The Wellcome Chemical Research Laboratories, established 1896 : Frederick B. Power, Director.

Contributors

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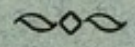
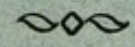
THE WELLCOME
CHEMICAL RESEARCH LABORATORIES

ESTABLISHED 1896



FREDERICK B. POWER, PH. D., *Director*



SNOW HILL,
LONDON, E.C.

THE WELLCOME
CHEMICAL RESEARCH LABORATORIES

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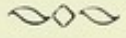

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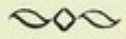

6, KING STREET, SNOW HILL,
LONDON, E.C.

THE WELLCOME

CHEMICAL RESEARCH LABORATORIES.

THOSE who have observed the progress of events in Great Britain during the last decade cannot fail to have been impressed with the remarkable developments and achievements by which it has been attended, especially in the domains of the chemical, physical, and biological sciences. The discovery within the past few years of several new elements in the atmosphere, the liquefaction, and even solidification, of gases that were hitherto regarded as permanent, the synthesis of several important organic compounds, the isolation of new substances, and the more precise characterisation of those previously known, together with the perfection of chemical processes and the applications of electricity in chemical and metallurgical operations, are but a few examples of the contributions to knowledge and the industrial progress which have signalised the closing years of the century.

The spirit of research has, in fact, now become so diffused as to have penetrated into almost every department of human knowledge and activity. With a broader recognition of its usefulness, and even of its necessity, as an element of progress, research is no longer confined to institutions of learning, but has proved to be a quite indispensable factor in its relation to industrial pursuits, as well as for the study of those important problems in medical science which are so intimately associated with the health and happiness of mankind. It has indeed been truly said that "without a knowledge of the constitution or structure of the molecules which go to make up the substances employed as remedies, therapeutics, or the administration of these remedies, can never be an exact scienee. Thus the research chemist may contribute,

though indirectly, his share towards placing medicine upon a real and scientific basis."

It is worthy of note that the year 1896 was marked by the establishment in Great Britain of at least three laboratories devoted exclusively to scientific research — namely, the Davy-Faraday Research Laboratory connected with the Royal Institution, which was formally inaugurated in December, 1896; the new Research Laboratory of the Royal College of Physicians of Edinburgh, which was formally opened in November, 1896; and the WELLCOME CHEMICAL RESEARCH LABORATORIES, which were established in the summer of 1896.

The scope of these laboratories and the directions in which research is conducted in them naturally differ. The first mentioned, for example, is more especially of an academic character, and is therefore devoted to somewhat abstract investigations in chemistry and physics; the second is stated to have for its primary object the examination of morbid specimens and material, the study of zymotic diseases, and, in general, bacteriological, physiological and pathological work; while the third, the WELLCOME CHEMICAL RESEARCH LABORATORIES, are designed for investigations in both pure and applied chemistry, and, in the latter instance, with special reference to the study of that large class of both organic and inorganic compounds which are employed as medicinal agents in the treatment of disease.

The importance of the work which it is the purpose to accomplish in these different, but more or less closely related, departments of science is apparent, and is duly appreciated by those who recognise the deficiencies of existing knowledge.

In response to numerous requests, it has been considered that a brief sketch of the WELLCOME CHEMICAL RESEARCH LABORATORIES, descriptive of their organisation, development, and present equipment, would prove of interest to a considerable number who have not the opportunity of inspecting them.

The first announcement of the plan of Mr. Henry S. Wellcome to establish the chemical research laboratories which bear his

name was made on the occasion of a dinner given by him to the present Director, Dr. Frederick B. Power, at the Holborn Restaurant, London, on the evening of July 21, 1896. The occasion was a memorable one in many respects, for the gathering included a large number of distinguished representatives of the various sections of the scientific world. It was then explained by Mr. Wellcome that the work which he proposed to inaugurate was one which he personally had very much at heart, that it would be carried out on no selfish lines, but would be controlled and dictated with the highest regard for science. It was also made clear that the new chemical research laboratories were to be entirely distinct from those of the Works of his firm, in which, as heretofore, research would also continue to be conducted. The expressions of appreciation of the high purpose and the scientific spirit which had actuated Mr. Wellcome in the development of such extended plans for chemical research, as manifested by various distinguished speakers on the occasion referred to, were indeed most auspicious, and fittingly commemorated the inauguration of the work that was to be undertaken.

The first home of the laboratories was in a building located at No. 42, Snow Hill. A view of the equipment of one of these laboratories is given in Plate VIII. It was recently found desirable to make considerable extensions. In order to accomplish this, it was decided that the laboratories should be transferred to a building of their own, of which they should have complete use and possession. Such premises were secured at No. 6, King Street, Snow Hill, where, in a very central part of London, and amid surroundings replete with many of its most interesting historical associations, the laboratories are now located.

The building is a handsome, modern one of Venetian style of architecture, and comprises four stories and a basement. A view of it is represented by Plate I.

On the ground floor of the building are the office of the Director and the library, a section of the latter being shown in Plate II. The library is a well selected one, and quite complete

for the special requirements. It contains not only a considerable number of recent chemical and pharmacological works, but also complete sets of many journals, such as the *Journal of the Chemical Society*, *Berichte der deutschen chemischen Gesellschaft*, the *Chemical News*, *Journal of the Society of Chemical Industry*, etc. Files of many of the more important chemical, pharmaceutical and medical periodicals of England, America and Germany are also kept. As several very large and complete scientific and technical libraries are also at all times accessible to members of the staff, it is evident that the requirements in this direction are most abundantly supplied. In the library there is also a cabinet containing specimens of the various substances prepared in the course of laboratory investigations, which already form a collection of considerable interest.

The laboratories proper are located on the first, second and third floors of the building, and are represented in Plates IV., V. and VI. They are similar in their arrangement, are provided with gas and electricity for both illuminating and heating purposes, and completely equipped with all the necessary apparatus and appliances for conducting chemical investigations. There are pumps on each table for filtration under pressure, and special adaptations for vacuum distillations. A separate connection with the electric main supplies the current for heating iron plates used for the distillation of ether and other similar liquids. Each laboratory is provided with fine analytical and ordinary balances, which are carefully protected from dust and moisture by tightly-fitting glass cases. A view of one of these is afforded by Plate III. There are also telephones on each floor, so that communication between the different laboratories or with the Director's office can be quickly effected.

The basement of the building, which is well lighted by electricity, contains the combustion furnace and all the appliances for conducting ultimate analyses, a large electric motor for working the shaking and stirring apparatus, the drug mill, etc., and a dark-room adapted for polarimetric or photographic work. In

direct communication with the basement are dry and commodious vaults, which afford ample room for the storage of the heavier chemicals and the reserve stock of glass ware, etc. By means of a small lift articles may be conveniently transported from the basement to any floor of the building.

From this brief description, and the accompanying photographic illustrations, it will be seen that the WELLCOME CHEMICAL RESEARCH LABORATORIES are unique in their appointments and in the purpose they are designed to accomplish.

It is, perhaps, hardly necessary to explain that some of the problems which engage the time and attention of members of the staff—which comprise a number of highly-skilled and experienced chemists—are of technical application, having reference to the perfection of the chemical products of Burroughs Wellcome & Co. These naturally do not always afford material for publication, and many other difficult researches extend over considerable periods of time. Nevertheless, several publications, embodying the results of original work contributed to various scientific societies, which are now consecutively numbered, have already been issued by the laboratories and distributed to institutions and individuals who are considered to be interested in them. Other work in progress will, from time to time, form the subjects of future communications.

Although too short a time has elapsed since the establishment of these laboratories to afford much material for a historical retrospect, their present measure of success enables the hope to be confidently entertained that they will justify the expectations of their founder and of those who are in sympathy with the work which they aim to accomplish.

LONDON, *June*, 1900.

PLATE I.

THE WELLCOME
CHEMICAL RESEARCH LABORATORIES.

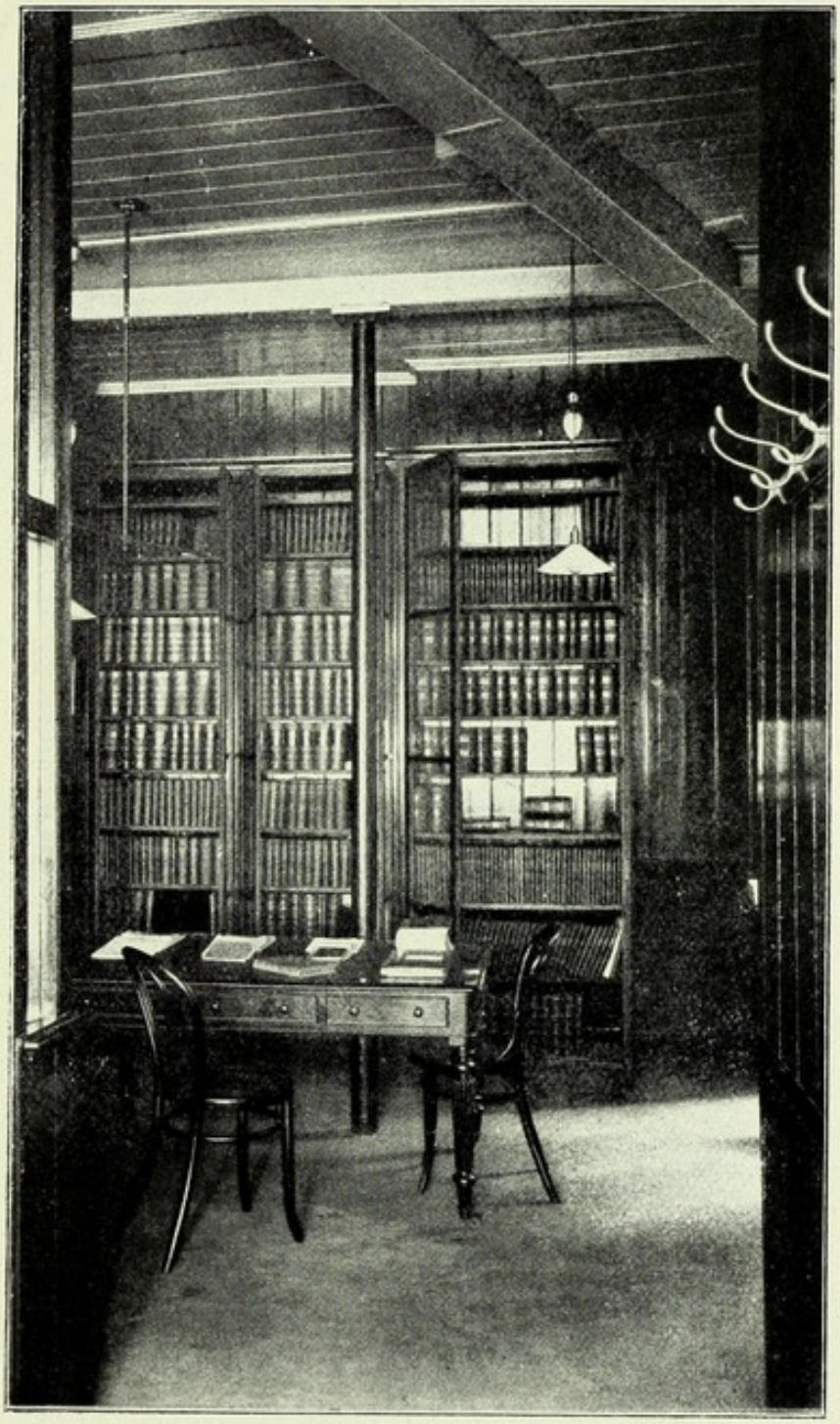

PLATE II.

PORTION OF THE LIBRARY.

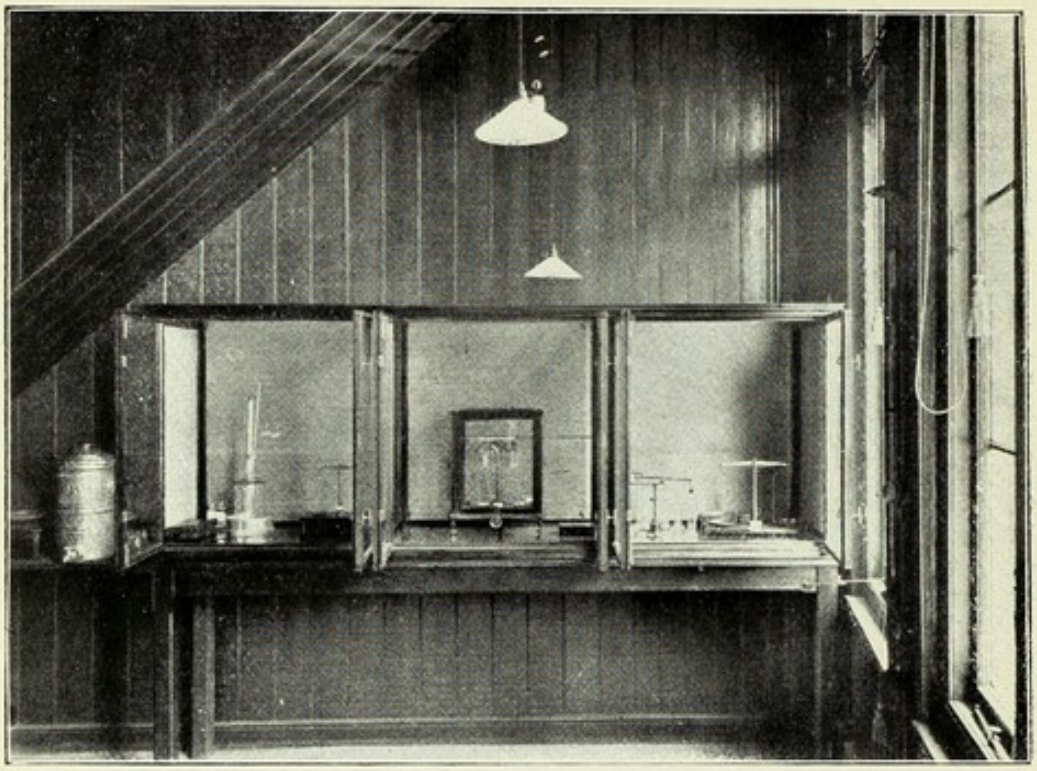

PLATE III.

ONE OF THE BALANCE CASES.

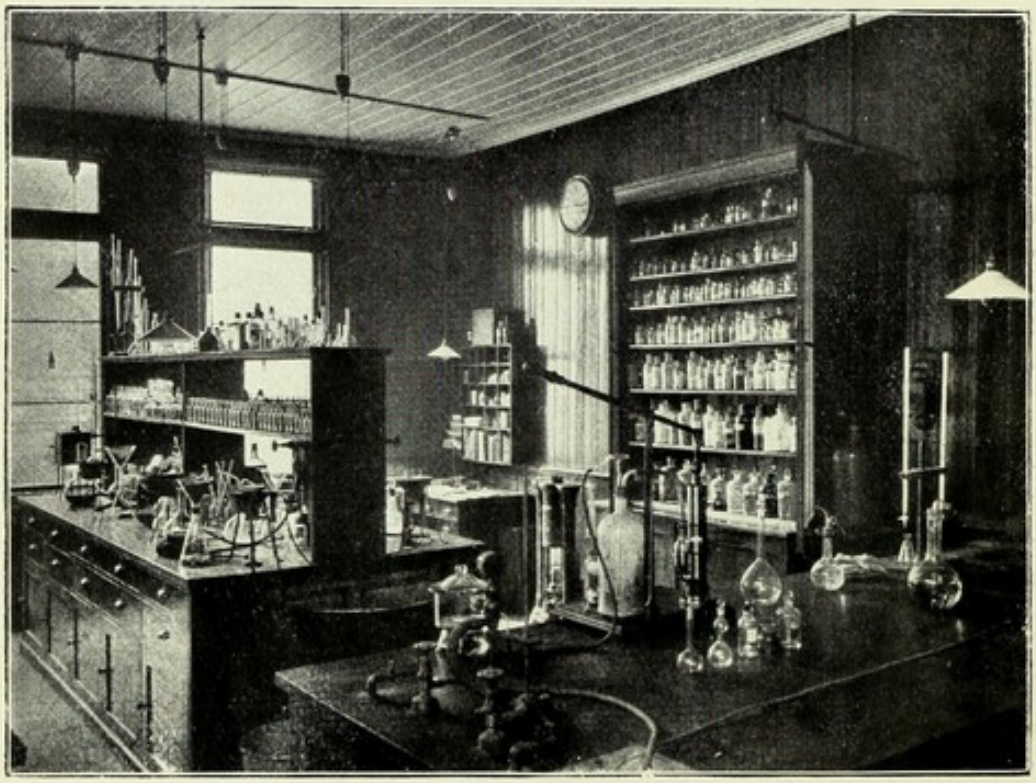

PLATE IV.

THE LABORATORIES, FIRST FLOOR.

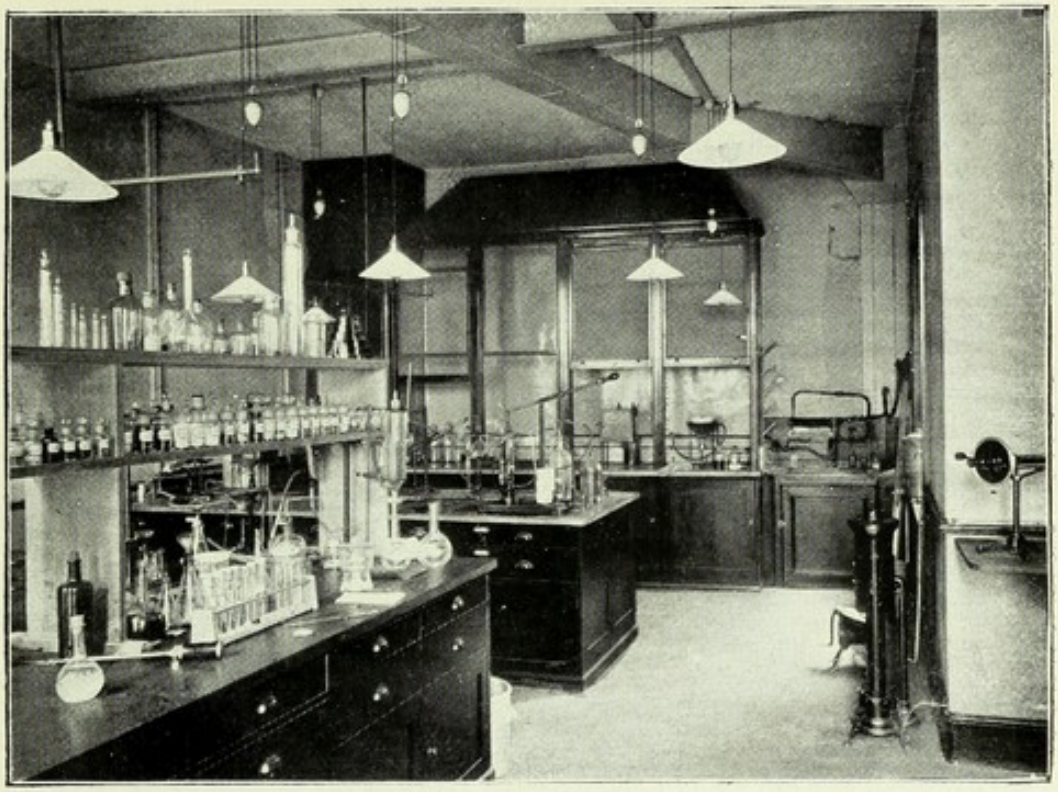

PLATE V.

THE LABORATORIES, SECOND FLOOR.

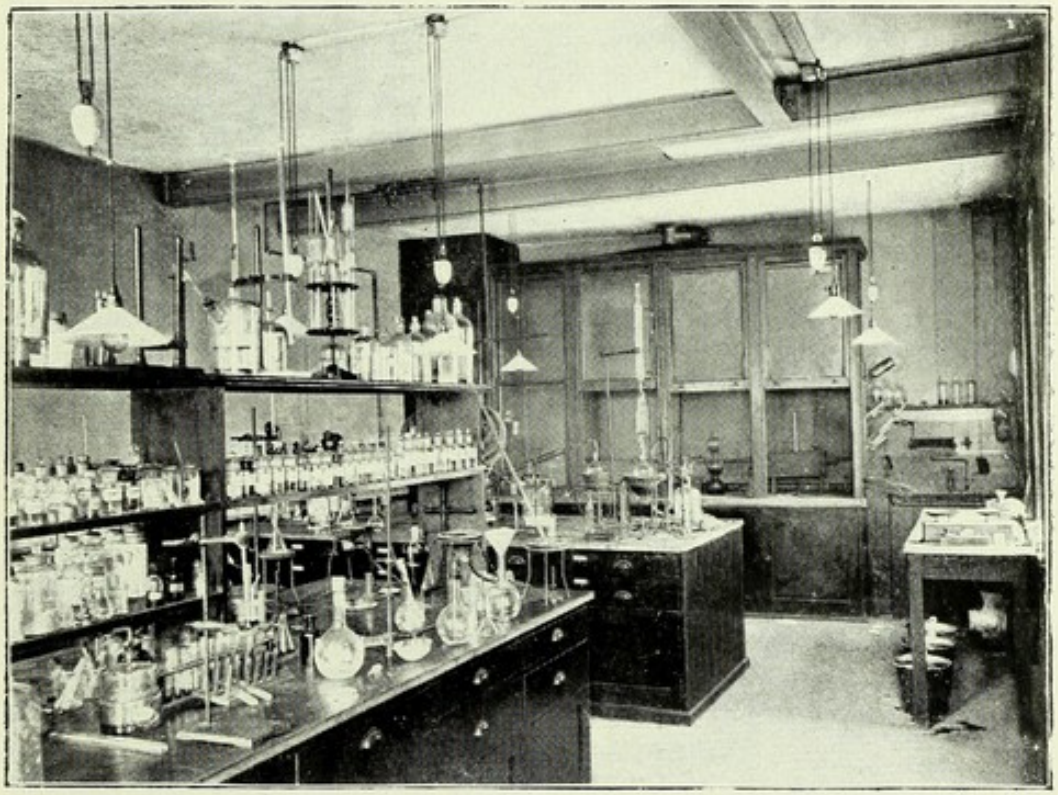

PLATE VI.

THE LABORATORIES, THIRD FLOOR.

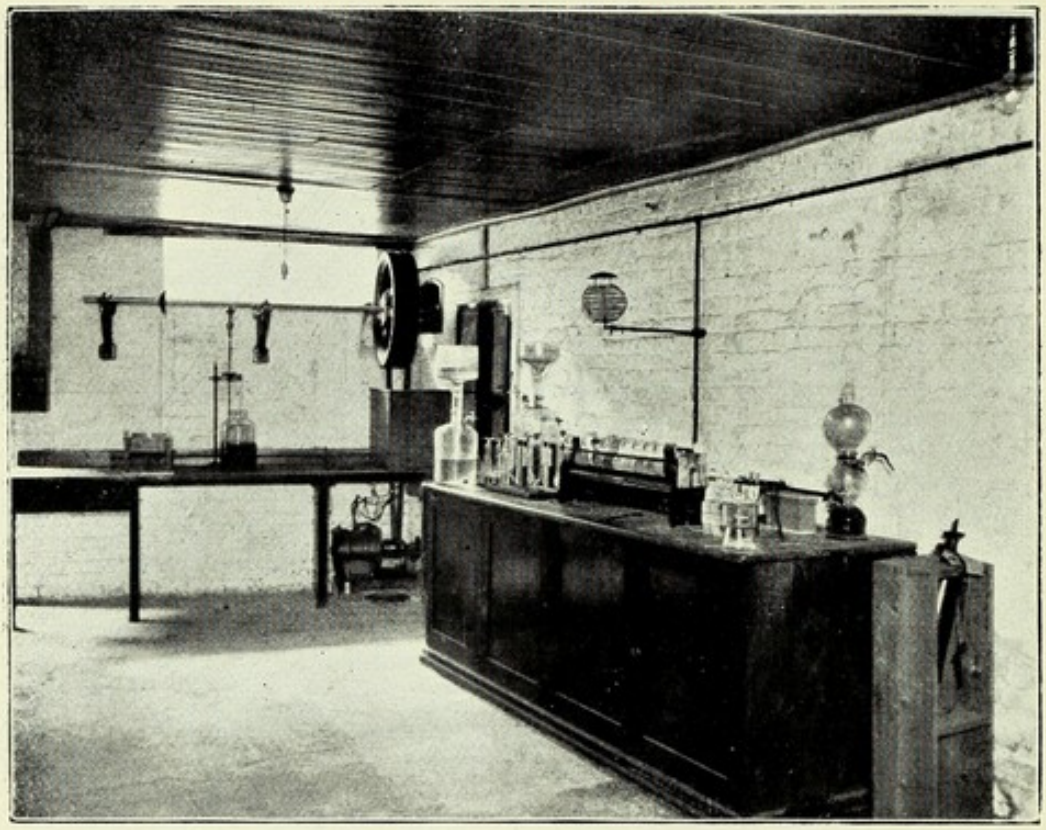

PLATE VII.

THE COMBUSTION ROOM.

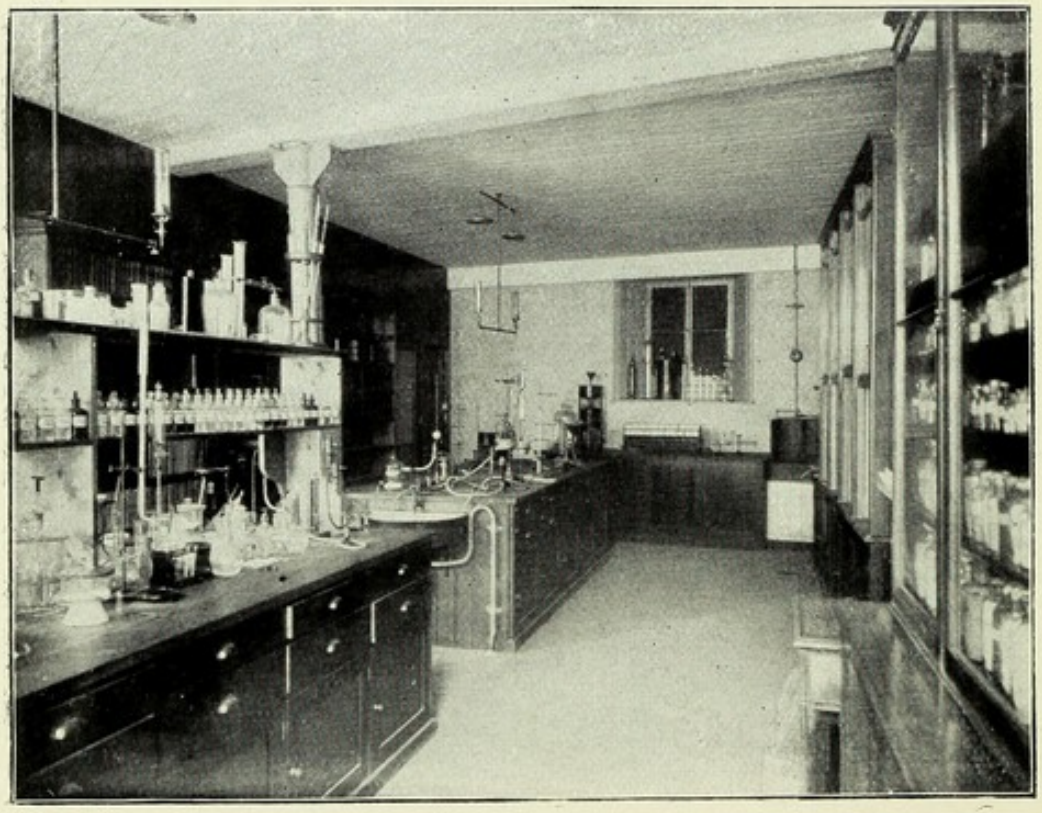

PLATE VIII.

ONE OF THE OLD LABORATORIES AT 42. SNOW HILL.

REPRINT FROM PRESS REPORT

A DINNER given to DR. FREDERICK B. POWER,

ON THE OCCASION OF THE FOUNDING OF

THE WELLCOME CHEMICAL RESEARCH LABORATORIES.

A NOTE-WORTHY step has been taken by Mr. Henry S. Wellcome, of the firm of Messrs. Burroughs Wellcome & Co., of London, in the establishment of chemical research laboratories, under circumstances which give promise of important results. For the direction of this undertaking, Mr. Wellcome has selected Dr. Frederick B. Power, formerly of the Wisconsin State University, who has had a distinguished career in connection with research chemistry and pharmacognosy, and was one of the principal technical workers in the revision of the United States Pharmacopœia. In honour of Dr. Power, and to celebrate the occasion, a dinner was given by Mr. Wellcome on Tuesday, July 21st.

Nearly fifty gentlemen, distinguished in chemical, medical, and allied branches of science, sat down to dinner in the Duke's Salon of the Holborn Restaurant, Mr. H. S. Wellcome presiding. The handsome antique salon was tastefully decorated, and behind the chairman the Union Jack and the Stars and Stripes of America were intertwined, and a very artistic souvenir of the occasion, containing a portrait of Dr. Power, was presented to each guest. During the evening some choice selections of music were rendered.

Professor Alexander Kerr, M.A., of Wisconsin University, proposed the toast of "The Queen," in a hearty and effective speech. He related how, some years since, there came into the circle of professors of his University the guest of the evening. With his quiet and courtly manners Dr. Power had captured their affections at once. He continued his professorship for nine years, during which time he successfully organised a special department of pharmaceutical chemistry. Then to their profound regret, he resigned in order to give more time to research. A report of that evening would give great pleasure to his colleagues at the University, where Dr. Power had so brilliantly distinguished himself.

Mr. Charles Umney, F.I.C., F.C.S., proposed "The President of the United States." After speaking of the bonds of affection which would always join the

two great English-speaking peoples, he said he was very glad to have the presence amongst them that night of Dr. Power, and he trusted that that distinguished investigator's work on this side of the ocean would be as successful as it had been on the other.

Mr. Wellcome proposed the toast of the evening. He said that Dr. Power, whom they had the pleasure of welcoming that night, had been a close personal friend of his since his boyhood. They were classmates together at the Philadelphia College of Pharmacy. At the same time, he felt that while they were classmates Power was his teacher. Power developed at a very early age that peculiar genius which had so influenced his work through life, so that, whilst he was a student at college, he was yet a teacher of his fellows. They were all impressed with the brilliancy of his work and the modesty of his manner. He carried off the laurels at that institution, taking the highest prize for his chemical work, and, young as he was at that time, he became the chief of Professor Parrish's laboratory. Under the guidance of that distinguished man, as well as under those other great teachers whom they were both privileged to have as instructors—Professors Bridges, Procter, and Maisch, all of whom had since passed away—he showed his first marked inclination for research, and he was urged by his fellows to follow a professional career.

Soon after he graduated at the Philadelphia College, Power went to Germany, where, after a full course at the Strasburg University, he took the degree of Doctor of Philosophy, and became first assistant to that distinguished scientist, Professor Flueckiger. On one occasion, Professor Flueckiger expressed to him (Mr. Wellcome) the opinion that if he had ever known a genius in research work, that genius was Dr. Power. The conscientiousness, thoroughness, and accuracy of his work, and his fertility of mind, had undoubtedly impressed his former teacher.

Returning to America, Power took the position of demonstrator of analytical chemistry at the Philadelphia College of Pharmacy, and was soon after called to the professorship at the Wisconsin University to which Professor Kerr had referred. This position he filled for nine years with great distinction. Then, resigning his professorship, he accepted a tempting offer from the firm of Messrs. Schimmel & Co., and undertook the direction of their American laboratories. His researches had been characterised from first to last by thoroughness and accuracy.

When a subject had been taken up by Power, even if it had apparently been exhausted by others, he found something more, but no one who had ever followed him in his researches had succeeded in finding that he had missed anything. He (Mr. Wellcome) had long been engaged in important researches, but he found many difficulties in connection with carrying out complex investigations at his works; and though research at the works was important and would always be continued, he resolved on establishing special chemical research laboratories, and had succeeded in inducing Dr. Power to take the directorship and complete control of that department, which was entirely separate and distinct from all their business departments. Dr. Power would be supported by a staff of able chemists, and he knew that the work done would be most thorough and exhaustive.

Dr. Power had selected Dr. Jowett as a member of his staff, and that gentleman was known to most of them for the large number of prizes he had taken in his short career, and for the splendid work he had done in collaboration with Professor Dunstan. Professor Dunstan had written to him (Mr. Wellcome) regretting his absence that evening, but congratulating him on having secured the services of

Dr. Power, and adding that if he also secured Dr. Jowett he ought to have very strong and successful work carried out. He (Mr. Wellcome) was sure that they all appreciated the importance of research work. It was a matter which he personally had very much at heart, and he felt that with such a director as Dr. Power, assisted by such a staff as he would draw about him, he would be able to ascertain something which might be of value to the world at large. That work would be carried out on no selfish lines. It would be controlled and dictated with the highest regard for science, and the personality of those interested ought to be a sufficient guarantee for its success.

They knew that from the earliest dawn of creation man had regarded with awe the phenomena of Nature, and the wonderful works of the Almighty with which he was surrounded, and groping after light and knowledge, he had tried to pierce those mysteries. But it was only within our own age that man, now perhaps better endowed with genius, had the audacity to face Nature thoroughly and fearlessly and attempt to wrest from her her profoundest secrets. This had been done with wonderful success, and none would dare to predict where that work of investigation would end. He asked them to drink most heartily to the guest of the evening, Dr. Power.

Dr. Power, who was most cordially received, said in response: "Mr. Wellcome and gentlemen, realising fully the significance of this occasion, I can assure you that it is difficult, I might almost say impossible, for me to adequately express my appreciation of the kind and cordial sentiments which have here been spoken, and which have deeply stirred my emotions. It is certainly to me a great pleasure and privilege to be introduced in such a felicitous manner to so many distinguished representatives of science and art, and to be able to form the personal acquaintance of those so highly esteemed and honoured in the professions which you severally represent. It is my sincere hope that the kindly greeting which you have here extended to me may especially serve to inaugurate many enduring and cherished friendships among those whom I now meet for the first time, as well as to bind still more firmly the ties of older associations, so that as the years roll on this occasion may be reverted to, not simply as one of ephemeral festivity, but rather as one productive of worthy aspirations and fraught with precious memories.

"In coming among you it is my desire to contribute what little I can to that branch of chemical science which is so intimately associated with the professions of medicine and pharmacy, and to which some years of my life have already been devoted. In thus joining my efforts with yours I am impressed with the fact that in the aims and pursuits of scientific work we are restricted by no narrow or disputed geographical boundaries, for as there exists a language common to all civilized nations in which chemical facts may be expressed, so I feel that we are bound together by a common purpose, which is the advancement of knowledge and the development of such of the resources of nature as may confer blessing and benefit to our fellow men.

"In this great city with its teeming activity, one is not only impressed with the broad opportunities which it offers through its vast libraries, its museums, and its renowned institutions for the promotion of every department of human learning, but also with the associations which cluster round its historic past. I should not feel myself competent to refer more than casually to this, even from the limited standpoint of our own departments of science. Nevertheless, it is an inspiration to recall in memory some of the events connected with the labours of those who at one time, and to some extent, were strangers like myself in the great metropolis,

as possibilities are thus suggested to which perhaps in a smaller measure we may be permitted to aspire, and which at least afford subjects that are worthy of most earnest emulation."

Reviewing the labours of Professor Hofmann and Professor Auguste Kekulé, Dr. Power recalled the circumstance that it was in the course of the long rides which he was wont to take on the top of a London omnibus that Kekulé first conceived the remarkable and most interesting theory concerning the structure or configuration of the benzene molecule as represented by the alternate single and double linkage of its carbon atoms in the hexagonal ring.

The achievements of those who were at one time, or of others who are now, such active scientific workers, chiefly served to impress them with the magnitude of the work which still remained to be performed. Lord Kelvin had said that one word characterized the most strenuous of the efforts for the advancement of science that he had made perseveringly for fifty years, and that was "failure." But what splendid compensations for philosophical failures they had in the admirable discoveries regarding the properties of matter, and in the application of science to the benefit of mankind with which those fifty years had abounded.

In conclusion Dr. Power said: "And now, Mr. Wellcome and gentlemen, with the contemplation of these few thoughts, and with the assurance of my grateful recognition of the honour which your presence here this evening has conferred upon me, I shall enter upon the duties in my new sphere of labour, not only with an earnestness of purpose, but with the hope that in after years it may be possible to say that they were faithfully performed. It will also be my special desire that the work to be accomplished in the Wellcome Research Laboratories shall always be of such a character as to reflect credit upon the scientific spirit, the enterprise, and the noble generosity of him to whom their foundation is due, and whose name they bear."

Mr. Fletcher Moulton, Q.C., F.R.S., in a speech of much humour, proposed "Science Universal."

Professor D. E. Hughes, F.R.S., in responding, warmly welcomed Dr. Power to this country.

Mr. Newton Crane proposed "Medical Science," and associated with the toast the name of Dr. Sydney Ringer, who had made the demonstration of therapeutic science something of great value to humanity.

Dr. Sydney Ringer, M.R.C.S., F.R.S., after referring to the recent rapid strides in medicine and chemistry, said: "We welcome you here to-night, Dr. Power, as a distinguished man of science, and we hope you will continue your distinguished career here. We welcome you here—I speak with deep feeling on my own part—as men who are always glad to welcome Americans upon their merit, and as coming from a great country and a great people."

Professor P. Carmody, F.I.C., F.C.S., of Trinidad, proposed "Chemical Industry."

Mr. David Howard, F.C.S., F.L.S., replied, saying that he presumed he had been selected to acknowledge this toast because he had a somewhat long record. He had himself made quinine for forty years and he began to make it when he was twelve years of age. His father and his grandfather had carried on the manufacture of chemicals before him. One thing that they had learned was that chemical industry depended entirely upon pure science, and, depending as it did upon science, it was not the matter of any one locality or nation, but of all humanity. Any little chemistry he knew he owed to his great teacher,

Dr. Hofmann; and, therefore, he at any rate owed a debt to other than Englishmen. The more one knew of one's neighbours the more one recognised that knowledge was a whole, and that no nation had any peculiar right to the whole of it. And upon the point that it was pure science that made applied science, let there be no mistake—they could not put too high science to work. If they were to have the best and highest applied science they must put Pegasus himself in the yoke.

He felt that the highest scientific skill was not exercised in vain when it was employed for the good of humanity, and it was not a secret confined to one or another, but open to all, and recognised by none more clearly or more practically than by the great firm of which the chairman was the head. It was only in keeping with the past history of that firm that he should have chosen so able and so scientific a man as Dr. Power to assist them in research.

Might he say again, drawing upon his own experience, that it was the greatest mistake to suppose that even in the simplest things they could do without research? They had the text-books certainly, but the manufacturer who knew no more than the text-books was indeed done for—and it was only by research that they could learn more than their text-books told them. He cordially welcomed Dr. Power as one who had fully recognised that great truth which alone could make a future for applied chemistry.

Professor Meldola, F.R.S., F.I.C., F.C.S. (Technical College, Finsbury), in proposing the toast of "The Press," said that if he might make a digression he would like to express his very great satisfaction at being the means of stating how keenly they appreciated the enlightenment which had led their host to inaugurate that most important departure amongst the long list of his industrial achievements. It was a departure which he was sure would bear the most important fruit, and there was no branch of industry which would not benefit by such a departure if they were fortunate enough to secure such an expert as Dr. Power.

Dr. B. H. Paul, F.C.S. (Editor *Pharmaceutical Journal*), replying to the toast, said that they must be grateful for the participation of the great continent of America in chemical science within recent years. He was glad to say that the impulse that had been exercised in that direction was about to be supplemented by bringing over to this country Professor Power to take the direction of the Wellcome Research Laboratories. That was a step which he thought was a worthy supplement to the stimulus which had undoubtedly been already produced by the famous house of Burroughs, Wellcome & Co. They had imported Dr. Power as an infectious element, and he hoped that the work which he would do would breed an infection that would seize upon some of our own people. He heartily congratulated Mr. Wellcome upon the wise step which he had taken, and wished him all success in the prosecution of it.

Mr. A. Gordon Salamon, A.R.S.M., F.I.C., F.C.S., in proposing the toast of "Our Host," said he was gratified that Mr. Wellcome, having achieved a considerable position in the world of industrial chemistry, took pride in associating himself with its purely scientific development, and having endowed himself for research, he was going to equip others, whom he would select with the greatest possible care, to add to that variety of knowledge which, he need not say, is most sadly needed in this country. With Dr. Power as director this important departure was in very safe hands. They had heard many speeches that evening,

but they all focussed towards the same point, which was the sympathy which they all felt with Mr. Wellcome's plans, and he did not think he need say more than to ask them to drink with all sincerity to the health of one who had the courage to inaugurate such a movement, and who, by the evidence which he had given in the past, and by the experience which he had gained, would be absolutely sure to carry it to a successful issue.

Mr. Wellcome made a suitable response.