgeon shows how much

energy could be taken out of the human organism. The Mayo brothers were generally in their operating theatre by 7:30, and Harvey Cushing after breakfast at 8:00, was driven over to the hospital. While the chauffeur drove on to school with the Cushing children, their father was in his hospital office, attending to correspondence. He remained thus for about two hours occasionally eating buttered toast, and was ready to commence his operations by about eleven o'clock.

There followed lengthy, meticulous and laborious hours. Few people who picture the glamorous lives of great surgeons could face the strain of sitting in a darkened and moist room, working with deft touches of fingers at the bottom of a cavity a few inches across, patiently arresting the blood from tiny arteries, handling everything with prodigious delicacy, never hurrying, hardly ever relaxing, each faculty strained upon that narrow field which is the interior of a human skull brightly illuminated from an electric lamp fastened to the operator's forehead. For three or four hours this must go on, silently, with every moment deliberately keyed down so as to be quite undramatic; yet behind it is the human life at stake, and in consequence the emotions of the operator can never run cold. He must give of himself all the time, never allow his attention to wander, must keep a look-out for all possible danger signs, while the team of six or eight assistants who are in the theatre have to be directed by his responsible brain.

The older surgeons, following Lister's hallowed routine, had been content if each object in the operating theatre were free from germs, but now, a new peril had been discovered. The surgeon himself, the nurses or any of his assistants, might harbour virulent microbes in the throat, and these would nimbly find their way in the air and even through the layer of gauze which

he wore uncomfortably in front of his mouth, and into the wound in the patient's body. The operation might be jeopardized, and a patient's life lost from these unexpected enemies.

At three or four o'clock he may relax, slip off his moist gown, change his sweat-soaked shirt and have some more buttered toast and a cup of tea. Even before he has taken off his rubber gloves he will dictate a note about the operation and make a few sketches of what he has seen inside that patient's skull, and all these records will be preserved for his archives. Then there are ward visits and ward dressings to be done, and it will be six or seven o'clock before he can go home to have the first unhurried meal of the day. Yet after dinner, there is more work to do, reading papers, writing addresses, making up statistics of his cases. Being a brain surgeon was perhaps the most exhausting life of any professional man.

Behind that strenuous, and often grim professional routine, his life among his family was most happy and satisfying. Mrs. Cushing was more to him than merely the wife of a busy doctor, and William, Betsy, Mary were growing up, while Henry and Barbara were getting to an age to appreciate their amusing father, and hear with wonderment of his fierce prejudices against modern art, modern jazz and modern bobbed hair. The children had to keep quiet in the evening, because he was sure to be working in his study. His disapproval of cocktails and smoking as suitable activities for Mrs. Cushing and the girls was later modified under the inexorable feminine pressure of the home, for with all his Puritan background, Harvey Cushing was tolerant and generous, with too much sense of humour to be inhuman.

Harvey Cushing worked laboriously at his craft, working upon brain operations, gathering specimens, accumulating knowledge about unusual symptoms. His sole hobby, apart from an enor-

mous number of friendships, lay in collecting early medical books and writing about them. For instance, there was that great anatomist Vesalius, one of the intellectual giants of the Renaissance, the first teacher to make a systematic textbook about the human body. He was as much a person in Cushing's life as his friends in Boston.

But now, this strenuous though fascinating peace-time routine was to be broken by a summons such as no surgeon could fail to hear, and few could fail to accept. Harvey Cushing used to say that only once in his life had he been persuaded to take a proper vacation and go fishing in Canada, and that was the year the European war broke out.

10. SURGERY GOES TO WAR

In modern wars, improvements in medicine and surgery form the greatest humanitarian achievements. It seems that only extremes of hatred and human suffering can evoke the finest possibilities in the art of treatment. The four years of the first World War brought the work of modern surgeons to maturity. It was indeed the first real chance to try out new methods on a large scale. Lord Lister himself had died only in 1912, though he had lived to see his life's work confirmed on the battlefield in both the Franco-Prussian and South African wars. But, compared with what was to come, those were rehearsals only. Between 1914 and 1918 the field doctors developed in a crescendo of opportunities. In one week crushed limbs, punctured abdomens and shattered skulls brought them more need of antiseptic surgery than in a lifetime at home, and the surgeons learned how much interference the human frame could stand, and yet recover. War, which extends human knowledge in so many directions, looked with indulgence upon them only.

As early as August 1914 a group of Americans living in Paris had organized an American ambulance, that is a mobile team of doctors, nurses and orderlies, which centred upon an existing American hospital at Neuilly and which soon had beds for five or six hundred patients. Certain American universities were asked to provide medical personnel to assist this enterprise; the first of these surgical units was led by the Cleveland doctor, George Washington Crile, and in April 1915 Harvey Cushing reached the Western Front at the head of a corresponding group from Harvard. He was to be in the war practically until the end. His temperament was not that of the neutral; to him the tragedy of conflict was the surgeon's opportunity, and his inveterate habit of keeping a journal shows us how he was able to adapt his individual way of life to conditions such as men had not been called upon to endure before.

He operated upon Americans, English, French and Germans in every conceivable situation. In Boston he had specialized in head cases, but here in this early period of the war, the surgeons had to handle whatever came, and the greatest brain technician of the day spent his time in the routine of cleaning out wounds and searching for bits of shrapnel. It was as though a great landscape artist were to be obliged to paint doors and tables. Yet that surgical discipline of the commonplace had its part to play in making him even more efficient. At home he was used to thinking of a single cranial operation as a day's work, but now he would get through eight in one day; each night, or sometimes early next morning, he wrote up the journal, often with sketches, and whenever he could be spared, this omnivorous man would visit other sectors of the war, taking photographs (to the indignation of any Brass Hat who might be near), talking to soldiers, looking at maps, accumulating raw material for his gauging and comparing intelligence. As we think of Colonel

Harvey Cushing among the mud-drenched heroes of Flanders, we may smile to think of the inhibitions of William Stewart Halsted in such places. An operating surgeon is a man essentially of the emergency, and after illness, war is the most desperate emergency of human beings. In both fields the surgeon is at home. His eye misses little, not even trivialities. Harvey Cushing chronicled both the big and little aspects of the war. The dreadful waste of food in the trenches—enough from one officers' mess to feed a working-class family for a whole week! Such a thing as 'bread and butter pudding never heard of' noted the frugal New Englander. Sometimes his spirits rose to the high tune of the conflict, and he felt that the savage inside him adored its squalor and wastefulness, its danger and strife, and glorious noise, and that man was intended more for this, than to sit in an easy chair with a whisky and evening newspaper.

After experience of the horrible mud of Passchendaele, through heaps of stones which the men called 'Wipers' which had been once the fair city of Ypres, he came to Boulogne for winter quarters, where he organized a research committee of fellow surgeons who would meet and go over such subjects as gas-gangrene, trench fever and problems that were severely practical, unlike most medical research in times of peace. At any moment of the day or night the hospital in the Casino might be overwhelmed with an avalanche of bombed cases requiring immediate surgical attention, and the 'Baccarat' Ward, the large room formerly dedicated to high stakes, became a scene of gambling for men's lives, and soldiers on stretchers filled the corridors and verandas that had once been devoted to agreeable flirtation over drinks. It was exciting and satisfying: the average man lived more abundantly in those situations; but only the thinker could make their meaning permanent.

In the hospitals of Northern France, the surgeon's bugbear

was a new peril—gas-gangrene. Out of the soil and mud which was part of the environment of every soldier, came a subtle microbe unforeseen by Pasteur, which as it grew in the wound, produced bubbles of gas, so that the infected part of the body became swollen like a tense sponge that later putrefied with horrible results. Harvey Cushing must have been reminded often of his old friend the Dean of Johns Hopkins, for the germ that caused these unforeseen results in the war wounds of Flanders was a near relation of that *bacillus aerogenes capsulatus* which W. H. Welch had discovered in 1892. For years it had seemed an interesting discovery, but of no practical importance, but now that microbe which the bacteriologists rejected had become the major problem of war-time surgery, and the academic preoccupations of men like Popsy turned out to be the greatest wisdom. The surgeons learned to open up these deep gas-filled spaces of the wound, for the organism was shy of oxygen, and could multiply only where it was absent. In those years there were few antiseptics strong enough to kill gas-gangrene; no penicillin, no sulphonamides, and the surgeon had to put his trust in mechanical cleansing in order to encourage natural immunity. An American, Henry Dakin, and a Frenchman, Alexis Carrel, invented a way of irrigating wounds so that drops of antiseptic flowed constantly from tiny glass tubes into the deep crevasses where the gas-gangrene organism multiplied.

In the life of a field surgeon there were unexpected relaxations. One day, eight out of the ten patients admitted to the field neurological hospital of which Harvey Cushing was in charge, suffered from strange and unfamiliar symptoms. The pupils of their eyes were large, they had hallucinations. On being questioned all of them admitted eating berries from an unknown bush four or five feet high. With a certain provisional diagnosis in his mind, Cushing and a fellow surgeon went off botanizing

to look for the bush. Having no compass, they got lost in a beech wood. They wandered further and came across rusty barbed wire and huge shell craters in the muddy earth, and there, in the chalk below, Cushing picked up a fossilized bivalve and the jaw of a prehistoric ape-like animal. Near this they plucked some branches bearing berries, and ploughed on until they met a French soldier who pointed the way back to their hospital, and casually remarked that the berries they were carrying were poisonous and not to be eaten. Here was the solution of the mystery of those hallucinations. Even in the theatre of war, with shrapnel, gas shells and snipers' bullets that ordinary plant Belladonna, 'the deadly nightshade,' can be dangerous.

In these grim and endlessly changing circumstances of war, the practical motto he gave his assistants was 'Do what you can, with what you've got, right where you are,' and yet behind that faculty of immediate extemporization, was the craftsman's impulse to improve his methods.

As for the war itself, well, it went on its mysterious way apart from the will of everyone engaged in it. Their lives in the base hospitals passed in a succession of dense crises and bewildering trivialities added into a drama that had to be lived through in the vain hope that it would be understood. There were air raids, and there were rats. In a primitive wooden hut surgical procedures were carried out such as would have shocked William Stewart Halsted into horrified impotence. Procedures which his habit of perfection would have extended to a whole hour, now had to be carried out in ten minutes in sheds and tents and holes in the ground. Oil stoves refused to burn, and bell tents leaked. A peculiar magnet used to extract steel fragments from head wounds would only work when some higher authority would permit the current to be turned on. A distinguished French surgeon asked how the Americans produced in their patients

such smooth scars. A mysterious, odourless gas caused symptoms which no one had ever encountered before. In the hospital mess an unbelievably fatuous Englishman turned up, and had his leg pulled by the Americans, and they in turn admired the British research workers who came from the universities to get a glimpse of war's problems.

War—it could be compared only to life itself: it was fascinating, disgusting, trivial, prodigious and seemingly endless.

One day towards the end, Harvey made his first aeroplane flight over the beautiful Loire Valley, finding this new mode of progression the most comfortable way of moving about, and he came down tingling all over as though after a glass of champagne.

He had been summoned to this safe area, away from the surgical hurly-burly of Boulogne, for a special, though at first undisclosed purpose, and jokingly he had told his friends before leaving that he was probably to be reprimanded for some misdeeds. Privately, however, he really expected to receive military promotion. But the jest was more true than the hope.

Harvey Cushing was indeed in serious danger of being court martialed. The exact diagnosis of his crime is not mentioned in the surgeon's diary, but we can infer that it was some impatient criticism of the British Army which had fallen into an unimaginative censor's hands, and Cushing's inveterable habit of photographing military as well as non-military objects. A letter of apology saved him from humiliation, but not from an acute period of anxiety for nine days while this ridiculous charge hung over his head.

During those last few hectic and horrible months, gas warfare was introduced by the Germans, mustard gas in yellow shells, arsenical gas in blue and phosgene in green shells. Seven hundred thousand Americans were now in France, but at the great offen-

sive of Compiègne, the Germans claimed 10,000 allied prisoners.

Besides wounds, lice and poison gas, there were other enemies even more subtle than the Germans, a vague peril known as trench fever, and influenza which was sharpening its weapons in this war for its even greater carnage in 1919. Colonel Cushing was a victim of the unknown, for like most diseases that afflict doctors, this was hard to diagnose. During that acute attack of grippe he found himself threatened with blindness. But it turned out to have been nothing more serious than presbyopia—a premature development of the vision of old age which had come over his eyes during that enforced enfeeblement. Other complications were held over until later, but that bout of fever behind the lines was the physical turning-point in his life. He was only forty-nine years old.

The Hindenburg Line was as yet unbroken, and in September 1918, German prisoners, with ignorant complacency, were assuring their allied captors that further behind it, there were three more strong lines of defence. But the allies were now on the move, northwards and eastwards: even a field surgeon could not help but gather that, and an observer as keen as Harvey Cushing knew much more. The sure knowledge that a German counter-offensive was inevitable, bringing heavy American casualties and demand upon base hospitals sobered his thoughts. 'Meanwhile,' he wrote laconically, 'we gain experience.' He was now in charge of Mobile Hospital No. 6 (head cases). Having persuaded the army command that this type of wound demanded special attention, he was ready for the worst that battle might do to men's brains. Then came an unexpected crisis in the surgeon's personal life.

Some high temperature, irregular heart and wobbling legs. Deep nervous reflexes uncertain—why Colonel Cushing was ill!

Perhaps the late consequences of that earlier attack of grippe. War weariness invaded even the jerky and lively pages of the journal. Yet the Kaiser was on the eve of abdication. The surgeon was in bed with grippe, a hot water bottle ('not a bad combination,' he wrote) and reading Drury's *History of France.* Below the knees, his legs were asleep. But the diary does not flag. 'President Wilson has caught the Kaiser with his trousers down and taken two smacks at him.'

Though the daily pages could hardly credit the fact, the Great War was really coming to an end. While Harvey Cushing was in bed, meditating upon French history and his post-war plans, the German peace emissaries were received by Marshal Foch in the railway coach and the guns were silent. Feeling the occasion still too grim to celebrate, the Colonel had tea beside a wood fire and discussed religion with the matron and padre.

The surgeon's war was over, and Harvey Cushing could go back to the tame operating of civil life, and occupy, if he cared, one whole morning with a single head case at the Peter Bent Brigham H.Q. in Boston, Massachusetts. Three winters had passed since he had gone to war at the head of the Harvard Unit, while his country was still at peace: three seasons of mud, excitement and a wondrous growth in his technique for dealing with injuries of the brain. The surgeon had developed, but the man Harvey Cushing had not escaped the finger of war. He wore stronger spectacles, and his legs gave him trouble. Those few years in France and Belgium had aged him inexpressibly.

11. SURGERY HAS COME OF AGE

Home from the first World War came the surgeons of many lands, fatigued in mind and spirit, but refreshed by professional achievement. In the grim laboratory of the casualty clearing station they had learned some new ideas; some control over

wound healing, success in injuries to bones and joints, recognition of psychological maladies under the provisional name of shell shock. But the greatest advance was the new confidence which medicine had gained. The generation of surgeons who were at their best between 1914 and 1918, which included the two Mayo brothers, Harvey Cushing and Berkeley Moynihan, was the first to have grown to maturity in the routine of antisepsis. The peace settlement of Versailles endured for hardly ten years. But wartime surgery became a permanent part of human culture.

Harvey Cushing was now at the zenith of his clinical judgment. He was the world's greatest brain surgeon yet he did not demand very high fees, though if a very wealthy client came along, he would sometimes exact from him a tribute of dollars for the upkeep of his surgical laboratory. No less than earlier, he preferred to carry through the whole operation with his own hands, however many hours it might take, and the pupil of William Stewart Halsted still sought greater perfection. To prevent surgical shock, a running record of the patient's blood pressure was kept throughout the whole operation, so that prompt steps could be taken if heart failure threatened. Assistants and pupils, all trained surgeons, came from different countries. An Australian graduate who had fought at Gallipoli said that war was nothing to the excitement and fatigue of being Harvey Cushing's lieutenant. The mortality in brain tumour had been reduced from 40 per cent to 8.7 per cent in conditions formerly quite incurable and he was striving to bring them even lower. Harvey Cushing was ready to acknowledge that a brain surgeon made mistakes. How could it be otherwise in that wilderness of the infinitely small, where measurements were in millimetres, and hours of the most painstaking labour could be defeated by bleeding from an artery so small that it could hardly be seen? Before he began his

work at Johns Hopkins, 36,000 cases of brain tumour had been admitted in a period of ten years, but only thirty-two had been diagnosed during the patient's lifetime, and of these none but two had been operated upon, both with fatal results.

Cushing's mental vitality was extraordinary. His own brains had ripened early giving him a long start over his contemporaries. Besides numerous case reports, he wrote scientific papers and letters up to 10,000 words a day. Now this unique brain surgeon was to take on the greatest literary labour of his life.

In the Baltimore days, his next-door neighbour had been William Osler, the man who shot into the medical ether like a medical meteor, and became a professor at Oxford and the most loved and talked-of doctor of the twentieth century. Of such a man surely a great literary portrait could be made. But how to catch the brilliant mercurial spirit of William Osler, and yet make it come to life again. Was this a task for a man who spent his life working on the human brain, and whose contacts with literature were mostly in previous centuries?

It meant, he calculated with true American optimism, a year's work, but he was drawn to it as men are fascinated by a great artistic project. He began to collect the material, the innumerable letters and postcards which Osler wrote, the humorous memories of his friends, his medical papers and case books, and he arranged them in chronological order. He used a long library table. A biographer needed plenty of elbow room, just like a surgeon. The year which had been dedicated to the work shot past and still the pile of references grew on Harvey Cushing's table, and each evening he performed magic rites to summon Osler's ghost and compel it to take form. Often the ghost must have laughed at the biographer's spells, but slowly it was caught and materialized. William Osler was dead, but a new artistic personality was coming to

life in the million words which Harvey Cushing wrote. It is the privilege of writing to present larger people than we can ever meet in life, and this man which Harvey Cushing had created became one of the immortals, and future ages will comprehend him more faithfully than the world has generally known its scientific leaders. Upon this splendid model a like memorial service was later provided for Cushing himself in the biography of Dr. John F. Fulton.

12. TWO THOUSAND BRAINS

Cushing's life work culminated in his two thousandth operation for a brain tumour. There, in his own handwriting, was a note upon each of the two thousand done just after the operation, with microscope sections of the tumour itself, and the most complete records of the patient's progress. They were encouraged to write to him on each anniversary of the operation, and now he had a dossier of life stories going back twenty years. He catalogued these macabre histories with the same imposing care as he had given to his books, and now, looking back over his experience, he realized that he had been very much more confident about brain operations at the end of his first two years of working upon them than he was now after a quarter of a century. Yet knowledge had been gained, and this could be passed on via the Brain Tumour Registry. It was not merely an exercise in professional vanity. Harvey Cushing loved manuscripts and rare books, but this gathering of the proofs of his own surgical skill in the two thousand cases was his true library.

It is rare to find three such talents in one man: the merely manual craftsmanship which the surgeon needs in his daily work; the human insight which enabled Cushing to produce the Osler biography; and the cool curiosity of the man who collected two

thousand brain specimens all patiently annotated in his own handwriting. The union of three faculties like these proves that the healing art is based on a synthesis of many talents, and that the greatest doctors are those with widest interests. None of Harvey Cushing's patients had cause to regret that he was a cultivated lover of books and a man of the world.

Popsy Welch was still at Baltimore, vital and vernal, with his beard now pointed, and his cult of books and art and sun-bathing kept him in touch with the newest in medicine. He had become more interested in the preventive than the curative outlook, and giving up pathology, he had founded a School of Public Health.

The indefatigable Popsy had also taken up the study of medical history and was laying the foundations of a splendid library of old books at Johns Hopkins. With his usual talent for human manipulation he planned that Harvey Cushing, on his retirement from active surgery, should return to Baltimore and take charge of this growing collection of early medical works. One day Dr. Welch journeyed to Boston, officially to give a lecture, but with the ulterior purpose of persuading his friend to fit in with the plan. Harvey Cushing met his visitor early one morning at the railroad station, with snow on the ground. But Popsy Welch jumped out of the train carrying a light overcoat over his arm and nearly eluded him. Later on there was some trouble because of certain white spots which the meticulous host noticed on his guest's waistcoat and to which Popsy was quite indifferent. These had to be sponged off, Popsy protesting that he had bought this suit in Paris eighteen months ago, and he did not see why it was not thought good enough for Boston. The lecture passed off. Dr. Welch poured his persuasions. But on this occasion he failed entirely. Dr. Cushing would not be drawn back to Baltimore,

even with the dazzling prospect of that historical library. He had other plans of his retirement which, under the age-limit rule, was now drawing near with inevitable speed.

He still kept up his schedule at the Peter Bent Brigham Hospital, but that undiagnosed bout of fever in the base hospital had left a crippling weakness in the arteries of his lower limbs. Sometimes when moving along the hospital corridor, he would abruptly stop and begin to talk about a patient. Or when outside, he would suddenly halt and make conversation about a flower or the sunshine. These were clever disguises for a distressing cramp in the legs, caused by the narrowing of the arteries. But his main activities, operating on the brain, collecting books and attending surgical conferences, went on though at a somewhat slower rhythm. At last came the day, so distressing for a man of Harvey Cushing's temperament, when he must leave his post at the hospital. The age-limit for compulsory retirement was intended to prevent a surgeon from trying to carry on after his powers had waned, and Harvey Cushing himself had proposed the age of sixty-three. But that had been twenty years before, when he was young and vigorous, and such an anniversary as a sixty-third birthday seemed far away. Those twenty years had passed away like a flash. Younger surgeons had grown up, who felt as confident as the eager Harvey Cushing had done when he came to Baltimore from Boston, and now, because he had decided then that a surgeon needed youth as his ally, he was to be pushed aside. He performed his last operation as surgeon-in-chief and took the boat for Europe.

Now came the fulfilment of the plan which had made him decline Dr. Welch's invitation to return to Baltimore. Before even be became a medical student, Harvey Cushing had graduated in Arts at Yale, and now he seemed to be inspired with a longing to go back to the scenes of his freshman days of forty

years before. The college authorities pounced upon this notion, and created specially for him a professorship of neurosurgery. Harvey Cushing removed to Yale, and as part of his luggage were his fine historical library and his two thousand specimens.

13. THE SICK GO TO THE PRAIRIE

William and Charles Mayo now received the same respect from their countrymen as for years they had been accustomed to enjoy in the clinics and universities of Europe. The fraternally associated prophets were honoured in their own home town and state. Their joint career was accepted as one of the natural American marvels, like Niagara Falls or the Grand Canyon, and most fantastic reports were rumoured and believed of their skill. It was said that no patient had ever died after one of their operations. To go to Rochester was a certain cure. The Mayos were infallible. And the smallest medical detail, instrument or treatment, that could be connected by name with the Mayos of Minnesota, was accepted at once. They were a legend, a fetish, they could do no wrong. Americans were flocking to their clinic as though to the healing spring of Lourdes, coming for 'alterations and repairs' and the relief of obscure maladies which had defeated their doctors in Kansas City, St. Louis, Detroit and the eastern states.

There was a tale of a distinguished doctor in the South who required a surgical operation and went to consult a surgeon in New Orleans. This surgeon was found to be away ill, and the ailing doctor went on to Memphis, Tennessee, where there lived another reliable consultant. But it happened that he too was sick, and the patient moved on northwards to Cincinnati, only to find that the specialist he sought in that city was himself seeking surgical aid. Eventually, with a malediction upon all ailing surgeons, the doctor-patient turned up at Rochester, thinking

that surely, even if one of the Mayo brothers were ill, the other would be able to help him.

After the operation, he related his experience. And then he heard the other side of that story. In Rochester, in bed under the care of the Clinic, were the three he had vainly attempted to consult, the sick surgeons from New Orleans, from Memphis and Cincinnati who had each had the same impulse in their difficulty. When doctors haunt a particular member of the profession to aid themselves and their families, it is good sign of merit.

But there is always another side to the medal of success. In their days of success as in the time of struggle, the Janus-like energy of American public opinion was busily focused upon Rochester, and Mayos were alternately praised and damned, lauded as the greatest phenomena in medicine, condemned as a pair of advertising charlatans. The critics got busy in the guise of panegyrists. The Mayo brothers were constantly hearing reports that they had decided to move to Chicago or New York. Deans of Faculty and medical organizers would point out how much better the Mayo Clinic would be if it were different. In spite of the Mayo reputation, the critics talked as though the two brothers were still just a pair of country doctors who would get patients much more easily if they moved to 'a good address' in one of the cities where they would be in touch with other surgeons and would know what was going on. These self-appointed approvers had not realized that the current was reversed, the tide was flowing in the opposite direction. With the growth of the automobile, people were less in love with the larger centres, and now patients and post-graduates flocked on the prairie town, turning away from metropolitan hospitals, and the medical world was changing. Christian Fenger with his European outlook, his gentle austerity and his background of long-forgotten wars was no

more. Nicolas Senn's towering personality, his intolerant confidence, had passed into tradition. The high-pitched Irish brogue of John Benjamin Murphy would echo for ever in the minds of those who had learned their craft in his clinic, but the man himself, worn out prematurely by the intensity of his nature, had hardly lived to see the fruit of his efforts to modernize surgery.

Berkeley Moynihan, the English surgeon whose oratorical wizardry had been the despair of John B. Murphy, had visited the Mayos and was their warm admirer. He himself had risen too in the interval after the first World War which he saw from the battle-front. He was President of the Royal College of Surgeons of England, and he had become Lord Moynihan of Leeds, and he would have liked to be British Ambassador to the United States. A matchless operator, a magnificent speaker, a man of boundless self-confidence and not displeasing egotism, he was now the ruling prince among British surgeons. His judgment was that William Mayo possessed the combined qualities of a statesman, diplomat, captain of industry, financier and surgeon, blended in one tremendous force the like of which had never been known and probably never would be known again in connection with the science and art of healing.

The work of the Clinic itself had much extended, but the most significant change was that which Henry Plummer had demanded years before. Internal medicine had become as important as surgery. It was now possible to be treated in Rochester for any sort of condition. This change had come gradually, because surgery was still growing more quickly than medicine, and the number of patients needing operation was always so great that they crowded out the purely medical cases. But by the end of the first World War, internal medicine was firmly established at the

Clinic, and the leadership of the brothers Mayo had virtually returned to general practice by a revolution of the wheel of progress that would have pleased their father, that all-round doctor. Sir William Osler's remark in this connection is quoted by Mrs. Clapesattle, the biographer who knows the Mayos through and through, and it epitomizes the nature of the change which had taken place. 'The surgeons have had their day—and they know it. The American St. Cosmos and St. Damien—the Mayo brothers, have made their Clinic today as important in medicine as it ever was in surgery. Wise men. They saw how the pendulum was swinging.'

When asked the cause of the Mayo success, William would say: 'We happened to be born at the right time when surgery and medicine were growing.' That was true of the brothers as it is true of every achiever; yet their work is much more than an accident of birth and opportunity. The Mayos' spiritual contribution to the art they loved was their belief that a patient was better looked after when several doctors collaborated in his treatment. They believed wholeheartedly that the future of medicine lay in group collaboration. They taught their disciples that the prestige of the Mayo Clinic could never be damaged by what its critics might say outside, but only from weaknesses within, and they managed to inspire their own physicians and surgeons and laboratory men with an ideal of fellowship.

Group medicine is one way of improving the fertility of the medical field, but it is not the only way. What are we to make of the great individualists? Can we imagine, for instance, John B. Murphy as a member of a group? William Stewart Halsted could never work with other men, unless he were the leader, and they obedient pupils. Harvey Cushing advanced surgery by his personal genius, and the true psychological leadership of personality and charm, yet even to him younger men were necessary as helpers and friends, but not as equals. Even William and

Charles Mayo owed their foundation to that great individualist their own father, and they drew pupils from all over America through the magnetism of personality.

There is no escape from the conclusion that both influences are at work. The art of healing advances through original talent, and is sustained by sympathetic minds working together. The true leader always finds his team out of those who want nothing more than to give up all and follow him. The real test comes only with time. The talented individual dies and his name survives as a glorious memory in the lives of those he has taught.

But it is not only the individual that dies—the collective organization too has its term of years. Its life becomes extinct, and its spirit grows cold. There is a certain clamminess about trust funds which tend to lie like a heavy damp blanket on the top of originality and initiative.

We have to think of progress in the art of healing as infinitely varied, like life itself. The musicians live and die, but the music is eternal. Those changeable appearances which we call 'diseases' alter from one generation to another according to man's habits and environment, and to cure man's sickness we need both the magic of the individual and the tenacity of the group such as the doctors whom William and Charles Mayo inspired.

14. THE GENIUS OF THE CLINIC

We can understand this interaction between individual ideas and group methods through a glance at the work upon diseases of the thyroid gland which was an outstanding performance at the Mayo Clinic. Among the group of individualists at Rochester, one man stood out as different from the others. This was Henry Plummer, the doctor's son who had first attracted Will Mayo's attention through his knowledge of blood diseases. Plummer's part in developing the collective work of the Clinic was very

great: yet he was the born rebel. Upon Henry Plummer they fathered all the characteristic yarns of the absent-minded professor —the man who invited a friend to lunch, allowed him to pay the bill, then pocketed the change; the man who sold his automobile to a doctor on the Clinic staff, then drove it home and locked it in his own garage; the husband who forgot to put on his necktie, and, so it was rumoured, would one day neglect to put on his trousers.

One of the fields of medicine which his brain fertilized was the group of thyroid gland diseases—goitre—those ugly and often dangerous swellings in the front of the neck, found in Swiss peasants and the inhabitants of other hilly parts of the world. In valleys of the Himalayas, and the mountain cantons of Switzerland they were common, and the great Theodor Kocher of Berne had carried their treatment further than any surgeon except the Mayos. It was known that this gland, the thyroid, was somehow connected with the storage and use of iodine in the body.

But there was one group of thyroid diseases in which the gland seemed, as it were, to go mad. It swelled, burst into frenzied activity, and sent out a dangerous form of secretion which excited the whole nervous system and poisoned the heart. When attempts were made to remove this over-active gland by surgery, the results were poor because the patient was in a toxic state. This state is called 'ex-ophthalmic goitre' because the eyeballs protruded, and the patient has a startled, anxious look as well as a very rapid heart beat. In this sort of thyroid disease, the Mayo Clinic was to make great progress, and this was due largely to Henry Plummer.

It was his brain which rose above the mass of facts and conflicting theories, and who perceived that ex-ophthalmic goitre really embraced two distinct and separate conditions. One of these was simple overaction of the gland, which sent out overabundance of iodine. The other meant overaction of the gland,

plus a poisonous type of secretion, because the thyroid could not find in the body enough iodine to make up a healthy secretion. In the first type of case, it would be harmful to give iodine to the patient: there was too much of it already. But in the second form of the disease, doses of iodine were just what the body needed in order to bring back that dangerous form of thyroid secretion towards normal. Henry Plummer's hypothesis was at first quite unproved, but was the result of much thinking. It went contrary to the dogmas about goitre which were held at the time. But it led to an advance in treatment, and Charles Mayo's operative skill built upon the chemical theories which Plummer had evolved.

But Henry Plummer was not entirely a theorist. He might forget to pay for his guest's lunch, he might wander through the Clinic buildings talking brilliantly then unaccountably breaking off his conversation, exhibiting all the signs of disembodied genius—yet it was he who gave the men of the Mayo Clinic the proper environment needed for their work. After many experiments he devised the envelope method of handling case papers so that details of thousands of patients could be found promptly whenever they were needed for reference. Henry Plummer was the man who inspired the telephone system by which the clinic doctors could talk to one another long before such intercommunication was the regular thing. Henry Plummer planned the first Mayo Clinic building in 1912; fourteen years later he designed the new tower which rose into the Rochester sky and is today the headquarters of Mayo dreams. That second effort was his final contribution to the Clinic, and is outwardly imposing as his work upon the thyroid gland is intangible. Henry Plummer achieved the dual role of a philosopher who was good at doing things; a practical American hustler who nevertheless believed in the power of thought.

15. A COLLEGE OF HEALING

William Mayo had never outgrown the long thoughts of a boy. He, of the two brothers, was the planner, the dreamer, and he never allowed the daily routine to curb his mental excursions into the future. The Mayo Clinic had begun as a family group of prairie doctors driven to specialize in surgery, but before long they had been obliged to dabble in laboratory medicine. This again had grown into a whole department of medical research. The Mayo Clinic had pushed out its long multiplying arms, taking in more and more of the territory of illness. After the first World War, the patients demanding treatment were more than ever, and already the Clinic building and even the much-extended St. Mary's Hospital had become too small. Patients overflowed into hotels, laboratories were set up in shops, x-ray apparatus in basements, and the Clinic itself, which had been opened in 1914, was already too small. But to Dr. Will Mayo those healthy signs were less important than the great question of how his work was to serve progress in the more distant future when he and his brother were gone. Wealthy Americans were endowing universities and research corporations, of which the most eminent was the Rockefeller Foundation. It was becoming the accepted thing for millionaires to give money for experimental work in the medical sciences. And now the Mayo brothers converted their proprietary clinic into an educational trust, and in future the profits accruing from the cure of the sick at Rochester would go back into the extension of the Clinic and its professional services. But there was one further and last step.

The Mayo Clinic had become a great teaching institution, and it was desirable that it should be associated with a regular Medical School. A hurricane of professional fury broke out, and the Mayos were accused of making a 'phantom gift' to the uni-

versity, and fastening on to it a private corporation, run for profit. Dr. Mayos' set-up at Rochester—why it was run for private profit, and the managers were trying to drive a good financial bargain for themselves by making it respectable through affiliation to the university. Such was the argument of less reputable critics.

But the Mayos' star was in the ascendant. Will Mayo went to the Legislature in St. Paul and gave them a piece of his mind. He must have been angry, that day, with the ire of a son whose father has been made a fool of, and whose inward ideals have been degraded by being discussed by petty minds. Those who heard him then said it was the most powerful thing they ever listened to. He spoke of that country physician who taught his sons to use their intellectual and bodily powers to help others. He spoke of himself and his brother as trustees for the money they had made out of their practice, money which they now wished to give back to the people in the form of better chances for young doctors. With scorn, he said he cared nothing for the opposition of that minority of the medical profession who were criticizing the gift, and then, as though saddened yet inspired by the preventable deaths which, like every other doctor, he had encountered, he finished with the prayer that those dead should not have died in vain.

Before that inspired oration, opposition melted as indeed obstacles always did before Will Mayo's will.

The Mayo Foundation became an academic corporation, part of the University of Minnesota, dedicated to research and the higher training of doctors, its pupils selected from the cream of medical graduates, and called Fellows. By a different route, William and Charles Mayo had reached the goal of post-graduate medical education sought by Dr. Welch at Johns Hopkins.

This transformation of the Mayo Clinic into one of the world's medical universities is probably the greatest operation which William and Charles Mayo ever performed.

16. IS THERE A PHILOSOPHY OF MEDICINE?

We began this chapter of the lives of certain modern surgeons with a wistful hangover from the dreams and hopes of the art of healing in the nineteenth century. We expected to find in this new world of medicine, represented so strikingly by the Mayo Clinic, some answer to those aspirations. Mankind desires relief. Humankind urgently hopes for a delivery from its pain, and a cure for its maladies. How much has the medicine of America given to the realization of this ideal?

First of all, organization of the scientific aspects of the doctor's work. Never has that been carried so far, and the methods followed at the Mayo Clinic are typical.

Then there is the idea of group medicine, that of several doctors working in association and the patient being studied by several of them. In this, the Mayo Clinic is not unique, but it is most representative.

There is no doubt that these developments of medical science and organization have brought enormous benefits.

Medicine and surgery have become amazingly complex and conspicuously efficient. We should rather have the appendix removed by the most junior surgeon in Rochester, than be attended for perityphlitis by Sir William Jenner in the 'Blue Room' of Windsor Castle. A goitre in the neck, a painful gall-bladder, a broken leg, these would be misfortunes in which we should be happy to feel that superb cleanliness, incomparable finesse, and rigid laboratory tests were being applied to our particular case as though they had been perfected for us, and for us alone. Even for cancer, a tumour that perhaps might be capable of successful

removal, then the wizardy of technique and experienced handling, the miracle of anaesthesia, the scope of chemotherapy—these possibilities would be like a balm to our anguish when confronted with the desperate human situation. It would be a comfort to know that several good brains met in conference over our case alone, to the exclusion of all other cases, and discussed between them the possibilities so that every conceivable danger was foreseen.

The person who understands the real meaning of group medicine, as practised in a first class way, and yet would not desire to have it for himself or his family in the hour of sickness is an imperfect logician. There is no question that chemistry, physics and biology are the basic sciences of the doctor, and if they can be brought close to the patient's bedside, the human frame, which is only a piece of nature obeying their yet half understood chemical and physical rules, will be helped to conquer its illness.

The success of modern medicine and surgery is so spectacular that we are in danger of thinking that it has finally solved the problem of human pains and ills.

Yet such a hope would be doomed to failure and disappointment. To handle disease upon the physical plane alone is to deal with only one half of its terrors.

That infected piece of tissue can be cleaned or removed, but we cannot tell why the microbes settled there. A tumour can be taken out, but we do not know why it developed. The human arteries can grow as hard as pipestems, but no one fully can explain why they become so in one man and not in another. Every advance in clinical science only seems to deepen the ultimate mystery. Chemistry brings the disease under the spotlight, yet the surrounding darkness is blacker still. The more we understand the sciences of medicine, the more we need to know of the soul and spirit of man, if we are to cure his diseases.

There is one more fundamental fact of medicine. Illness changes, both from person to person, and generation to generation. The sick man is the supreme egotist. Illness invents new symptoms, takes on fresh masquerades. Fashion changes even in microbes. We are faced with the possibility that those things which we call by the names of diseases, have no real significance at all, and are only the protean disguises of some evil mode of functioning which lurks in the background and can change its form to outwit the doctor. We shall not be deceived into thinking that illness can be prevented and cured by any system of efficiency. Those card indexes, laboratories, conferences, all those modern wonders that bring the practice of medicine nearer to the organization of commerce, are not the ultimate accomplishment but temporary aids. Perhaps the only means of curing the sick lies with the physician who loves them, thinks day and night over their symptoms, mulls over their problems, and heals through a protracted effort of his skilled imagination.

To peer into the future we need an element of the fantastic, but the whole history of medicine teaches us that the paradox of one generation becomes the sober reality of the next. In this spirit we can look forward. May we not surmise that the influence that produces the cure, is less the degree of expert technique, but some chemical change in the soul of the patient, when its molecules make contact with a change that has been initiated first in the soul of the physician? Perhaps ultimately more diseases will yield to this trained sympathy once we have found the way to inspire it in medical students.

At the summit of fourteen storeys of the new clinic building was a carillon of bells. Europeans find it impossible to understand modern America unless they grasp this element of the fantastic, and what modern European would have dreamed of putting bells in a medical clinic?

Those chimes represent the soul of the place, the fantasy which inspired William and Charles Mayo and which was the motive power of their scientific achievement. The untraditional northwest of America brought this marvel into being, in a way impossible to Europe of the twentieth century where the art of medicine is losing its connection with wonder.

17. THE CARILLON PLAYS FOR THE MAESTROS

An ailing doctor, thinks Bernard Shaw, is an absurdity.

The Mayo brothers had enjoyed good health for seventy-seven and seventy-five years respectively. Their secret of soundness lay more in a regular life with an aim that demanded all their mental resources than in any artifice of hygiene, but now the day came when both Dr. Will and Dr. Charlie performed their last operations, and felt the main chapter in their lives was closed. They made arrangements for the work of directing the Mayo Foundation to go on under the men they had trained. They seemed to have many years before them to enjoy leisure and contemplation. Their mercurial father had lasted until ninety-two, when he died only as the result of an accident, while their mother lived on in Rochester until she was over eighty. The Mayo brothers had the first prerequisite of long life: they came of tough parents.

William Mayo was accustomed to spend the winter in Arizona. It was more relaxing to breathe mountain air filled with sunshine than to endure the damp and frost of southern Minnesota, as he had done for seventy years of his working life, but his thoughts were never far from Rochester. At the end of the winter of 1938-39, he decided to return to the clinic to undergo what was becoming commonplace for people past middle age, a complete medical overhaul, and the doctors of the Mayo Foundation focused their trained senses upon one more patient, dearer to

them than all the notable men and women who had passed through their hands.

The diagnostic routine was now complex, but it was exceedingly smooth. In that fourteen-storey building the patient was examined first by one of the heads of one of the medical services, and then passed to specialists who performed the more unusual examinations. The blood and urine would be tested, x-rays taken of teeth, the intestines and lungs, and every means known to science used to illuminate that particular patient's constitution. Soon a whole sheaf of reports filled with much curious knowledge would be produced, and a patient who after the way of most sick people, was absorbed in himself, might find satisfaction in knowing the number of milligrams of sugar in his blood, or the concentration of acid in his stomach.

This piling up of bodily information had its morbid side. Perfect health means that we are indifferent to our functions; yet only through such an accumulation of fact can the clinical interpretation of the doctor be safeguarded against mistakes. The man who had built up this organization was now to test its efficiency from a novel aspect.

The Mayo routine was applied to Dr. William Mayo, and it worked well. Seeing it from the patient's point of view, he must have admired, and fully comprehended perhaps for the first time, the perfection of what he had created, and now he was fated to go through a mental experience which had been that of so many of his patients. That complete medical overhaul disclosed that Dr. Mayo had cancer of the stomach.

Surely, such knowledge must be more terrible to a surgeon than to any other man, for his fancy is not vague, it is filled with the most accurate detail. He can picture the evil thing, predict its rate of growth, measure its power. His mind knows the mathe-

matics of the probabilities. He can tell to within five per cent his chances of remaining a man alive for five years.

Dr. Mayo recovered well from the operation and was back at work when the news came of the sudden ending of the partnership which meant his whole life. Charles his brother had died suddenly.

This was the greatest loss William Mayo could have suffered, but in the course of nature, it was perhaps fated that Charlie should go first, the younger brother whom he had always watched over, Charlie who was so full of brilliance and human frailties. Early in their lives they had come to know one another as brothers best can, and they had accepted the roles which hereditary talent had ordained for each: Will to be the leader, Charlie to work upon the more rare and intricate problem; Will to be the great abdominal surgeon, and Charlie the specialist in the thyroid and the head and neck; Will to become the convincing lecturer with clear exposition and faultless logic, Charlie the popular speaker whom everyone enjoyed. Yet their life's work for the clinic had been a joint and several responsibility and each of them spoke not in the first person singular, but in the formula 'my brother and I,' and those who challenged them knew he must meet not only the tough mind of William, but the fathomless intuition of Charles.

Death of our parents afflicts wounds that time can heal, but the passing of brothers and sisters makes a ragged hole in the psyche that is almost beyond surgical aid.

They had worked inseparably, and now William was left to hear alone the sound of the carillon from the tower of the Mayo Clinic which was his brother's creation as much as his own. For a few weeks he heard it, and then one day he too explored the enigma which no surgeon's craft has ever been able to penetrate.

Two months after the death of Charlie, the profession of surgery in all parts of the world heard that the fruitful partnership of the brothers Mayo had ended where it begun, in that pleasant prairie town which they had made famous.

18. GOODBYE TO THE PAST

In the centre of Rochester, white in the shimmering heat or gleaming above the snow, rises a handsome square steeple at the summit of fourteen storeys, where hundreds of doctors labour to explore the mysteries of medicine. Next door the first building of the Mayo Clinic which had seemed so wonderful when opened in the year 1914, was now dwarfed by the graceful giant rising beside. From the tower there floated over the valley the chimes imported from England, and naturalized in the prairie air, sweet and soft harmonies which sailed through the windows of the patients' rooms of St. Mary's Hospital, still managed by the same Franciscan sisterhood which had chosen old doctor Mayo to look after their sick.

The carillon bells of the clinic tower played for William Mayo a requiem that will echo through medicine. The whole set-up, fourteen-storey clinic, and hospital nursed by women in robes belonging to the Middle Ages; the complicated mechanism used in the investigation of disease, and the enormous distances by which patients travelled to be cured in those rooms; above all, the co-operative spirit of group medicine and sharing of credit which lay behind the efficiency of these doctors, these wonders made the Mayo Clinic a truly American phenomenon.

The art of healing has changed in a hundred years, from the day when Sir William Knighton drove by coach to Windsor Castle to attend to the gout and the follies of George IV, and a Mayo was summoned professionally to the White House in

THE MAYO CLINIC, ROCHESTER

Washington. We have come a long way since Sir James Clark read his thermometer by the Lake of Geneva, to that day when Harvey Cushing performed his two thousandth operation on the brain. What a difference, what a revolution. Yet though disease had changed, the human being is the same, and the doctor in charge of his case no more than a man. Perhaps one day in the future, the physician will learn to heal himself, and would thus be greater than the illness he professed to cure.

Underneath, medical practice was not fundamentally different, and as they meet in the shades, William Knighton and William Mayo may exchange memories of the cases which passed through their hands. Harvey Cushing may discuss the pituitary gland with Brown-Séquard, and Florence Nightingale might even talk over spiritual problems with the mother-superior of St. Mary's Hospital, Rochester. Since they had seen further into the unknown than most members of their calling, they would acknowledge that, compared to the small achievements of their art, the part which remained unexplored was an almost limitless continent.

REFERENCES

BOOK ONE

LADY KNIGHTON, *Memoirs of Sir William Knighton* (1838)
A. ASPINALL, *Letters of George IV* (1938)
JOHN MASEFIELD, *Sea Life in Nelson's Time* (1905)
Greville's Diary
DOROTHY MARGARET STUART, *The Mother of Victoria* (1941)
LORD PORTMAN, *The Case of Lady Flora Hastings* (1839)
SIR JOHN SIMON, *English Sanitary Institutions* (1897)
HARRIETT WILSON, *Memoirs* (1825)
SIR SYDNEY LEE, *Queen Victoria* (1902)
LYTTON STRACHEY, *Queen Victoria* (1920)
R. B. BRETT, *Girlhood of Queen Victoria* (1912)
SIR THEODORE MARTIN, *Diaries of the Prince Consort*
HON. ARTHUR PONSONBY, *Henry Ponsonby: Life from his Letters*

BOOK TWO

MRS. C. L. LEWES, *T. Southwood Smith, A Retrospect* (1897)
BENJAMIN WARD RICHARDSON, *The Health of Nations* (1887)
T. SOUTHWOOD SMITH, *Lecture on Jeremy Bentham* (1832)
T. SOUTHWOOD SMITH, *Divine Government* (1816)
SIR LESLIE STEPHEN, *Jeremy Bentham* (1900)
MAURICE MARSTON, *Sir Edwin Chadwick* (1925)

BOOK THREE

SIR EDWARD COOK, *Life of Florence Nightingale* (1913)
J. B. O'MALLEY, *Florence Nightingale, 1820-1856*
Memoirs of Elizabeth Fry, by her Daughters (1847)
EDMUND MAURICE, *Life of Octavia Hill* (1913)

REFERENCES

BOOK FOUR

Sir Humphrey Rolleston, *Endocrine Organs in Health and Disease* (1936)

F. Rouget, *C. E. Brown-Séquard et son œuvre* (1930)

J. M. D. Olmsted, *C. E. Brown-Séquard* (1946)

J. M. D. Olmsted, *Claude Bernard* (1939)

BOOK FIVE

Helen Clapesettle, *The Doctors Mayo* (1941)

W. G. MacCallum, *William Stewart Halsted* (1930)

Harvey Cushing, *From a Surgeon's Journal, 1915-1918* (1936)

Loyal Davis, *Surgeon Extraordinary (J. B. Murphy)* (1938)

G. Donald Bateman, *Berkeley Moynihan* (1940)

John F. Fulton, *Harvey Cushing* (1946)

Sir Frederick Treves, *Grand Corniche Road* (1920)

Lectures on the History of Medicine given at the Mayo Clinic, 1926-1932 (1933)

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