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Souvenir of the INTERNATIONAL PRESS CONFERENCE, LONDON, 1909.

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THE EVOLUTION OF JOURNALISM
ETCETERA

SOUVENIR OF THE
INTERNATIONAL PRESS CONFERENCE
LONDON
1909

With the Compliments of
BURROUGHS WELLCOME & CO.
Welcome Coll.
"Man's earliest chronicle was his footprint; it told of his coming, his going, and of his doings."

Henry S. Wellcome
ACKNOWLEDGMENTS

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(For full Index see pages 349-352)

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Index
INTRODUCTION

SOME EPOCHS IN THE EVOLUTION OF JOURNALISM

The intense desire to convey to other and kindred beings the record of their impressions, the story of their triumphs, and even the vision of their thoughts, hopes and ideals, in a manner more permanent and far-reaching than by spoken word, has gripped the best and noblest of each successive generation of men, and urged them forward as though with a compelling hand. It has fashioned them into artists, sculptors, architects, poets and writers, as nature and occasion served, and each in his own way has added to the ever-growing volume of human tradition.

So typical is this characteristic of man that it serves to differentiate him from the lower animals, even in the early dawn of his evolutionary development.

Man alone, of all animals, possesses the graphic instinct, and that faculty he appears to have developed from a period which is lost in the mists of antiquity. It is in the exercise of this gift that we find the genesis of journalistic record, as it is clearly evident that the earliest form of recording and disseminating news was the illustrated chronicle which prehistoric man depicted on such primitive media as horns, bones, rocks, and the walls of caves.

The fragment of reindeer antler graved with the form of the mammoth was but the prototype of the illustrated chronicle of our later days.

The prehistoric tribal artist (forerunner of the war correspondent) delineated the sudden pouncing of the raider and the fierce combat of primitive men.

Step by step the pictograph, which was the origin of caligraphy, was supplemented by signs and symbols which
served to convey, not at first words, but ideas depicted in graphic scenes of life and action.

The early Babylonian chronicled the struggle between two kingdoms, in curious cuneiform characters on his tablet of clay, thousands of years before the Christian Era, while the antient Egyptian graved his hieroglyphic records on wood, papyrus and stone. The famous Rosetta stone, which solved to our scholars the mystery of the early Egyptian caligraphies, is an example of a State chronicle in the time of the Ptolemies.

The Biblical Chronicles tell us of the Creation, of the Deluge, and of warfare, power, glory and the rise and fall of nations, and finally of the Redeemer.

A century before the Christian Era, the Greek scribes reported the speeches of their orators on papyrus.

To China, that mysterious land of early culture, is assigned the earliest official printed periodical chronicle, which took the form of Imperial edicts, the first of which is said to have been issued more than two thousand years ago, and continues at the present day.

The early Hindus incised on the stone pillars of their antient temples, chronicles of their great kings and warriors, recording their glorious deeds and prowess in battle.

On the American continents many chronicles have been left indicating prehistoric human activities, and the rise and fall, during unknown ages before the Christian Era, of succeeding civilisations, the architectural remains of which may be compared with those of Nineveh and of Egypt.

The warlike Romans recorded the progress of their ever-victorious armies, as well as events of public interest, in the form of news-letters which were known as the Acta Diurna.

Pliny tells us that Julius Cæsar, during his consulship, ordered the Diurnal Acts of the senate and people to be published. The Roman reporters (called "Actuarii") were undoubtedly expert in their calling, as historians relate that they were
employed by Cicero to report verbatim the speech of Cato in the great debate on the Catiline Conspiracy.

The Anglo-Saxon chroniclers recorded on vellum for posterity the account of the invasion of Britain by the Romans, and later historians, like Froissart, crystallised in uncial or Gothic script the stirring events of mediæval times.

William of Malmesbury, Higden, and their fellow chroniclers recorded with fidelity the events of the picturesque period in which they lived.

To the great discovery in Europe of the art of printing, about 1450, which affected so profoundly civilisation throughout the world, journalism owes its greatest debt.

From Germany the pupils of Gutenberg soon spread far and wide, and about the year 1474 saw the first book printed in English by William Caxton. Wynken de Worde, worthy follower of his master, took up the torch, which has since shed its light to the farthest corners of the world.

The story of the printed newspaper or modern chronicle in London, which took its rise at the close of the sixteenth century, is told in the following pages, which show the evolution from its very modest beginnings to the great journals of world-wide circulation of to-day.

H. S. W.

"The Newspaper is the only instrument by which the same thought can be dropped into a thousand minds at the same moment."—De Tocqueville.
<table>
<thead>
<tr>
<th>Year</th>
<th>Place</th>
<th>Name</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.C.</td>
<td>Pekin</td>
<td>Pekin Gazette</td>
<td>Earliest known printed Periodical</td>
</tr>
<tr>
<td>B.C.</td>
<td>Rome</td>
<td>Acta Diurna</td>
<td></td>
</tr>
<tr>
<td>A.D.</td>
<td>Frankfort-on-Main</td>
<td>Frankfurter Journal</td>
<td></td>
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<tr>
<td>1615</td>
<td>Antwerp</td>
<td>Nieuwe Tijdinghen</td>
<td></td>
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<tr>
<td>1622</td>
<td>Boston, Massachusetts</td>
<td>Boston News-Letter</td>
<td>Continued until loss of Boston by the British</td>
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<tr>
<td>1631</td>
<td>Paris</td>
<td>Gazette (de France)</td>
<td></td>
</tr>
<tr>
<td>1643</td>
<td>London</td>
<td>Diurnall Occurrences</td>
<td>First publication of Parliamentary proceedings</td>
</tr>
<tr>
<td>1648</td>
<td>Rome</td>
<td>Acta Diurna</td>
<td></td>
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<tr>
<td>1650</td>
<td>Stockholm</td>
<td>Post (och Inrikes)</td>
<td></td>
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<tr>
<td>1655</td>
<td>Edinburgh</td>
<td>Mercurius Caledonius</td>
<td>Ten numbers only published</td>
</tr>
<tr>
<td>1659</td>
<td>London</td>
<td>London Gazette</td>
<td></td>
</tr>
<tr>
<td>1660</td>
<td>London</td>
<td>The Postboy</td>
<td>First London Daily Paper</td>
</tr>
<tr>
<td>1662</td>
<td>Edinburgh</td>
<td>Edinburg's Review of the Affairs of State</td>
<td>Continued until 1753</td>
</tr>
<tr>
<td>1672</td>
<td>London</td>
<td>Berrow's Worcester Journal</td>
<td></td>
</tr>
<tr>
<td>1690</td>
<td>London</td>
<td>The Morning Post</td>
<td>First successful London Daily</td>
</tr>
<tr>
<td>1702</td>
<td>St. Petersburg</td>
<td>St. Petersburg Wiedomosti</td>
<td></td>
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<tr>
<td>1704</td>
<td>London</td>
<td>Defoe's Review of the Affairs of State</td>
<td>Continued until June, 1713</td>
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<tr>
<td>1704</td>
<td>Boston, Massachusetts</td>
<td>Boston News-Letter</td>
<td>Continued until loss of Boston by the British</td>
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<tr>
<td>1708</td>
<td>Dublin</td>
<td>Dublin Gazette</td>
<td></td>
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<tr>
<td>1712</td>
<td>Hamburg</td>
<td>Hamburg Correspondent</td>
<td></td>
</tr>
<tr>
<td>1716</td>
<td>Rome</td>
<td>Gazzeta di Roma</td>
<td>Continued for nearly 90 years</td>
</tr>
<tr>
<td>1720</td>
<td>Madrid</td>
<td>Gazzeta de Madrid</td>
<td>Continued until about 1850</td>
</tr>
<tr>
<td>1733</td>
<td>Dublin</td>
<td>Freeman's Journal</td>
<td>Earliest Irish Daily Paper</td>
</tr>
<tr>
<td>1772</td>
<td>London</td>
<td>The Morning Post</td>
<td></td>
</tr>
<tr>
<td>1782</td>
<td>Glasgow</td>
<td>Glasgow Herald</td>
<td></td>
</tr>
<tr>
<td>1785</td>
<td>London</td>
<td>The Times</td>
<td>Known until 1788 as Universal Daily Register</td>
</tr>
<tr>
<td>1789</td>
<td>Paris</td>
<td>Moniteur Universel</td>
<td></td>
</tr>
<tr>
<td>1792</td>
<td>London</td>
<td>The Observer</td>
<td>Long the leading London Newspaper</td>
</tr>
<tr>
<td>1794</td>
<td>London</td>
<td>Morning Advertiser</td>
<td></td>
</tr>
<tr>
<td>1798</td>
<td>Leipsic</td>
<td>Allgemeine Zeitung</td>
<td></td>
</tr>
<tr>
<td>1802</td>
<td>London</td>
<td>Globe</td>
<td></td>
</tr>
<tr>
<td>1817</td>
<td>Edinburgh</td>
<td>The Scotsman</td>
<td>Daily from 1855</td>
</tr>
<tr>
<td>1827</td>
<td>London</td>
<td>The Standard</td>
<td>Morning Paper from 1857</td>
</tr>
<tr>
<td>1841</td>
<td>London</td>
<td>Punch</td>
<td></td>
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<tr>
<td>1842</td>
<td>London</td>
<td>Illustrated London News</td>
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</table>
### Abbreviated Chronological Table

**Showing Progress of Journalism—(contd.)**

<table>
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<th>Name</th>
<th>Remarks</th>
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<td>London</td>
<td>Lloyd's Weekly News</td>
<td></td>
</tr>
<tr>
<td>1842</td>
<td>Madrid</td>
<td>Heraldo</td>
<td>Chief Spanish Journal for many years</td>
</tr>
<tr>
<td>1846</td>
<td>London</td>
<td>The Daily News</td>
<td></td>
</tr>
<tr>
<td>1847</td>
<td>Turin</td>
<td>Il Risorgimento</td>
<td>Edited by Cavour</td>
</tr>
<tr>
<td>1847</td>
<td>Florence</td>
<td>L'Opinione</td>
<td></td>
</tr>
<tr>
<td>1847</td>
<td>Glasgow</td>
<td>North British Daily Mail</td>
<td></td>
</tr>
<tr>
<td>1849</td>
<td>Berlin</td>
<td>Volkszeitung</td>
<td>Reputed to have the largest circulation in Germany</td>
</tr>
<tr>
<td>1855</td>
<td>London</td>
<td>The Daily Telegraph</td>
<td></td>
</tr>
<tr>
<td>1859</td>
<td>London</td>
<td>Sporting Life</td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>London</td>
<td>Sportsman</td>
<td></td>
</tr>
<tr>
<td>1865</td>
<td>London</td>
<td>Pall Mall Gazette</td>
<td></td>
</tr>
<tr>
<td>1869</td>
<td>London</td>
<td>The Daily Chronicle</td>
<td>As Clerkenwell News, 1855</td>
</tr>
<tr>
<td>1869</td>
<td>London</td>
<td>Graphic (Weekly)</td>
<td></td>
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<tr>
<td>1881</td>
<td></td>
<td>Evening News</td>
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<td>1884</td>
<td></td>
<td>Financial News</td>
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<td>1888</td>
<td></td>
<td>Financial Times</td>
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<tr>
<td>1888</td>
<td></td>
<td>The Star</td>
<td>Evening Paper</td>
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<td>1889</td>
<td></td>
<td>Financial Truth</td>
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<tr>
<td>1890</td>
<td></td>
<td>The Daily Graphic</td>
<td>Illustrated</td>
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<td>Morning Leader</td>
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<td>Westminster Gazette</td>
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<tr>
<td>1896</td>
<td></td>
<td>The Daily Mail</td>
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<tr>
<td>1900</td>
<td></td>
<td>Financier &amp; Bullionist</td>
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<tr>
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<td>Daily Mirror</td>
<td>Illustrated</td>
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<td></td>
<td>(Evening Standard (1827))</td>
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<tr>
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<td>St. James Gazette (1880)</td>
<td>Incorporated 1905</td>
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<tr>
<td>1909</td>
<td></td>
<td>Daily Sketch</td>
<td>Illustrated</td>
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### Some Recent London Dailies

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Remarks</th>
</tr>
</thead>
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<tr>
<td>1881</td>
<td>Evening News</td>
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<td>1884</td>
<td>Financial News</td>
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<td>1888</td>
<td>Financial Times</td>
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<td>1888</td>
<td>The Star</td>
<td>Evening Paper</td>
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<td>The Daily Graphic</td>
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<td>1892</td>
<td>Morning Leader</td>
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<td>1893</td>
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<tr>
<td>1896</td>
<td>The Daily Mail</td>
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</tr>
<tr>
<td>1900</td>
<td>Financier &amp; Bullionist</td>
<td>As Financier 1870</td>
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<tr>
<td>1903</td>
<td>Daily Mirror</td>
<td>Illustrated</td>
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<tr>
<td>1905</td>
<td>(Evening Standard (1827))</td>
<td></td>
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<tr>
<td>1905</td>
<td>St. James Gazette (1880)</td>
<td>Incorporated 1905</td>
</tr>
<tr>
<td>1909</td>
<td>Daily Sketch</td>
<td>Illustrated</td>
</tr>
</tbody>
</table>
SOME

ANTIENT CHRONICLES
Pictographic Chronicle of the Reindeer Period. (Earliest known representation of a man.) Serpents and horses' heads are also depicted. From the Grotto of Les Eysies. Europe.

Portrait of Mammoth
Drawn with a flint on a piece of mammoth's ivory, from cave of La Madeleine, Dordogne, France

Prehistoric Pictographic Chronicle of a fight between two reindeer, graved upon a schistose rock. Europe.

Prehistoric Chronicles
A Babylonian Clay Tablet written in Cuneiform characters of E-an-na-du, Governor of Shirpurla (Lagash), 4500 B.C.

It contains an interesting account of a struggle between two city kingdoms which occurred about 4500 B.C.

Translation—

(1) "E-an-na-du, Viceroy of Shirpurla, endowed with power by En-ki (Ea) and nourished with the holy milk of the Lady of the Mountain, the attendant of Uma, priestess of Euch.

(2) "Son of A Kurgah, Viceroy of Shirpurla, the land of Ara, he conquered the land of—he conquered—Gisukh he conquered.

(3) "The city of Ur he ruled and to Ningivsu his word he gave."

The remainder of the inscription relates to some buildings erected by the king.
CUNEIFORM NEWS CHRONICLE OF ANTIENT BABYLON
(Translation on page 14)
ANTIENT BABYLONIAN CHRONICLE

Account of the building of the walls and temples of Babylon by Nebuchadnezzar II., about 604-562 B.C., inscribed in archaic Babylonian characters upon a black basalt slab
Prehistoric Pictographic Rock Chronicle. South Africa.


PREHISTORIC AFRICAN CHRONICLES
Antient Egyptian Hieroglyphic and Pictorial Chronicle
Rameses II. leading his warriors in battle, 1322 B.C.
In the time of the Ptolemies, State documents were promulgated by inscribing them on shaped stones, which were set up in public places. The famous Rosetta stone here depicted was a publication record of this kind, and was set up in the ninth year of the reign of Ptolemy Epiphanes, or Ptolemy V., 205 B.C. It is written in Hieroglyphics, Demotic and Greek; a specimen of each of these forms of caligraphy is here represented.
Antient Phœnician Chronicle
This inscription in the Phœnician character was cut on the wall of the conduit of the Pool of Siloam about 700 B.C.
Antient Assyrian Chronicles

These two clay tablets, giving an account of the Creation and the Deluge, are from the library of Assur-bani-pal, King of Assyria about 668-626 B.C., at Nineveh.
Ancient Assyrian Pictorial Chronicle

A carving in basalt depicting an ancient Assyrian King receiving homage and tribute from five conquered nations
Some of the earliest examples of Greek pictographic symbols depicting:
Ancient Greek Chronicle

Written on papyrus about 100 B.C., reporting Hyperides' Oration against Philippides
Antient Hindu Chronicle
about 240 B.C.

Giving an account of King Vrishadéra, and relating his deeds, his prowess in battle, etc.
4TH OF THE KALENDS OF APRIL IN THE YEAR 585, AFTER THE BUILDING OF ROME.

It thundered, and an oak was struck with lightning in that part of Mount Palatine called Summa Velia, early in the afternoon.

A fray happened in a tavern at the lower end of Banker Street, in which the keeper of the Hog-in-Armour Tavern was dangerously wounded.

Tertinius the Ædile, fined the butchers for selling meat which had not been inspected by the overseers of the markets.

The fine is to be employed in building a chapel to the temple of the goddess Tellus.
A Viking pictograph traced on rock representing one of their foreign raids. Dating from an unknown period before the Christian Era.
Primitive Pictographic Chronicle. Australia
Prehistoric Pictographic Rock Chronicle, Utah.
Incised on very hard blue granite

Prehistoric Pictorial Earth Chronicle, Wisconsin.
In the form of mounds, depicting a treaty of alliance between two tribes
Prehistoric Pictographic Rock Chronicles of Masaya, Central America
Prehistoric Pictographic Painted Rock Chronicles of Managua, Central America
Antient Toltec Hieroglyphic and Pictorial Chronicle.
Yucatan
ANTIENT MEXICAN PICTORIAL CHRONICLE
Representing a company of traders and messengers being attacked on a journey
Prehistoric Pictographic Rock Chronicle
South America
Jejetepeque Prehistoric Rock Chronicles
South America
ANTIENT CHIMU MODELLED CHRONICLE
Representing a Chimu Royal Warrior with his national weapon. Before the Christian Era. From the Hewett-Myring Collection.
1 and 2) Warriors in Combat
3 and 4) Scenes of the Chase
5) A Chimú Mercury
6) Representation of an unidentified and extinct beast of burden which was ridden by lying flat across its broad level back

Antient Chimú
Pictorial Chronicles

Dating from an unknown period before the Christian Era. From the unique collection of Mr. Hewett-Myring, now being offered to the British Museum. This collection may be acquired by the nation if some public spirited man of wealth will render this possible.
A Victorious General being honoured by his King on his return from a Campaign

Depicting a Military Victory over a Naval Enemy

ANTIENT PERUVIAN PICTORIAL CHRONICLES
Written about the year 1066, giving an account of the invasion of Britain by Julius Caesar
From the duke of Brest, from letters to the duke of Lancaster, he sent the duke sense and reason of the same letter into, being a new instance to the intent to have them publish sealed in spaign. To the knight to whom the duke of Brest sent him, he told how to use all his business.
The Pekin Gazette. China

The earliest known printed periodical chronicle, said to have been founded long before the Christian Era. Its publication has been continuous up to the present day.
NORTH AMERICAN WAMPUM CHRONICLE
A treaty of peace concluded by William Penn, about 1681
THE EVOLUTION OF JOURNALISM

SOME FAMOUS LONDON JOURNALS
AND SOME
EDITORS OF MODERN LONDON CHRONICLES
Caxton showing specimen of his printing to King Edward IV. at the Almonry at Westminster
The 23. of May.

WEEKELY Nevves from Italy, GERMANIE, HUNGARIA, BOHEMIA, the PALATINATE, France, and the Low Countries.

Translated out of the Low Dutch Copie.

LONDON,
Printed by I. D. for Nicholas Bourne and Thomas Archer, and are to be sold at their shops at the Exchange, and in Popes-head Pallace. 1622.

THE WEEKELY NEWS

The Weekly News
THE DIURNALL OCCURRENCES, OR
DAYLY PROCEEDINGS
OF
Both Houses, in this Great and Happy
PARLIAMENT,
From the third of November, 1641
to the third of November 1641.

WITH
A Continuation of all the Speeches,
from June last, to the third of November,
1641.

LONDON,
Printed for William Cooke, and are to be sold at his shop
at Fourniells-Inne Gate, in Holborne, 1641.

THE DIURNALL OCCURRENCES
THE DIURNALL OCCURRENCES OR DAYLY PROCEEDINGS OF BOTH HOUSES WAS
first issued on Nov. 3rd, 1641, under the authority of the Long Parliament,
and contained the first publication of parliamentary proceedings
The Mercurius Aulicus
First printed in Oxford in 1642 at the time of the Civil War. It was the forerunner of many political journals entitled the Mercury.
The London Gazette

Published by Authority.

From Thursday, February 3, to Monday, February 7, 1665.

The following is an extract from the London Gazette, published on February 5, 1665:

The London Gazette
First published in London, February 5th, 1665, under the control of Joseph Williamson, Charles Perrot being for some time acting editor.
The first daily morning paper was the Daily Courant, first published on March 11th, 1702, by a bookseller named Mallet
The Morning Post

Originally known as The Morning Post and Daily Advertiser, founded November, 1771, by Henry Bate, and edited by him from 1775 to 1780
Fabian Ware, Editor of the Morning Post

Editor of the Morning Post. Born at Clifton, Bristol, 1869. Educated by private tutors and at the Universities of London and Paris; Bachelier-ès-Sciences 1894. Ten years assistant master in secondary schools; education examiner and inspector. Director of Education, in Transvaal, 1901, 1903-5; and Orange River Colony, 1903-5. Contributor to the Morning Post 1899; became Editor 1905.
C. Moberley Bell
Managing Editor of The Times. Born 1847. Author of Khedives and Pashas, 1884; Egyptian Finance, 1886; From Pharaoh to Fellah, 1889.
George Washington Talbot

Editor of the Morning Advertiser since 1903. Born in Dublin, December, 1848; son of the late Henry Wm. Talbot, newspaper proprietor of Williams-town, Co. Dublin; educated at Kingstown School and Kilkenny College. After some experience of journalism in Ireland, joined the staff of the Morning Advertiser in 1887.
The Globe
The first number. Founded 1802
Hildebrand Harmsworth, Proprietor of the Globe and Golf Illustrated; founder of New Liberal Review

Hildebrand Harmsworth

H. A. Gwynne

Editor of The Standard since 1904. Born in 1866. Was Times correspondent in the Balkans; Reuter's in Roumania, 1893; in Ashanti, 1895; with Lord Kitchener's Expedition to Dongola, 1896; with the Greco-Turkish War, 1897; and the Berber and Peking Expedition, 1898; and afterwards went through the Boer War. Appointed Foreign Director of Reuter's Agency, 1904.
Punch
Founded in 1841, and first edited by Mark Lemon
Owen Seaman, M.A., D. Litt.

Editor of Punch since 1906. Born 1861. Professor of Literature at Durham College of Science, Newcastle-on-Tyne, 1890; began writing for Punch and for National Observer as "O.S." in 1894; joined staff of Punch, 1897, and became Assistant Editor, 1902. Called to the Bar, Inner Temple, 1897

Owen Seaman, Editor, Punch; Writer, National Observer
The Illustrated London News
Founded in 1842 by Herbert Ingram
Sir William Ingram, Bart.
Managing Director Illustrated London News and Sketch, Ltd. Born, 1847; son of the late Mr. Herbert Ingram, M.P. for Boston, founder of the Illustrated London News. M.P. for Boston, 1874-80, 1885-86, 1892-95

Sir William Ingram, Bart., Managing Director, Illustrated London News and Sketch, Ltd.
The Daily News
Founded in 1846 by Bradbury and Evans, with Charles Dickens as first Editor
Editor of the Daily News. Born in 1865; received his early journalistic training on the staff of the Essex County Chronicle, published in his native town, Chelmsford. After a brief stay at Bournemouth, he joined the Northern Daily Telegraph at Blackburn in 1886, and remained with that paper until his appointment to the editorship of the Daily News in 1902. Author of a series of pen portraits entitled "Prophets, Priests and Kings"
The Daily Telegraph

Originally issued under the title of The Daily Telegraph and Courier, founded by Col. Sleigh as a single sheet at twopence, on 29th June, 1855
John Merry Le Sage, Lieutenant, City of London; Managing Editor, The Daily Telegraph

Lieutenant of the City of London; Managing Editor of the Daily Telegraph. Born 1837. After a short provincial career joined the staff of the Daily Telegraph, and served as special correspondent in France, Germany, Italy, Russia, Egypt, America and Canada; accompanied the Germans in the 1870-71 campaign, and Lord Wolseley in Egypt in 1882; and was in Paris during the Commune. Acting Editor of the Daily Telegraph for many years.
The Daily Chronicle
Founded 1869 on the older Clerkenwell News, which dated from 1855, by Edward Lloyd, and first edited by R. Whelan Boyle
Robert Donald, Managing Editor, the Daily Chronicle, Lloyd's Weekly News; Municipal Journal; Publisher of Municipal Year Book, London Manual
THE QUEEN'S SECLUSION.

A little paragraph appeared in the newspapers lately to renew a hope which has been fulfilled as completely as it was not. "We are informed that Her Majesty will open Parliament in person next week."

This was the first paragraph—precisely in that authoritative tone which carries conviction straight into the minds of most newspaper readers. Yet whenever the herald who brought such good tidings from Court was little credited. The trumpets sounded—that we all heard; but no concerted voice answered it even in the hollow place in our own hearts where the hope of what we most desire. The most timid reporter hesitated to believe, and his whose task in editorial announcements that his lady was complete, found himself emblazoning a strangely astonishing sensation. So the announcement announced itself in any one. Had we not been told of journalists and politicians who endeavoured to adhere what they worked by declaring it an already certain? Those questions were asked by many people. The answer to the first one is that the Queen never at any moment intended to open Parliament this session—there is no such large authority large type to prove it—and to the other, that if the time was played it was a trick which only a very few philosophers can muster enough to condemn. There may be some prejudice of the ceremonials reform kind who fiercely reject that of trios is not believed, but they are not philatelists.

It is what we consider those gentlemen are, who we must expect the Queen's language in her deep, public life. It may not be for them, and if Her Majesty's retirement was not brought then, it is eaten up by the coming of the Queen is almost to end and agitation at last. We shall not use, indeed, others for effect but none that we can think of which touches the affectation in which some have lately described the subject. What want may arise from a tone in a state of things which there may not exist. The Sovereign of England is not an absolute, nor can it be reconciled to the public, which may not be neglected in the multitude of personal sorrow. Her Ministers are not, and, indeed, and it is more, what—what can it be!—the Queen's knowledge to neglect the real, the sovereign's, her faithful. Their faithful goodness goes on, and such is always, and the idea is to keep that, for our concerns that has grief also continues, can she by the sympathy of a few that it has not been told by too much. Taking it, just a moment of the region of more human kindness when at some better let, we may go to be set at with the Queen's language, life can be encouraged. Indeed, the country's has had enough of the great blessing, at this last, we seek to have brought upon ever since her royal bend. We have all been living under a mistake for the Queen's language is no at all, by an example of honest affection and of heartfelt truth in that place where examples, and yet her speech, the same, as the fact, the speech of education throughout the reign should triumph the other classes of the nation. These views, in fact, by such admirable men, have been adopted by the Russian Government, and we find them rooted with promptness in a paragraph which bears the following: "The Moscow Nobility demanding a Convention."

The Pall Mall Gazette
Founded by George Smith (of Smith & Elder) on February 7th, 1865, and first edited by Frederick Greenwood
The Westminster Gazette
Founded by Sir George Newnes in 1893, and first edited by E.T. Cook.

73
THE GRAPHIC
Founded December 1869

74
CARMICHAEL THOMAS

Born in 1856, and has been at the Graphic since he was 17 years of age. He has been engraver, Sub-Editor, Editor and Chairman, also Managing Director of the Graphic, Daily Graphic, and Bystander, which last position he still holds. He has read papers on illustrated journalism before various institutions and has been connected with the Royal Society of Arts as treasurer, and vice-president and member of the council. Has served on committees at the Board of Education in connection with fine arts. Vice-president of the Newspaper Society, 1909
THOMAS MARLOWE

THE SPHERE

Founded January, 1500
Clement King Shorter, Editor, The Sphere; Asst. Editor, Penny Illustrated Paper; Editor, Illustrated London News, English Illustrated Magazine; Founder, Omar Khayyam Club
The Daily Express
Founded in 1900 by C. Arthur Pearson
Ralph D. Blumenfeld, Editor, Daily Express; Reporter, Chicago Herald; Editor, Music and Drama; Editor, New York Evening Telegram; Correspondent, New York Herald; News Editor, Daily Mail; Foreign Editor, Express
Some Famous Founders and Proprietors of Newspapers
John Walter ("The First"), First Proprietor, The Times; Founder, London Daily Universal Register; The Times
Lord Burnham, K.C.V.O., D.L., J.P.


Formerly Sir Edward Levy Lawson, Bart. Born 28th December, 1833. Principal proprietor of the Daily Telegraph; Lieutenant for the City of London. President of the Institute of Journalists, 1886; President of the London Press Club since 1905; and President of the Newspaper Press Fund, 1909.
Sir George Newnes, Bart., M.P.

Born 13th March, 1851. Founder of George Newnes, Limited, proprietors of Strand Magazine, Tit-Bits, etc.; founder of the Westminster Gazette. Was M.P. for Newmarket from 1885 to 1895, and has represented Swansea town since 1900

Sir George Newnes, Baron, MP; Proprietor, Strand Magazine, Tit-Bits; Founder, Westminster Gazette
Mr. Alfred Charles Harmsworth. Born 15th July, 1865. Well known as the founder of a great number of successful popular journals and magazines, including the Daily Mail. He supported the Jackson-Harmsworth Arctic expedition. He was knighted in 1904, and raised to the peerage as Baron Northcliffe in the following year.
Principal proprietor of Pearson's Weekly, the Daily Express, the Standard, and numerous periodicals. Born 24th February, 1866. After leaving Winchester he joined the staff of Sir George Newnes and rapidly rose to the position of manager; after four years he resigned and founded the great newspaper enterprises of which he is chief.
Some Notable London Contributors to the Evolution of Journalism
Born 1784. Died 1847. Son of the founder and proprietor of The Times, he became the active manager of the paper in 1803, and by his exceptional talent, energy and resourcefulness greatly enhanced its importance. He organised a system for collecting accurate foreign intelligence and transmitting it rapidly to London, and in 1814, after great difficulties, he succeeded in printing The Times by steam. Elected Member of Parliament for Berkshire in 1833.
John Thaddeus Delane

A famous Editor of *The Times*. Born 1817; died 1879. Educated at private schools, King's College, London, and Magdalen Hall, Oxford. In May, 1841, when not quite 24 years of age, Mr. Walter appointed him Editor of *The Times*, and he retained that position for 36 years. Under his guidance the paper attained a circulation and influence till then unequalled in journalism. His outspoken criticisms of the railway mania and of the management of the Crimean War were memorable features of his time.
Journalist, Dramatic Author and Wit. Born in 1803. His ather, Samuel Jerrold, was the manager of a theatre at Sheerness. As a boy he was a midshipman under Captain Austen, brother of Jane Austen the novelist. At 21 he wrote "Black-eyed Susan," and afterwards a number of highly successful comedies and melodramas. Constant contributor to PUNCH from 1841, in which journal his immortal "Caudle Lectures" appeared. He was associated as dramatic critic, contributor, and Editor with a number of journals, including the SUNDAY MONITOR, the MONTHLY, NEW MONTHLY, BALLOT, ATHENÆUM, BLACKWOOD'S, the ILLUMINATED MAGAZINE, and for the last few years of his life was Editor of LLOYD'S WEEKLY NEWSPAPER. Died in 1857.
Who was born in 1812, was a Journalist as well as a Novelist. He began his writing career as a reporter for the Morning Chronicle, and contributed some of his early papers and sketches to the pages of the Evening Chronicle and the Monthly Magazine. In after years he became the first Editor of the Daily News, and, for a longer period, of Household Words and All the Year Round. Author of Pickwick Papers, David Copperfield, and many other world-famed novels.
Sir John Tenniel, R.I.

Veteran Punch cartoonist. Born 1820; created a Knight, 1893. Doyen of journal artists, having been actively engaged on the staff of Punch for fifty years: he joined in 1851 and retired in 1901. Besides innumerable political cartoons in Punch, he has illustrated Lalla Rookh, The Ingoldsby Legends, Alice in Wonderland, Alice through the Looking-Glass, etc., etc.
Journalist and Novelist; of Italian descent. was born in London 24th November, 1828. Became a contributor to Household Words in 1851, and afterwards to the Welcome Guest, the Illustrated London News, and the Cornhill Magazine. Founded and edited Temple Bar, 1860-66. Special Correspondent for the Daily Telegraph during the American Civil War, in Italy with Garibaldi, and in France 1870-71. Died 1895.
Journalist and Author; born 3rd February, 1841. Educated at Bowker's, Chesterfield, and by private tutors. Came to London in 1868 to conduct The Gentleman's Magazine; for years Special Correspondent in Europe of the New York Times and Sydney Morning Herald; represented the Standard on special mission to America; edited Sunday Times and The People, in which latter paper he published his well-known series of "Cigarette Papers." Author of a number of successful novels and plays. Died in 1907.
George Manville Fenn, Writer, Chambers' Journal, All the Year Round; Editor, Cassell's Magazine; Once a Week
Right Hon. Henry Labouchere, P.C.

Edmund Yates, Journalist and Novelist. Born Edinburgh, 1831. He went into the Civil Service, but in 1854 turned his attention to literature, writing many novels, etc. Later he became Editor of Temple Bar, Tinsley's Magazine, and other periodicals; but his principal achievement was the founding, in conjunction with Grenville Murray, in 1874, of the Society weekly, The World, which he edited for many years. Died 1894.

Journalist, Poet, *Littérateur*. Born 10th June, 1832. Educated at Rochester, King’s College, London, and University College, Oxford. Won the Newdigate Prize 1853. Was appointed Principal of the Sanskrit College at Poona, India. Joined the staff of the *Daily Telegraph* in 1861 and continued to be associated with that journal. Died in 1904. Author of *The Light of Asia* and numerous other works.
Sir Edward Russell, Kt., F.J.I.


Sir Edward Russell, Editor, Liverpool Daily Post; Critic, Morning Star; Treasurer, Newspaper Press Fund; President, Institute of Journalists.
Sir Francis Cowley Burnand, Kt.

Editor of PUNCH, 1880-1906. Born 29th November, 1836. Educated at Eton and Trinity College, Cambridge. Commenced literary career at age of fifteen by writing a farce, which was produced at Theatre Royal, Worthing. Founder of the A. D. C., Cambridge. He was associated with H. J. Byron in founding FUN, but at 25 began writing for PUNCH, and in 1880 became Editor. Has written over 120 plays, chiefly burlesques and light comedies. Knighted in 1902.
Sir Hugh Gilzean Reid, Kt., LL.D., J.P., F.J.I.

A Vice-President of the International Press Conference, 1909


Sir Hugh Gilzean Reid, Vice-president, International Press Conference, 1909; Chief founder and first President, Institute of Journalist; Promoter, International Press Congress (Belgium, 1894); Founder, North-Eastern Daily Gazette; President, Society of Newspaper Proprietors and Managers, 1898-99.
Veteran Journalist. Born at Cambridge 23rd September, 1838. Educated at private schools and Working Men's College, London. Worked for twelve years in the composing-room of Lloyd's Weekly News; Sub-Editor, 1866; Editor, 1884; retired 1907. Now writing his reminiscences of 53 years on Lloyd's Newspaper. Has travelled through America and Canada, Syria and the Holy Land, Africa, Austria, Dalmatia, Bosnia and Herzegovina. Delegate to Conference of International Association of Journalists at Berlin in 1908.
WILLIAM SENIOR, F.J.I.

Editor of the Field since 1900. Born 1838. Entered journalism in 1858, and joined Daily News staff in 1866, acting for over a quarter of a century as its Special Correspondent; Angling Editor of Field: 1883, well known under his angling nom de plume “Red Spinner.” Author of books on travel and sport. Celebrated last year the jubilee of his professional career.
Journalist and Author. Born 1840. Inaugurated his journalistic career by writing for the *Evening Star*, 1866; later, on staff of *Morning Star, Press Association, Manchester Guardian, World* (London), *World* (New York), and *Daily News*. Author of several popular novels, including *No. 5 John Street*.
For some thirteen years Editor of the Pall Mall Gazette; Hon. Treasurer Newspaper Society. Born in London, 22nd October, 1844; son of Robert Marshall Straight, barrister. Educated at Harrow. Engaged in newspaper and magazine work till 1865, when called to the Bar, and became a very successful advocate. M.P. for Shrewsbury, 1870-1874. Judge of the High Court of Judicature at Allahabad from 1879 until 1892, in which year he was Knighted.


Sir F.C. Gould, Caricaturist and Journalist, Truth, Pall Mall Gazette; Trader, London Stock Exchange
Edward Linley Sambourne

Sir Henry W. Lucy, J.P.

Manager of the Press Association since 1880. Born 1847. Commenced work on the Launceston Weekly News, 1858, and in 1865 went to the Central Press Agency; Sub-Editor Press Association on its foundation in 1870, and was thereafter continuously advanced. Secretary of the Provincial Newspaper Society 1870-1881

Edmund Robbins, Manager, Press Association; Journalist, Launceston Weekly News, Central Press Agency; Sub-Editor, Press Association; Secretary, Provincial Newspaper Society
George R. Sims, F.J.I.

"Dagonet" of the Referee. Born in 1847. He has written continuously for the Press and the stage since 1874. His peculiar knowledge of London life has been strikingly presented in many of his writings, and over a score of plays. Author of a number of popular novels, Dorcas Dene; Memoirs of a Landlady, etc.
Sir Joseph Lawrence, J.P., F.J.I.

A Vice-President of the International Press Conference, 1909

Born 23rd September, 1848. Chairman of Linotype and Machinery, Ltd., Commissioner of Lieutenancy for City of London. Member of Surrey County Council; was one of the principal and earliest pioneers of the Manchester Ship Canal. Member of Parliament for Monmouth Boroughs, 1901-1906

Sir Joseph Lawrence, Vice-president, International Press Conference, 1909; Commissioner of Lieutenancy, City of London
Representative in Parliament of Liverpool (Scotland Division) since 1885. Born in Athlone, 1848. Was Reporter on Saunders’ Newsletter, Dublin, 1867; Sub-Editor on Daily Telegraph, 1870; later, on New York Herald (London). Founded and was first Editor of the Star, Sun, Weekly Sun, M.A.P., P.T.O., and T.P.’s Weekly. First entered Parliament as Member for Galway, 1880. Author of several biographical and historical works.

T.P. O’Connor, Reporter, Saunders’ Newsletter, Dublin; Sub-editor, Daily Telegraph, New York Herald (London); Founded and Editor, Star, Sun, Weekly Sun, M.A.P., T.T.O., T.P. Weekly; MP
W. T. Stead

Editor of the Review of Reviews and the Masterpiece Library. Born in 1849. Was Editor of the Northern Echo, Darlington, from 1871 till 1880; Editor of the Pall Mall Gazette, 1883-89. Founded the Review of Reviews, 1890; the American Review of Reviews, 1891; Australasian Review of Reviews, 1894; commenced the Masterpiece Library of Penny Poets, Novels and Prose Classics in 1895. Has issued numerous characteristic publications dealing with public events since 1884.

W.T. Stead, Editor, Review of Reviews, Masterpiece Library; Editor, Northern Echo; Editor, Pall Mall Gazette; Founder, Review of Reviews, Australian Review of Reviews; commenced Masterpiece Library of Penny Poets, Novels and Prose Classics; [Author, The Last Will and Testament of Cecil J. Rhodes, 1902]
W. L. COURTNEY, M.A., LL.D. F.J.I.

Born in 1850. Became Editor of Murray's Magazine and the Fortnightly Review in 1894; is on the staff of the Daily Telegraph, and a director of the publishing firm of Chapman and Hall. He was Headmaster of Somersetshire College, Bath, in 1873, and has written many interesting essays.
Edward Eden Peacock, Manager, Morning Post; Managing Director, East of England Newspaper Company; Secretary, Savage Club
Major G.F. Gratwicker, President, British International Association of Journalists; Managing Director, Devon and Exeter Daily Gazette; Sheriff, Exeter; President, Institute of Journalists; Founder, Orphan Fund; Delegate, International Congress of the Press at Antwerp, World's Press Congress at St. Louis
Harry Furniss, Artist and Journalist. Born Wexford, 1854. Settled in London at the age of nineteen. Has been for many years a contributor to the Illustrated London News, Graphic, Black and White, and principal magazines. Joined staff of Punch in 1880. Has toured United States of America, Canada, Australia, etc., as humorous lecturer. Founder of Like Joko and New Budget, and author of a number of illustrated books.
Alderman S. S. Campion, J.P., F.J.I.
A Vice-President of the International Press Conference, 1909
President of the Institute of Journalists, 1908-9; President of the British International Association of Journalists, 1902-6. Part proprietor of the Northampton Mercury and allied publications. Was largely instrumental in founding the Provident Fund of the Institute of Journalists, and was its first Treasurer.
Frank Lloyd, F.J.I.

A Vice-President of the International Press Conference, 1909


Frank Lloyd, Director, Edward Lloyd, Ltd; Associate, Daily Chronicle, Lloyd's Weekly News; Vice-President, British Association of Journalists, Newspaper Press Fund
Richard Caton Woodville, Artist, Battle Painter, Turkish, Egyptian campaigns
E. T. REED, J.P.

Ernest Parke, J.P.

Managing Editor of the Morning Leader and the Star. Born 1860. Was formerly a reporter of the Daily Gazette and Sub-Editor with the Midland Echo, both of Birmingham, and later joined the staff of the London Echo, afterwards going to the Star.
Arthur Spurgeon, General Manager, Cassells, Ltd.; Journalist, Norfolk News, Eastern Daily Press; Managing Editor, Lowestoft Weekly Press; Parliamentary Representative, Managing Editor, National Press Agency; Chairman, Western Newspaper Company
Member Executive Committee International Press Conference, 1909

J. Alfred Spender, Editor of the Westminster Gazette since 1896. Born 1862. Educated at Oxford. Was editor of the Eastern Morning News, Hull, from 1886 to 1890; went to the Pall Mall Gazette, 1892; and was appointed Assistant Editor of the Westminster Gazette on its foundation in 1893.
JOHN FOSTER FRASER, F.J.I.

Special Correspondent, Traveller, Lecturer. Born 1868. First engaged in provincial journalism, and commenced in London in 1892; later, on parliamentary work. Cycled round the world, 1896; later, journeyed through Siberia, and in 1901 crossed Manchuria. Visited United States, Canada, the Balkans, Russia, etc., as journalist, and is special Parliamentary Correspondent of the Standard; occasional contributor to the Reviews.
A. Winton Thorpe, Manager, Proprietor, London News Agency; Managing Director, London News Agency Photos, Ltd.; Assistant Editor, Nottingham Daily Express; Editor, Galignani’s Messenger; News Editor, Sunday Times, Sunday Sun
John Gessings, Editor, Central News Agency; Chairman, Column Printing Company, Ltd.; Government Telegraph Service; London Correspondent, Manchester Courier; Edinburgh Courant; Editorial Staff, Reuter’s Agency; London staff, Melbourne Argus; Night Editor, Central News; Editor, Central News; Editorialist, American newspapers; Member, Institute of Journalists, Savage Club, Press Club
Wilfred Creyke King, Managing Director, Exchange Telegraph Company

Wilfred Creyke King

Appointed Secretary of the Exchange Telegraph Company (the well-known News Agency) in 1884, which post he held until 1898, when, on the death of Captain Wm. H. Davies, he became Managing Director.
Sidney James Low, Barrister, Inner Temple; Editor, St. James's Gazette; Special Correspondent, Prince of Wales in India; Author, Dictionary of English History, The Governance of England, A Vision of India, Political Histor of the Reign of Queen Victoria; Contributor, the Reviews
H. T. Cadbury, Esq.
A Vice-President of the International Press Conference, 1909
One of the proprietors of the Daily News.
Miss Stuart, Vice-President, International Press Conference, 1909; Secretary, British International Association of Journalists
James Baker, F.R.G.S., F.R.Hist.S.

Journalist, Author, Traveller and Lecturer. Born 1847, his father being founder of a West of England publishing firm. Has travelled in Europe, Asia and Africa, and recounted his experiences in various works. Special correspondent for Pall Mall Gazette, Black and White, The Queen, &c. Was voted Great Silver Medal of Prague for his studies of Bohemia, and in 1908 was made a Knight of the Imperial Order of Francis Joseph. Hon. Secretary of the British International Association of Journalists since 1906.
J. H. Warden, F.J.I.
Hon. Treasurer of the International Press Conference, 1909
Associated with the Hendon and Finchley Times; original Hon. Treasurer of the British International Association of Journalists, 1897
Some Famous War Correspondents

Some Famous War Correspondents
Sir William Howard Russell, Special Correspondent, the Times, Crimean War, 1854-56; Florence Nightingale; the India Mutiny, 1857-58; U.S. Civil War, 1861-62; Prussian-Austrian War, 1866; Franco-German War, 1870; South Africa, 1879-80; Egypt, 1883-84; Author, The Adventures of Dr. Brady, Hesperothen: A Visit to Chile; The Great War with Russia

Sir William Howard Russell, Kt., LL.D., D.Litt., F.R.G.S., F.Z.S.

Veteran War Correspondent. Born 1829. Was Special Correspondent of the Times during the Crimean War, 1854-56, during which period he wrote a famous series of letters depicting the terrible sufferings of the campaign, which led to the first great reform of army field ambulance, military hospitals, and the nursing of the sick and wounded in war, under the noble guidance of Florence Nightingale; the Indian Mutiny, 1857-58; the Civil War in the United States, 1861-62; the Prussian-Austrian War, 1866; the Franco-German War, 1870; South Africa, 1879-80; and Egypt, 1883-84. Visited Egypt and the East in the suite of the then Prince of Wales, 1868, and accompanied him to India as Honorary Private Secretary in 1875-76; and in 1879 visited South Africa with Lord Wolseley. Author of numerous books, including The Adventures of Dr. Brady; Hesperothen; A Visit to Chile; and The Great War with Russia. Sir W. H. Russell, who was a Knight of the Iron Cross, a Commander of the Legion of Honour, and an English Knight, was long regarded as the doyen of War Correspondents.

He died in 1907.
Sir Henry M. Stanley

Stanley first rose to fame as a Journalist. He acted as Press Correspondent in the American Civil War and in the Indian Wars of the West.

The New York Herald, in 1868, sent him as War Correspondent with Sir Robert Napier (afterwards Lord Napier of Magdala) throughout the Abyssinian campaign which culminated in the fall of Magdala. He got his news to London a week ahead of all others. He attended the opening of the Suez Canal, roamed the near Eastern Countries, and went through the Carlist and Republican Wars in Spain.

Instructed by Gordon Bennett (New York Herald), Stanley made a remarkable horseback journey through Asia, and led his famous expedition into Central Africa, and found and relieved Dr. Livingstone at Ujiji. He accompanied Sir Garnet (now Lord) Wolseley's Ashanti Expedition to Coomassie. His vivid word-pictures of warfare have probably never been surpassed.

On the death of Livingstone in 1873, Stanley resolved to continue that great man's work, and for the New York Herald and the Daily Telegraph, he led, for more than three years, an exploring expedition through the "Dark Continent." He made many important discoveries, including the southernmost source of the Nile, and Lake Albert Edward; he was first to circumnavigate Victoria Nyanza (an inland freshwater sea of 32,167 square miles) and Lake Tanganyika (14,000 square miles). Explored the upper reaches of the Congo, and traced that mighty river to the sea, victoriously fighting fifty desperate battles in fifty days against fierce cannibal tribes. He solved the great problem of the watersheds of Central Africa, which had hitherto confused and baffled the geographers of the world, many of whom believed that the upper sources of the Congo were the head waters of the Nile.

Stanley made urgent appeals to the British Government to occupy the wasting regions of East, West and Central Africa, including what is now German East Africa and the Great Congo States, and lying across the Cape to Cairo route. All this had been opened up by him and other Englishmen. His entreaties were in vain. Finally, commissioned by the King of the Belgians, Stanley founded the immense Congo Free State, abounding in natural wealth. On his return to the Congo, the cannibal tribes which had fought his exploring expedition received him with respect. He made blood brotherhood with the chiefs, taught their valiant warriors the handicrafts of peace, and opened the way for Christian Missions. Many of these same cannibals, now skilled artisans, are building the Congo steamers.

When Khartoum fell, and Gordon was slain, Stanley responded to the call of the world to rescue Emin Pasha, Gordon's Governor in Equatoria. He led his historic expedition through "Darkest Africa" for three years, relieved Emin, discovered the fabled Mountains of the Moon, and solved the remaining problems of the sources of the White Nile.

To retrieve something from what England had thrown away, Stanley negotiated a treaty for an exchange of territory which secured an all-British route for the Cape to Cairo Railway. This treaty was officially accepted, signed and sealed, but, very soon after, a faint-hearted British Government hastened to abandon it on the demand of the head of a nation which England had gratuitously enriched with vast African possessions.

Although Stanley was challenged and disputed at every step, his discoveries, his facts, and his records have in the end been conclusively verified.

His income was derived exclusively from his work and the proceeds of his writings. He possessed no property in Africa.

At the time of Stanley's first expedition it was estimated that more than a million lives were sacrificed every year in African tribal warfare and slave raiding. Stanley effectually crushed the slave trade, brought peace throughout Central Africa, and opened up immense regions to civilisation and commerce. He died May 10th, 1904, and was buried not by the side of Livingstone in Westminster Abbey (for the nation has no voice or power to decide) but in the little village churchyard at Pirbright, Surrey.
George Alfred Henty

Journalist, Veteran War Correspondent and Author. Born at Trumpington, Cambridge, in 1832. After being educated at Westminster, he proceeded to Caius College, Cambridge, but before he was able to finish his academic course there, an opportunity occurred for him to gratify his love of adventure which he was unable to resist—the outbreak of the Crimean War. He obtained a post in the purveyors' department of the army and went out to the war, but the rigour of the campaign was too much for his health and he was invalided home. On his recovery, he went to Italy and there organised the Hospitals of the Italian Legion. Prior to that, however, he had acted as a Special Correspondent for the STANDARD, and for nearly half a century contributed to that journal. As its War Correspondent, he went through the war between Austria and Italy, and through Garibaldi's Italian campaign. With Sir Robert (afterwards Lord Napier of Magdala) throughout his Abyssinian Campaign. Was present at the opening of the Suez Canal. Through the Franco-German War, the Siege of Paris, Carlist Rebellion, and the Servian War. Was with Sir Garnet (now Lord) Wolseley on his Ashanti Expedition to Coomassie. Accompanied the Prince of Wales (now His Majesty the King) on his tour through India. He was also famous as an author of boys' books. He wrote over eighty stories, averaging three or four a year. Among his works were OUT ON THE PAMPAS, A SEARCH FOR A SECRET, THE MARCH TO MAGDALA, ALL BUT LOST, THE MARCH TO COOMASSIE, THE YOUNG COLONIST, THE YOUNG FRANC-TIREURS, WITH THE BRITISH LEGION, WITH KITCHENER IN THE SOUDAN, and THE TREASURE OF THE INCAS. Mr. Henty died on board his yacht at Weymouth on November 16th, 1902.
George Alfred Henty
Veteran War Correspondent and Author
ARCHIBALD FORBES, LL.D.

Special Correspondent of the Daily News. Born at Boharm Manse, Keith. He was for some years in the Royal Dragoons, but in 1870-71 he went through the great Franco-German struggle as War Correspondent for the Daily News, and afterwards with the Carlists in Spain, in Cyprus, in the Russo-Turkish Campaign, and in the Zulu War of 1879 he distinguished himself by his extraordinary swiftness, tact and audacity in securing accurate information, and by the vivid pen-pictures of stirring events which he contributed to his journal. Forbes delivered numerous lectures in Great Britain, America and Australia, and was the author of the following books: Drawn from Life; Glimpses through the Cannon Smoke; Chinese Gordon; Studies of War and Peace; Napoleon III., etc. Died in 1900.
Archibald Forbes
On the staff of the Daily News for many years
For many years Special Correspondent of the Daily Telegraph in Berlin and Vienna. War Correspondent during the Franco-Prussian War; with the Army of the Crown Prince in the Black Forest, and with the German Headquarters Staff at Versailles throughout the Siege of Paris. Owing to his close intimacy with Bismarck and Von Moltke, he made his famous coup by obtaining for the Daily Telegraph alone the terms of the capitulation of Paris long before they were communicated to other journalists. In like manner Beatty Kingston was in after years frequently privileged to receive and first publish pronouncements and exclusive information from Prince Bismarck. He spoke fluently many Continental languages, and had remarkable knowledge and gifts of music. Author of Monarchs I Have Met; Music and Manners; and many other works.
On the staff of the Daily Telegraph from 1866 until his death in 1900
Veteran War Artist and Correspondent of the *Illustrated London News*; son of the late William Henry Prior, draughtsman and landscape painter. He has represented the *Illustrated London News* in no less than twenty-four campaigns and revolutions, dating back from his first appearance on the battlefield during the Ashanti War of 1873. He saw the Carlist Rising of 1874, and was present in the Herzegovina, Servian, Turkish, Kaffir, Basuto, Zulu and Boer Wars. He was in the Egyptian Campaign of 1882; the Suakim and Nile Expeditions; the Burmese War; the Venezuelan, Brazilian and Argentine Insurrections; the Jameson Raid; the Matabele War; North-West Frontier, India; with Kitchener when he reconquered the Soudan; Cretan Insurrection; and at the Siege of Ladysmith, 1900. In 1875 he went to Athens in the then Prince of Wales’ suite, and later travelled with the King of Denmark’s expedition through Iceland. Accompanied the Marquis and Marchioness of Lorne on their first visit to Canada, and his pen and pencil have often been employed at State functions like the funeral of the late and the wedding of the present Czar of Russia, the Berlin Conference, the Delhi Durbar of 1902, etc.
Melton Prior
Special War Correspondent and Artist of the Illustrated London News
CHARLES WILLIAMS

War Correspondent. Born in 1838. After being educated at Belfast Academy, his health became indifferent, and he went to Nicaragua to recuperate, subsequently joining an expedition of adventure in that country. On returning to England, he joined the staff of the Evening Standard, and later became its Editor. Subsequently he became Editor and Manager of the Evening News. Then, as a War Correspondent, he followed General Sir Donald Stewart’s force on the march from Candahar to Kabul. Went through Lord Wolseley’s Nile Campaign for the Relief of Gordon; with the Desert Force of General Stewart; and at the battles of Abu Klea and Metemneh. As War Correspondent to the Daily Chronicle, he was throughout Kitchener’s Nile Expedition for the reconquest of the Soudan, and present at the battles of Atbara and Omdurman; whilst during the course of the Boer War he wrote in London the daily diary of the campaign for the Morning Leader. His varied journalistic experiences included a description of the coronation of the present Czar of Russia. He was always a stout upholder of the rights of the Press and of all that concerned the dignity of his profession. He was a good raconteur, having a vast store of sensational experiences, gained as a war correspondent, to draw upon. He was the author of many works, including, How We Lost Gordon, 1885; England’s Defence; Hushed Up—a criticism of the South African War; and Life of Sir Evelyn Wood. Charles Williams, who for years enjoyed the personal friendship and confidence of the great Political and Military Chiefs, died in his 67th year.
Charles Williams

War Correspondent for the Daily Chronicle, and for some time Editor of the Evening Standard and the Evening News
Bennet Burleigh

Veteran War Correspondent. Born at Glasgow. Fought in the American Civil War, was captured and twice sentenced to death. Acted as War Correspondent for Central News throughout Egyptian Campaign, and present at Battle of Tel-el-Kebir. Then for the Daily Telegraph was in all the Sudan Campaigns. Was with Generals Baker, McNeill and Graham's expeditions against Osman Digna at Suakim, and with Lord Wolseley's Nile expedition against the Mahdi. Crossed the desert from Korti with General Stewart's column, and was present at the battles of Abu Klea and Metemneh. In the Burma war and in other East Indian campaigns. In the second Ashanti Expedition. In the Chino-Japanese Wars. With Kitchener throughout his Nile Campaign against the Khalifa. Present at the battles of Atbara and Omdurman. Throughout the French Campaign in Madagascar and the South African Boer War. With the Somaliland Expedition. Throughout the Russo-Japanese War. Has been sent on many special journalistic missions for the Daily Telegraph to most parts of the Globe. Author of Empire of the East, etc., etc.
Bennet Burleigh
On the staff of the Daily Telegraph since 1882
Frederic Villiers

Yavor in Who’s Who. War Artist and Correspondent. Born on April 23rd, 1852, and has had an extremely eventful and varied career. He was educated at Guines, Pas-de-Calais, and in 1876 commenced in Servia his long series of journalistic war pictures for the Graphic. In 1877 he was with the Russians in Turkey, and was present at the battles of Saitschar, Alexinatz, and Mount Yavor; with the Russians too he witnessed and depicted the Passage of the Danube, and the fighting at Biela, Plevna, and Shipka. A little later the Afghan War of 1878 took him to Gadamuck and the Bazaar Valley. The next few years were marked by such diverse happenings as a voyage round the world; the battle of Tel-el-Kebir; the coronation of Czar Alexander III.; the fight in the Broken Square at Tamai in 1884; Sir William Hewitt's Mission to King John of Abyssinia; Wolseley's Expedition up the Nile for the Relief of Gordon, during which he was twice wrecked; joined the march of Stewart's heroic column across the Desert; present at the battles of Abu Klea and Gubat in 1885; then back to Europe and across the Bulgarian frontier with the Servian invaders in 1886, to witness the wild struggle at Pirot and the Nishava Valley. Through the Burmese War of 1887. Mr. Villiers then betook himself for a time to more peaceful scenes, and having journeyed across Canada with the Governor-General, went on a lecturing tour through America and the British Isles, and in 1892 visited the Chicago Exhibition. In 1894, as Special Artist for Black and White, New York Herald, San Francisco Examiner, and the London Standard, he went through the Chinese-Japanese War, and was with the Japanese army at Ping Yang and at the taking of Port Arthur. Four years later he witnessed the triumph of Kitchener at Omdurman and the final downfall of the Khalifa. The South African War and the Russo-Japanese War found him again in the field, and he was the only war artist present at the second siege of Port Arthur. In addition to his journalistic work, Mr. Villiers is the author of several books, including Pictures of Many Wars; Port Arthur; Peaceful Personalities and Warriors Bold; etc.
Frederic Villiers
War Artist and Correspondent for the Graphic, Illustrated London News, Standard and other papers
Edward Frederick Knight

War Correspondent, Journalist and Author. Born 23rd April, 1852; eldest son of Edward Knight, Papcastle, Cumberland. Educated at Westminster School and Caius College, Cambridge. Has travelled extensively in South America, Turkey, South Africa and Central Asia. His first experience of soldiering was with the French as a volunteer in 1870. He was Times Correspondent in the Hunza-Nagar Campaign, 1891, throughout which he served as an officer, and was mentioned in despatches. Also in the following wars and expeditions: Matabeleland, 1893-95; Madagascar, 1895; Soudan Campaign, 1896; Greece, 1897; Soudan, 1897-98; Cuba, 1898; Spain, 1899; For the Morning Post, South Africa, 1899-1900. In the South African Campaign he was severely wounded at Belmont, and lost his right arm. Besides his contributions to the Press, Mr. Knight is the author of numerous books, including ALBANIA AND MONTENEGRO; THE CRUISE OF THE FALCON; THE THREATENING EYE; THE FALCON ON THE BALTIC; THE CRUISE OF THE ALERT; WHERE THREE EMPIRES MEET, etc.
E. F. Knight
War Correspondent on the staff of the Times for many years, and recently with the Morning Post
Lionel James

Of old Anglo-Indian stock. Educated in England. Went to India at an early age and became an Indigo Planter in Bengal. In 1895 he accompanied Sir Robert Low's Expedition for the relief of Chitral, as war correspondent for Reuter's Agency and Calcutta Englishman. In the Frontier Indian War of 1906-7 he again went to the front and followed the operations on behalf of the Englishman, Times of India, and The Graphic, acting as war artist as well as correspondent. For Reuter's Agency he accompanied Kitchener during his Nile Campaign and reconquest of the Sudan. In 1898 joined the staff of The Times (London) in whose service he has visited nearly every country in the world. Acted as special war correspondent for The Times during 18 months of the Boer War. Organised and directed The Times dispatch boats during the Russo-Japanese War. After battle of Laio Yang Mr. James sent notable descriptive cable message filling a whole sheet of The Times. In 1908 accompanied Gen. Sir James Willcocks' Expedition on the Indian Frontier War. Recently in Persia (Tabriz), Turkey, Macedonia, Montenegro, Bosnia, Herzegovina and Servia. Commands a squadron of the King's Colonial Yeomanry. Author of several books under the nom de plume of "Intelligence Officer," including On the Heels of De Wet, Side Tracks and Bridle Paths, etc., etc.
LIONEL JAMES, F.R.G.S.
War Correspondent for The Times and Special Correspondent for REUTER in several campaigns
George Warrington Steevens

George Warrington Steevens, B.A.

War Correspondent, Travelling Journalist and Author. Born December 10th, 1869. Educated City of London School and Balliol College, Oxford, graduating B.A. Oxford and London University. On the editorial staff Pall Mall Gazette, 1893 to 1896. Joined staff Daily Mail 1897. Travelled in many countries, contributing special articles on political, social and general subjects. As War Correspondent he went throughout the Greco-Turkish War and Kitchener’s Soudan Campaign against the Khalifa. Present at the battles of Atbara and Omdurman. At the front in the South African War, from the first until his untimely death from typhoid fever at Ladysmith during the siege in 1900. Although very young he ranked high amongst journalists and war correspondents, was accurate in his facts, had extraordinary graphic power and pleasing literary style—notable for his vivid pictures of battle-field scenes. Took most hazardous risks in the firing line when in pursuit of news. Author of Naval Policy; Monologues of the Dead; The Land of the Dollar; With the Conquering Turk; With Kitchener to Khartoum; The Tragedy of Dreyfus; From Cape Town to Ladysmith
William Maxwell

War Correspondent and Travelling Journalist. For some time with the Standard. For the Daily Mail he went with Lord Kitchener on his famous march to Khartoum, and was present at the battles of Atbara and Omdurman. Accompanied the Kaiser through the Holy Land and Syria. He sailed with Sir George White for the Cape; was besieged in Ladysmith, and on the relief of the garrison went to Kimberley, then on to Bloemfontein, and was present with Lord Roberts' army in the series of engagements which led up to the capture of Lydenburgh and Komati Poort. He saw President Kruger at Delagoa Bay, and returned to Pretoria by Laing's Nek. Arriving in Europe he witnessed and described the funeral of Queen Victoria, the wedding of the Queen of Holland, and the enthronement of King Edward and his Queen in Parliament. He went with the Prince and Princess of Wales on their tour through Australia, Canada, and the Colonies, and later with Mr. Chamberlain on his South African tour 1902-3. Attended the Peace Conference at the Hague. Mr. Maxwell has since accompanied His Majesty the King on his visits to Lisbon, Gibraltar, Malta, Naples and Rome. With the victorious Japanese army under Kuroki, he was present at the battles of Yalu and Sha-ho; and with Nogi at the fall of Port Arthur. With the Prince of Wales on his Indian tour, interviewing the Sultan of Morocco at Fez. Visited Persia and reported on the death of the elder Shah and on the coronation of his son, the late Shah; journeyed through Persia and along the line of the projected German Railway from Persian Gulf to Constantinople. In addition to his numerous journalistic writings Mr. Maxwell is the author of With the Ophir round the Empire; Sixteen Famous Battles; With the Japanese from Yalu to Port Arthur.
WILLIAM MAXWELL, F.J.I.

War Correspondent and Travelling Journalist; joined the staff of the Daily Mail in 1905. For some years Parliamentary Journalist and London Correspondent for the Manchester Courier.
War Correspondent; began his journalistic career in Birmingham, but subsequently removed to London, where he joined the Star. From thence he went to the Pall Mall Gazette and afterwards to the Daily Mail, for which he has written for some thirteen years past. His first experience as a War Correspondent was gained in Cuba, when he accompanied the United States Army on behalf of the Daily Mail. In this capacity he was at the battle of Santiago, and many other actions. He proceeded to South Africa and was wounded by the Boers, his condition at one time being critical. Another great campaign through which he passed was the Russo-Japanese War, to which he proceeded via Siberia to Manchuria, accompanying the Russian forces. Mr. Hands has been in the thick of the revolutionary movement in Russia, and gained as a journalist, the confidence alike of Government officials and revolutionaries. He acted as Special Correspondent during the French operations at Casa Blanca.
Charles E. Hands
War Correspondent and Travelling Journalist for the Daily Mail
The Evolution of Weapons for the Battle of Life
I-Em-Hetep

Also called Imhotep, Imouthes Imhotpou

I-Em-Hetep ("He who cometh in peace"), the earliest known Egyptian deity of medicine and healing, was the good physician of gods and men. There is little doubt that he was a real personage, renowned for his skill in healing, who lived in the reign of Tser of the II. Dynasty, and was afterwards deified.
HISTORICAL EXHIBITION

OF

RARE AND CURIOUS OBJECTS

RELATING TO

MEDICINE, CHEMISTRY, PHARMACY

AND THE ALLIED SCIENCES

TO BE HELD IN LONDON 1913

ORGANISED BY, AND UNDER THE

DIRECTION OF

HENRY S. WELLCOME
THE AFFLICTION OF JOB
From a woodcut of the XVI century
Historical Medical Exhibition

With the object of stimulating the study of the great past, I am organising an Exhibition in connection with the history of medicine, chemistry, pharmacy, and the allied sciences. It is my aim to bring together a collection of historical objects illustrating the development of the art and science of healing, etc., throughout the ages.

The Exhibition will be strictly professional and scientific in character, and will not be open to the general public.

For many years I have been engaged in researches respecting the early methods employed in the healing art, both among civilised and uncivilised peoples. It has been my object in particular to trace the origin of the use of remedial agents.

Why were certain substances used in the treatment of disease? Was their adoption the result of study and practical observation, or was it more usually the result of accident?

Were the alleged virtues purely imaginary and due to some superstitious suggestion?

A consideration of such questions is always of interest and sometimes adds to our knowledge.

There is a considerable amount of information scattered throughout the world in folk-lore, in early manuscripts, and in printed books, but the difficulties of tracing out and sifting the evidence are great. I anticipate that the Exhibition will reveal many facts, and will elucidate many obscure points in connection with the origins of various medicines, and in respect to the history of diseases. It should also bring to light many objects of historical interest hitherto known only to the possessors and their personal friends.

I shall greatly value any information sent me in regard to medical lore, early traditions, or references to antient medical treatment in manuscripts, printed works, etc. Even though the items be but small, they may form important connecting links in the chain of historical evidence.

Interesting information concerning quaint customs practised in connection with the healing art, and items of curious medical lore, may often be gathered from peasants and others living in
country districts. Medical missionaries, and others in contact with native races, can also obtain particulars of interest in this connection. Every little helps, and, as I am desirous of making the Historical Medical Exhibition as complete as possible, I shall be grateful for any communications anyone may be able to make.

It is my desire ultimately to place before the Profession, in a collected form, all the information obtained.

The success of the undertaking will largely depend upon the co-operation of those who, like myself, are interested in these subjects. The following pages indicate the range of the proposed Exhibition. I trust I may count upon the kind assistance of readers possessing objects of historical medical interest, by lending them, so that the Exhibition may be thoroughly representative. I should also highly esteem information as to any similar objects in the possession of others.

I need hardly say that the greatest care will be taken of every object lent. All exhibits will be insured, also while in transit, if requested, and packing and carriage both ways will be paid. Unless a desire be expressed to the contrary, the name of each contributor will be mentioned in the catalogue, and placed with the exhibit.

Hints and suggestions in connection with the Exhibition will be much appreciated.

Owing to the magnitude of the work involved in arranging, classifying and obtaining loans of interest from all quarters of the globe, and to my desire to make the Exhibition as complete and comprehensive as possible, a considerable period of time is necessary. The date fixed, therefore, is 1913. Meanwhile, I should greatly appreciate any information which may be forwarded to me in regard to medical traditions, references and illustrations of antient medical or surgical treatment, and also the offer of any loans of suitable objects.

HENRY S. WELLCOME

Snow Hill Buildings
London (Eng.)
Classification of Exhibits for the Historical Medical Exhibition

Section 1

Paintings, drawings, engravings, prints, photographs, models, silhouettes, sculptures and casts of medical interest:

(a) Portraits of distinguished physicians, surgeons, alchemists, chemists, apothecaries, pharmacists, nurses, etc.

(b) Pictures of antient British and foreign, medical, chemical and pharmaceutical institutions.

(c) Representations of important and interesting events in the history of medicine, chemistry and pharmacy.

(d) Medals, medallions, and coins of medical interest.

Section 2

Rare and curious manuscripts, incunabula, books, periodicals, pamphlets and book-plates, on, and connected with, medical, chemical, pharmaceutical and allied scientific subjects.

Section 3

Letters, prescriptions, autographs, records of experiments, antient diplomas, licences, instruments, apparatus, and other personal relics of medical, pharmaceutical and chemical interest.

Section 4

Curiosities of Medicine:

(a) Materia medica of all ages. Specimens of antient medicines, remedial agents in all forms.

(b) Recipes and formulae of all ages.

(c) Antient and modern medicine chests—civil, military and naval.

(d) Votive offerings for health, antient and modern amulets, amuletic medicines, medals, tokens, seals, emblems, charms and talismans. Medical relics of savage and primitive peoples.

(e) Antient corporate insignia and early diplomas in medicine and surgery granted by British and foreign colleges.

(f) Rare and curious memorials of medical practice.

(g) Specimens illustrating medication by animal substances.

(h) Relics of the influence of astrology on medicine.
An Antient Method of Treating Headache

The actual cautery, a heated iron rod, was a favourite method of treatment for many diseases in Anglo Saxon times.
—From an MS. of the XII century.

Treatment for Plague in Medæval Times

Physician opening a plague bubo.—From a woodcut of the XVI century.
SECTION 5

Curiosities of Surgery, Anatomy and Pathology:—
(a) Relics of antient and mediaeval surgery, dentistry and veterinary surgery.
(b) Antient and mediaeval hospital equipment.
(c) Curiosities of anatomy, and curious anatomical models.
(d) History and development of instruments and appliances used in surgery and medicine.
(e) Historical and antient surgical instruments and appliances, etc.
(f) Instruments used in surgery in prehistoric times and by savage peoples.
(g) Improvised instruments and appliances that have been used in emergencies (especially those that have led to inventions and discoveries).
(h) Calculi and other pathological specimens of historical interest.
(i) Models for obstetrical teaching.

SECTION 6

Curiosities of Pharmacy:—
(a) Quaint pharmaceutical recipes.
(b) Scales, weights and measures of all ages.
(c) Antient stills, mortars and pharmaceutical implements.
(d) Curious bottles, carboys, retorts, alembics, ointment and specie jars, drug vases, pots, ewers and mills, etc.
(e) Curious laboratory apparatus.
(f) Antient prescription-books and price lists.
(g) Antient counter bills, labels, business cards, curious advertisements and trade tokens.
(h) Antient apothecaries’ shop-signs, early shop-fittings and appliances.
(i) Early pharmaceutical specialities, and specimens of obsolete and strange medical combinations.
(j) Old travellers’ advice books, curious orders, etc.

SECTION 7

Products and preparations, antient and modern, of chemical and scientific research:—
(a) First specimens of rare alkaloids and other active principles made by their discoverers.
(b) Rare elements and their salts, etc.
SECTION 8

Curiosities of Allied Sciences:

(a) Ancient herbaria.
(b) Abnormal plant forms.
(c) Curious magnetic and electrical appliances.
(d) Curious relics of dental surgery—
    (1) Early artificial dentures
    (2) Ancient instruments, appliances, etc.
(e) Optics—
    (1) Ancient spectacles and eye-glasses.
    (2) Early instruments and appliances used by oculists.

SECTION 9

Historical apparatus associated with important discoveries in medicine, chemistry, pharmacy, electricity, etc.
SECTION 10

(a) Objects of interest, antient and modern, connected with preventive medicine, public health, tropical medicine.
(b) Exhibits illustrative of physiology, anthropology, microscopy, bacteriology, biology and geography.
(c) Placards, posters, manifestos, declarations concerning epidemic diseases, etc.
(d) Antient bills of health.

SECTION II

Nursing and Ambulance:—
(a) Early hospital and general nursing.
(b) Accouchement chairs.
(c) Nursery appliances and feeding apparatus for infants.
(d) Ambulance appliances.
(e) Antient feeding-cups, bottles, urinals and bed-pans.
(f) Naval and Military nursing and ambulance appliances and equipments
(g) Relics and objects of interest associated with nurses.
(h) Relics of Foundling Hospitals.

SECTION 12

Quackery:—
(a) Antient and modern pictures, prints, and relics of notorious quack doctors.
(b) Specimens of quack medicines, preparations and appliances.
(c) Old bills, placards and pamphlets referring to quack medicines.

SECTION 13

Criminology:—
(a) Curious poisons.
(b) Historical objects connected with famous poisoning and other criminal cases.
(c) Curious methods of torture and execution.

SECTION 14

History of the nomenclature, causation and treatment of the most important diseases that have afflicted mankind from the earliest periods, for example:—
Smallpox, leprosy, plague, tuberculosis, epilepsy, scurvy, cholera, cancer, malaria, syphilis, king’s evil, etc.
Faith-Healing in Early Times

King Edward healing by touch. — From an engraving of the XVII century.

Quaint Surgical Treatment in the XIV Century

A surgeon of the XIV century applying a bandage to a dislocated jaw.
Some of these diseases were recognised by the Egyptians, Chinese, Hindoos, Hebrews and others, thousands of years ago, and antient methods of treatment are perpetuated to the present day.

It is my aim to map out as complete a history as possible of these and other specific diseases, and I shall appreciate the assistance of any who may be able to furnish links in the chain of evidence of identification, history, treatment, etc., etc., such as are obtainable from local medical folk-lore, antient manuscripts, and early printed books, etc.

Section 15

Photography:
(a) Objects illustrating the invention and history of photography.
(b) Early cameras and apparatus
(c) Daguerreotypes.
(d) Portraits of the pioneers of photography.
(e) Original papers and early MSS. on photography.
(f) Application of photography to medicine.
(g) Early X-ray apparatus.
(h) Curiosities of photography.

Section 16

Adulteration and falsification of drugs, medicines, food-stuffs, fabrics, and of any articles affecting health, or associated with medicine, chemistry, pharmacy and allied sciences.

All communications respecting the Historical Medical Exhibition should be addressed to—

HENRY S. WELLCOME

Snow Hill Buildings, LONDON, E.C. (Eng.)
Antient Irish Amulets of Gold and Stone
used as charms against disease

Thibetan
Charm, or Amulet
carried
to prevent
disease
Without a scientific foundation no permanent superstructure can be raised. Does not experience warn us that the rule of thumb is dead and that the rule of science has taken its place; that to-day we cannot be satisfied with the crude methods which were sufficient for our forefathers, and that those great industries which do not keep abreast of the advance of science must surely and rapidly decline?"

This institution is conducted separately from the business of Burroughs Wellcome & Co., and is under distinct direction, although in the Laboratories a large amount of important scientific work is carried out for the firm.
THE WELLCOME
CHEMICAL RESEARCH LABORATORIES

FREDERICK B. POWER, PH.D., LL.D.
Director of the Laboratories

KING STREET, SNOW HILL, LONDON (ENG.)
Awards Conferred Upon The
Wellcome Chemical Research Laboratories

International Exposition
St. Louis, 1904

One Grand Prize and
Three Gold Medals

International Exhibition
Liége, 1905

One Grand Prize
One Diploma of Honour
And
Two Gold Medals

International Exhibition
Milan, 1906

One Grand Prize

Franco-British Exhibition
London, 1908

Two Grand Prizes

For
Chemical and Pharmacognostical Research
Etc., etc.

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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 signalled the closing years of the past and the beginning of the new 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 science. 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, equipment and development 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 Dr. Frederick B. Power, the present Director, 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, but it was soon 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 on page 192.
On the ground floor of the building are the office of the Director, and the library, the latter being 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 obtained 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 on pages 196, 198. 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 mains 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. 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 a combustion furnace and all the appliances for
conducting ultimate analyses, whilst two other furnaces of the most approved construction are available in the laboratories; it also contains a large electric motor for working the shaking and stirring apparatus, drug mill, etc., and a dark-room adapted for polarimetric or photographic work. A view of a portion of the combustion room is shown on page 198. 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 comprises 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, a considerable number of publications, embodying the results of original work contributed to various scientific societies, which are now consecutively numbered, have already been issued. Other investigations in progress will, from time to time, form the subjects of future communications.

Although too short a period has elapsed, since the establishment of these laboratories, to afford much material for a historical retrospect, their present measure of success may be considered to have justified the expectations of their founder and of those who are in sympathy with the work which they aim to accomplish.
Scientific Papers Published by The Wellcome Chemical Research Laboratories

1. Some new gold salts of Hyoscine, Hyoscyamine and Atropine
2. The characters and methods of assay of the official Hypophosphites
3. Note on the mydriatic Alkaloids
4. Preparation of Acid Phenyllic Salts of Dibasic Acids
5. A new method for the analysis of commercial Phenols
6. The assay of preparations containing Pilocarpine
7. Pilocarpine and the alkaloids of Jaborandi Leaves
8. A new glucoside from Willow Bark
9. The constitution of Pilocarpine—Part I
10. The composition and determination of Cerium Oxalate
11. Researches on Morphine—Part I
12. Observations relating to the Chemistry of the British Pharmacopoeia
13. Mercurous Iodide
14. The composition of Berberine Phosphate
15. A contribution to the Pharmacognosy of official Strophanthus Seed
16. The chemistry of the Jaborandi Alkaloids
17. A new admixture of commercial Strophanthus Seed
18. Researches on Morphine—Part II
19. The constitution of Pilocarpine—Part II
20. The chemistry of the bark of Robinia Pseud-acacia, Linn.
21. The anatomy of the bark of Robinia Pseud-acacia, Linn.
22. A soluble Manganese Citrate and compounds of Manganese with iron
SCIENTIFIC PAPERS—continued

23. The chemical characters of so-called Iodo-tannin Compounds
24. The constitution of Pilocarpine—Part III
25. A new Synthesis of \( \alpha \)-Ethyltricarballylic Acid
26. The constituents of the essential oil of Asarum Canadense, Linn.
27. Derivatives of Gallic Acid
28. The occurrence of Salicin in different Willow and Poplar Barks
29. The constituents of commercial Chrysarobin
30. The constituents of an essential oil of Rue
31. Methyl \( \beta \) -Methylhexyl Ketone
32. Interaction of Ketones and Aldehydes with Acid Chlorides
33. The Anatomy of the Stem of Derris uliginosa, Benth.
34. The Chemistry of the Stem of Derris uliginosa, Benth.
35. The Constitution of Pilocarpine—Part IV
36. Preparation and Properties of Dimethylglyoxaline and Dimethylpyrazole
37. The Electrolytic reduction of Pheno- and Naphthomorpholones
38. Chemical examination of Kô-sam Seeds (Brucea sumatrana, Roxb.)
40. The constitution of Chrysophanic Acid and of Emodin
41. The constitution of Epinephrine
42. A Lævo-rotatory modification of Quercitol
43. The constituents of the essential Oil of Californian Laurel
44. Some Derivatives of Umbellulone
45. The constituents of Chaulmoogra Seeds
SCIENTIFIC PAPERS—continued

46. The constitution of Chaulmoogric Acid—Part I
47. Chemical examination of Cascara Bark
48. Chemical examination of Gymnema Leaves
49. The relation between Natural and Synthetical Glyceryl-phosphoric Acids
50. Gynocardin, a new Cyanogenic Glucoside
51. Preparation and Properties of 1:4:5—Trimethylglyoxaline
52. The constitution of Pilocarpine—Part V
53. The constitution of Barbaloin—Part I
54. The constituents of the seeds of Hydnocarpus wightiana, *Blume*, and of *Hydnocarpus anthelminitica*, *Pierre*
55. The constituents of the seeds of Gynocardia odorata, *R.Br.*
56. The Synthesis of Substances allied to Epinephrine
57. Chemical examination of Grindelia
59. Preparation and properties of some new Tropeines
60. The constituents of the essential oil from the fruit of Pittosporum undulatum, *Vent.*
61. The constitution of Umbellulone
62. London Botanic Gardens
63. Chemical and physiological examination of the fruit of Chailletia toxicaria
64. Chemical examination of Eriodictyon
65. The Botanical characters of some Californian species of Grindelia
66. The relations between natural and synthetical Glyceryl-phosphoric Acids—Part II
67. The constitution of Umbellulone—Part II
68. The reduction of Hydroxylaminodihydroumbreululoneoxime
69. The constitution of Chaulmoogric and Hydnocarpic Acids
SCIENTIFIC PAPERS—continued

70. The Constituents of the essential oil of American Pennyroyal
71. The constitution of Homo-eriodictyol
72. The interaction of Methylene Chloride and the Sodium Derivative of Ethyl Malonate
73. Chemical examination of the Fruit of Brucea antidysenterica, Lam.
74. Chemical examination of the barks of Brucea antidysenterica, Lam., and Brucea sumatrana, Roxb.
75. Chemical examination of Grindelia—Part II
76. Chemical examination of Lippia scaberrima, Sonder ("Beukess Boss")
77. Chemical examination of the root and leaves of Morinda longiflora
78. The constituents of the essential oil of Nutmeg
79. Chemical examination of Micromeria Chamissonis (Verba Buena)
80. The constitution of Umbellulone—Part III
81. The constituents of Olive Leaves
82. The constituents of Olive Bark
83. Chemical examination of Ipomoea purpurea
84. The characters of official Iron Arsenate
85. Preparation of a Soluble Ferric Arsenate
86. The constituents of the expressed Oil of Nutmeg
87. Chemical Examination and physiological action of Nutmeg
88. Some observations regarding "Oleuropein" from Olive Leaves
89. Chemical examination of Eriodictyon—Part II
90. The constituents of the bark of Prunus serotina
91. The constituents of the rhizome of Apocynum andro-saemifolium
92. iso-Amygdalin, and the resolution of its Hepta-acetyl Derivative

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This Institution is conducted separately from the business of Burroughs Wellcome & Co., and is under distinct direction, although in the Laboratories a large amount of important scientific work is carried out for the firm.
THE WELLCOME
PHYSIOLOGICAL RESEARCH
LABORATORIES

H.H. Dale

H. H. DALE, M.A., M.D.

Director

Brockwell Hall, Herne Hill, London (Eng.)
Awards Conferred Upon The

Wellcome Physiological Research Laboratories

International Exposition
St. Louis, 1904

One Grand Prize and
One Gold Medal

International Exhibition
Liège, 1905

One Grand Prize
And
Two Gold Medals

International Exhibition
Milan, 1906

One Grand Prize

Franco-British Exhibition
London, 1908

Two Grand Prizes

For

Physiological Research and Preparations

Etc., etc.
The activities of the Wellcome Physiological Research Laboratories cover a wide field of therapeutic investigation. The production of Anti-Sera and of bacterial preparations for therapeutic inoculation, and the researches in bacteriology and the mechanism of immunity necessitated by the progressive development of this comparatively new department of therapeutics, have been carried on side by side with investigations into the mode of action and the nature of the active principles of drugs of animal and vegetable origin, and the production by synthesis of substances identical with, or related to, the naturally occurring principles, in chemical structure and pharmacological action. Incidental to this pharmacological work has been the development of methods for controlling and standardising, by physiological means, the activity of potent drugs to which chemical methods of assay are not applicable.

**ANTI-SERA**

A large series of Anti-Sera is now available for therapeutic use, and many have been first produced in these Laboratories. In addition to the antitoxic sera, possessing the power of neutralising the soluble toxins produced in artificial culture by certain organisms, or elaborated in the poison glands of animals, a large series of bactericidal sera has been produced by immunising horses against the actual bacterial substance of such pathogenic organisms as do not excrete their poisons. Early representatives of the two classes were Diphtheria Antitoxic Serum and Anti-streptococcus Serum, and these have maintained their position as the most widely and successfully used sera of their respective classes. These Laboratories were pioneers in the production of these sera in the British Empire.
BIRD'S-EYE VIEW OF THE WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES
DIPHTHERIA ANTITOXIC SERUM, ‘WELLCOME’

Since the foundation of the Wellcome Physiological Research Laboratories, a number of pamphlets, leaflets and reports dealing with therapeutic sera have been issued in connection therewith.

In the early editions, the origin, history and development of serum therapy were given, as well as an explanation of the meaning of the expression “antitoxin unit.” It is scarcely necessary to repeat that the antitoxin unit adopted at the Wellcome Physiological Research Laboratories is the Ehrlich-Behring unit. It is not intended in these notes to take into view any of these aspects, but merely to bring up to date and present, in a succinct form, the progress of the treatment and the results obtained by means of it in more recent years. Diphtheria Antitoxic Serum is standardised by Ehrlich’s method. In its earlier form the unit was based upon the power of completely neutralising the local as well as the general effects of the minimum dose of a given specimen of diphtheria toxin which sufficed to kill in 48 hours a guinea-pig weighing 250 grammes. The quantity which just sufficed for this was said to contain one-tenth of a unit. Thus, if 0.01 c.c. just completely protected, the serum was said to contain 10 units per c.c.

Samples of serum, carefully standardised by this method in the early days of its introduction, having been preserved, it soon became known that one-tenth of a unit of serum would not protect against ten times the minimal fatal dose of every filtered culture. An explanation of this curious fact has been put forward by Ehrlich. The filtered culture contains, besides the specific toxin, other bodies, named by him “toxoids,” which, while incapable of causing death in moderate doses, have yet the power of combining with the antitoxin and rendering this inert. The number of minimal fatal doses which one-tenth of a unit of serum will neutralise depends, therefore, on the ratio of toxoids to toxin in the filtrate. For the purpose of testing serum,
therefore, it is necessary to use a filtrate the neutralising capacity of which has been ascertained by careful titration with standard diphtheria antitoxic serum. This standard has remained unaltered throughout, thanks to the fact that some of the earliest serum tested has been carefully preserved.

In May, 1897, a change in the method of standardising serum was introduced by Ehrlich. The presence or absence of a local swelling at the seat of injection is no longer taken as the criterion of neutralisation, but the death or survival of the animal—four days being taken as the limit; and the test dose of filtrate is no longer that which is neutralised by one-tenth of a unit, but that which just suffices to kill the animal within four days when mixed with a whole unit of serum. This change did not introduce any alteration of the standard, because the test dose is ascertained by a series of experiments in which a unit of the standard serum is employed. It has the great advantage of being a purely objective method. For instance, no discrepancies can arise from difference of opinion as to what is to be considered as the smallest local swelling worthy of notice. All errors of measurement, also, are reduced ten per cent.

STATISTICS OF TREATMENT BY DIPHTHERIA ANTITOXIC SERUM

Amongst the most valuable English statistics on the subject are those compiled by the Medical Officers of the Metropolitan Asylums Board; and from them may be gathered the following figures: In 1894, only a small number of cases were treated with antitoxin. In 1895, 61.8 per cent., and in 1896, 71.3 per cent., of the total cases were treated with antitoxin, it not having been employed in moribund or hopeless cases, nor in those which were doubtful in nature, or so mild as not to require any specific treatment.

The accompanying table shows clearly a regular percentage decrease in mortality pari passu with a regular increase in the percentage of cases treated with antitoxin:
### Cases of Diphtheria Treated in the Hospitals of the Metropolitan Asylums Board

<table>
<thead>
<tr>
<th>Year</th>
<th>Antitoxin-treated cases.</th>
<th>Mortality.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per cent.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of all cases</td>
<td>Per cent.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>of all cases</td>
</tr>
<tr>
<td>1888-95</td>
<td>...</td>
<td>28.5</td>
</tr>
<tr>
<td>1894</td>
<td>...</td>
<td>29.6</td>
</tr>
<tr>
<td>1895</td>
<td>...</td>
<td>22.5</td>
</tr>
<tr>
<td>1896</td>
<td>...</td>
<td>20.8</td>
</tr>
<tr>
<td>1897</td>
<td>...</td>
<td>17.5</td>
</tr>
<tr>
<td>1898</td>
<td>...</td>
<td>15.5</td>
</tr>
<tr>
<td>1899</td>
<td>...</td>
<td>14.0</td>
</tr>
<tr>
<td>1900</td>
<td>...</td>
<td>12.2</td>
</tr>
<tr>
<td>1901</td>
<td>...</td>
<td>11.1</td>
</tr>
<tr>
<td>1902</td>
<td>...</td>
<td>11.0</td>
</tr>
<tr>
<td>1903</td>
<td>...</td>
<td>9.69</td>
</tr>
<tr>
<td>1904</td>
<td>...</td>
<td>10.0</td>
</tr>
<tr>
<td>1905</td>
<td>...</td>
<td>8.2</td>
</tr>
<tr>
<td>1906</td>
<td>...</td>
<td>8.99</td>
</tr>
<tr>
<td>1907</td>
<td>...</td>
<td>9.6</td>
</tr>
</tbody>
</table>

The Colchester epidemic in the summer of 1901 furnishes evidence of especial weight (Journal of Hygiene, April 1, 1902). Up to a certain date, the cases in hospital were treated with antiseptic sprays. These in all amounted to 81, of whom 21 died, giving a case mortality of 25.9 per cent. After this date, all the cases were treated with antitoxin without antiseptic spray, and of 119 so treated, 7 died. The case mortality of this group was therefore 5.8 per cent.

The inference that antitoxin thus saved many lives is much strengthened by the fact that of 37 cases treated at home before the date indicated, 10.8 per cent. died, whilst of 48 cases treated at home after this date, 14.5 per cent. died. This concurrent evidence clearly shows that the severity of the disease was not declining at the time when such good results were being obtained at hospital with antitoxin.
Curative and prophylactic doses of diphtheria antitoxic serum

Experiments on animals have shown that the amount of antitoxin which is necessary to save life increases at a rapidly accelerating rate according to the length of time which elapses between the injection of the diphtheria virus and the administration of the curative serum, and this is amply confirmed by the results of experience in hospitals. Thus Wernicke and Behring, having determined the amount of antitoxic serum necessary to save from death a guinea-pig which had immediately before been injected subcutaneously with a lethal dose of diphtheria toxin, found that ten times this amount was required to effect a cure if this administration was deferred until eight hours after the injection of the toxin; whilst twenty-four hours afterwards, fifty times the initial quantity was necessary.

The efficacy of antitoxin given early in the disease, and the urgent necessity of beginning the treatment at the earliest possible moment, are well illustrated by the following statistics from the Brook Hospital, published in the Metropolitan Asylums Board Report for 1902:

<table>
<thead>
<tr>
<th>Day of the disease on which treatment commenced</th>
<th>Mortality per cent.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1897</td>
</tr>
<tr>
<td>First</td>
<td>0.0</td>
</tr>
<tr>
<td>Second</td>
<td>5.4</td>
</tr>
<tr>
<td>Third</td>
<td>11.5</td>
</tr>
<tr>
<td>Fourth</td>
<td>19.0</td>
</tr>
<tr>
<td>Fifth</td>
<td>21.0</td>
</tr>
</tbody>
</table>
The serum from normal horses may cause rashes and rise of temperature in susceptible individuals, but apart from this the only limit to the administration of antitoxin is the bulk of the fluid in which it is contained. Therefore a large dose should be given at the earliest possible moment, whenever there is reason to suspect diphtheria, and in cases which progress unfavourably, the treatment may be repeated in about six hours, giving at least double the initial dose.

Far less, however, is to be expected from repeated injections at intervals than from one full dose given at the outset of the attack. In no case should either the administration of antitoxin or the repetition of the dose be delayed until the result of a bacteriological examination has been made known.

Curative Dose.—The dose for a case of moderate severity should not be less than 2000 units, and in severe cases 4000 units at least should be given at once, and larger doses are recommended by many authorities. These doses should be given irrespective of age, because diphtheria is very fatal to young children. If any difference were to be made, adults would have the smaller doses, as the prognosis in diphtheria improves with the age of the patient.

As the question of the keeping-quality of sera is frequently raised, it may be stated generally that, provided they are kept in a cool place at a fairly constant temperature, and protected from light, these sera may be relied upon to remain practically unaltered for at least a year from the date of issue. They are issued in phials hermetically-sealed in the blow-pipe flame, a method which greatly favours this result.

Prophylactic Dose.—Protective injections, of at least 1000 units, may be administered to the rest of the family whereof one member has been attacked with diphtheria. It must be borne in mind, however, that the prophylactic action gives only a temporary protection.
Staphylococcus pyogenes
Magnification 1000 diam.

Bacillus tuberculosis
Magnification 1000 diam.
against attack to the person so treated, the protection thus conferred lasting probably about three weeks at the most. The whole of the contents of one phial may be injected in each case. It should be carefully noted that, when once a phial is opened, it is highly undesirable, owing to risk of contamination, to reserve a portion of the contents for a future occasion. It should all be used at once on one or more patients.

**BACTERIOLOGICAL DIAGNOSIS OF DIPHTHERIA**

The injection of antitoxin at the earliest possible moment in the course of the disease may be a matter of such importance to the patient that this should be done on the clinical evidence alone where the diagnosis is doubtful; but immediate steps should be taken to confirm the diagnosis by bacteriological methods.

**ON SERUM ERUPTIONS**

In some cases, the administration of a curative serum is followed by rashes and transitory rise of temperature; occasionally by pains and swellings in the joints. These accidents have been shown to be also caused by normal horse serum, so that they are not to be attributed to the anti-bodies in the serum. The introduction of more highly potent serum, allowing a diminution of the bulk to be injected, has rendered these complications less frequent. They arise for the most part during convalescence, and do not appear to have resulted in any case in death, though they have doubtless sometimes retarded recovery.

The following account of this subject, by Dr. Arthur Stanley, is quoted from the *British Medical Journal*, February 15, 1902. It deals with 500 cases of diphtheria at the North-Western Hospital of the Metropolitan Asylums Board, all of which were treated with antitoxin: "The diagnosis of doubtful cases was
Streptococcus erysipelas
Magnification 1000 diam.

Bacillus coli communis
Magnification 1000 diam.
verified by bacteriological examination. The total number of
deaths in the series was 80, a death-rate of 16 per cent. The
antitoxin was injected in quantities usually of 4000 Behring
antitoxin units immediately after admission, but varied from
1000 to 30,000 units according to the severity of the case and
the time of admission after onset. No constant relation
between the quantity of antitoxin given and the frequency of
eruption was noted, but in one case, where antitoxins from two
different sources were injected at the same time,
two separate antitoxin rashes were observed; the
first occurring ten days, and the second fourteen
days, after the giving of the antitoxins. No
special sources of antitoxin were found to cause a pre­
ponderating number of eruptions, and the eruptions occurred
throughout the two years I was working with diphtheria.

"Skin eruptions appeared in about a fourth of the
cases. The period of onset was usually during the second
week after the giving of the antitoxin. The eruption
met with was not so peculiar as to be pathognomonic, but was
sufficiently marked, especially in relation to the general
symptoms, as to constitute a distinct type.

"There may be a little desquamation after severe and pro­
longed erythematous, but there is rarely any confusion between
true scarlet fever occurring in the course of diphtheria and
eruptions produced by antitoxin.

"The general symptoms, beyond a rise of temperature of
some 3° F. and its accompanying malaise, are not marked.
Pains in the joints have been frequently described,
but were not observed in one of these 500 cases. Temperature
This result may have been due to the cases being
chiefly among children. The only marked case in which
pain was present was that of a girl of 13, who had frontal
headache and lumbar pain extending down the thighs. She
had a marginate erythematous eruption, and the temperature
rose to 101° F.
"Transient early erythematous blushes, and also urticaria, often occur soon after the injection of antitoxin, but these may be generally considered to be of traumatic origin, and not to be related to any specific property of the antitoxin. The area of skin, before injection, was sterilised with soap and carbolic lotion, and the injection syringe was boiled before each injection. No abscess at the seat of injection occurred.

The occurrence of an antitoxin eruption during the course of a case of diphtheria did not appear to influence the prognosis seriously, though it cannot but be held that any febrile disturbance of the heart would tend to have a harmful effect. No case, however, was observed where fatal heart-failure was precipitated by the occurrence of an antitoxin eruption."

A long experience of reports received at the Wellcome Physiological Research Laboratories, leads to the conclusion that idiosyncrasy of the patient is more responsible for the varying severity of the eruption and other symptoms attributable to serum than the use of serum from different horses.

It seems probable that a considerable mitigation of the inconvenient symptoms which are liable to follow the use of serum will be rendered possible, in the case of Diphtheria Antitoxic Serum, by the methods of fractionation and purification of the antitoxic globulins which are coming into use. Not only by this treatment are those proteins of serum removed, which, though devoid of antitoxic value, play a large part in the production of the unpleasant after-effects, but a considerable concentration of the antitoxic element is rendered possible. The reduction in volume of the necessary injection thus effected is a great practical advantage.

Several observers have found the administration of calcium salts efficacious in preventing or dispelling serum-rashes.
An interesting light has in recent years been thrown on the susceptibility of some patients to the toxic action of serum, by the observation that the injection of a small quantity of horse-serum into an animal renders it liable to fatal intoxication by a large dose given upwards of ten days later. Goodall has shown (Journal of Hygiene, 1907) that an injection of serum may render a patient liable to severe constitutional effects when another injection is given even two years later; and interesting cases are on record in which patients have had progressively more severe symptoms as a result of three or more successive injections of serum separated by intervals of years. It must be borne in mind, however, that cases of natural abnormal susceptibility to other substances are not uncommon. Eggs, strawberries, shell-fish, etc., produce in certain individuals, when taken in comparatively minute quantities, symptoms very similar to the serum rashes.

**ANTIVENENE**

This serum continues to maintain its claim to be a trustworthy remedy for snake-bite, if injected in large quantity, not later than three or four hours after the bite. A case reported in the *Lancet* of January 5, 1901, illustrates the efficiency of fresh antivenom serum, even after the appearance of general symptoms, and in the absence of any local treatment except sucking the wound. The serum was injected into each flank, about 3½ hours after the bite.

'Wellcome' Brand Antivenom Serum is standardised against the venom of the Cobra and Russell Viper (Daboia), and is the result of immunising horses against these and venoms from representatives of other genera, including the Krait (Bungarus) and Sea-snake (Enhydrina). It is, therefore, a polyvalent antivenene, which alone could be regarded as of more than local applicability.

The local treatment of snake-bite is very important, and depends upon the fact that "it is possible, after even half an
hour or more from the time of the bite, a considerable portion of the venom may still be unabsorbed at the site of the injection, and so may still be destroyed” by suitable means (Lancet, February 6, 1904, page 355).

The first thing to do in every case where the position of the bite makes it possible, is to place a ligature (rope, cord or handkerchief) round the limb between the wound made by the fangs of the snake and the body, and wash the wound thoroughly, encouraging it to bleed.

The wound should then at once be bathed with a fresh solution of chloride of lime (1/60 in distilled water), or with a 1 per cent. solution of chloride of gold, with the object of destroying in situ any venom which may remain unabsorbed (Calmette, Institut Pasteur de Lille).

Or a small incision may be made through the wound, and pure crystals of permanganate of potassium, moistened with a little water, rubbed into it. (Captain L. Rogers, I.M.S., quoting Brunton, Fayrer and others. Lancet, February 6, 1904, page 354).

The successful carrying out of either of these procedures depends upon an intelligent appreciation of the exact position of the poison, which may be indicated by a local extravasation of blood-stained serum.

The following important considerations should be specially noted:—

In severe cases, and in others where some time (two or three hours) has elapsed after the bite, the serum should, if possible, be injected intravenously.

The dose should not be less than 10 c.c., whether injected subcutaneously or intravenously. The snake-bite should be very carefully cleansed and disinfected before injecting the serum.

"Artificial respiration may . . . be of great value while medical aid or antivenene is being sent for. . . ."

Lancet, February 6, 1904, page 352.
ANTI-TETANUS SERUM

This serum, like anti-diphtheria serum, is antitoxic in its action. Although it may be stated that some cases of this disease have been distinctly benefited by its administration, in many others the serum has failed. A consideration of the nature of the disease shows why this is so, and why, even more than in diphtheria, it is necessary to commence the treatment at the earliest possible moment.

Tetanus is a disease caused by the action of the toxin of the bacillus tetani upon the central nervous system; the toxin, as in the case of diphtheria, being produced in some local lesion, the seat of the growth and multiplication of the specific organisms. In tetanus, the toxin makes its way to the motor ganglion cells, partly by way of the nerves in connection with the affected part, and partly by way of the blood.

Unfortunately, the convulsive stage of tetanus is an indication not of the commencement of the disease, as is the appearance of a membrane in diphtheria, but of a comparatively advanced stage of the disease, and of the occurrence of serious damage to the nervous system. The remedy should therefore be administered immediately on the manifestation of any distinct symptoms, possibly tetanic, such as difficulty in opening the mouth, stiffness in the neck, or the onset, some days after the accident and without obvious cause, of an acute pain at the point of injury; and in view of the fact that the tetanus bacillus is localised and restricted to the seat of infection, attention is called to the advantage, in cases of punctured wounds, of excising freely and thoroughly the tissues around. The curative dose of anti-tetanus serum may vary from 50 c.c. to 100 c.c., in one dose or more, but, as a prophylactic in the treatment of wounds contaminated with dust, dirt, soil, etc., a smaller dose of 10 c.c. is said to be sufficient. This protection, however, does not persist longer than five or six weeks. It should be remembered in considering doses, that it is impossible at present to state
definitely the quantity of serum necessary to meet a given case, for so much depends on the severity of the attack, and the stage at which treatment is begun. It is, therefore, better to give a large dose at the commencement. The old medicinal treatment should not be neglected.

The records of 98 cases treated by serum were collected by Weischer (Münch. Med. Woch., Nov. 16, 1897). Of these, 41 died. the mortality per cent. thus being 41·8.

The serum has been injected directly into the substance of the brain with success, and it has been claimed that this method gives the best results. A full account of this, giving details of the operation, may be found in the British Medical Journal, Jan. 7, 1899.

Whilst as a curative agent, the serum has thus proved a relative failure, it has proved a most valuable prophylactic in the case of wounds infected with soil in districts where tetanus abounds.

BACTERICIDAL SERA

Anti-streptococcus Serum.—The disappointing results which were obtained in many cases in the early days of the preparation of anti-streptococcus serum were doubtless due in part to the absence, at the time, of any adequate classification of the streptococci, with the result that a serum prepared against one strain of streptococcus was tried for a wide range of different infections, which would now be recognised as due to specifically distinct organisms.

Polyvalent Anti-streptococcus Sera.—A prolonged and serious attempt has been made in conjunction with clinical observation and laboratory tests to obtain specific polyvalent anti-streptococcus sera. Cultures were obtained from as many cases as possible of a particular disease, taken from such situations and under such precautions as to make it probable that the organisms were causally associated with the disease. The following are details of the origin of the organisms used in producing some of the 'Wellcome' Sera:
Anti-streptococcus Serum (Puerperal Fever).—Cultures from 26 cases, mostly fatal, obtained from the uterus or the spleen.

Anti-streptococcus Serum (Erysipelas).—Cultures from 3 cases.

Anti-streptococcus Serum (Scarlet Fever).—Cultures from 9 cases, several of which were fatal, obtained from the blood, the spleen and the knee-joint.

Anti-streptococcus Serum, Rheumatism (Micrococcus Rheumaticus).—Cultures from 6 cases, obtained from the knee or shoulder-joint.

Anti-streptococcus Serum, Polyvalent.—The horses are immunised against all the strains mentioned above, and, in addition, with strains obtained from 2 cases of Angina Ludovici and 6 cases of Ulcerative Endocarditis (from blood cultures obtained during life), and with 10 strains of Streptococcus Pyogenes from Pyaemia, Mammary Abscess, Acute Peritonitis, Suppurative Arthritis, etc.

This "shot-gun" serum has found more extended application than any of those prepared from organisms associated with a particular clinical picture, and the recorded cases in which its use has been attended with beneficial results are now too numerous to leave much room for doubt of its efficacy in streptococcal infections.

A much more scientific classification than that based upon the symptoms of the case from which the organism originated has been made possible by Gordon’s classification of the streptococci in accordance with their habit of growth in culture media containing various sugars. A serum has been prepared by immunising against nine strains of streptococci isolated from various cases and all identified by their behaviour when grown in sugar media as belonging to Gordon’s Pyogenes group IIb. The result of the use of this serum in an acute case of streptococcal infection from a post-mortem wound was such as to encourage belief in its value.
Bacillus diphtheriae
Magnification 1000 diam.

Bacillus typhosus
(Stained to show flagella)
Magnification 1000 diam.
A point to be specially borne in mind is that all cases of puerperal fever, spreading inflammation of the skin or subcutaneous tissues, are not necessarily associated with the presence of actively growing streptococci. They may be due to some quite different organism, and so would not be benefited by injections of anti-streptococcus serum. The importance of ascertaining by bacteriological tests the kind of organism at work in all such cases is thus manifest.

Other bactericidal sera which have been prepared at the Wellcome Physiological Research Laboratories are:

**Anti-Anthrax Serum.**—A serum prepared by Sclavo has been used with success in cases where no surgical interference was undertaken. It has been prepared at these Laboratories by injecting horses and asses with killed broth cultures of virulent *Bacillus anthracis*.

**Anti-coli Serum.**—In the preparation of this 20 strains of *Bacillus coli* are used, obtained mostly from the peritoneum in fatal peritonitis and the uterus in puerperal fever due to *B. coli*.

**Anti-staphylococcus Serum.**—This is also a polyvalent serum, cultures of staphylococcus albus, aureus, citreus and hæmorrhagicus, 15 in all, and all obtained from pus, being used in its preparation.

**Anti-dysentery Serum.**—Prepared by injecting killed cultures of Shiga's, Flexner's and Kruse's bacilli, 6 strains in all being used.

**Anti-gonococcus Serum.**—This is prepared from strains obtained from urethritis and gonorrhoeal conjunctivitis, and is described as having given good results in the acute stage of the disease.

**Anti-meningococcus Serum.**—Four strains of the diplococcus of Weichselbaum are used.
Micrococcus rheumaticus
Magnification 1000 diam.

Bacillus anthracis
Magnification 1000 diam.
ENDOTOXINS AND ANTI-ENDOTOXINS

Endotoxin is the name given to the toxins contained within micro-organisms in contra-distinction to toxins obtained in culture filtrates. Various methods of obtaining endotoxins have been used, but the best is probably that devised by the late Allan Mcfadyen. He found that organisms when subjected to a very low temperature, such as that of liquid air, still retain their vitality, so that, when again brought to the normal temperature, they are found not to have suffered in any essential respect. At this low temperature, the organisms are readily broken up by grinding. Extracts from this material are obtained in dilute solution of caustic alkali. An elaborate grinding apparatus was devised by Mcfadyen and Rowland for this purpose. The juice so obtained is filtered through a Berkefeld filter to remove the uninjured organisms. The quantity of dissolved material is approximately shown by the amount of precipitate obtained on acidulating with acetic acid.

Anti-endotoxins are obtained by injections of endotoxins into animals in a similar manner to that used for other anti-sera. Mcfadyen, in the case of typhoid, claimed to have prepared, by this means, a very much stronger anti-serum than has been found possible by the injection of the intact organisms. He also prepared an anti-endotoxic cholera serum by injecting goats intravenously. His results show a very high degree of both antitoxic and bactericidal power in the sera so obtained.

Recent clinical trials of an anti-typhoid serum prepared at the Wellcome Physiological Research Laboratories by Mcfadyen's method have given very promising results.

BACTERIAL VACCINES

While it seems clear that, even with the methods of preparation which have as yet been fully tried, the anti-bacterial sera have a certain value, it cannot be denied that they have not, in the same degree as the antitoxic sera, fulfilled the early hopes.
of their efficacy. Meanwhile, the technique for estimating phagocytic activity introduced by Leishman, and its application and development at the hands of Wright and others, has given a noteworthy impetus to the method of actively immunising the patient against the organism attacking him, by injection of very small doses of a killed culture of the same organism. The new method of controlling the effect of an injection, by determination of the "opsonic index," has not only given a stimulus to the extensive use of vaccination with killed cultures in various chronic suppurations and localised inflammations; it has also, to a remarkable extent, reinstated in the confidence of the medical world the tuberculin (T. R.) of Koch, which had been brought into discredit by the unfavourable results of its early application, in doses which, as the new methods of control indicate, were much too large for safety or benefit. While Wright's opsonic method has undoubtedly been largely responsible for the revival of interest in specific inoculation and the widening of its scope, its complicated and specialised technique has probably had a deterrent effect on the spread of the method in general practice. At present there is a perceptible tendency to doubt the need for the elaborate and difficult opsonic determination, and its adequacy as a control. If this movement continues in the direction of reliance on constitutional indications or a more simple phagocytic determination, it will undoubtedly lead to a wider use of these so-called bacterial vaccines.

Vaccines are usually prepared by suspending in saline solution organisms grown on nutrient agar or some such solid medium, and heating for half an hour at 60° C. They are standardised according to the number of micro-organisms present in 1 c.c. The counting may be done by the absolute method, i.e. direct counting of a known dilution in a Thoma-Zeiss apparatus by a method similar to that employed in enumeration of red blood corpuscles. This is a tedious process, and it is more usual to employ Wright's or Harrison's method. Wright's method is to mix the vaccine with fresh blood in known proportion, make a film
of the mixture, stain and then compare the total number of red corpuscles in a large number of fields with the number of organisms in the same fields. If the number of red blood corpuscles per cubic mm., the proportion by volume of blood and vaccine, and the ratio of the counts are known, it is a matter of simple calculation to determine the number of organisms present per c.c. of vaccine. The objection to this method is that many organisms may be dissolved by the bacteriolyisins of the blood plasma. To overcome this difficulty, Harrison washes the blood corpuscles by several centrifugalisations with citrated saline to remove all the blood fluids, determines by a Thoma-Zeiss count the number of cells present in the suspension of red corpuscles in saline, and then proceeds as in Wright’s method. It is of considerable value to control the counts by means of the dried weight, which, for each organism used, bears a fairly constant ratio to the bacterial count.

**Typhoid vaccine** is used only as a prophylactic, and not at present as a curative, agent in typhoid fever. To secure immunisation, two doses are given. The first dose consists of 0.5 c.c. of vaccine, equivalent to 500 million bacteria. The second, **given ten days later**, is 1 c.c., equivalent to 1000 million bacteria.

After the first, and, to a much smaller degree, after the second inoculation, local and constitutional symptoms may occur, the severity of the local symptoms usually varying inversely as that of the constitutional. The local symptoms, present at the site of injection, are redness, swelling, pain and tenderness.

The following vaccines have been successfully employed therapeutically:—

**Staphylococcus Vaccine, Mixed**

Containing *Staphylococcus pyogenes aureus, albus and citreus.*

This vaccine may be employed in various staphylococcic infections, such as pustular acne, furunculosis, carbuncle, sycosis, blepharitis and localised abscesses.
The initial dose is usually 500 million organisms. A second
dose may be given in a week's time, or, if the constitutional
effects of the first dose have been slight and evanescent,
1000 million organisms may be deemed necessary. Many
authorities recommend the use of much smaller doses.

**Staphylococcus Vaccine, Aureus**

*Containing Staphylococcus pyogenes aureus.*

This vaccine is employed in the treatment of acne and
sycosis. It should only be used when the infection has been
shown to be due to *Staphylococcus aureus* alone.

The dose usually employed is similar to that in the case of
Staphylococcus Vaccine, Mixed.

**Gonococcus Vaccine**

*Containing Micrococcus gonorrhoeae.*

This vaccine may be used in the chronic and later stages
of gonorrhoea, in gleet and gonorrhoeal prostatitis, and
also in such generalised infections as gonorrhoeal arthritis.
Good results have also been obtained in the acute stages
of gonorrhoea.

The initial dose recommended by different authorities varies
considerably: in some cases only 5 million organisms, and in
other cases as many as 250 million are injected as an initial
dose. Subsequent dosage is regulated by the constitutional
effect. In infection of a delicate organ such as the iris, very
small doses are required.

**Streptococcus Vaccine, Polyvalent**

*Containing over 60 strains of streptococci obtained from the
following sources: erysipelas, scarlet fever, puerperal fever,
rheumatic fever, septicæmia, angina, pneumonia and ulcer-
ative endocarditis.*

This vaccine may be used in all forms of localised or general-
ised streptococcic infection, *e.g.* abscesses, septicæmia, pyæmia,
otitis media, endocarditis, peritonitis of streptococcic origin,
puerperal septicæmia, and erysipelas.
The dose is from 20-50 million organisms, and it may be administered at intervals of from one to three weeks, according to the reaction produced.

**Bacillus Coli Vaccine**

Containing the *Bacillus coli communis*.

This vaccine may be used in all forms of coli infection of the bladder, ureters, kidneys and peritoneum; in appendicitis due to the bacillus coli; in mucous colitis, and in coli infection of the uterus and gall bladder.

The initial dose is 5-15 million organisms, which may be repeated, or increased, according to the reaction produced, from 2 to 10 days later.

**Pneumococcus Vaccine**

Containing various strains of the *Diplococcus pneumoniae* (Weichselbaum).

This vaccine is used in pneumococcic infections of all kinds, pneumonia, empyema, pericarditis, endocarditis, septicæmia, meningitis and pneumococcic infections of joints.

The usual dose is 10-50 million organisms, which may be repeated, according to the reaction produced, every 36 or 48 hours.

**Acne Vaccines**

Recent research has shown that acne is primarily due to infection by a micro-organism known as the Acne Bacillus. In the early stage, when the eruption is papular in character, a bacteriological examination of the comedones or "black-heads" shows a pure acne bacillus infection. Later on, infection by the staphylococcus occurs, giving rise to the acne pustule.

A vaccine is chosen for treatment, therefore, in accordance with the stage and nature of the infection.

**Acne Bacillus Vaccine**

This is intended for the treatment of the papular form of acne. In this form comedones are abundant, but suppuration has not yet occurred. There is no febrile reaction after the injection of this vaccine, but if the dose be excessive a prolonged negative phase results, in which a fresh crop of
Reaction to mallein of a healthy horse immunised against Diphtheria toxin. The horse was subsequently killed and the absence of glanders confirmed by post-mortem examination.

<table>
<thead>
<tr>
<th>Temp. at time of injection</th>
<th>After 9 hours</th>
<th>After 12 hours</th>
<th>After 15 hours</th>
<th>After 18 hours</th>
<th>After 21 hours</th>
<th>2nd day</th>
<th>3rd day</th>
<th>4th day</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.0</td>
<td>102.6</td>
<td>102.4</td>
<td>101.8</td>
<td>101.6</td>
<td>100.6</td>
<td></td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

Swelling:
- 2" × 3" well defined
- 3" × 5" 4" × 8" decreasing

Reaction to mallein of a glandered horse.

<table>
<thead>
<tr>
<th>Temp. at time of injection</th>
<th>After 9 hours</th>
<th>After 12 hours</th>
<th>After 15 hours</th>
<th>After 18 hours</th>
<th>After 21 hours</th>
<th>2nd day</th>
<th>3rd day</th>
<th>4th day</th>
</tr>
</thead>
<tbody>
<tr>
<td>99.8</td>
<td>104.2</td>
<td>104.2</td>
<td>104.0</td>
<td>104.0</td>
<td>103.0</td>
<td></td>
<td></td>
<td>103.0</td>
</tr>
</tbody>
</table>

Swelling:
- 4" × 4" sharply defined
- Increasing rapidly
- Very large

Animal destroyed.

Temperature:
- 100.0
- 102.6
- 102.4
- 101.8
- 101.6
- 100.6
- 100.0
- 99.8
- 104.2
- 104.2
- 104.0
- 104.0
- 103.0

Swelling:
- Well defined
- Decreasing
acne papules appears. However, these papules disappear by subsequent injections.

**Acne Vaccine, Mixed**

This is for use in ordinary cases of acne, usually characterised by the presence of comedones and pustules. A bacteriological examination of such cases shows a mixed infection by the acne bacillus and the staphylococcus (*aureus, albus or citreus*).

**Dose.**—The initial dose is 4 or 5 million acne bacilli with or without staphylococci, according to the nature of the case. Subsequent dosage is regulated by the local effect. Larger doses than 10 million acne bacilli can rarely be tolerated.

In the pustular and furuncular forms of acne without comedones, Staphylococcus Vaccine, Mixed, is used.

**Tubercle Vaccine (Human or Bovine)**

An emulsion of killed tubercle bacilli of human or bovine origin.

Treatment should commence with a dose of 1 c.c. of emulsion containing 0.0001 mgm. dried tubercle bacilli, increasing to 0.0005 mgm., or even more, according to the indications of the opsonic index, or the clinical symptoms.

**Mallein and Tuberculin**

*Mallein* is a bacterial filtrate used in the diagnosis of glanders. It is prepared from cultures of the organism causing glanders (*Bacillus mallei*) which have been grown for about six weeks on bouillon containing glycerin, sterilised by heat and filtered. A small quantity of some antiseptic, such as phenol, is added as a preservative. When injected under the skin of a normal horse, mallein produces little or no apparent effect, but should the horse be suffering from glanders a large swelling forms at the seat of injection, and this is usually accompanied by a rise in the temperature of the animal.

Recent investigation at these Laboratories (Südmer sen and Glenny, *Journal of Hygiene*, 1908) has shown that many non-glandered horses, if they have been immunised against other
bacterial products, give a reaction to mallein in some ways similar to that given by glandered animals.

The size of the swelling produced in such cases appears to depend on the degree of immunity. Thus, in the case of a group of horses injected with diphtheria toxin, 6 of which were highly immune, all gave large local reactions; out of 7 moderately immune, 4 gave large swellings; and in 4 horses in which the serum had a low antitoxic value, only small mallein reactions were produced. The local swelling obtained in such healthy, immune horses differs very markedly from that given by the glandered animal in its rapid disappearance. Similarly, when a rise of temperature is produced by mallein in a healthy horse immunised against other bacterial products, this is smaller, attains its maximum more rapidly, and is far less persistent than the febrile reaction to mallein of a horse suffering from glanders. These differences are illustrated in the charts on page 234.

Similar results were obtained upon immune horses with tuberculin and several other bacterial products, such as those obtained from *Streptococcus, Bacillus coli communis, Bacillus typhosus*.

**Tuberculin ("Old" Tuberculin).**—Tuberculin for veterinary diagnostic use is prepared from bacillus tuberculosis by a method similar to that used in the production of mallein from bacillus mallei. For the diagnosis of tuberculosis in cattle the temperature reaction is of much greater importance than the local effect of the injection. A rise in temperature of 2.5° F. within 12 to 15 hours of injection is usually considered sufficient to warrant the condemnation of an animal.

**Ophthalmo-Tuberculin Reaction.**—The reaction is produced by purified tuberculin obtained by the alcoholic precipitation of ordinary tuberculin. If a small quantity of the precipitate, dissolved in water, be applied to the surface of the conjunctiva, a marked reaction results in the case of tuberculous
individuals. It is too early to decide definitely in favour of
this method of diagnosis over the old one of injection,
since cases have been reported where some
inconvenience due to persistence of inflammation
has arisen as a consequence of the application to
the eye. Cases have also been reported in which reactions have
been obtained in non-tuberculous subjects.

Several methods of diagnosis have been recommended, in
which the tuberculin is applied to the scarified or otherwise
prepared skin, and which depend likewise on the increased
susceptibility to tuberculin of the tuberculous subject.

THE SERUM DIAGNOSIS OF TYPHOID FEVER

A series of investigations, made in different countries, has
brought to light the fact that the serum of an animal rendered
highly immune to the typhoid bacillus has a marked action
upon the organisms, causing them to lose their motility, and to
become collected together into little masses, which rapidly sink
to the bottom of the tube containing the mixture of serum and
culture.

Following this, the fact that the serum of patients suffering
from typhoid fever usually gives a reaction with cultures
of the typhoid bacillus, similar to, though less
marked than, that given by the serum of animals Typhoid
immunised by the bacillus, has been confirmed
by a host of observers. This affords evidence of great weight
that the bacillus is really the cause of typhoid fever, and it
also affords a valuable method of diagnosis.

In the serum of those suffering from typhoid fever, the re-
action is said to have been observed as early as the fourth day.
Usually it appears about the beginning of the second week, but
it is undoubtedly often absent at this period. According to
Courmont (Revue de Médecine, October, 1897), it is in cases
which are exceptional, either on account of complications or
severity, or because they are extremely mild, that the agglu-
tinative power is feeble or delayed; in simple cases of moderate
severity it appears constantly about the sixth or seventh day, is active, in dilution of 1 in 100, about the tenth day, undergoes a more or less rapid rise towards the end of the febrile period (critical rise), and then disappears more or less rapidly. The persistence of the agglutinative power after recovery appears to be very variable, in some cases rapidly disappearing, in others remaining for years. The blood of those who are not suffering from typhoid fever, and from whom no history of this disease can be obtained, occasionally gives a reaction in dilution of 1 in 10, or even 1 in 30 (the dilutions recommended by Widal). But these instances do not appear to be sufficiently numerous to impair seriously the value of the test. It is thought desirable, however, to use higher dilutions, viz., 1 in 50.

From the considerations briefly set out above, it seems permissible to conclude that—(1) A negative reaction is of little value in the early days of the fever. It is of greater importance in proportion to the lateness of the period at which it is observed. It can, however, never absolutely exclude typhoid fever. (2) A positive reaction, on the other hand, except with dilutions of less than 1 in 40, is sound evidence of typhoid fever, present or past. The latter can be excluded if several quantitative tests have been made at different periods, and decided changes in the agglutinative power observed.

Recently an ophthamalo-reaction in typhoid fever, produced by a special culture filtrate and resembling the tuberculo-ophthalmic reaction, has been described by Chautemesse, and some promising results of a similar nature have been obtained by the use of a typhoid endotoxin prepared at the Wellcome Physiological Research Laboratories.

ORGANO-THERAPY

The brilliant success which attended the introduction of the treatment of myxœdema by administration of thyroid substance, led to the investigation of the effects of other ductless glands. In no other case has a similar success attended similar methods; but the attention directed to these organs has resulted in the
discovery of marked physiological actions, of great therapeutic importance, possessed by some of them. It has been shown, by Schäfer and others, that the posterior or infundibular lobe of the pituitary gland contains an active principle—as yet of unknown nature—the effects of which are not less striking than those of the more familiar active principle of the supra-renal medulla. The effects of the pituitary extract include arterial constriction, intense and prolonged contraction of the uterus, and profuse secretion of urine. The action on the uterus is already attaining therapeutic importance, while the use of the tonic effect on the arteries to combat surgical shock has been recommended by several observers, notably by Mummery and Symes. The diuretic effect should also render the extract of great value in certain conditions.

HEMISINE

'HEMISINE' is a name given to the active principle occurring in the medulla of the supra-renal gland and other smaller masses of paraganglionic tissue related to sympathetic ganglia. Its action likewise is closely connected with the sympathetic nervous system, intravenous injection producing all the effects which are elicited by stimulation of the nerve fibres of the true sympathetic system. Prominent among these is a great rise of blood-pressure, produced by constriction of peripheral arteries and augmentation of the heart's activity. So active is 'Hemisine' in this direction, that a dose of as little as 0.00001 gramme will produce a perceptible rise of blood-pressure. Contraction of the uterus is also caused in those animals in which the sympathetic nerve-supply to that organ is motor in function. These effects are illustrated by tracings.

TYRAMINE

'TYRAMINE' is a name which has been given to the organic base \( p\)-hydroxyphenylethylamine \((\text{HO-} \rightarrow \text{CH}_2\text{-CH}_2\text{-NH}_2)\). It has been recognised now for some years, having been first pointed out by Abelous and his associates, that extracts
of putrefied meat contain substances which, when injected into the circulation, produce an effect on the blood-pressure reminiscent of that produced by supra-renal extracts. The same phenomenon was encountered by Dixon and Taylor, who found that certain extracts of human placenta caused a rise of blood-pressure and contraction of the uterus, it being subsequently demonstrated by Rosenheim that a certain amount of putrefaction of the placenta was necessary for the development of this activity. The substances concerned in this action have recently been isolated at the Wellcome Physiological Research Laboratories, and identified as iso-amylamine, phenylethylamine, and \( \rho \)-hydroxyphenylethylamine (Barger and Walpole, *Journal of Physiology*, xxxviii, p. 344, 1909). The action of these substances has been found to be similar in most respects to that of the supra-renal active principle, but weaker and more prolonged (Dale and Dixon, *Journal of Physiology*, xxxix, p. 25, 1909).

Of the three, \( \rho \)-hydroxyphenylethylamine is much the most active, being also the most nearly related in chemical structure to the supra-renal principle. Its relatively weak and prolonged action, as compared with the latter, enables it to be absorbed from the alimentary canal or the subcutaneous tissues, so that its general constitutional effects, rise of blood-pressure, increased vigour of the heart’s action, and contraction of the uterus, can be produced by administering it by the mouth or hypodermically. The study of this substance has recently gained greatly in interest by the discovery (Barger and Dale, *Journal of Physiology*, 1909, xxxviii, p. 77, [Proc. Phys. Soc.]) that it is present in watery extracts of ergot, and is chiefly responsible for the well-known effects of such extracts on the blood-pressure and the uterus.

Several methods of preparing this base synthetically have been worked out at the Wellcome Physiological Research Laboratories (Barger, *Journal of the Chemical Society*, xcv, p. 1123, 1909), and it will probably find wide therapeutic use.
ERGOTOXINE AND ‘ERNUTIN’

Many substances which have in the past been described as active principles of ergot, and which undoubtedly showed physiological activity, have not possessed the characteristics of pure chemical substances. Such were the sphacelomic acid and cornutin of Kobert, and the chrysotoxin, secalintoxin, and sphacelotoxin of Jacoby. On the other hand, the alkaloid which Tanret isolated in an undoubtedly pure and crystalline form, and named ergotinine, was found by several observers to possess practically no pharmacological action, although there was some clinical evidence of its activity. Recent work in the Wellcome Physiological Research Laboratories (see Dale, Journ. of Physiol. xxxiv, p. 163, 1906; Barger and Carr, Journ. Chem. Soc., xci, p. 337, 1907; Barger and Dale, Bio-Chem. Journ. ii, p. 240, 1907) has cleared up this anomaly by demonstrating the presence in ergot of the alkaloid ergotoxine, which is closely related chemically to ergotinine, being a hydrate of the latter and easily produced from it, but differing from it in being intensely active physiologically.

Ergotoxine, though itself amorphous, forms crystalline salts, and has accordingly been prepared in a chemically pure condition. Its physiological action is characteristic, consisting of a stimulant action on plain muscular organs, and in particular on the arteries and the uterus. When a large dose is given, a secondary paralytic effect on the motor functions of the true sympathetic nervous system is produced. As a result, the injection of ‘Hemisine,’ or stimuli applied to the sympathetic nerves concerned, now cause a fall of blood-pressure and relaxation of the uterus in place of the previous rise of pressure and contraction. This secondary action affords a convenient means of recognising the presence of the active alkaloid, and estimating the quantity present in any specimen or preparation of ergot. This physiological method of assay is the more valuable in that no satisfactory chemical method is yet available for estimating ergotoxine.
No. 1. Tracing showing the effect of 'Hemisine' on the Blood-Pressure

See page 246

No. 2. Tracings illustrating action of 'Hemisine' and Method of Standardisation

See page 247
As indicated in the description of 'Tyramine,' it has now been shown that the activity of watery ergot extracts is chiefly due to the presence of $p$-hydroxyphenylethylamine. It is quite in accord with what might be expected on theoretical grounds, that the ferments of a fungus like ergot should, equally with putrefactive bacteria, have the power of producing the base from the amino-acid tyrosine, derived, in this instance, from the proteins of the rye-grain. The presence of varying amounts of $p$-hydroxyphenylethylamine, together with small amounts of ergotoxine, accounts for the whole of that action of ergot extracts on the blood-pressure, which has been widely recommended as a basis of standardisation.

'Ernutin' is a fluid preparation which contains these active principles of ergot in a definite and uniform proportion, unmixed with depressant and harmful impurities.

**Physiological Standardisation**

No insistence is needed on the desirability of a uniform standard of activity in all drugs, and especially in such as contain principles of a highly active and toxic nature. In the case of some, such as cinchona or belladonna, such a standardisation is easily carried out by chemical means. There are, however, other drugs in which the active principles are of such a nature that attempts at chemical estimation are only misleading, even though the active principles are recognised and something known of their chemical nature. Typical instances of such drugs are those of the group including digitalis, strophanthus and squill. In the case of digitalis, research in these Laboratories (Barger and Shaw, *Year-Book of Pharmacy*, 1904) has shown the futility of the chemical methods suggested and the adequacy of an estimation based on the effect of the drug on the frog's heart. The conclusions reached apply, with little modification, to strophanthus and squill, and preparations of all these drugs are now standardised by this method in these Laboratories.
Cannabis indica is a notoriously variable drug, but, by observing the nervous symptoms produced by a given dose in a dog or cat, a fair estimate of the activity of any specimen can be made.

Ergot is another drug in which the amount of the active principles varies to a very marked degree. The isolation of ergotoxine, and the demonstration of the presence of ergot $\beta$-hydroxyphenylethylamine in ergot extracts, may eventually lead to the development of a satisfactory chemical method of determining its activity. Hitherto, however, a physiological method based on the action of ergotoxine and $\beta$-hydroxyphenylethylamine described above has proved a far surer guide than any chemical assay.

The purity of a specimen of 'Hemisine' can be much more satisfactorily determined by comparison of its activity to that of a standard specimen than by chemical tests. The method illustrated, in which the amount of a given 'Hemisine' specimen is determined, which produces a rise of blood-pressure equal to that given by a given dose of a specially-prepared pure standard sample, is found in these Laboratories to be workable to an accuracy of about 5 per cent., and is used in standardising all supra-renal preparations.

Kymographic tracings are exhibited illustrating the action of drugs mentioned above, and methods of physiological standardisation.

DESCRIPTION OF TRACINGS

(1) 'Hemisine.' The lines of tracing, from above downwards, are:

I. Plethysmographic tracing of heart volume.

II. Manometer-record of blood-pressure from the carotid artery.

III. Signal line, showing time of injection.
At \( H \) \( 0.0001 \) gm. of 'Hemisine' was injected into the jugular vein, causing a large rise of blood-pressure, and quickening and strengthening the heart-beat.

(2) 'Hemisine'—

(a) Effect of 'Hemisine' on the blood-pressure of a decerebrate cat:—

Lines of tracing—

(1) Blood-pressure.
(2) Signal line marking the point of injection.
(3) Time-clock marking every 10 seconds.

(b) Method of standardising 'Hemisine' and other supra-renal gland preparations. Varying doses of the solution to be tested are interposed between injections of \( 0.0002 \) gm. of the standard specimen of 'Hemisine.' Effects of standard doses are indicated by a \( X \). Between the injections the recording drum is moved back so as to produce partial superposition and facilitate comparison.

(c) Effect of 'Hemisine' on the isolated heart of a rabbit, perfused though the coronary circulation with oxygenated Ringer's solution (Locke's method). At \( X \) \( 0.0005 \) gm. of 'Hemisine' was added to the perfusion fluid.

(3) Effect of 'Hemisine' and Ergotoxine on the blood-pressure and the uterus—

(a) Effect on the blood-pressure of intravenous injection of

(A) \( 0.0005 \) gm. of 'Hemisine.'
(B) Alcoholic extract from \( 1 \) gm. of ergot.
(C) ... ... ... ...
(D) \( 0.0005 \) gm. of 'Hemisine.'
(E) ... ... ...

Showing the rise of blood-pressure and subsequent reversal of the effect of 'Hemisine' due to ergotoxine in the ergot.
No. 3. Tracings showing the effect of ‘Hemisine’ and Ergotoxine on the Blood-Pressure and the Uterus. See page 247

No. 4. Tracings showing the effect of Strophanthus on the Heart and Blood-Pressure

See page 249
(b) Effect of 'Hemisine' on the blood-pressure and uterine contraction. At \( \text{Hemisine} \) was injected, intravenously, producing a temporary rise of blood-pressure and a similarly evanescent contraction of the uterus.

(c) Effect of ergotoxine on the blood-pressure and uterine contraction. At a dose of 0.002 gm. ergotoxine was injected, producing a large rise of blood-pressure and very powerful and persistent uterine contraction.

(d) Effect of intravenous injection of 0.5 gm. of chrysotoxin (ethereal ergot extract) on the blood-pressure and uterus of a monkey. The effect on the uterus is the only one of importance.

(4) Effect of Strophanthus on the heart and blood-pressure of a pithed cat. Lines of tracing are:

1. Cardiographic tracing, showing pull exerted by the heart on a lever held by a light spring.
2. Manometer-record of blood-pressure.
3. Zero line of manometer.
4. Time-clock marking seconds.

(a) Before injection of strophanthus.

(b) After injection of a small therapeutic dose, rise of blood-pressure and augmentation of the heart-beat. The vagus centre being destroyed, the rate of the heart-beat is only slightly reduced.

(c) After further injection of strophanthus, the heart-beat, still powerful, becoming quicker and irregular.

(d) After a toxic dose of strophanthus. Heart-beat rapid, feeble and irregular. Blood-pressure falling rapidly.
DESCRIPTION OF THE WELLCOME PHYSIOLOGICAL RESEARCH LABORATORIES

The original laboratories, established in 1894, were enlarged from time to time to meet the requirements of constantly increasing work, until it was found necessary to acquire more commodious premises. The new laboratories were established at Brockwell Hall, Herne Hill, London (Eng.) in the early part of 1899.

Brockwell Hall is an old-fashioned country mansion, standing in its own grounds. The adaptation of these premises to the requirements of research work has been carried out with the greatest care, and no pains or expense have been spared in rendering their appointments as complete as possible; so that the Institution's highly-qualified staff of research workers have full scope for their energy.

The room shown in the illustration on page 238, is the principal Bacteriological Laboratory. In this laboratory research is carried on in bacteriology and serum-therapeutics, injections are made for the standardisation of sera prepared in the establishment, and the elaborate series of sterility tests is made to which all sera are submitted before issue. On the other side of the entrance-hall is the principal Chemical Laboratory (see page 240), devoted to research on the nature of naturally occurring substances of biological importance, and the synthesis of new compounds likely to be pharmacologically and therapeutically interesting.

A small Chemical Laboratory; the Secretary's office; a dark room for photographic work; and the Library, are also on the ground floor. The Library is well supplied with standard works of reference, both chemical and physiological, and the current scientific literature of both these subjects, as well as that of bacteriology, is well represented.

The spacious cellarrage contains, in addition to compartments for storage of various materials, a recently-erected cold chamber,
9 ft. \( \times \) 7 ft. in floor area, kept constantly below freezing-point by means of an ammonia freezing installation, and also an incubating room.

The Physiological Laboratories are situated on the first floor of the building. In these rooms physiological and pharmacological research, and the physiological testing and standardising of various drugs and chemicals are carried on.

On the same floor are:

1. **Serum office.** A small room at the head of the staircase where all the records of procedures connected with serum production are preserved in perfect order for daily work and reference.

2. **Sterile serum room.** A room paved with cement and fitted with special glass benches for the manipulation of serum. It can be flushed all over with water to free the air from dust, and, with the door closed, can be sterilised with formalin. It is provided with a large porcelain dialysing-tank, and is used for the processes involved in the artificial concentration of antitoxin.

3. A room devoted to the preparation and standardisation of bacterial vaccines.

4. **Serum testing room.** A room set apart for making dilutions of diphtheria antitoxic serum and preparation of injections of mixed diphtheria toxin and serum used in standardising the latter for issue from the laboratories (to Messrs. Burroughs Wellcome & Co.). The standard apparatus employed is never moved from this room nor used for any other purpose.

5. A third chemical laboratory, provided with special mechanical appliances for working at low pressures.

Two special laboratories are devoted to the preparation of media: one, a small pent-house, occupied entirely in the production of test-tube media for use in the bacteriological laboratory; the other, a commodious well-lit outbuilding communicating with the boiler-house, having a floor paved with cement, and the
One of the Rooms in which Phials are Filled

Special Laboratory for the Collection of Blood and Separation of Sera
walls enamelled in order to facilitate cleaning. Here is made nutrient broth of various kinds on a large scale, to be used in the preparation of the various cultures and toxins for use in the stables. This laboratory is also used for the initial work upon crude animal material before it is sent to the chemical laboratory for further elaboration. Between this room and the boiler-house are two compartments, one for stores, the other to accommodate the large high-pressure steriliser which can deal with bottles, containers, etc., of large size.

The serum, after being obtained in the collection-laboratory adjacent to the stables, is taken to a special building recently erected, where all further processes involved in separating it and measuring it into phials are now carried out. The building contains a cleaning-room for all apparatus used in the manipulations; a sterilising-room, for the heat-sterilisation of the same; and a phial-room, where the phials, in which the sera and vaccines are issued, are cleaned and prepared for sterilisation, and subjected to scrutiny after filling.

The rest of this building is completely closed from the outside air, and ventilated by an ample current supplied by a large motor-fan, placed outside in a special building. The air is passed through a germ-proof filter before it enters the main building; the rooms are constructed without angles or corners, and can be sterilised nightly with formaldehyde vapour, which the sterile, fan-driven air removes again in a few minutes. This sterile section includes:

1. A store-room in which the sera and vaccines are kept, ready to be run into the issuing-phials.

2. Duplicate rooms in which the process of separating the serum from the clot is carried out. One of these rooms is always being sterilised while the other is in use. These rooms open out of the serum store, and can only be approached through it. A small chamber, in which the serum is mechanically driven through germ-proof filters into the storage bottles, also opens out of the store-room.

3. A room in which the serum is filled into phials. This is approached from the phial-preparing room by means of a
INTERIOR OF ONE OF THE STABLES
double air-lock. Before entering the room the assistants must assume sterilised overalls, caps and goloshes, and sterilise the hands. Into this room the serum passes by tubes from the store room, and each phial, as soon as filled, is passed under a glass screen to another assistant, who immediately seals the neck at the blow-pipe.

Between the main building and the animal houses a brick building of one storey has been erected. The one room on the ground level is specially fitted for bacteriological work. The floor is cemented, the walls tiled to a height of four feet, and all corners avoided by a rounding of angles. In this room manipulations are carried out connected with stock cultures, special research work, and the preparation of various vaccines. The cellagar, surrounded by a drained area, is divided into two rooms. The larger, 12 ft. square, is kept at a constant temperature, ranging from 35°–40° at different levels in the room. This is used for incubation on a large scale. Alongside it is a smaller room, in which a still atmosphere affords especially suitable conditions for bacteriological operations. Recently another building, containing three laboratories, and two rooms for keeping rodents, has been erected at a distance from the other buildings, for the purpose of special bacteriological research.

**The Stables and other Adjuncts**

The stables are situated about one hundred yards from the laboratories. They are lofty, well-lighted and well ventilated, and are fitted with every convenience and contrivance conducive to the well-being of the horses. The walls are of white glazed brick and cement, the floor being paved throughout with the best stable bricks.

The old stables and coach-houses of the Hall have been remodelled in accord with modern views, and are now used for the testing of new horses with mallein and tuberculin before they are admitted to one of the large stables. Near by is a special laboratory for
the collection of blood and separation of sera. This laboratory, like the stables, has been so built as to permit of the whole room being flushed with water, so that sera can be manipulated under the conditions necessary for ensuring sterility.

An entirely new system of drainage for the laboratories, stables and other premises has been carefully carried out.

The laboratories, stables, outbuildings and grounds are electrically-lit, and are all in telephonic communication.

Electric installation

The boiler, engine and dynamo necessary for the generation of the current used in the various motors on the premises are placed in brick and cement buildings adjoining the south-west side of the Hall. Near the boiler is a large cylindrical steriliser, constructed for a working pressure of 30 lb. The sterilisation of all large vessels containing nutritive media, etc., is effected here, as also of all vessels which have been used in the laboratories.

The grounds contain a large paddock, and also gardens for growing vegetables for the animals. A large store for fodder, with electrically-driven chaff-cutter, has recently been erected.

THE ANIMAL HOUSES

A large animal house has been erected, which accommodates all the rodents required for the work of the laboratories. It contains full provision for the efficient isolation of animals inoculated with living cultures. The heating and ventilation of this building have been very carefully carried out, with a view to the health and comfort of the animals.

Another range of sheds contains well-drained, comfortable kennels for dogs, a stable for goats, and a steam-heated apartment for cats, communicating with a large open-air cage.
Weapons of Precision Produced by Science and Industry

Weapons of Precision
Produced by
Science and Industry
'Wellcome' Chemical Works, Dartford, Kent
THE WORK OF
BURROUGHS WELLCOME & CO.

From the time of the founding of the firm, progress has been steady and continuous. The keynote of this success lies in the firm’s own original scientific work, conducted under the most favourable conditions, as well as its ready recognition of all scientific advances and research, and adaptation of the results to the methods of modern production.

"The rule of thumb is dead and the rule of science has taken its place."

"Science and Industry" has been the guiding motto of B. W. & Co. from the first. They have aimed at attaining and maintaining the highest possible degree of excellence in the products they issue. By keeping abreast of research work, and by promptly adopting the most scientific modern methods, they have not only kept pace with the latest developments in medicine and pharmacy, but have been pioneers in the introduction of some of the most notable agents employed in modern medicine, and have contributed largely to the great advances of the times.

Patient and persistent research* by a staff of chemical, pharmaceutical and physiological experts has yielded fruitful results. Not only has the firm satisfied the highest requirements of physicians by the purity, reliability and scientific precision of the products, but it has met the needs of conscientious pharmacists who pride themselves on the supreme quality of everything they dispense.

* Research pioneered by Burroughs Wellcome & Co. many years ago is still continued in their works by a highly-qualified staff. The Wellcome Chemical Research Laboratories, King Street, London (Eng.), and the Wellcome Physiological Research Laboratories, Brockwell Hall, Herne Hill, London (Eng.), are Institutions conducted separately and distinctly from the business of Burroughs Wellcome & Co., and are under separate and distinct direction, although in these two Institutions a large amount of important scientific work is carried out for the firm.
PORTION OF FRONTAGE
BURROUGHS WELLCOME & CO.'S CHIEF OFFICES, LONDON
Corner of Holborn Viaduct and Snow Hill
facing Holborn Viaduct Station
To supply medicaments characterised by purity, accuracy, uniformity and reliability has been the firm's policy from its earliest days. This has been achieved by devising new appliances, by employing only the most scientific methods, and by conducting the various stages of manufacture under the direct supervision and control of specially-trained and qualified pharmacists and other experts. That success has been achieved is amply evidenced by the high appreciation accorded by physicians and pharmacists throughout the world to the "Weapons of Precision" created by the firm. Untiring, strenuous endeavour and vast expenditure have been required to attain these results.

**Working Imperially**

Mr. Joseph Chamberlain has taught the nation to think Imperially,—Burroughs Wellcome & Co. work Imperially.

It has been the special ambition of this firm to win back to England by actual merit some of the lost industries snatched away from the country in recent years by alert, enterprising rivals of other lands, who wisely and well apply science to their industries, and slumber not. B. W. & Co., never content with the time-honoured "rule of thumb" methods, have in a considerable measure gratified their ambition. Particularly in the production of Fine Medicinal Chemicals including the powerful alkaloids, glucocides and other active principles now so largely replacing the use of bulky and nauseous crude natural drugs, thus securing greater certainty and uniformity of potency.

In this work it has been the aim not only to equal but to surpass foreign production, and the results speak for themselves.

**Pioneers in New Drugs**

The firm has pioneered the introduction of many new and valuable natural drugs, notable amongst which may be mentioned Strophanthus, or Kombé, the powerful African arrow poison which has proved so efficacious in certain heart disorders.

"Turned a deadly enemy into a valued friend"
Italian Depot:
Burroughs Wellcome & Co.
26, Via Legnano, Milan
Sir Thomas Fraser of the Edinburgh University first investigated and demonstrated the properties of Kombé from a comparatively small specimen, and B. W. & Co. immediately took vigorous steps to procure supplies of the drug regardless of expense and immense difficulties.

Emissaries were sent to collect the small reserves of arrow poison from the rude huts of many Central African warriors. In this way a fair quantity was accumulated, but at a cost of more than £20 per pound.

Thus the true Strophanthus Kombé was first introduced to England and to the world—B. W. & Co. were first in the field.

A bundle of the first consignment of strophanthus which reached Europe for Burroughs Wellcome & Co.

These earliest supplies were obtained quite regardless of monetary considerations, and, notwithstanding the great cost, parcels of the drug and its preparations were at once distributed, without charge, to leading physicians throughout the world. By this means the therapeutic properties of strophanthus were confirmed by investigators in various lands.

For more than a year this was the only supply of Strophanthus outside the "Dark Continent," and then B. W. & Co. again secured all that was obtainable, and were the only suppliers for many months. Strophanthus is now one of the approved remedies of the Pharmacopoeias. In less than two years the firm was treating several hundred-weights of strophanthus seeds at a time, thus securing perfect uniformity in the activity.
of the products, and enabling the dosage and action to be controlled with precision.

Arrow-head poisoned with strophanthus

Amongst those who were interested in the introduction of strophanthus were Sir John Kirk (then of Zanzibar), and Dr. David Livingstone, who referred to its employment by natives as an arrow poison, in his narrative of his expedition to the Zambesi. It was the intimate association which Burroughs Wellcome & Co. have always had with the pioneers of African exploration which enabled them to be first in placing supplies of the drug at the disposal of the medical profession.

Plumed seed of Strophanthus Kombé

**Strophanthus Kombé**, the source of the drug, is a woody climber growing freely in many parts of Eastern Africa. From the seeds the natives prepare a paste with which they poison their arrows.
South African Offices and Warehouses:
BURROUGHS WELLCOME & CO.
5, Loop Street, CAPE TOWN
The seeds are contained in follicles, and each bears a beautiful plume-like appendage springing from a delicate stalk. Each seed weighs about half a grain.

**Pioneers in Pharmacological Work on Animal Substances**

When renewed attention was drawn to the therapeutic action of certain animal substances, this firm pioneered the pharmacological work on the various glands, having already been long engaged upon researches on brain matter and other substances of animal origin, they were first to produce a stable and reliable product of the thyroid gland, and this remains the standard and accepted preparation amongst the medical profession throughout the world.

Although the principle suggesting and guiding this modern departure in therapeutics is the outcome of recent physiological research, the belief in the use of organs or tissues for the relief of human suffering, or for the production of certain physical conditions, is known to have existed from the earliest times.

The belief in the utility and value of animal glands and tissues in the cure of disease is not altogether the outcome of modern research, for we learn from Herodotus, fifth century B.C., that in his day, the people called Badini or Geloni "used the testicles of otters, beavers and other square-faced animals for diseases of the womb." From prehistoric times savage tribes have been accustomed to eat the hearts of lions, tigers and other courageous animals, and even of human enemies, with the object of acquiring added valour in battle. And so, after the lapse of centuries, the fruits of man's early instinct have been reaped for his benefit by modern scientific men.

Among old-world medicines, compounds of the organs and tissues and excreta of mammals, birds, fishes and insects occupied permanent positions of prominence. They were included in the London Pharmacopeia issued by the Royal College of Physicians in 1676, and in Salomon's New London Dispensatory of 1684. The present increasing use of animal
substances may be largely traced to the researches and enthusiastic advocacy of Brown-Séquard, though it must be admitted that such advocacy was exaggerated, and perhaps lacked dignity and reserve. In spite of his attitude, which experience has not justified, he in some considerable measure succeeded in establishing his contention that all glands, with or without excretory ducts, give to the blood, by internal secretion, principles always important and in most cases essential, to the general well-being of the body.

Organo-therapy, animal medication, and glandular therapeutics are among the terms now applied to the administration of organs or tissues or of the internal secretions of glands, in certain diseases, induced, or believed to be induced, by the degeneration, disease, defective development, or removal of the corresponding organs, tissues, or glands. Many diseases, arising from defective functions of particular organs, are now treated by these animal substances, and the principle has been established that the lessened or lost power of an organ may in some cases be restored by the administration of corresponding organs taken from healthy lower animals.

The work of Burroughs Wellcome & Co. on these animal substances has been directed not to the therapeutics but to the chemical and pharmacological side, and the production of active and staple products for the use of the medical profession, and in this they have attained marked success.

Amongst other animal products dealt with was the suprarenal gland, which yielded first to Abel and Crawford a powerful and highly valuable active principle under the title Epinephrine, other workers produced modified products, but the active principle was first produced in a dry, soluble, active form in the Wellcome Physiological Research Laboratories, and is now issued by the firm under the title 'Hemisine.'

Good or Evil

Ergot, the blessed and cursed blight of rye, which has wrought much good and much evil, a substance greatly valued
as a remedy, and yet it destroyed countless lives during the grain plagues called St. Anthony's fire of the middle ages.

Ergot of rye has been one of the problems that has long baffled scientific workers. It was investigated in these same laboratories, and the true representative active principle was discovered, and is now issued as a standardised product of great power and uniform activity of immense importance to the medical profession.

**Therapeutic Sera**

The Wellcome Physiological Research Laboratories were pioneers in the production of Anti-Diphtheritic Serum in the British Empire, and also supplied the first used in America. During the early days, and until the real value was conclusively demonstrated, all offers to purchase supplies of the serum were refused, but all that could be produced was freely placed without charge at the disposal of the principal clinics, hospitals and private medical men who had diphtheritic cases under treatment. These trials proved successful, and the 'Wellcome' brand of serum supplied by B. W. & Co. has continued to hold first place throughout the Empire. These laboratories have done a vast amount of original work in the whole range of therapeutic sera—and in vaccines, etc., and in many other organic bodies of importance in medicine.

Though these Physiological Research Laboratories are conducted under separate and distinct direction, and many of the researches are solely of scientific interest as contributions to human knowledge, yet much work of practical value is carried out for the firm, the Principal of which founded the laboratories.

**Fine Chemicals**

The Wellcome Chemical Research Laboratories have worked in the same manner with benefit to science and to the firm, devising new chemical processes and producing new chemical
agents, both organic and inorganic. The investigations of
vegetable drugs and their representative principles have yielded
highly important results, both in the discovery
of new principles and in raising the standard
of purity and potency of valuable well-known
substances, notably Pilocarpine, Aconitine, etc., etc. The
co-operation of these two research laboratories, with their
efficient scientific staffs working under the guidance of the
two highly-qualified Directors, distinguished for thoroughness
and accuracy, is of immense importance to the firm.

But the research work does not rest here. There is also in
the experimental and analytical laboratories at the firm's works,
a highly-skilled staff constantly engaged in research for the
discovery of new active chemical and pharmaceutical substances,
and for the improvement of those already known.

Amongst the recent discoveries are 'SOAMIN,' the new substance
which has proved so successful in the treatment of Syphilis,
and of the dread Sleeping Sickness now rapidly decimating
the population of the Congo, Uganda and other parts of
Central Africa; 'ORSUDAN,' now under trial for Malaria; and
'Nizin,' the new antiseptic, powerful, but free from many of the
dangers of other antiseptics.

A large number of other important developments in
chemistry and pharmacy have been made in these laboratories,
including the production of Chloroform of a standard that
secures greatly increased safety and uniformity, and the
confidence of the medical profession.

In the manufacturing departments every operation is studied
with the view to new discoveries and improvements, and aiming
to make daily progress.

Equipments

Completely fitted cases have been devised to meet the
requirements of up-to-date medical men and others
engaged in medical and sanitary science; for example,
hypodermic, ophthalmic cases, urine testing, water analysis,
bacteriological testing cases, etc.
Medicine and first-aid chests, cases, belts, etc., for military and naval purposes, for explorers, missionaries, travelling journalists, war correspondents, aeronauts, motorists, yachtsmen, planters; in fact, equipments for the air, for the earth, for the depths, and for every clime under every condition.

**HISTORY OF COMPRESSED DRUGS**

Burroughs Wellcome & Co. are successors to, and the sole proprietors of, the business of Brockedon, who, in 1842, originated compressed medicines in the shape of bi-convex discs—issued under the designation of "compressed pills." The production of compressed substances has been developed and carried to a high state of perfection by B. W. & Co. This has been accomplished by research and the use of chemicals of exceptional quality, and by the employment of specially-devised machinery of rare accuracy. This exclusive machinery, invented by the firm, and produced at great cost, operates with the precision of the finest watch-work. By its aid the firm's specially-trained expert chemists are enabled to prepare compressed products for issue under the 'Tabloid,' 'Soloid' and other brands, of unique accuracy of dosage and of a perfection of finish never before attained. These products present medicines, etc., of so varied a character as to represent a range of dosage of 1/1000 of a grain to 60 grains or more.

The qualities of purity, accuracy, activity and stability which characterise 'Tabloid' and 'Soloid' products have secured unusual appreciation and approval from medical and pharmaceutical experts, and these preparations are prescribed in private practice and in military and civil hospitals in all parts of the world.

**MEDICAL AND FIRST-AID EQUIPMENTS**

From the time of the founding of the business, Burroughs Wellcome & Co. have made a special feature of studying medical and surgical requirements for expeditions to tropic and
THE

'Tabloid' \[\text{Invented by B. W. & Co.}\]

AND

'Soloid'

They mark the work of Burroughs Wellcome & Co.

They mean "Issued by Burroughs Wellcome & Co.

They stand for

24 CARAT products
arctic and other trying climates, especially for the use of explorers, journalists and other travellers; for armies in camp, on the march, and in the battlefield.

Careful and prolonged enquiry and practical experimentation have enabled them to so perfect their equipments for these purposes that almost every military expedition and journalistic pioneering tour of recent years has been fitted out by the firm.

B. W. & Co.'s General Offices

The firm's chief offices and administrative premises are centrally situated in the City of London, facing Holborn Viaduct Station, and at the junction of Holborn Viaduct and Snow Hill. They are thus within a stone's throw of such historic sights as St. Paul's Cathedral, the Old Bailey (Central Criminal Courts), the Charterhouse, St. Bartholomew's, and Smithfield.

Originally occupying only the corner building, these offices have been extended, at the demand of increased business, both along Holborn and down Snow Hill until the street frontage has become nearly 300 feet, and the floor space 43,000 square feet (see page 262).

'Wellcome' Chemical Works

The 'Wellcome' Chemical Works (illustrated on page 260), which form the principal manufacturing premises of the firm, are situated at Dartford, Kent, near London. On one side the Works have direct water communication with London and the Docks of the Waterway of the Thames; on the other side they front on to the railway and so are in touch with the metropolis and the Continent.

Six B. W. & Co.'s Establishments Abroad

In addition to the Chief Offices and Works in England, Burroughs Wellcome & Co. have fully-equipped establishments at New York, Montreal, Sydney, Cape Town, Milan and Shanghai. Photographs of the Milan, Sydney and Cape Town Branches appear on pages 264, 266 and 268.
Awards Conferred Upon

Burroughs Wellcome & Co.

International Exposition
St. Louis, 1904

Three Grand Prizes
and
Three Gold Medals

International Exhibition
Liege, 1905

Six Grand Prizes
Three Diplomas of Honour
and
Three Gold Medals

International Exhibition
Milan, 1906

Three Grand Prizes
Three Diplomas of Honour
and
One Gold Medal

Franco-British Exhibition
London, 1908

Seven Grand Prizes
One Diploma of Honour
and
Two Gold Medals

Making in all more than

220 Highest Awards

Conferred upon the firm for the
Scientific Excellence of their products
at the
Great Exhibitions of the World

276
'Tabloid' Brand First-Aid

For
Journalists, War Correspondents, Automobilists, Aeronauts, Yachtsmen, Sportsmen, Travellers, Tourists, etc.

Compact outfits of bandages and first-aid accessories, etc., suitable for use when travelling.

Price in London
50/-

Cases and contents are of the B. W. & Co. sterling quality

No. 702. 'Tabloid' First-Aid (Registered) (Royal Blue enamelled leather)—closed. Measurements: 7 x 3/4 x 2 3/4 in.

No. 702. 'Tabloid' Brand First-Aid (Registered)

Contains 'Tabloid' Bandages and Dressings, 'Vaporole' Aromatic Ammonia, for use as "Smelling Salts," 'Borofax,' Hazeline' Cream, Sal Volatile, Carron Oil, tourniquet, gutta-percha tissue, plaster, protective skin, scissors, pins, etc., and eight tubes of 'Tabloid' and 'Soloid' Brand products.

In Rex Red, Royal Blue or Brewster Green enamelled leather.

Price in London
50/-

No. 702. 'Tabloid' First-Aid (Registered) (Brewster Green enamelled leather)—open
No. 707. 'Tabloid' Brand First-Aid (Registered)

Contains 'Tabloid' Bandages and Dressings, Va-  
oporole Aromatic Ammonia, for use as "Smelling  
Salts," 'Borofax,' Carron Oil, plaster,  
protective skin, pins, etc., and six tubes of 'Tabloid' and 'Soloid' Brand products.

In Rex Red, Royal Blue or Brewster Green  
enamelled metal, or in aluminised metal.

Price in London 7/6

No. 712. 'Tabloid' Brand First-Aid (Registered)

Contains 'Tabloid' Bandages and Dressings, 'Vaporole' Aromatic Ammonia,  
for use as "Smelling Salts," 'Borofax,' Carron Oil, plaster,  
protective skin, pins, etc., and six tubes of 'Tabloid' and 'Soloid' Brand products.

In Rex Red, Royal Blue or Brewster Green  
enamelled metal, or in aluminised metal.

Price in London. 10/=
The medicinal contents of these cases are selected in view of emergency requirements; but, if desired, they can be fitted with 'Tabloid' and 'Soloid' Brand products selected by the purchaser's physician, so that a prescribed course of treatment may be continued whilst travelling.

No. 715. 'Tabloid' Brand First-Aid (Registered)

Price in London
10/6

No. 715. 'Tabloid' First-Aid (Registered) (Black japanned metal)
Measurements: \( \frac{3}{4} \times 4 \frac{1}{2} \times 2 \) in.

Contains 'Tabloid' Bandages and Dressings, 'Vaporole' Aromatic Ammonia, for use as "Smelling Salts," 'Borofax', Sal Volatile, Carron Oil, gutta percha tissue, plaster, protective skin, scissors, pins, etc., and eight tubes of 'Tabloid' and 'Soloid' Brand products.

In Rex Red, Royal Blue or Brewster Green enamelled metal, or in aluminised or black japanned metal.

No. 723. 'Tabloid' Brand First-Aid (Registered)

Contains 'Tabloid' Bandages and Dressings, 'Vaporole' Aromatic Ammonia, for use as "Smelling Salts," 'Borofax', 'Hazeline' Cream, Sal Volatile, Carron Oil, lancet, tourniquet, gutta percha tissue, plaster, protective skin, scissors, pins, etc., and nine tubes of 'Tabloid' and 'Soloid' Brand products.

In Rex Red, Royal Blue or Brewster Green enamelled metal, or in aluminised metal. (See illustration overleaf)
No. 905. 'TABLOID' Brand Photographic Outfit
(Registered)

A complete compact chemical outfit for developing and fixing plates, films, bromide or gaslight papers, and for toning and fixing P.O.P.

Contents make over one-and-a-half gallons of solution.

In Rex Red, Royal Blue, Imperial Green or Bright Scarlet enamelled metal, or in black japanned metal,


The compactness and portability of this case render it particularly suitable for the busy Journalistic Photographer and for the War Correspondent.

For details of 'Tabloid' Photographic Products, see also next page.
PHOTOGRAPHY IN JOURNALISM

Photography has assumed in recent years a most important place in journalism. The realism of the camera adds materially to the effectiveness of the word-picture even when it concerns home news, whilst for the war correspondent and travelling journalist it is essential that pictorial records should supplement the pen.

The difficulty, especially for the journalist in war or abroad, has been that photography demanded a considerable addition to the bulk of his equipment, and the results were uncertain, owing chiefly to difficulties with sensitive chemicals. To-day the camera-maker is able to produce instruments of surprising compactness and the chemist is able to offer the journalist chemicals which occupy a minimum of space and achieve the maximum of efficiency.

'Tabloid' Photographic Chemicals are pure chemicals compressed into small bulk, but yet more readily soluble than the same chemicals in crystallised form. These products each contain a precise weight, so that the trouble of weighing or measuring is entirely obviated. Simply dropped into a measure-glass containing the necessary quantity of water, they disintegrate and dissolve with remarkable rapidity.

The advantages which 'Tabloid' chemicals possess in home use are intensified when development and similar operations have to be conducted under trying conditions. This wonderful compactness is shown by the illustration opposite. A complete chemical outfit of 'Tabloid' products is comfortably carried in the pocket or wallet without danger of trouble consequent on the breakage of bottles of fluids.

The fact that 'Tabloid' Photographic Chemicals will retain their activity unimpaired, with ordinary care, in all climates accounts for their successful use by the leading War Correspondents, Explorers and travellers of modern days.

Not only do 'Tabloid' Photographic Chemicals rid development, toning and other processes of all the uncertainties which accompany the use of impure chemicals and stale solutions, but...
they also remarkably simplify these operations, and impart to them a scientific precision which cannot otherwise be obtained.

All developers and chemicals essential for the practice of photography at home and abroad are issued as ‘Tabloid’ products, but to meet the special needs of those who, like journalists, travellers and war correspondents, require the utmost condensation and the widest utility in the equipment they carry, Burroughs Wellcome & Co. have issued, as the results of special research and wide experience, a developer which is universal in utility and unique in compactness. This is ‘Tabloid’ ‘Rytol’ Universal Developer. It is so compact that the materials for 88 ounces of solution occupy only the same space as one ounce of fluid. It is so universal in application that it will develop plates, films, bromide and gaslight papers as well as lantern slides with equal facility and equal certainty. It makes a bright clear solution even with water which with ordinary chemicals becomes cloudy and discoloured. The importance of this to travellers who are forced to use whatever water is available will be readily appreciated.

**CORRECT EXPOSURE IN ALL LANDS**

The journalistic photographer and correspondent has to be sure of his exposure in all parts of the globe and under a great variety of conditions. He must make certain of securing records of events which will not recur. He must be able to decide on the correct exposure quickly and under a wide variation of place and circumstance. To meet this need, Burroughs Wellcome & Co.’s photographic experts have condensed the results of their special study of the question of exposure into a pocket-book known as The Wellcome Photographic Exposure Record, and have combined with their own experience that of Journalists, War Correspondents and Travellers in all parts of the globe from the Arctic to the Antarctic. Many methods have been devised for ensuring correct
exposure—some requiring complicated calculations, others the use of elaborate tables or special apparatus. The simplest and most certain method is provided by the ingenious mechanical Calculator contained in each copy of The Wellcome Exposure Record. Its essential feature is a disc, one turn of which tells the correct exposure at a glance.

The illustration here shown makes its simplicity clear. The central white portion is the revolving disc which registers with the two fixed scales, shown in tint. Facing the Calculator are tables giving light values, so arranged that the table for each month comes to the front in its proper season. The Calculator is set by turning the disc until the subject to be photographed registers with the figure representing the light value. That one turn is all that is necessary. In addition to thus providing an easy way of calculating correct exposure, The Wellcome Exposure Record is a pocket note-book and encyclopædia of photographic information. There are three Editions—(1) Northern Hemisphere, (2) Southern Hemisphere, (3) United States of America. These editions give the information necessary for correct exposure in all parts of the world.
The massive outer case for the chest is shown on the left. It is composed of wood, decorated with hieroglyphics, amongst which are the royal cartouche and the figure of a crouching jackal.

The chest itself is depicted on the right. It is composed of plaited papyrus reeds, and is supported on a stand. The chest is divided into six compartments, each containing a beautifully-shaped medicine jar of oriental alabaster. Various medicinal roots, and a wooden spoon, the handle of which is ornamented with the head of Hathor, were discovered in the chest.

This unique Egyptian medical equipment was discovered at Thebes, and demonstrates the huge bulk and cumbersome fittings, combined with paucity of supplies, which have been characteristic of medical outfits from the days of the Pharaohs until the introduction of 'Tabloid' products. The modern medical man armed with a 'Tabloid' brand Pocket-Case carries a scientific therapeutic equipment, the equivalent of which in the drugs of ancient Egypt could be transported only by a regiment of slaves.
HISTORICAL
MEDICAL EQUIPMENTS
USED IN
MILITARY, GEOGRAPHICAL
AND
JOURNALISTIC EXPEDITIONS
Fabricius, a noted Swiss physician of the XVI century, recommended that the military chest should be furnished with no less than 362 varieties of medicine, some of which contained as many as 64 ingredients. The complexity of arrangement, the huge bulk and great weight, the liability to breakage, and the complicated inconvenience of medicine chests persisted until the introduction of 'Tabloid' Medical Equipments.
THE SMALLEST MEDICINE CHEST IN THE WORLD

This tiny gold medicine chest is fitted with twelve square medicine chest bottles containing 300 doses of 'Tabloid' Brand Medicaments, equivalent to 15 pints of fluid medicine.
'Tabloid' Medical and First-Aid Equipments
Have reached the North Pole, and as near to the South Pole as man has gone
The Medical Equipments of the present day differ notably from those of olden times in two distinct directions—diminished bulk, and in purity and efficacy of content. This improvement has only been effected in the last quarter century and mainly by B. W. & Co.; before that time, campaigning medicine chests had to be either of enormous and unwieldy size, or, if small, they could contain only the most meagre supplies.

In the Middle Ages, owing to the great variety and bulky nature of the remedial agents used, the medicine chests employed in military campaigns assumed enormous proportions, and it was not until the middle of the nineteenth century that progress was made towards reducing the bulk of campaigning medical outfits.

Size of one product of ‘Tabloid’
Cinchona Tincture, min. 30

Length of 30 min. tube of same diameter as ‘Tabloid’ product

Early explorers, particularly in Africa, found the difficulties of procuring suitable portable medical supplies practically insuperable, and the horrors of disease and death associated with their expeditions were almost beyond description.

"When I think [said the late Sir H. M. Stanley, in the course of one of his lectures] of the dreadful mortality of Capt. Tuckey's Expedition in 1816, of the Niger Expedition in 1841, of the sufferings of Burton and Speke, and of my own first two expeditions, I am amazed to find that much of the mortality and sickness was due to the crude way in which medicines were supplied to travellers. The very recollection causes me to shudder."
'Tabloid' Medical Equipments

In Arctic and Antarctic Exploration
That a very marked change has taken place can be gathered from a more recent speech of this eminent explorer and journalist, in which he said:—

In my early expeditions into Africa, there was one secret wish which endured with me always, and that was to ameliorate the miseries of African explorers. How it was to be done I knew not; who was to do it, I did not know. But I made the acquaintance of Messrs. Burroughs Wellcome & Co. As soon as I came in sight of their preparations and their works, I found the consummation of my secret wish. On my later expeditions I had all the medicines that were required for my black men, as well as my white men, beautifully prepared, and in most elegant fashion arranged in the smallest medicine chest it was ever my lot to carry into Africa.

One of the 'Tabloid' Brand Medicine Chests carried by the late Sir H. M. Stanley through 'Darkest Africa,' and brought back, after three years' journey, with the remaining contents unimpaired.

In his books, Founding the Congo Free State and In Darkest Africa, the late Sir H. M. Stanley wrote in the very highest terms of 'Tabloid' Medical Equipments.

Amongst other cases used during Stanley's travels is the famous "Rear-Guard" 'Tabloid' Medicine Chest, which remained in the swampy forest regions of the Aruwhimi for nearly four years, and more than once was actually submerged in the river. When it was brought back to London, the remaining contents were tested by the official analyst of The Lancet (London, Eng.), who reported that the 'Tabloid' medicaments had perfectly preserved their efficacy.
TABLOID
MEDICAL EQUIPMENTS

IN MOROCCO
The late Surgeon-Major Parke, Stanley's Medical Officer, in his *Guide to Health in Africa*, writes:

The medicinal preparations which I have throughout recommended are those of Burroughs Wellcome & Co., as I have found, after a varied experience of the different forms in which drugs are prepared for foreign use, that there are none which can compare with them ['Tabloid' products] for convenience of portability in transit, and for unfailing reliability in strength of doses after prolonged exposure.

At this point it is of interest to turn to the 'Tabloid' Medicine Chest, here illustrated, which was discovered near Kenya, in the Aruwhimi Dwarf Country. It was the last chest supplied to Emin Pasha, Gordon's Governor of the Equatorial Soudan. This chest was taken by Arabs when Emin Pasha was massacred in 1892, and was recaptured by Baron Dhanis, Commandant of the Congo Free State troops, after the battle of Kasongo. It was subsequently stolen by natives, and finally recovered by an officer of the Congo Free State, and returned to Burroughs Wellcome & Co.

The following is a copy of Emin Pasha's letter written to Burroughs Wellcome & Co. on receiving the chest:

Gentlemen,—I found the medicine chest you forwarded me fully stocked. I need not tell you that its very completeness made bound my heart. Articles like those could not be made but at the hand of the greatest artists in their own department. If any one relieved from intense pain pours out his blessings, they will come home to you.
'Tabloid'
Medical Equipments

IN CENTRAL AFRICA
I should like to expatiate somewhat longer on the intrinsical value, but sickness preventing me to do so. I wish you to believe me,

Yours very faithfully

Dr. Finin Pasha

Another case associated with Stanley is the raw-hide ‘Tabloid’ Medicine Case used by Thomas Stevens, the well-known journalist who travelled round the globe on a bicycle, and was the hero of other pioneer exploits in different parts of the world. Stevens was the first to greet the great explorer on his return to civilisation, and during his twelve months’ journeyings in Masailand and German East Africa, was greatly impressed with the portability and compactness of his medical outfit, and with the efficacy of its contents. In his book, *Scouting for Stanley in East Africa*, he wrote: “Stanley, in recommending these Medicines [‘Tabloid’ products], has earned the gratitude of every man who goes to a tropical country.”

A history of all the ‘Tabloid’ equipments associated with African exploration would, of itself, make a large volume, and it is only possible to make brief mention of a few other instances of their use.
'Tabloid'  
Medical Equipments  

in  
Egypt
That 'Tabloid' Equipments excel for military purposes has been abundantly demonstrated during various British and foreign military campaigns. The following is an extract from the Official Government Report, made by the Chief Medical Officer of the last British Military Expedition to Ashanti, on the 'Tabloid' Brand Medical Equipment which was supplied by Burroughs Wellcome & Co.:—

The supply of medicines, both as to quality and quantity, left nothing to be desired. There was no scarcity of anything. The 'Tabloid' medicines were found to be most convenient and of excellent quality. To be able to take out at once the required dose of any medicine, without having to weigh or measure it, is a convenience that cannot be expressed in words. Time is saved to an extent that can hardly be realised, and so is space, for a fitted dispensary, or even a dispensary table, is unnecessary. The quality of medicines was so good that no other should be taken into the field. The cases supplied are almost ideal ones for the Government. They are light, yet strong, and the arrangement of the materials and medicines is as nearly perfect as possible.

It is instructive to compare the experience of this Expedition with that of the Wolseley Ashanti Expedition of 1873, fitted out according to old-time methods. The suffering and loss of life were then terrible, for want of suitable medical equipments.

Without exception, 'Tabloid' Medical Equipments have been used in all the campaigns of the last twenty-five years, and have played an important part in combating the diseases which seem inseparable from an army in the field.

During the American war with Spain, in Cuba and the Philippines, 'Tabloid' Medical Equipments were specially ordered for, and used by, the U.S. Army and Navy.

The Expedition which, under the command of Lord Kitchener, defeated the Khalifa and reconquered the Soudan, was supplied with 'Tabloid' Medical Equipments.

An illustration of one of the 'Tabloid' Medical Equipments specially designed for, and supplied to, the British Colonial
'Tabloid' Medical Equipments in Thibet
Forces for use in the recent South African Campaign is here shown. Similar cases were designed for, and supplied to, the City of London Imperial Volunteers and Imperial Yeomanry.

One of the ‘Tabloid’ Brand Medicine Cases specially designed for, and supplied to, the troops from the various British Colonies, for use in the South African Campaign.

The equipment of the American Hospital Ship Maine, and the valuable services it rendered in connection with the campaigns in South Africa and in China, are so recent as to be within the memory of all. The whole of the medical outfit was supplied by Burroughs Wellcome & Co.

One of the ‘Tabloid’ Brand Medicine Chests specially designed for, and supplied to, the Hospital Ship Maine.
'Tabloid' Medical Equipments in China
Referring to this equipment, The Lancet (London, Eng.) reported:—

The whole of the medical outfit has been supplied by Messrs. Burroughs Wellcome & Co. One of the medicine chests supplied by this firm is in tooled leather, designed by Mr. Henry S. Wellcome.

The following description of this chest may be of interest:—

The chest is made of oak covered with Carthaginian cowhide, tooled by hand, with chaste designs successfully representing in allegory the alliance of Great Britain and America in the succour of the wounded. On the top panel appear the Union Jack and the Stars and Stripes entwined, portraits of Queen Victoria, George Washington and President McKinley; also representations of the British Lion and American Eagle. The front panel bears portraits of Lady Randolph Churchill (Mrs. George Cornwallis-West), the hon. secretary and the hon. treasurer of the fund; a picture of the ship itself; a scene representing the British Lion, wounded by an arrow which lies at his side, being ministered to by Britannia and Columbia. A frieze is formed by a representation of an American Indian wampum, upon which Brother Jonathan and John Bull are depicted hand-in-hand. The panel at each end of the chest represents Britannia and Columbia supporting a banner bearing the Red Cross, and on the panel at the back the British Regular and Colonial Lancers are shown charging a Boer force. Keble's line, "No distance breaks the tie of blood," and Bayard's phrase, "Our kin across the sea," are inscribed on the chest. This beautiful cabinet contains a number of smaller cases fitted with 'Tabloid' and 'Soloid' products and 'Tabloid' Hypodermic Outfits, and is in itself a compact and complete dispensary.

In addition to their adoption by military and naval authorities, 'Tabloid' Medical Equipments have been used by the War Correspondents who have accompanied all modern expeditions.
The conclusive proofs afforded by all these campaigns and expeditions of the incomparable utility of the B. W. & Co. equipments, under circumstances of the most trying nature, naturally led to their still more extensive employment in South Africa during the late war. The trying conditions of transport and the climatic influences were just such as 'Tabloid' Equipments and 'Tabloid' Equipments only, had been proved, by earlier experience, to be capable of resisting. Constant references were made to the adequacy and efficiency of the equipments supplied.

A WAR CORRESPONDENT'S EQUIPMENT

The Late G. W. Steevens' 'Tabloid' Brand Medicine Chest

An equipment of the greatest personal interest is the chest here illustrated. It was formerly the property of the late G. W. Steevens, and used by him throughout the war in Greece, the two Soudan campaigns, and his journey in India. In the South African War the same chest did good service until this brilliant writer's life was brought to a premature end during the siege of Ladysmith.
IN ARCTIC AND ANTARCTIC EXPLORATION

In the hitherto unsuccessful endeavours to reach the Poles, and in the exploration of Arctic and Antarctic lands, 'Tabloid' Medicine Chests have taken a pioneer position, and continue to hold supremacy.

The 'Tabloid' Belts and other Medical Equipments supplied to Nansen for his journey in the Fram, and those used by the Jackson-Harmsworth Arctic Expedition, have been added to the historic collection of Burroughs Wellcome & Co.

One of the 'Tabloid' Brand Medicine Belts carried by Nansen on his Arctic Expedition.

The Italian Arctic Expedition, commanded by the Duke of the Abruzzi, found that, despite the fact that the northern latitude of 86° 33' 49" was reached, the

One of the 'Tabloid' Brand Medicine Cases carried by the Duke of the Abruzzi's Polar Expedition.

'Tabloid' Medicine Chests and Cases with which the Expedition was equipped were brought back with their remaining contents quite unaffected by the rigour of the climate.
Commander Peary, to whose record stands the achievement of reaching the farthest northern latitude, writing from Etah, Greenland, reports:—

Burroughs Wellcome & Co. 'Tabloid' Medicine Cases and supplies have proven invaluable.

The entire medical outfit of the National Antarctic Expedition was furnished by Burroughs Wellcome & Co.,

and on the return of the Discovery, with the members of the Expedition on board, the medical officer made a highly satisfactory report on the 'Tabloid' Medical Equipment.

In August, 1901, the Discovery left England, and, in the following January, crossed the limit of the Antarctic Circle.
Having passed the farthest eastward point attained by Ross sixty years before, the explorers discovered a new land, which they named King Edward VII. Land. One of the most noteworthy features of the Expedition was the arduous sledge journey undertaken by the commander, Captain Scott, accompanied by Lieutenant Shackleton and Dr. Wilson. This journey over the ice occupied three months, and the latitude of 82° 17' South was reached.

On sledge journeys the question of weight is of great moment. The traveller on such occasions must carry but the barest necessaries, and of these the lightest procurable. The medicine chest is an important item, for upon the efficacy of its contents the lives of the explorers may depend. Every drug carried must be of the utmost reliability, in the most compact state, and capable of withstanding an extremely low temperature.

That 'Tabloid' Medical Equipments fulfil all requirements has been proved again and again. They enable the traveller to carry a comparatively large supply of medicines, and may be used under conditions which would render the carriage and administration of ordinary preparations impossible.
To the enthusiasm of Sir Clement Markham, K.C.B., then President of the Royal Geographical Society, the successful organisation of the National Antarctic Expedition was largely due. Referring to the 'Tabloid' Medical Equipment of the *Discovery*, he reports:

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National Antarctic Expedition,
1, Savile Row,
Burlington Gardens, W.
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The Medical Equipment of the Exploring Ship of the National Antarctic Expedition was entirely supplied by Messrs Burroughs Wellcome & Co., and, proved in every way most satisfactory.

The few other drugs and preparations which were taken with the Expedition were only supplied for purposes of experiment, and, can in no way be regarded as part of the medical equipment.

Clement A. Markham

27 April 1905
Dr. Kættlitz, the Senior Medical Officer to the Expedition, reports:—

**Discovery, Antarctic Expedition**

The Medical Equipment of the *Discovery* Exploring Ship, of the National Antarctic Expedition, was entirely supplied by Messrs. Burroughs Wellcome & Co., mostly in the form of ‘Tabloid,’ ‘Soloid’ and ‘Enule’ preparations.

The preparations proved in every way most satisfactory, and there was no deterioration of any of them, in spite of the conditions of climate and temperature to which they were exposed. The few other drugs and preparations which were taken with the Expedition were only taken for purposes of experiment.

The cases supplied by Burroughs Wellcome & Co. to us have also been found satisfactory; the small leather one was very useful upon sledge journeys, being light and compact. The No. 251 ‘Tabloid’ Case was used for some weeks at the camp eleven miles north of the ship, when the whole ship’s company was engaged in sawing and blasting the ice, and it was found very convenient.

The other cases were useful in our cabins, etc., for a handy supply.

**EXPERIENCE OF AN ENTERPRISING JOURNALIST**

Mr. Julius Price, the special artist and correspondent of the *Illustrated London News*, reports that he carried his ‘Tabloid’ Medicine Case over 30,000 miles through Arctic regions, across Siberia, through China, Japan and America. Despite the severe wear and tear of this great journey, the case has suffered little, and the remaining contents are quite unaffected by exposure to every variety of climate.
Two typical reports on ‘Tabloid’ Equipments are appended:

Extract from the report of R. F. Rand, Esq., M.D., F.R.C.S., Principal Medical Officer, British South Africa Company:

We have had Burroughs Wellcome & Co.'s “Congo” Chests, fitted with ‘Tabloid’ medicines, in daily use during the occupation of this country. They have proved of inestimable service.

Extract from the report of the late W. H. Crosse, M.D., M.R.C.S., Principal Medical Officer, British Royal Niger Company:

All these ‘Tabloid’ drugs are so good it is impossible for me to speak more highly of one than another. They are all of the very best quality, each drug is accurately described, and reliable. To the traveller these preparations are simply invaluable, and I would strongly advise every one coming out to the Tropics to get a full supply of ‘Tabloid’ medicines.

Burroughs Wellcome & Co. have for many years made a special study of the requirements of travellers and expeditions, not only in respect of compactness, portability and permanence, but also in the selection of remedies necessary to combat the maladies prevalent in every clime, from the Arctic to the Antarctic.

‘Tabloid’ Brand Medicine Cases contain, in a small space, a complete outfit of pure drugs in doses of extreme accuracy. They can be carried in the pocket, in the carriage or motor-car, or on the cycle, their contents being always ready for use in emergencies. They are specially valuable to the country practitioner, who is often called upon to cover long distances, and who would experience great difficulty in carrying or obtaining supplies of such medicines as he may desire to administer promptly, were it not for the convenience and portability of ‘Tabloid’ Brand Medicine Cases.
Pleated Compressed Bandages and Dressings were originated and introduced by Burroughs Wellcome & Co.

'TABLOID' Bandages and Dressings provide the means of applying strictly scientific treatment, and in cases of accident enable those on the spot to render first-aid treatment should medical assistance be unavailable or delayed. Their use in such emergencies may prevent serious complications which frequently arise in minor accidents, and from the neglect of wounds, abrasions, etc.

Graphic representation showing relative bulk of an ordinary and a 'Tabloid' Bandage, each 6 yds. × 2-1/2 in. One-half actual size

'TABLOID' Bandages and Dressings are made of materials of the finest quality, very highly compressed. Each is enclosed in an efficient protective covering, thus securing freedom from all risk of contamination. For all purposes, whether at home or when travelling, they are superior to the ordinary varieties and their advantages are obvious.

NOTE.—A further important advance, original with B. W. & Co., is the issue of these 'Tabloid' Bandages and Dressings—sterilised. When ordering, please specify sterilised if so required.
"The strong thing is the just thing."

Carlyle

‘Tabloid’ marks the work of Burroughs Wellcome and Company.

The use of the word is to enable the physician, chemist and patient to get the right thing with one short word, instead of the firm’s long name.

If another maker applies the word to his product, the act is unlawful. ‘Tabloid’ is our trade-mark.

If a vendor disregards it, in dispensing or selling, the act is unlawful—for the same reason.

We prosecute both offenders rigorously, in the interest of physicians, chemists, patients and ourselves.

Please inform us of any instance of either offence.

Burroughs Wellcome & Co.
The small black rectangle represents the premises occupied when Mr. Sudlow joined the firm. In twenty-five years the premises occupied have increased more than 800 times, as represented by the white rectangles above.
In honour of ROBERT CLAY SUDLOW
General Manager of BURROUGHS WELLCOME & CO
and in commemoration of his loyal and efficient services to the firm for more than a quarter of a century
Awarded by HENRY S. WELLCOME
Principal

Obverse and Reverse of a Gold Commemoration Medal
Specially designed and struck in honour of Robert Clay Sudlow, and presented to him in commemoration of his loyal and efficient services to the firm for more than a quarter of a century
By Chemical Industry We Thrive
THERE'S A TIME FOR WORK

WELFARE WORK

AND A TIME FOR PLAY
Bird's-Eye View of Wellcome Club and Institute Buildings and Grounds
“And all this house was peopled fair
With sweet attendance, so that in each part
With lovely sights were gentle faces found,
Soft speech and willing service; each one glad
To gladden, pleased at pleasure, proud to obey.”

Sir Edwin Arnold
"The true veins of wealth are purple—not in rock, but in flesh—and the final outcome and consummation of all wealth is in producing as many as possible full-breathed, bright-eyed and happy-hearted creatures."

*Ruskin*
OBJECTS OF THE WELLCOME CLUB AND INSTITUTE

From the first, Welfare Work has been a special feature with the firm. This Club and Institute is a part of the general scheme, and was founded for the benefit of the employees of Burroughs Wellcome & Co. who number more than sixteen hundred of both sexes, including a large number of professional scientific workers. The premises consist of the old manor house formerly known as Acacia Hall, together with other buildings which provide libraries, reading rooms, assembly rooms, a gymnasium, and extensive grounds through which the river Darent runs.

The objects of the club are—to promote harmony and happy social intercourse amongst the employees and to supply them with a pleasant resort outside of business hours—to encourage mental and physical recreation by means of music, literary and other entertainments, technical and other instruction classes with occasional lectures, and athletics, field sports and games.

The Executive Committee of the club regulates the conduct of the club and controls the use of the river for boating, swimming, fishing, etc., as well as the library, museum, baths, games and various other features. All suitable technical journals and a large selection of newspapers, magazines, etc., are available in the reading rooms.

All employees willing to attend the Dartford Technical Institute have their fees paid, and the firm gives prizes through the Institute for proficiency in the technical subjects in which it is interested.
CLUB HOUSE FOR MEMBERS OF THE STAFF

Containing music room, ladies' sitting, dining, writing and dressing rooms; gentlemen's sitting, dining, writing, and smoking rooms; secretarial offices, and committee rooms.
of the most interesting events which have taken place in the town of Dartford for many years past was the opening of the Wellcome Club and Institute. When it is remembered that the prosperity of the town is so closely identified with that of its greatest industry, it is not surprising that Saturday's event evoked so much enthusiasm throughout the district. Messrs. Burroughs Wellcome & Co. have always been recognised as model employers, and the events of the day bore eloquent testimony not only to this kindly consideration of the welfare of their employees, but also to the precision, exactness and marvellous organisation which has always characterised their work.

The club has been founded by Mr. Wellcome, the head of the firm, to provide the employees with opportunities for recreation, and for promoting technical education. With these ends in view, he acquired the Manor House, commonly known as Acacia Hall, together with its beautiful and extensive grounds, through which flows the river Darent. The manor house itself and the adjoining buildings have been elaborately fitted and furnished to meet the new requirements. A large gymnasium and extensive baths and lavatories with the most perfect modern fittings have been built, and the grounds beautifully laid out for the purposes of enjoyment and recreation.
The Library Building and Club House for Lady Employees

No pains or expense have been spared in any direction, and it is doubtful if there is any body of employees in the world which can boast of so magnificent a club and pleasure park.

**The Day's Proceedings**

The proceedings on Saturday were favoured with perfect weather, and great credit is due to those responsible for the arrangements, which were admirably carried out. At 11 a.m., immediately after the special train conveying the London visitors steamed into Dartford station, the day's programme commenced with a fire drill at the firm's works and laboratories. From the station platform an excellent view was obtained. Sir Hiram Maxim, the distinguished engineer, who was present, timed the display and stated that the streams of water from four principal points were in full play within two minutes of the sounding of the alarm which called out the firemen.

**Service at the Parish Church**

The company then proceeded to the historic old Parish Church, which was quickly filled by the visitors and the firm's employees. The service, conducted by the Rev. E. P. Smith, Vicar of Dartford, was, although simple and undenominational in character, a beautiful and impressive ceremony, in which were appropriately included the following texts:

"Bear ye one another's burdens, and so fulfil the law of Christ."
—Gal. vi. 2.

"And that ye study to be quiet, and to do your own business and to work with your own hands, as we commanded you; that ye may walk honestly towards them that are without, and that ye may have lack of nothing."—1 Thess. iv. 11 and 12.

The service over, the party, headed by visitors and the principal members of the staff, accompanied Mr. Wellcome from the church to the gates of the club, where Mr. Sudlow, the general manager, presented his chief with a golden key.
Club House for Gentlemen Employees

Containing sitting, writing, smoking, tea rooms, etc.
Mr. Sudlow said: "Mr. Wellcome, the members of the management in London and at Dartford beg your acceptance of this key as a memento of this very interesting occasion."

Mr. Wellcome unlocked and swung open the gates, saying: "I declare this Club and Institute now open, and may God bless and prosper it." The visitors were then conducted over the club buildings and through the grounds, which were much admired.

The Luncheon

At 12-30 an adjournment was made for luncheon. About eleven hundred sat down to an excellent repast in an enormous marquee erected in the club grounds, all the company except a few visitors being employees and wives of employees. Mr. Wellcome acted as chairman and Mr. Sudlow as vice-chairman. After the loyal toasts—

The Toast of the Day

"The Employees—Success to the Wellcome Club and Institute"

The Chairman said: "Most of those assembled here to-day are employees of the firm. People often speak to me with wonderment at the good relations which exist between the firm and its employees, and the explanation which I have always been able to give in reply to such comments is that there is mutual consideration. It is and always has been the policy of the firm to consider the welfare of everyone associated with it, and by our bearing, our warmth of feeling, and our interest in the welfare of our employees we have won consideration from them, and we have a corps of employees, which, I am proud to say, I believe surpasses any similar body of people employed by any other firm in the world."
Gymnasium and Assembly Room

Fully equipped with all apparatus necessary for the practice of indoor athletics
"By our care in selecting those who possess not alone the required talents and qualifications, but who are also in hearty sympathy with us in our unique work, and by fostering mutual regard, we secure not only the hand work, but the heart work, of those who are associated with us. We have not only efficiency and devoted zeal amongst our great chiefs who form our Managerial Staff, and in the distinguished Directors of my Chemical Research Laboratories and of the Physiological Research Laboratories, but also expert workers as Heads of Departments, and again in the personnel of their staffs, and yet again amongst the rank and file. I must pay a special tribute to the efficiency of the Ladies' Departments, so ably presided over by the talented Lady Superintendent, ably supported by a highly-qualified staff of lady assistants, some of whom are efficient scientific workers.

"It is peculiarly gratifying to me to-day, in inaugurating this club, to feel that I meet with those associated with me heart to heart. A strong spontaneous expression has come to me from the employees which accords perfectly with my own ideas and sentiments that this club should not be regarded as a charitable institution, but should be self-supporting. I want it to be a resort and meeting place for the promotion of harmony and happiness amongst the employees—an institution for mental and physical recreation and development, where all shall be knitted closer together in personal friendship. I am certain that a charitable institution, or what is usually so-called, is not what we want. None of the employees of Burroughs Wellcome & Co., I am thankful to say, are in need of charity. They are self-respecting, self-reliant, and self-supporting, and I want them always to continue so. I am doing, and shall do, all I can practically to facilitate the work of organisation and equipment. The premises, suitably furnished and maintained, I am very gratified to offer for the purposes of the club and institute.

"I rely upon the members working hand in hand and heart to heart to make a success of this institution on a self-supporting
B R I D G E  O V E R  T H E  D A R E N T

Connecting the lawn with the orchard, garden and playing fields
basis. It is my strong desire that every employee will become a member of the club and institute. We shall have an administrative committee, but also every member of the club should regard himself or herself as a member of a grand committee with duties to perform. It is essential to the success of this club that the members should all strive to bury every selfish desire in order to promote the happiness of their associates. We had some beautiful texts this morning during the inaugural service at the church. I want to recall one—'Bear ye one another's burdens.' We know that those who seek their own selfish gratification in this world are the least happy, and those who try to bear each other's burdens and to assist each other, get the greatest happiness to be found in this life. Following such a course requires self-sacrifice, and I hope everyone will keep this text in view, and that it will be the first and constant thought and endeavour of members of this club and institute to make others happy.

"I cannot sufficiently express to the members of the Management at London and Dartford, who have presented me with a golden key with which to unlock the gates of this club and institute, how deeply touched I am by this expression of their kindness. I am always receiving kind consideration and support from these, my valued associates. I shall always treasure this jewel. Those beautiful giant storks, in antique bronze, which grace the fountain immediately within the entrance to the grounds, were presented to us by Mr. Lloyd Williams, of the Works Management. We all deeply appreciate his generous gift of these superb works of art. Let us drink heartily the toast 'The Employees, and Success to the Wellcome Club and Institute,' and I associate with the toast the name of Mr. R. Clay Sudlow, our esteemed General Manager, the oldest member of our staff, and my invaluable right-hand support in the direction of this great business.'

MR. R. CLAY SUDLOW replied: "Before I refer to the toast that has been so very kindly proposed from the chair,
THE GARDEN CREEK

Is a tributary of the Darent, dividing the orchard from the kitchen garden
I believe I shall be expressing the feelings not only of the employees, whom I am very proud to represent, but also of the visitors who have honoured us with their presence, when I say how glad we are to have Mr. Wellcome with us to-day in renewed health. He is the hardest worked and the hardest working member of our large community, and it is a matter for very sincere rejoicing that, after another twelve months of incessant thought and labour in the conduct of this huge and ever-increasing business, he is able to preside over us on this unique occasion, this red letter-day in the annals of the firm, with his accustomed force and vigour.

"I cannot but think that the knowledge gained by us here this morning as regards the extent of the provision made for our comfort and happiness, of the advantages and privileges secured to us by this club and institute is a perfect revelation. The idea of this club, as we all know, originated with Mr. Wellcome. It is absolutely his creation, and we owe him a very deep and a lasting debt of gratitude for the initiation of the scheme, and for the immense amount of thought and study that he has so ungrudgingly given, in order to make this club perfect and complete in every detail.

"If I mistake not, our visitors have already come to the conclusion that to be an employee of the firm of Burroughs Wellcome & Co. is to occupy a very happy and a very privileged position. As the oldest member of that body—next year I shall attain my majority in Mr. Wellcome's service—I am glad to assure our visitors that their conclusion is an absolutely just one. Mr. Wellcome has proved himself a master whom it is at once a pride, a pleasure, and an honour to serve, and there are many of us here present today who, having given him our best, feel that we fall very short of the service that we would desire to render him.

"Mr. Wellcome, you have told us that you do not want, and that you do not look for thanks, but I do hope that you will
The Sports Field
The first of the playing fields
allow us to express our very deep appreciation of your generous kindness in placing this club at our disposal, of the personal feeling you have thrown into the undertaking by loaning to the club many of those treasures that you have been at such pains during many years to collect, and of your friendly goodwill in allowing us, in accordance with our unanimous wish, to call this club by your own name. We sincerely hope that you will be spared for many years to witness, and to rejoice in, the complete fulfilment of the high ideal that you have formed with regard to your employees, and may that realisation be brought about in a great measure by means of the Wellcome Club and Institute, so happily and so successfully inaugurated to-day."

**Toast: "The Firm."**

Professor John Attfield, F.R.S., said: "I have the great honour of asking you to drink to the continued prosperity of the firm of Messrs. Burroughs Wellcome & Co. I have known the members from the foundation of this great firm—the firm which began in so small a way, and which has developed to such enormous proportions. I assume that everyone present is interested in the leading work of this firm, which is the association of scientific and commercial pharmacy.

"The firm is distinguished in many ways. It is distinguished for its progressive spirit. I look at the various journals of pharmacy and medicine that are published in our Colonies and India, as well as those published in the United Kingdom, and I never take up one but I find the mention, and sometimes a very long mention too, of this great and powerful and successful firm. A second great characteristic of the firm is the entire reliability of all the articles it sends out. I am sure no one could have followed its development without noticing the wonderful originality that has always characterised it; and I may add that
all this is chiefly due to the present head of the firm, Mr. Wellcome, and his wonderful skill in organisation in every department.

"Talking of organisation, we who are here to-day as visitors, must, I am sure, have been charmed by the evidence of organisation which we have seen from the time we left Charing Cross till the present moment. The great comfort of the arrangements of that special train that was provided for us; and, when we had arrived at Dartford station, the very interesting fire alarm drill, with its wonderful evidence of promptitude and precision; the extremely beautiful and, I may add, poetic inauguration service at the church, and the interesting, though it has been termed formal, opening of the Club and Institute, by Mr. Wellcome. I was very proud indeed, seeing that I have known the principals of the firm for so many years, and have watched their progress, to be the first one welcomed on this occasion by Mr. Wellcome when he opened the gates with that beautiful golden key, which has been presented to him by his managers.

"I feel sure you will respond to this toast for, perhaps, a deeper reason than I have offered you up to the present time, and this is the spirit which characterises this firm from beginning to end, and which I take to be, first, the promotion of scientific and commercial research, and secondly, the promotion of good-fellowship amongst all the employees. Now, here I venture to speak, as Mr. Wellcome said, from the heart to the heart, because of my extreme interest in all that relates to research in pharmacy and the promotion of friendly intercourse amongst those who follow that calling. It is now 36 years since a few of us assembled in a very small room at Newcastle, and ventured to start an association [The British Pharmaceutical Conference] having objects which I find here to-day reflected in one of the greatest firms of the world—that is, the promotion of research in connection with pharmacy, and the promotion of
SITTING ROOM
Staff Club House
good fellowship amongst the followers of that calling. I allude to it as I want to remind you once more that the objects of that society, which we ventured to set forth as objects that could be followed by the principals and by the employees of every pharmacy in this country, are the principles which are so successfully prosecuted by the firm of Burroughs Wellcome & Co.

"I cannot but rejoice and congratulate Mr. Wellcome on the fact that, in addition to his organisation of scientific and commercial research coupled with good fellowship, as indicated by this club, enormous financial success, which has been abundantly deserved, has been realised.

"I must allude, before I sit down, to one other great pleasure that has forced itself upon me, though I must not say much about it, because a compliment to myself is in it, and that is that in every department of this great firm I find myself here to-day welcomed by my old pupils. Their merits have been realised by this firm, and I can assure them, though I am perfectly certain they need no such assurance, that the men they have obtained from the Bloomsbury Square Laboratories and Lecture Rooms were some of our brightest ornaments during the whole time I was connected with that Institution, viz., from 1863 to 1896. I come here and I find Mr. Lloyd Williams, Dr. Jowett, Mr. Carr, and many others—but really they are too numerous to mention—all old students who distinguished themselves at Bloomsbury Square, now occupying prominent and responsible positions in this firm.

"On all these grounds, and you will see I have given you a wealth of reasons, I heartily offer the toast to Messrs. Burroughs Wellcome & Co., and I will associate with the toast the name of the chief ornament of the firm, Mr. Henry S. Wellcome."

Mr. WELLCOME replied: "No one could fail to be deeply gratified by the honour Professor Attfield has done to our firm
Music Room
Staff Club House
and to me. I, as a youth, took my first lessons in chemistry from Professor Attfield's text-book. This great master led my first steps in gaining a knowledge of chemistry, and I feel it a peculiar honour that he should have paid such a tribute to the results of the efforts to which I have devoted my life. I am obliged to acknowledge that there are material grounds for Professor Attfield's tribute to the successful work of the firm. Our strides have not been spasmodic, they have been steady. Each succeeding year has shown a substantial advance of about one hundred additional employees.

"Professor Attfield touched upon one feature of our work which is especially dear to me, that is my two Scientific Research Laboratories. We are sometimes asked to say more about what is being done there. Our products constantly indicate to the profession important results. But you are not likely to learn the details of all our doings in the outside world. There is much extremely important work going on in these research laboratories of the highest scientific and practical importance—work that is satisfactory to us as marking progress, and which promises us still greater advancement. The greatest work is sometimes done silently."

Toasting: "The Press and Visitors."

The Chairman said: "We are honoured by the presence of distinguished visitors from the four quarters of the globe, and some of these are old and intimate personal friends of mine, who have strengthened me in my work by their counsel and their friendship. There are those of the Press here who have not failed when we have done anything that merited it to chronicle it, and this has been greatly to our advantage. We have only asked to be treated on our merits, and we have been treated justly by the Press. I will ask you to drink very heartily to the toast of The Press and the Visitors, connecting with the toast the name of Dr. Creasy, of the British Medical Journal."
Dr. Creasy replied: "It is a very great privilege to be the guest of a firm like this. It is a privilege, moreover, because this firm is one that has gained, and gained rightly, the highest repute in the world for good scientific work of every description. What the Press says is only what is due to the splendid work that is done by the firm."

**Entertainments**

Shortly after luncheon an adjournment was made to the sports field for a pretty floral maypole dance by a group of lady employees. This was followed by athletic sports, most of the events of which were very keenly contested and watched with intense interest. Tea was then served in the great marquee.

In the evening there were well-contested aquatic sports, a graceful and artistic musical bicycle ride by lady employees, the cycles being elaborately decorated with flowers. The presentation of the prizes followed, and the day's entertainment culminated in a magnificent display of fireworks and an illumination of the grounds. The twinkling of hundreds of fairy lights effectively arranged throughout the grounds, the glow of Chinese lanterns everywhere among the trees, and the flood of coloured light from the fireworks, combined to form an entrancing spectacle, which was further enhanced by the quivering reflections in the river and lake. It formed a delightful setting to the final events of a day which was as enjoyable as it was unique in the history of chemical industry.

The absolute precision with which every item in the programme, from early morning until nearly midnight, was carried out, was evidence of a most complete and painstaking organisation, and was commented upon by scientific visitors as typical of the firm's remarkable scientific exactness in other directions.
Maypole Dance by Lady Employees
Wellcome Club and Institute
Tug of War
Inter-departmental—Wellcome Club and Institute
Dumb-Bell Exercises
By Members of the Gymnastic Club—Wellcome Club and Institute
Gymnastic Exercises
By Members of the Gymnastic Club—Wellcome Club and Institute
QUARTER-STAFF DISPLAY
By Members of the Gymnastic Club—Wellcome Club and Institute
Aquatic Sports
By Members of the Swimming Club—Wellcome Club and Institute
QUARTER-MILE HANDICAP RACE

By Members of the Athletic Club—Wellcome Club and Institute
Obstacle Race

By Members of the Athletic Club—Wellcome Club and Institute
Hockey Match

By Members of the Hockey Club—Wellcome Club and Institute
Boating on the Lake
Wellcome Club and Institute
WINTER SCENE
In the Grounds of the Wellcome Club and Institute
WHOLESALE CHEMISTS’ AND DRUGGISTS’ CRICKET CHAMPIONSHIP, LONDON

Won by the WELLCOME CRICKET CLUB five years in succession.

During these five years the Club’s record in the championship matches was—

Won 31  Drawn 1  Lost 3

At the end of the five years the Club withdrew from competition.
THE GREEK TEMPLE

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