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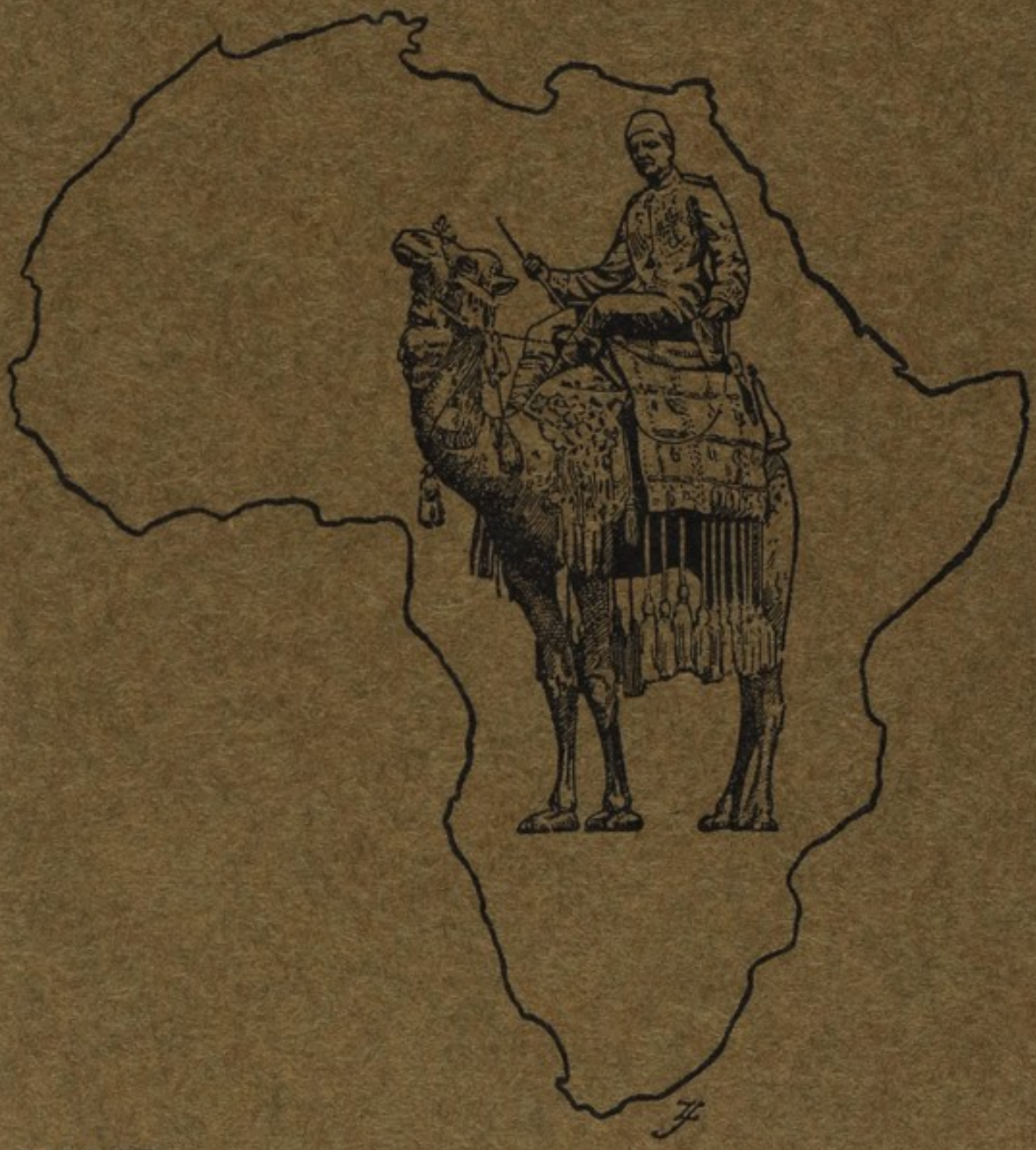


DINNER
TO
DR. BALFOUR

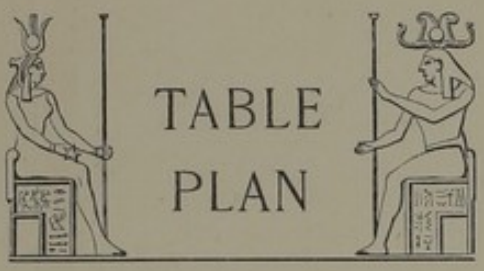


TABLE PLAN

List of Guests and Key to Table Plan.

ABRAHAM, Dr. PHINEAS. 15 B
ARMSTRONG, Prof. H. E. 2 B
ATTFIELD, Prof. JOHN. 7 B

BALFOUR, Dr. ANDREW. 4 A
BARNARDO, Dr. T. J. 23 C
BLAKE, M. B. 20 C
BRODIE, Dr. T. G. 24 B
BROWN, Dr. HORACE T. 14 B
BROWNE, J. H. BALFOUR. 3 B
BUDGE, Dr. WALLIS. 25 B

CANTLIE, Dr. JAMES. 9 B
CHRISTALL, GEORGE 11 D
COBBETT, Dr. L. 23 D
CREASY, Dr. L. ELIOT 17 B
CROSSE, Dr. W. H. 2 D

DANIELS, Dr. C. W. 3 D
DAVIES, Dr. D. S. 16 D
DOWSON, Dr. W. 13 D
DRUCE, G. CLARIDGE. 6 D
DUCKWORTH, Sir DYCE. 25 D

ELFORD, PERCY. 15 D

FAGAN, C. E. 17 D
FISHER, W. J. 2 C
FLETCHER, Dr. A. CHUNE. 22 D
FOULERTON, Dr. ALEX. G. R. 5 B

GREY, W. E. 7 C
GUBB, Dr. ALFRED S. 7 D
GUEST 8 C

HEWLETT, Prof. R. TANNER. 19 B
HILL, AUBREY T. 5 D
HOPKINS, Dr. F. G. 14 D
HOWES, Prof. G. B. 6 B
HUGGINS, Sir WILLIAM. 2 A
HUMPHREY, JOHN. 16 C

JOHNSON, H. FINNIS. 1 C
JOWETT, Dr. H. A. D. 21 B

LEITH, Prof. R. F. C. 18 D
LE SAGE, J. M. 4 C
LINSTEAD, EDWARD F. 5 C
LITTLEJOHN, Dr. HARVEY. 23 B

MACEWAN, PETER. 17 C
MANSON, Dr. PATRICK. 24 D
MELLANBY, JOHN. 10 D
MOORE, JOHN. 6 C
MORRIS, Dr. MALCOLM. 19 D
MURRELL, Dr. WILLIAM. 10 B

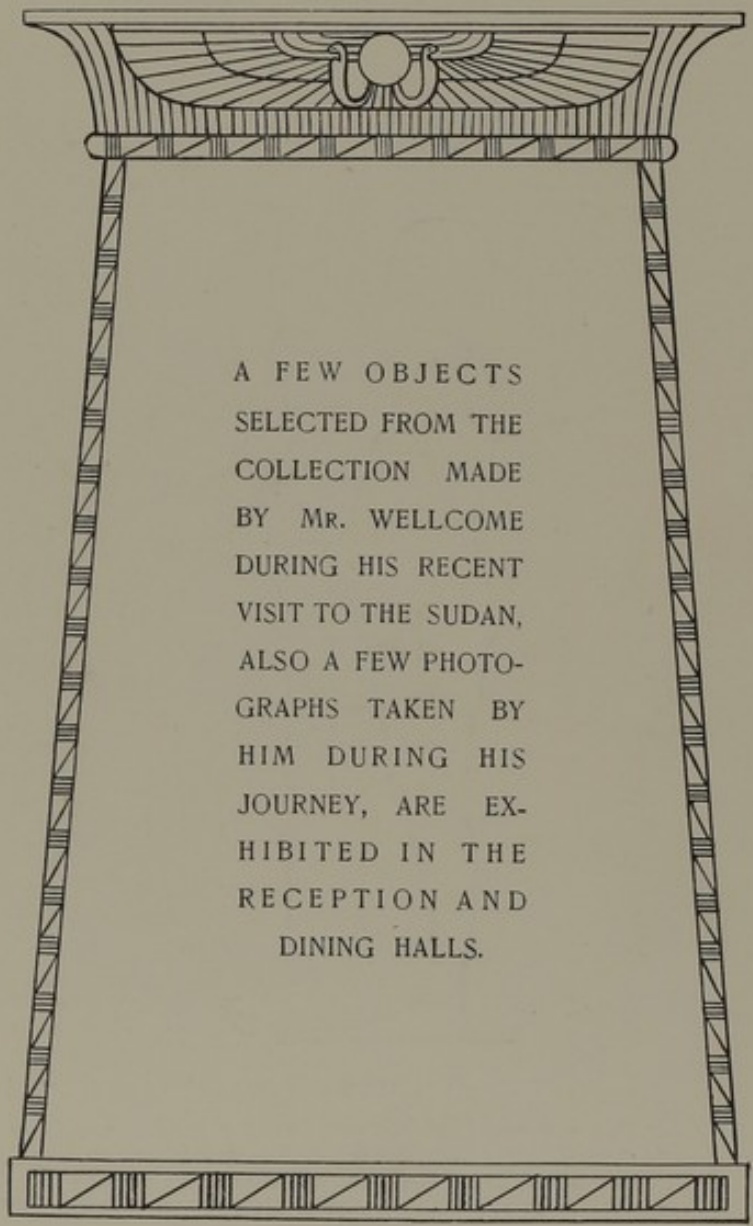
PEEL, Hon. GEORGE. 22 C
PIPER, W. G. 9 D
POST, M. 20 C
POWELL, Sir R. DOUGLAS. 1 B
POWER, Dr. FREDK. B. 23 B
PRIESTLEY, Dr. JOSEPH. 21 B

RICHARDS, JOHN MORGAN. 11 C
ROBBINS, E. 18 C
ROBERTS, Dr. DAVIES. 4 D
ROBINSON, A. C. 12 D

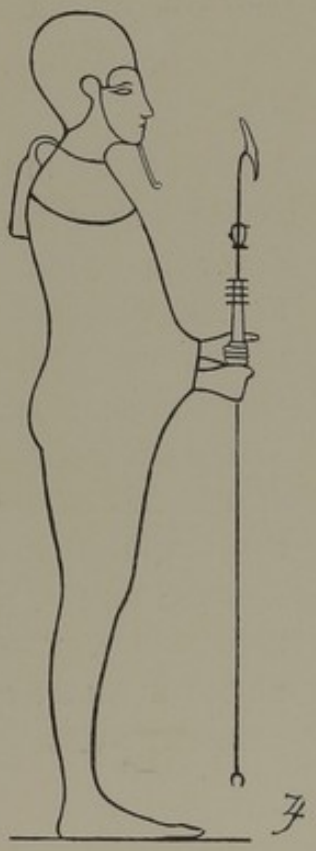
SALAMON, A. GORDON. 8 B
SCOTT, A. 9 C
SENIOR, WILLIAM. 3 C
SHARPE, Prof. R. BOWDLER. 20 B
SHAW, Dr. W. VERNON. 16 B
SMITH, HUGH C. 4 B
SMITH, J. COLLETT. 18 B
STANLEY, Sir HENRY M. 1 A
STARLING, Prof. E. H. 1 D
SUDLOW, R. CLAY. 12 C

TAYLOR, Surg.-Genl. Sir Wm. 5 A
THANE, Prof. G. D. 22 B
THRESH, Dr. JOHN C. 12 B
TIMES, M. 23 C
TYRER, THOMAS. 13 C

WAKLEY, Dr. THOMAS, Junr. 20 D
WALLER, MAURICE. 21 C
WALLIS, Dr. F. C. 21 D
WANT, W. PHILIP. 15 C
WATSON-WILL, W. 14 C
WELD, C. CORNING. 8 D
WELLCOME, HENRY S. 3 A



A FEW OBJECTS SELECTED FROM THE COLLECTION MADE BY Mr. WELLCOME DURING HIS RECENT VISIT TO THE SUDAN, ALSO A FEW PHOTOGRAPHS TAKEN BY HIM DURING HIS JOURNEY, ARE EXHIBITED IN THE RECEPTION AND DINING HALLS.



PTAH

Ptah was considered the most ancient of the Egyptian deities. He is called 'Father of the mighty fathers,' 'Father of the beginnings,' 'He who created the sun egg and the moon egg,' 'The creator of his own image.'

DINNER

TO

DR. ANDREW BALFOUR

DIRECTOR OF THE

CHEMICAL AND BACTERIOLOGICAL RESEARCH LABORATORIES

OF THE

GORDON MEMORIAL COLLEGE, KHARTOUM

HENRY S. WELLCOME

IN THE CHAIR

PRINCES' RESTAURANT

PICCADILLY

MONDAY, DECEMBER 8TH, 1902

Henry M. Stanley Dec 8. 1902

Andrew Balfour

R. Douglas Powell

L. M. Balfour Burne.

Henry L. Armstrong

Patrick Manson

Ronald Ross

Dru Drury

W. St. Wood

A. Chaine Fletcher.

THE CHEMICAL
AND
BACTERIOLOGICAL RESEARCH LABORATORIES
OF THE
GORDON MEMORIAL COLLEGE

These Laboratories are designed—

To promote technical education;

To promote the study, bacteriologically and physiologically, of tropical disorders, especially the infective diseases of both man and beast peculiar to the Sudan, and to render assistance to the officers of health and to the clinics of the civil and military hospitals;

To aid criminal investigations in poisoning cases (which are frequent in the Sudan) by the detection and experimental determination of toxic agents, particularly the obscure potent substances employed by the natives;

To carry out such tests in connection with water, food-stuffs, and health and sanitary matters as may be found desirable;

To undertake the testing and assaying of agricultural, mineral and other substances of practical interest in the industrial development of the Sudan.

The woodwork and fittings are executed in English oak, and Indian teak, previously baked at a high temperature for several months to season them suitably for the Sudan climate. Great care has been taken to make the equipment complete in every detail, and in accordance with the highest scientific standards.

VINS.

HOCK.

Hochheimer 1893.

CLARET.

Château Duplessis, Vintage 1887.

CHAMPAGNE.

Louis Roederer, spécial cuvée,
extra sec, 1893.

G. H. Mumm, extra sec, 1895.

BURGUNDY.

Corton 1887.

PORT.

Thompson & Croft's Old Tawny.

Grande Fine Champagne
"La Grande Marque."

CAFÉ. LIQUEURS.

MENU.

Huîtres Royales Natives.

Potage Edouard VII.
Crême Marquise.

Suprême de Sole Yvette.
Whitebait à la Diable.

Poularde à l'Ambassadrice.
Cœur de Filet de Bœuf Brillat-Savarin.
Pommes de Terre à la Voisin.

Cailles de Vigne à la Broche.
Salade Mâche, Céleri, Betterave.

Fonds d'Artichauts au Parmesan.

Turban de Pêches Impératrice.
Biscuit Glacé Tortoni.
Corbeille de Friandises.

Dessert.

MUSIC.

Valse Lente	"Tout Passe"	*Berger*
Serenata (pizzicato)...	"Loving Hearts"	*Kaps*
Song	"Violets"	*Wright*
Fantasia	From "Country Girl"	*Monckton*
Lied	"Nightingale"	*Zeller*
Berceuse	"De Jocelyn"	*Godard*
Entr'acte	"Amoureuse"	*...Berger*
Valse	"Dolores"	*Waldteufel*
Valse Lente	"La Lettre d'Amour"	*Stewart*
Meditation	... ...	*Gounod*
Serenata	... ...	*... Braga*
Lied	"O, Star of Eve" ("Tannhäuser") ...	*Wagner*
Valse	"Bleu"	*Marges*

Conductor: Herr KARL KAPS.

TOASTS.

HIS MAJESTY—THE KING.

Proposed by The Chairman.

THE RESCUERS AND ADMINISTRATORS OF THE SUDAN:
General the Right Hon. the Lord Viscount Kitchener, G.C.B.
The Right Hon. the Lord Viscount Cromer, G.C.B.
His Excellency Sir F. R. Wingate, K.C.M.G., K.C.B., D.S.O.
(Sirdar of the Egyptian Army and Governor-General of the Sudan.)
And others.

Proposed by Sir Henry M. Stanley, G.C.B., LL.D.

SUCCESS TO THE GORDON MEMORIAL COLLEGE, KHARTOUM.

Proposed by ~~Sir William Huggins, K.C.B., D.C.L., LL.D., D.Sc. (President of the Royal Society)~~

Response by Hugh Collin Smith (Trustee of the Gordon Memorial College Fund).

The Guest of the Evening—
ANDREW BALFOUR, M.D., C.M., B.Sc., D.P.H.
Director of the Chemical and Bacteriological Research Laboratories, Gordon Memorial College, Khartoum.

Proposed by The Chairman. *Response by* Dr. Balfour.

TROPICAL MEDICINE.

Proposed by ~~Surg.-General Sir William Taylor, M.D., K.C.B., K.H.P., Director-General, Army Medical Department.~~

Response by Dr. Patrick Manson, C.M.G., LL.D., F.R.S.

CHEMICAL RESEARCH.

Proposed by Sir Dyce Duckworth, M.D., F.R.C.P.

Response by Prof. H. E. Armstrong, Ph.D., LL.D., F.R.S.

BACTERIOLOGICAL RESEARCH.

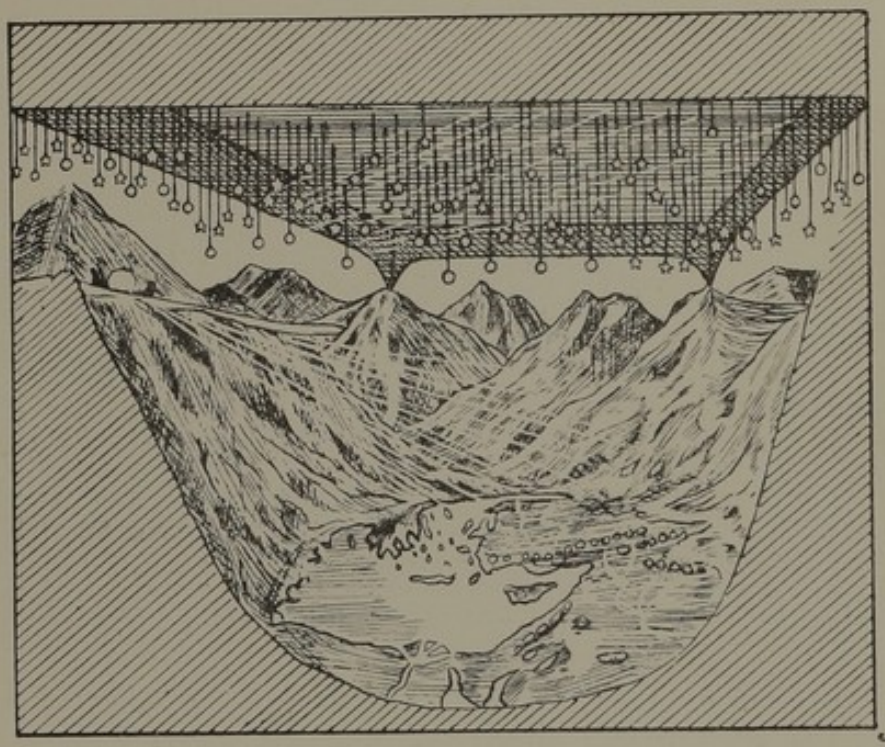
Proposed by Sir Douglas Powell, Bart., K.C.V.O., M.D., F.R.C.P., M.R.C.S.

Responses by Louis Cobbett, M.D., F.R.C.S.,
and Alex. G. R. Foulerton, F.R.C.S., D.P.H., F.C.S.

SCIENCE APPLIED TO INDUSTRIES—MAY THE EMPIRE "WAKE UP."

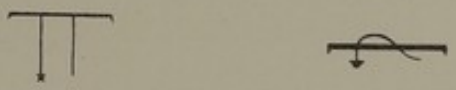
Proposed by ~~Prof. John Attfield, M.A., Ph.D., F.R.S.~~

Response by Thos. Tyrer, F.I.C., F.C.S.

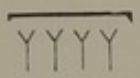


THE UNIVERSE AS REPRESENTED BY THE EARLY EGYPTIANS.

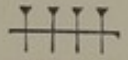
The early Egyptian conception of the universe was a rectangular box. The earth formed the bottom and sides, with Egypt in its centre. The sky stretched over it like an iron lid, having its earthward face capriciously spangled with stars or "lamps" hung from strong ropes. Originally the sky was supported by the trunks of four huge trees, which were subsequently thought not to be sufficiently stable, and were therefore superseded by four lofty peaks, called respectively "The Horn of the Earth," "The Mountain of Birth," "The Region of Life" and "The Region of the 'Very Deep'."



Early Egyptian signs for night.



Early Egyptian representation of the four tree pillars supporting the sky.



Method of designating storms or hurricanes, which represent the sky as detached and falling from its pillars.

MARDUK.

Marduk was the son of Ea, who was lord of the deep, and sovereign of the great waters. He controlled the lightning and the mysterious forces of heaven and earth, and is supposed to have been the earliest Chaldean genius of medicine. He was reverenced as the tutelary deity of healing about 5000 years B.C.

To him were ascribed the movement of the universe, the institution of the year and its division into twelve months. That all the gods might have their images visible in the skies, he mapped out on the vault of heaven groups of stars, which he allotted to them, and which seemed to men like real fabulous beings—fishes with the heads of rams, lions, bulls, goats and scorpions.

As the founder of the zodiac and lord of the planets, he was supposed to influence health and disease in mankind through the medium of the heavenly bodies. He reserved for himself the planet Jupiter, and so became the shepherd of the celestial flock. The Chaldeans thus extolled his powers :—

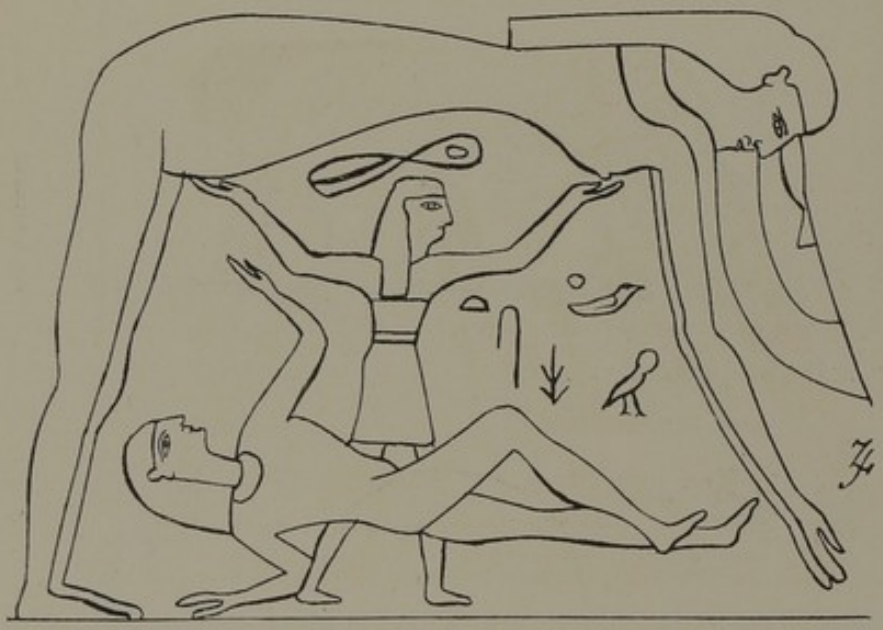
"O, Marduk, thou art glorious among the great gods!
No will is greater than thine.
Thou canst inflict upon the guilty one a dropsy which no incantation can cure.
Thou art the merciful one who taketh pleasure in raising the dead to life.
The merciful one who hath power to give life,
By thy spells the sick are restored."

NÛÎT, THE STARRY ONE.
Early Egyptian representation of Night.

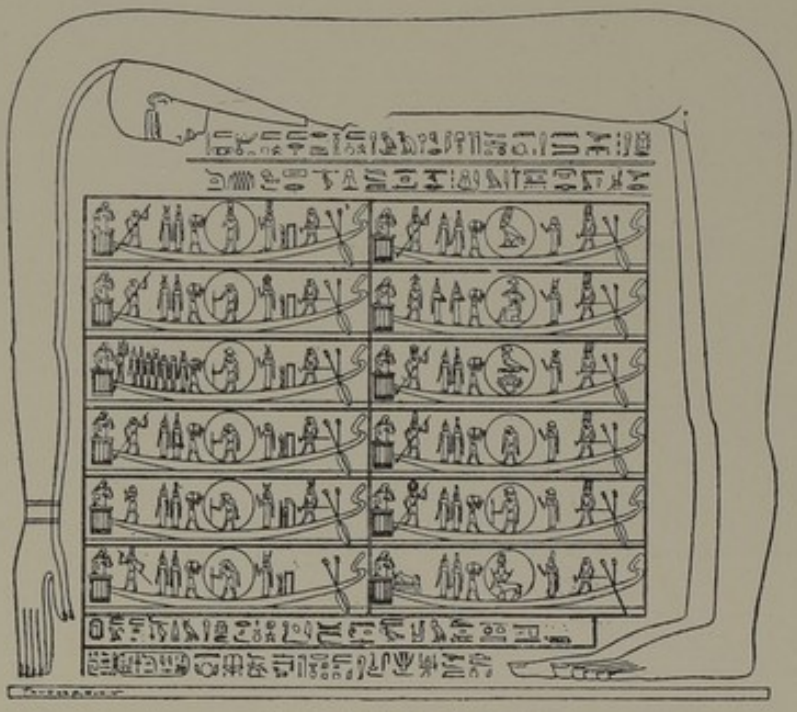
THE SUN, IN THE FORM OF THE CHILD HORUS,
SPRINGING FROM AN OPENING LOTUS-FLOWER.

THE STARRY NIGHT.

DAWN.



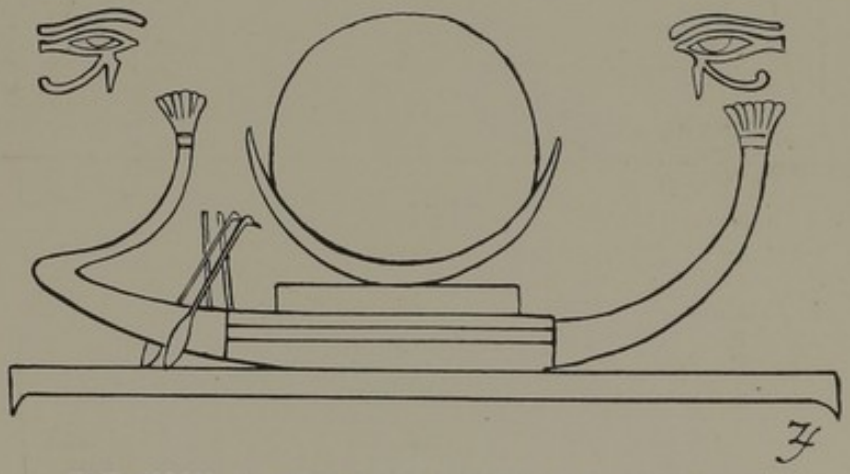
THE LIGHT OF DAY.



THE WHOLE DAY.

The Twelve Stages in the Life of the Sun, and its Twelve Forms throughout the Day.

THE SUN EMBARKING FOR HIS JOURNEY AT THE FIRST HOUR OF THE DAY.

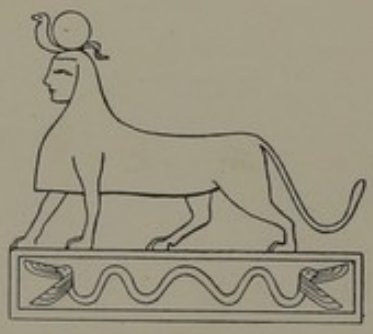


THE MOON IN HER BARK UNDER THE PROTECTION OF THE TWO EYES

EARLY EGYPTIAN CONCEPTION OF THE CHIEF CONSTELLATIONS OF THE NORTHERN SKY.

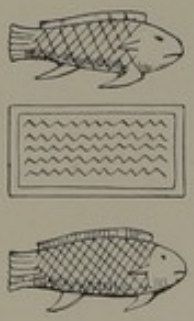
In the centre is the Haunch, represented here as a bull and now known as the Chariot, the Plough, or the Great Bear. Two lesser stars connected it with thirteen others, which recalled the form of a female hippopotamus, standing erect and carrying on her shoulders a monstrous crocodile.

Virgin.



Snake.

Cowherd, of Isis.



Fish.

Ship.

Crab.

Water Carrier.

Capricorn.

Janus.

Lion.

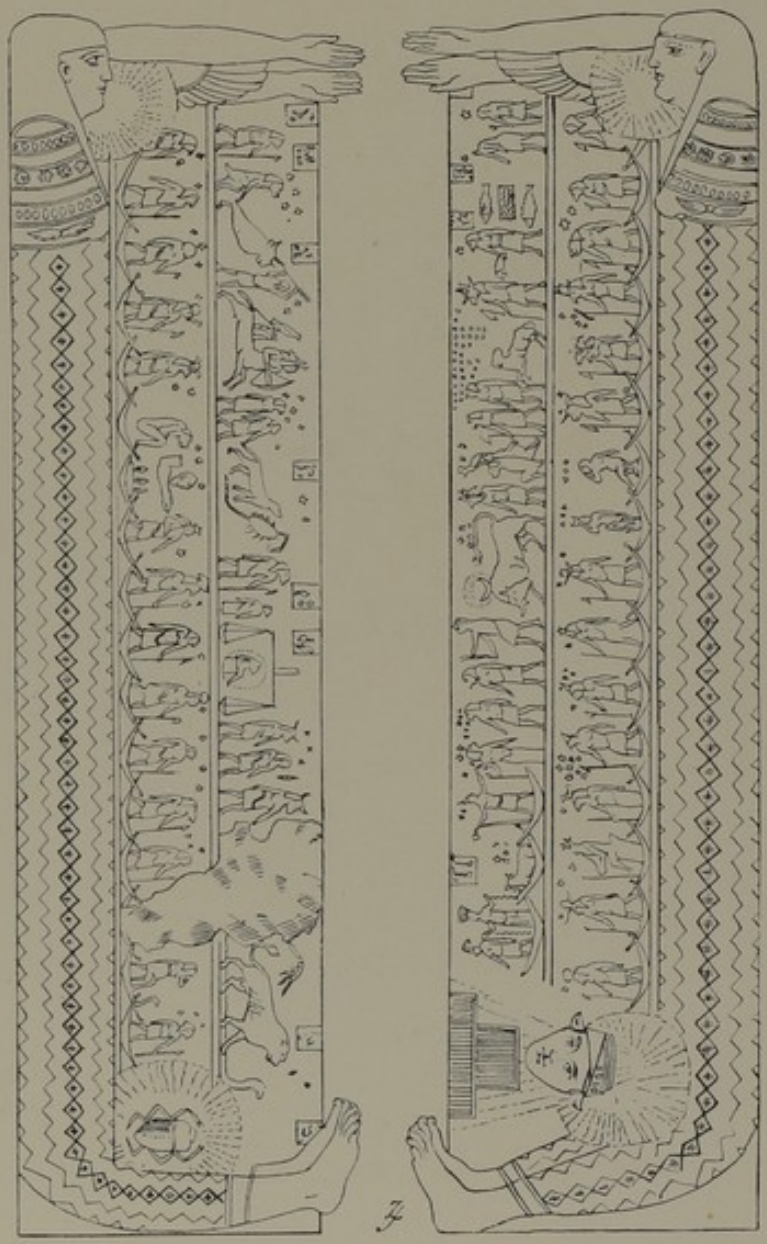
Dragon.

Scales.

SOME OF THE CONSTELLATIONS AS REPRESENTED BY THE EARLY EGYPTIANS.

A SPHERICAL EGYPTIAN ZODIAC.

The Egyptians believed in the power of the zodiac and its constellations to influence man in health and disease. Diseases were supposed to be cured by invoking the zodiacal regent of the part affected It was thus they cried to the affected deity: "Come efflux from the eyes of Horus! Come thou effusion from the eyes of the god Tum! Come, ye stuffs, ye who proceed from Osiris! Come to me and take from me the water, the pus, the blood, the pain in the eye, the blindness, the flow of matter, which are worked there by the god of the inflammations."



AN EGYPTIAN ZODIAC.

The Egyptian Zodiac is essentially the zodiac of an agricultural nation, and is supposed to have been largely founded on the Babylonian. The early Egyptians regarded the heavens as the abode of the gods, and adapted the zodiac and its constellations to their own pantheon. They apportioned the human body into twelve divisions, each of which was presided over and influenced by a certain deity, generally symbolised by some animal form.

ISIS.

ISIS, who represented to the early Egyptians the female element in creation, is here depicted giving nourishment to her child HORUS. On her head she bears a fish the emblem of fecundity.

NILUS.

NILUS, the deity representing the river Nile, to which the land of Egypt owes its fertility. The children playing about him correspond to and denote the several annual risings of the great river to the height of sixteen cubits.

SOME REMINDERS OF THE ANTIENT

SEATS OF LEARNING ON THE NILE.

The Nile was from a remote period and for long ages a cradle of the sciences and famous for its seats of learning.

The magnificent and wealthy sacerdotal schools associated with the temples included departments where medicine, astronomy, astrology, geometry and other branches of science were studied and cultivated, and to these antient universities students flocked from distant parts of the then known world. They combined, as our universities do, all the essentials of higher training, and according to Puschmann "subserved not teaching only, but also research."

The chief of these institutions was situate at Thebes with its hundred gates, and was founded about 3000 years B.C.

Then came Heliopolis, where dwelt the priests of the sun, which was regarded as especially the school of applied medicine.

Other schools were established at Memphis, Saïs, and Chennu.

In many respects the life of the Egyptian student 3000 years ago was similar to that of the student of to-day.

"Here," according to Baas, "they were provided with libraries, laboratories, and other aids to research."

THOT.

THOT, "he who conferred enlightenment upon doctors," was the earliest known Egyptian deity associated with medicine. The Egyptians also attributed to him the invention of the sciences and magic, of which he was believed to be the first exponent.

The students received practical guidance in the examination and treatment of the sick.

Instruction was founded upon the "sacred books" in which, it is said, "all the wisdom of the Egyptians was contained."

THOT, "who conferred enlightenment upon doctors," was looked upon as their author.

To these centres of learning in the later ages of Egypt's glory came Plato, *i.e.*, between 600 and 400 years B.C., who graduated at Heliopolis; Pythagoras, the disciple of Sonchês the Egyptian arch-prophet; Eudoxus and other Greek sages, to study the wisdom of the Egyptians.

In the course of the thousands of years that have elapsed since the Nile witnessed the attainment of those ideals in art, architecture and science, which are still unparallelled wonders of the world, we know that most of their precious arts have been lost.

But our records of their achievements in science are so incomplete, that we can for the most part only vaguely estimate what great scientific problems the savants of the Nile had revealed for the enlightenment of the world, only to pass back into the realm of darkness and mystery.

There remain noble monuments created by noble minds to tell us by their surpassing grandeur and graceful lines, of the lofty thoughts, and ambitions, which inspired the mighty makers and breakers of nations—who ruled the sacred river.

The country has passed through political upheavals and revolutions, the language is different and the religions have vastly altered, yet there linger many traces of their primal cults: their habits, customs, foods and implements are little changed. The people cling to their antient remedies, and they still cherish a belief in the power of the stars above to control the health and destiny of man. Where the antient Egyptian used the great scarabæus beetle, baked in snake fat, as a remedy for hæmorrhoids, his modern descendant employs a black beetle, baked in oil, for the same complaint. He still consults his astrological chart and performs rites indicative of certain constellations which he desires to call to aid the operation of the medicament employed.

The simples of the drugsellers in the Bazaar at Khartoum to-day are probably identical with those of the days of Rameses I.

ALCHEMY.

There is little doubt that Egypt was the birthplace of alchemy.

All the early alchemical MSS. agree with a remarkable unanimity that HERMES TRISMEGISTUS was the father of that science.

PRIEST WEARING THE PANTHER'S SKIN,
His Insignia of Authority.

He is supposed to have lived 2000 years B.C., or about the time of Moses.

He was the deified intellect and most probably the Egyptian god of letters.

He may have been identical with THOT, or possibly an emanation from that deity.

Alchemical Symbols, and antient sign of Hermes, probably of Egyptian origin, from an MS. written about 1100 A.D.

On the Rosetta Stone, HERMES is called "the great and great" or "the three times great."

His name is curiously perpetuated at the present day in connection with chemistry. To enclose a substance securely in a glass tube by fusing or sealing, was called in antient times securing with "Hermes his seal," from which we have the present expression—"to seal hermetically."

But it is impossible to state with anything like exactitude when alchemy took its rise.

Its origin is lost in the mists of antiquity.

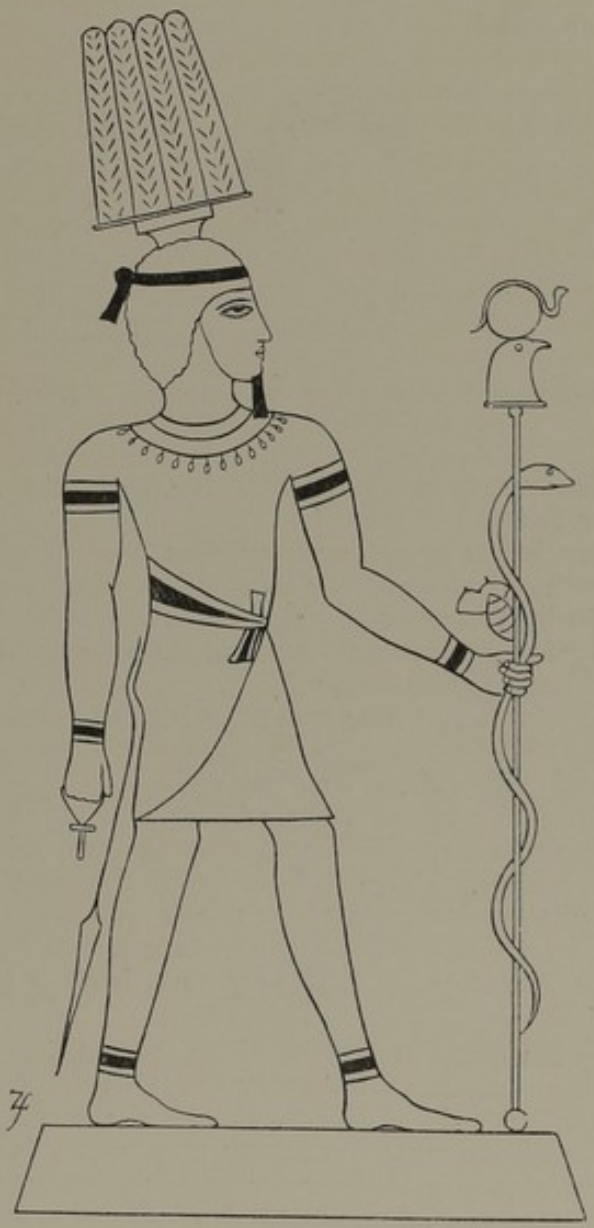
But Egypt is rich in traditions of long past ages—traditions confirmed by various papyri—concerning the mysterious art of transforming metals. There is distinct evidence that the Egyptians tried to transmute the base metals into the noble, and called the art by which they hoped to achieve it "chemia." This term with the Arabic prefix "al" very soon became naturalised as al-chemic.

The Leyden papyrus written about 300 B.C. gives some most interesting particulars of early Egyptian chemical processes, and contains a hundred and one chemical and alchemical recipes.

Herein are found various methods of purifying lead, recipes for the making of gold and silver for artistic purposes, a process for making tincture of gold and methods of preparing an imitation of gold called *Asem*, an amalgam of copper and tin.

The Egyptians stand out from among the earlier civilised nations, as having usefully applied their knowledge of chemical processes for their everyday needs.

They must have possessed at a very early date a considerable



HERMES TRISMEGISTUS.

("The thrice great.")

Supposed to have lived about 2000 years B.C. Believed by the early Egyptians to have been the originator of alchemy.

knowledge of methods of smelting metals, forming alloys, dyeing and the manufacture of glass. The Sudanese are to-day clever artificers in metal, and so well temper their swords and spears, that they easily hack in two our blades and bayonets. They are also expert and deft in working the precious metals and artful in making deceptive alloys. They smelt in crucibles fashioned by themselves from a porous native clay.

2,500 B.C. they obtained gold from quartz by crushing, fusing and washing.

They knew the effects of acids on colouring matters, and were acquainted with mordaunts, were, and are to-day, expert in tanning, preserving and working leather.

They used oxide of copper as a pigment and understood the art of enamelling on metals.

According to Lepsius they have employed arsenic, cadmium, antimony, natron and sulphide of mercury, for over 5000 years.

Berthelot believes that the doctrines of alchemy probably originated in the practical experiments of the early Egyptian goldsmiths occupied in making fraudulent substitutes for the precious metals.

However, alchemy was enshrouded in secrecy and fostered by the priesthood, the sons of kings alone being permitted to learn its higher mysteries.

It was in fact widely believed that Egypt owed her riches to the art of alchemy.

ASTRONOMY AND GEOMETRY.

The priests of Ra were the chief astronomers of antient Egypt.

They were called the "watchers of the night."

The story of the development of their ideas and conception of the universe (see illustration) presents a marvellous example of the wrestling of the human mind with the hidden mysteries of nature. Their systems, ever progressive, were elaborate, complex and picturesque.

They made charts of the constellations, and tables showing the position of the stars.

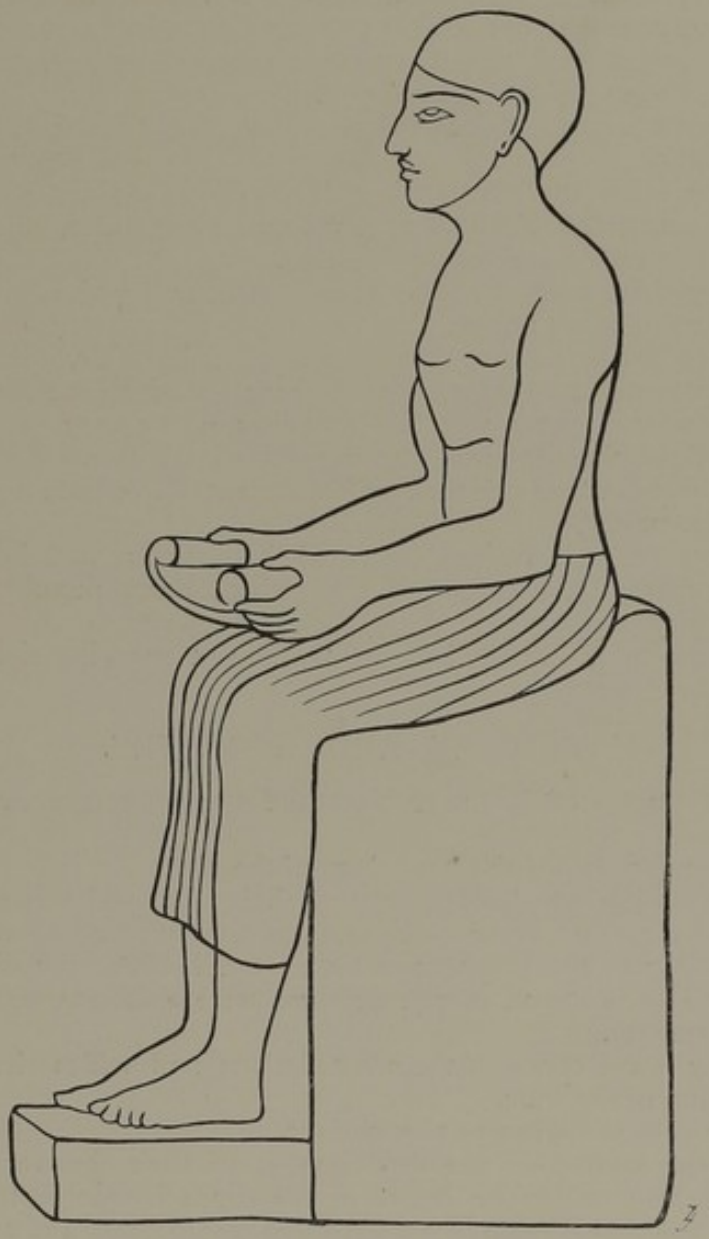
The plan of these was very curious.

In the course of the development of their theories they imagined, that under the centre of the sky a human figure sat upright, and that the top of his head was placed below the zenith.

The stars which were approaching the zenith were situate over a portion of this figure and their position was indicated in the table.

They knew at least five of our planets, and their characters, colours, and appearances were carefully noted.

Herodotus ascribes the origin of geometry to the Egyptians.



IMHOTPOU

IMHOTPOU or "He who comes in peace," was the earliest known Egyptian genius of medicine and healing. A prototype of the Grecian Asklepios.

The charts of the heavens, as arranged by the early Accadian shepherds in the days of breaking light, were added to and further developed by the Chaldeans during the ages of their intellectual supremacy. Chaldea appears to have influenced Egypt, as she also after elaborating her system of astronomy, influenced Greece.

The Egyptians were renowned throughout the then known world for their wisdom in "telling the stars."

ASTROLOGY.

Astrology, or the art of predicting future events from the heavenly bodies, was largely practised by the Egyptians and employed by them in the treatment of disease.

They believed the planets and stars to represent living forces which were daily manifest throughout the universe and in the health and destinies of man.

Each portion of the body was influenced by a certain constellation.

The future was also predicted by the oracles, of which Latona, Besa, the Theban Jupiter, and the oracle of Ammon were the chief.

They foretold future events of a private and public nature, for which purpose they took advantage of their arithmetical skill, this being of the highest importance to them in he study of astrology.

"For," said Diodorus, "the Egyptians observe the order and the movement of the stars, preserving their remarks upon each for an incredible number of years. They most carefully note the movements and positions of the planets as they pass through the Zodiac, as well as the influence by each, for good or evil, upon the body of man."

MEDICINE.

The art of medicine, more or less associated with astrology, was known and practised by the Egyptians from the dawn of their civilisation, and they appear to have given great attention to the preservation of the health of mankind.

They received many of their traditions and much of their knowledge from the Chaldeans, who understood medicine and astrology at a still earlier period. From the Egyptians we have our most antient medical records.

The Egyptians had several deities who protected the health of mankind.

The principal of these was ISIS.

She demonstrated her eminent medical skill by recalling her son HORUS to life.

SOKHÎTNIÔNKHÛ

(and his wife).

Sokhîtniônkhû, chief physician of the Pharaoh Sahurî of the fifth dynasty, "whose nostrils he made well." He wears the panther's skin denoting a priest-physician of high rank. Probably the earliest known regular physician in the world's history.

THOT then appeared and was regarded as the inventor of the arts in general, especially that of healing. He is supposed to have been the author of the earliest Egyptian medical works. They were first carved on pillars of stone, and subsequently collected into the book termed Ambre. He revealed himself to man as the first magician and became in like manner the first physician and surgeon.

IMHOTPOU, whose name has been beautifully translated as "he who comes in peace," was the Egyptian prototype of the Grecian Asklepios. A temple in his honour stood at Memphis.

APIS and SERAPIS were also regarded as skilled in the healing art.

The medical records of Egypt arise out of that early period of civilisation of which the pyramids, those mighty witnesses of a legendary past, speak to us. They stand forth in pictorial representation on the walls of temples and tombs, in implements (such as surgical instruments) and in papyrus rolls.

The medicine of early Egypt was distinctly characteristic.

It was divided into the science of higher degree and ordinary medical practice.

The highest class of priests, who studied the first 36 Hermetic or Sacred Books, were the physicians of the higher science, while the priests of the lower grade practised ordinary medicine.

They carried specialism to such an extent, that it is recorded there were "physicians for each part of the body."

It is doubtful if there were ever any real hospitals in antient Egypt. It is recorded that the sick were exposed in the streets so that passers-by might impart advice to them and tell them how they themselves had been cured.

Those who were able, went for advice to the temples, but there is no evidence that they underwent treatment there or remained for the healing of their complaints.

As already indicated, the Egyptians have from the earliest times paid the greatest attention to health, and particularly to their regimen and diet. It is stated that on three successive days every month they took a purgative and an emetic, on principle.

They were acquainted with a considerable number of drugs and had numerous formulæ for their preparation.

They were the first people to employ actual chemical preparations for medicinal purposes.

Their prescriptions show evidence of a cultivated pharmacy, and from the fact that apothecaries are mentioned in the books of Moses, it may be inferred that a distinct class of apothecaries existed in antient Egypt from whom Moses borrowed his regulations.

In operative surgery the physicians of the warlike Pharaohs had considerable skill.

They practised venesection and cupping, while in ophthalmic surgery, as might be expected, they were especially proficient.

Mental diseases were attributed to demoniac possession and treated by the use of amulets. The amulet to-day, prepared by the holy fakirs, who care for both body and soul, is held in high estimation throughout the Sudan, as a means of warding off dangers from disease and from evil spirits.

ANTISEPTICS.

Antiseptic processes were extensively employed in Egypt from primitive times. Necessity would suggest much, and observation of the habits of animals and insects were doubtless helpful.

Many members of the animal kingdom are endowed with protection from the destructive influences of septic matter. For instance, a vulture will eat in one day and without apparent injury, enough diseased and putrefying flesh to prostrate an army corps. Other living things protect themselves in various ingenious ways. Should a moth or other insect make its way into a hive of bees it will be killed and ejected. If this be impracticable, owing to its position, the carcase will be first stung, and then carefully walled up with wax, so that, excluded from the air and preserved by the formic acid secretion of the sting, decomposition is prevented and the bees are protected from septic influences.

From early times man appears to have been slow to recognise the grave dangers that menaced him from the proximity of putrefactive organic matter. Primitive methods of preserving fish and animal tissues by drying, smoking, curing with natural chlorides and nitrates were employed in Egypt from an early date. There is no evidence to show how far the early users of these processes understood the properties of the substances employed, the principles involved or the causes of decay, although their methods were effective.

The smoking of meat was practised by them, and it is probable that they recognised the value as an antiseptic of creosote, which is present in the smoke of wood fires. The torrid sun of the desert is a powerful steriliser—it not only destroys bacteria but it renders the land untenable for vermin.

The early Egyptians often protected their meats from the attacks of putrefactive bacteria by rapid drying, thus sealing them with an impervious outer coating. Amongst the scientists of ancient Egypt, who discovered and developed processes of embalming, there may have been a Pasteur or a Lister, and they may have introduced antiseptic methods into the operative surgery of their day, but of such we have no records. Whoever discovers the method by which the vulture renders himself immune, will solve an interesting problem and may confer a lasting benefit upon mankind.

DINNER
TO
DR. BALFOUR

TABLE PLAN

List of Guests and Key to Table Plan.

ABRAHAM, Dr. PHINEAS. 13 B
ARMSTRONG, Prof. H. E. 2 B
ATTFIELD, Prof. JOHN. 7 B

BALFOUR, Dr. ANDREW. 4 A
BARNARDO, Dr. T. J. 23 C
BLAKE, M. B. 20 C
BRODIE, Dr. T. G. 24 B
BROWN, Dr. HORACE T. 14 B
BROWNE, J. H. BALFOUR. 3 B
BUDGE, Dr. WALLIS. 25 B

CANTLIE, Dr. JAMES. 9 B
CHRISTALL, GEORGE 11 D
COBBETT, Dr. L. 23 D
CREASY, Dr. L. ELIOT 17 B
CROSSE, Dr. W. H. 2 D

DANIELS, Dr. C. W. 3 D
DAVIES, Dr. D. S. 16 D
DOWSON, Dr. W. 13 D
DRUCE, G. CLARIDGE. 6 D
DUCKWORTH, Sir DYCE. 25 D

ELFORD, PERCY. 15 D

FAGAN, C. E. 17 D
FISHER, W. J. 2 C
FLETCHER, Dr. A. CHUNE. 22 D
FOULERTON, Dr. ALEX. G. R. 5 B

GREY, W. E. 7 C
GUBB, Dr. ALFRED S. 7 D
GUEST 8 C

HEWLETT, Prof. R. TANNER. 19 B
HILL, AUBREY T. 5 D
HOPKINS, Dr. F. G. 14 D
HOWES, Prof. G. B. 6 B
HUGGINS, Sir WILLIAM. 2 A
HUMPHREY, JOHN. 16 C

JOHNSON, H. FINNIS. 1 C
JOWETT, Dr. H. A. D. 21 B

LEITH, Prof. R. F. C. 18 D
LE SAGE, J. M. 4 C
LINSTEAD, EDWARD F. 5 C
LITTLEJOHN, Dr. HARVEY. 23 B

MacEWAN, PETER. 17 C
MANSON, Dr. PATRICK. 24 D
MELLANBY, JOHN. 10 D
MOORE, JOHN. 8 C
MORRIS, Dr. MALCOLM. 19 D
MURRELL, Dr. WILLIAM. 10 B

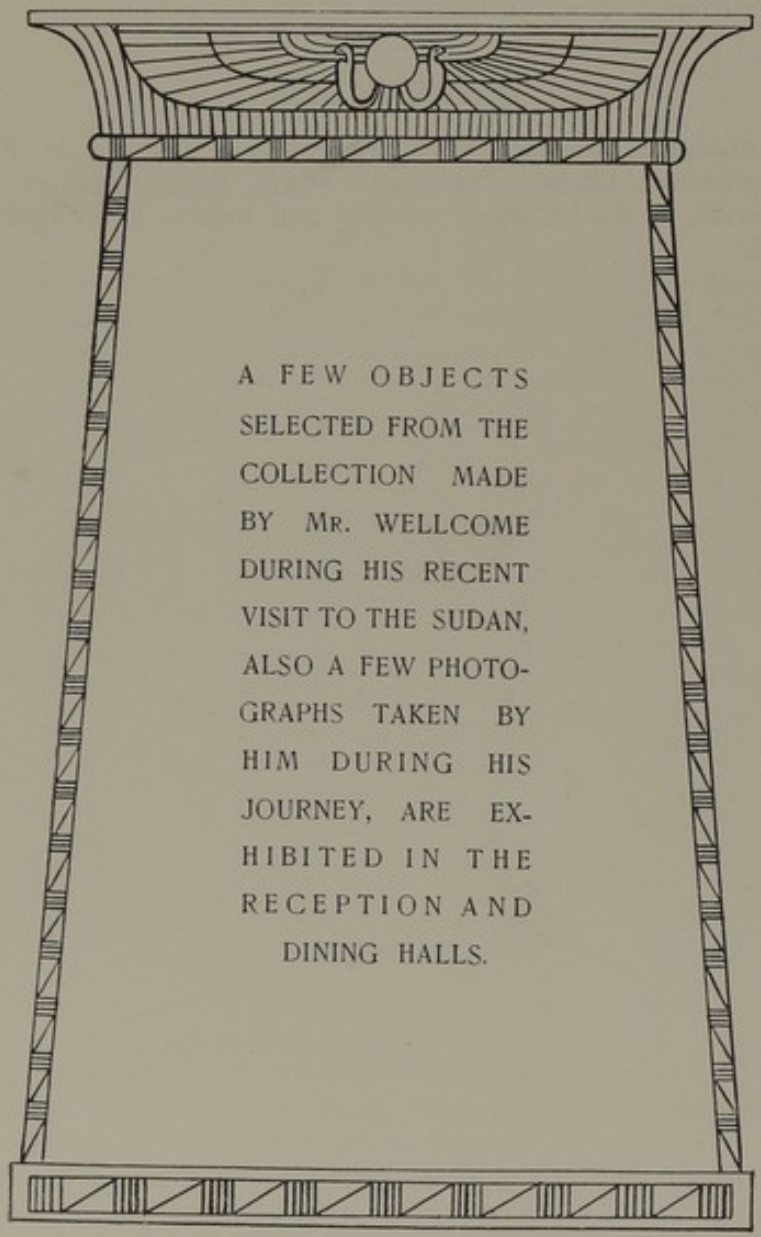
PEEL, Hon. GEORGE. 22 C
PIPER, W. G. 9 D
POST, M. 10 C
POWELL, Sir R. DOUGLAS. 1 B
POWER, Dr. FREDK. B. 13 B
PRIESTLEY, Dr. JOSEPH. 11 B

RICHARDS, JOHN MORGAN. 11 C
ROBBINS, E. 18 C
ROBERTS, Dr. DAVIES. 4 D
ROBINSON, A. C. 12 D

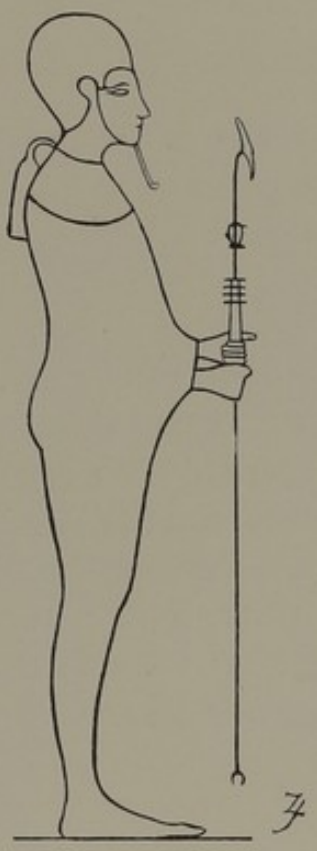
SALAMON, A. GORDON. 8 B
SCOTT, A. 9 C
SENIOR, WILLIAM. 3 C
SHARPE, Prof. R. BOWDLER. 20 B
SHAW, Dr. W. VERNON. 16 B
SMITH, HUGH C. 4 B
SMITH, J. COLLETT. 18 B
STANLEY, Sir HENRY M. 1 A
STARLING, Prof. E. H. 1 D
SUDLOW, R. CLAY. 12 C

TAYLOR, Surg.-Genl. Sir Wm. 5 A
THANE, Prof. G. D. 22 B
THRESH, Dr. JOHN C. 12 B
TIMES, M. 19 C
TYRER, THOMAS. 13 C

WAKLEY, Dr. THOMAS, Junr. 20 D
WALLER, MAURICE. 21 C
WALLIS, Dr. F. C. 21 D
WANT, W. PHILIP. 15 C
WATSON-WILL, W. 14 C
WELD, C. CORNING. 8 D
WELLCOME, HENRY S. 3 A



A FEW OBJECTS SELECTED FROM THE COLLECTION MADE BY MR. WELLCOME DURING HIS RECENT VISIT TO THE SUDAN, ALSO A FEW PHOTOGRAPHS TAKEN BY HIM DURING HIS JOURNEY, ARE EXHIBITED IN THE RECEPTION AND DINING HALLS.



PTAH

Ptah was considered the most ancient of the Egyptian deities. He is called 'Father of the mighty fathers,' 'Father of the beginnings,' 'He who created the sun egg and the moon egg,' 'The creator of his own image.'

DINNER

TO

DR. ANDREW BALFOUR

DIRECTOR OF THE

CHEMICAL AND BACTERIOLOGICAL RESEARCH LABORATORIES

OF THE

GORDON MEMORIAL COLLEGE, KHARTOUM

HENRY S. WELLCOME

IN THE CHAIR

PRINCES' RESTAURANT

PICCADILLY

MONDAY, DECEMBER 8TH, 1902

THE CHEMICAL
AND
BACTERIOLOGICAL RESEARCH LABORATORIES
OF THE
GORDON MEMORIAL COLLEGE

These Laboratories are designed—

To promote technical education.

To promote the study, bacteriologically and physiologically, of tropical disorders, especially the infective diseases of both man and beast peculiar to the Sudan, and to render assistance to the officers of health and to the clinics of the civil and military hospitals;

To aid criminal investigations in poisoning cases (which are frequent in the Sudan) by the detection and experimental determination of toxic agents, particularly the obscure potent substances employed by the natives;

To carry out such tests in connection with water, food-stuffs, and health and sanitary matters as may be found desirable;

To undertake the testing and assaying of agricultural, mineral and other substances of practical interest in the industrial development of the Sudan.

The woodwork and fittings are executed in English oak, and Indian teak, previously baked at a high temperature for several months to season them suitably for the Sudan climate. Great care has been taken to make the equipment complete in every detail, and in accordance with the highest scientific standards.

VINS.

HOCK.

Hochheimer 1893.

CLARET.

Château Duplessis, Vintage 1887.

CHAMPAGNE.

Louis Roederer, spécial cuvée,
extra sec, 1893.

G. H. Mumm, extra sec, 1895.

BURGUNDY.

Corton 1887.

PORT.

Thompson & Croft's Old Tawny.

Grande Fine Champagne
"La Grande Marque."

CAFÉ. LIQUEURS.

MENU.

Huîtres Royales Natives.

Potage Edouard VII.
Crême Marquise.

Suprême de Sole Yvette.
Whitebait à la Diable.

Poularde à l'Ambassadrice.
Cœur de Filet de Bœuf Brillat-Savarin.
Pommes de Terre à la Voisin.

Cailles de Vigne à la Broche.
Salade Mâche, Céleri, Betterave.

Fonds d'Artichauts au Parmesan.

Turban de Pêches Impératrice.
Biscuit Glacé Tortoni.
Corbeille de Friandises.

Dessert.

MUSIC.

Valse Lente	"Tout Passe"	*Berger*
Serenata (pizzicato)...	"Loving Hearts"	... *Kaps*
Song	"Violets"	.. *Wright*
Fantasia	From "Country Girl"	*Monckton*
Lied	"Nightingale"	... *Zeller*
Berceuse	"De Jocelyn"	*Godard*
Entr'acte	"Amoureuse"	...*Berger*
Valse	"Dolores"	*Waldteufel*
Valse Lente	"La Lettre d'Amour"	*Stewart*
Meditation	... ...	*Gounod*
Serenata	... ...	... *Braga*
Lied	"O, Star of Eve" ("Tannhäuser") ...	*Wagner*
Valse	"Bleu"	*Marges*

Conductor: Herr KARL KAPS.

TOASTS.

HIS MAJESTY—THE KING.

Proposed by THE CHAIRMAN.

THE RESCUERS AND ADMINISTRATORS OF THE SUDAN:

General the Right Hon. the Lord Viscount KITCHENER, G.C.B.

The Right Hon. the ~~Lord Viscount~~ CROMER, G.C.B.

His Excellency Sir F. R. WINGATE, K.C.M.G., K.C.B., D.S.O.
(Sirdar of the Egyptian Army and Governor-General of the Sudan.)

And others.

Proposed by ~~Sir HENRY M. STANLEY, G.C.B., LL.D.~~

SUCCESS TO THE GORDON MEMORIAL COLLEGE, KHARTOUM.

Proposed by Sir ~~WILLIAM HUGGINS, K.C.B., D.C.L., LL.D., D.Sc.~~
~~(President of the Royal Society)~~

Response by HUGH COLLIN SMITH (Trustee of the Gordon Memorial College Fund).

The Guest of the Evening—

ANDREW BALFOUR, M.D., C.M., B.Sc., D.P.H.

Director of the Chemical and Bacteriological Research Laboratories, Gordon Memorial College, Khartoum.

Proposed by THE CHAIRMAN. *Response by* Dr. BALFOUR.

TROPICAL MEDICINE.

Proposed by ~~Surg.-General Sir WILLIAM TAYLOR, M.D., K.C.B., K.H.P., Director-General, Army Medical Department.~~

Response by Dr. PATRICK MANSON, C.M.G., LL.D., F.R.S.

CHEMICAL RESEARCH.

Proposed by Sir DYCE DUCKWORTH, M.D., F.R.C.P.

Response by Prof. H. E. ARMSTRONG, Ph.D., LL.D., F.R.S.

BACTERIOLOGICAL RESEARCH.

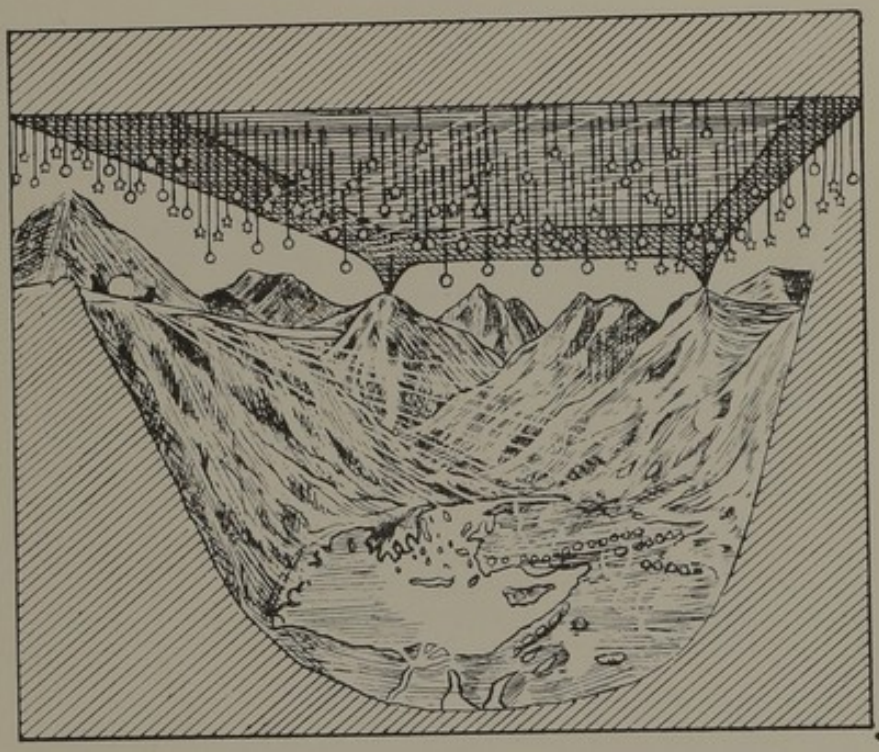
Proposed by Sir DOUGLAS POWELL, Bart., K.C.V.O., M.D., F.R.C.P., M.R.C.S.

Response by ~~LOUIS COBBETT, M.D., F.R.C.S.,~~ ~~and~~ ALEX. G. R. FOULERTON, F.R.C.S., D.P.H., F.C.S.

SCIENCE APPLIED TO INDUSTRIES—MAY THE EMPIRE "WAKE UP."

Proposed by ~~Prof. JOHN ATTFIELD, M.A., Ph.D., F.R.S.~~

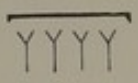
Response by THOS. TYRER, F.I.C., F.C.S.



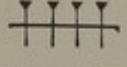
THE UNIVERSE AS REPRESENTED BY THE EARLY EGYPTIANS.

The early Egyptian conception of the universe was a rectangular box. The earth formed the bottom and sides, with Egypt in its centre. The sky stretched over it like an iron lid, having its earthward face capriciously spangled with stars or "lamps" hung from strong ropes. Originally the sky was supported by the trunks of four huge trees, which were subsequently thought not to be sufficiently stable, and were therefore superseded by four lofty peaks, called respectively: "The Horn of the Earth." "The Mountain of Birth." "The Region of Life" and "The Region of the 'Very Deep'."

Early Egyptian signs for night.



Early Egyptian representation of the four tree pillars supporting the sky.



Method of designating storms or hurricanes, which represent the sky as detached and falling from its pillars.

MARDUK.

Marduk was the son of Ea, who was lord of the deep, and sovereign of the great waters. He controlled the lightning and the mysterious forces of heaven and earth, and is supposed to have been the earliest Chaldean genius of medicine. He was reverenced as the tutelary deity of healing about 5000 years B.C.

To him were ascribed the movement of the universe, the institution of the year and its division into twelve months. That all the gods might have their images visible in the skies, he mapped out on the vault of heaven groups of stars, which he allotted to them, and which seemed to men like real fabulous beings—fishes with the heads of rams, lions, bulls, goats and scorpions.

As the founder of the zodiac and lord of the planets, he was supposed to influence health and disease in mankind through the medium of the heavenly bodies. He reserved for himself the planet Jupiter, and so became the shepherd of the celestial flock. The Chaldeans thus extolled his powers :—

"O, Marduk, thou art glorious among the great gods!
No will is greater than thine.
Thou canst inflict upon the guilty one a dropsy which no incantation can cure.
Thou art the merciful one who taketh pleasure in raising the dead to life.
The merciful one who hath power to give life.
By thy spells the sick are restored."

5

NÛÎT, THE STARRY ONE.

Early Egyptian representation of Night.

Inscription -

Heaven rests in peace over thy soul
The under-world is under thy body.

—

Twelfth hour of the night -
Twelfth hour of the day -

THE SUN, IN THE FORM OF THE CHILD HORUS,
SPRINGING FROM AN OPENING LOTUS-FLOWER.

6

THE ~~STARRY NIGHT~~.

Early Dawn

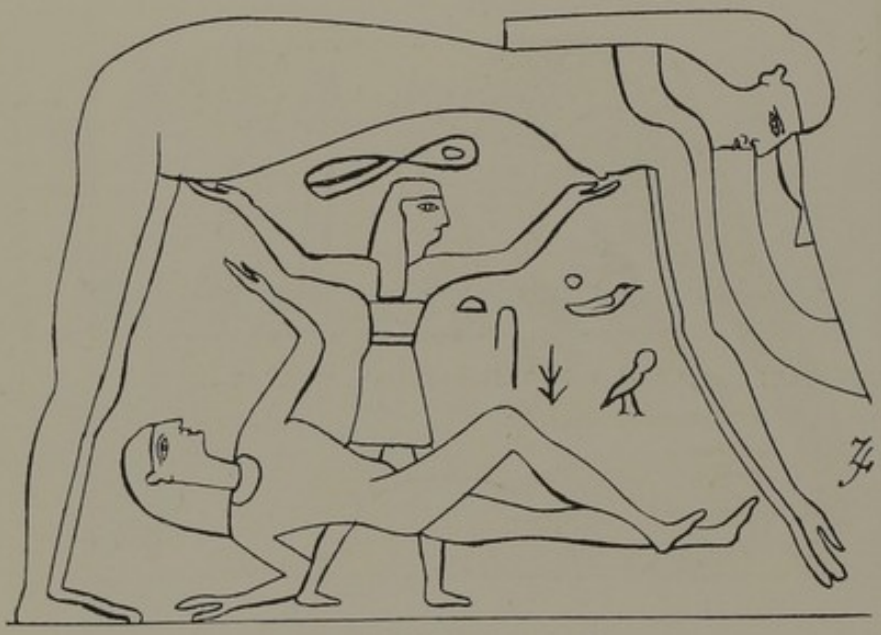
Seba upholding the starry firmament
While the Earth God sleeps.

8

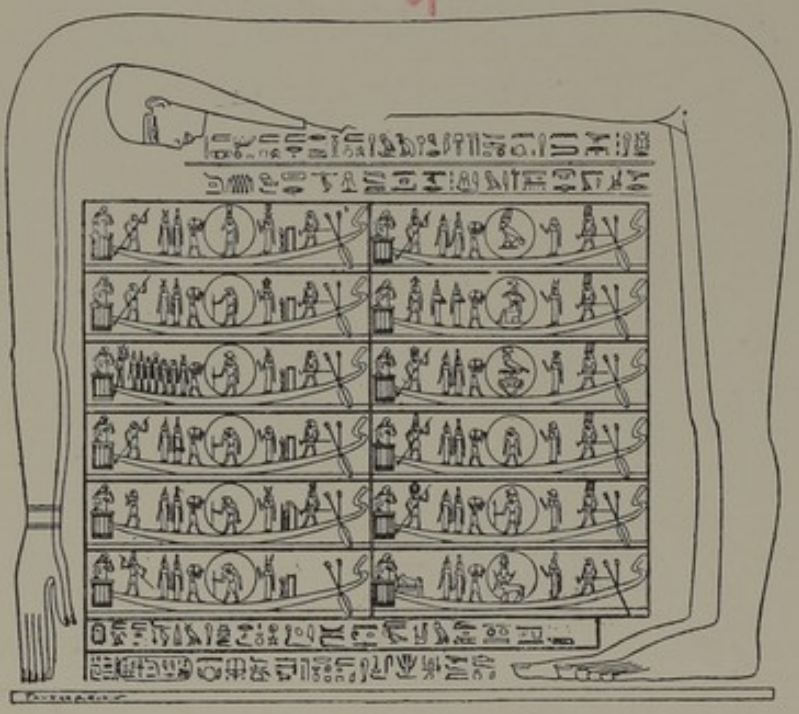
~~DAWN~~.

Morning

The Earth God just rising from his slumbers.
Night begins to pale into morning



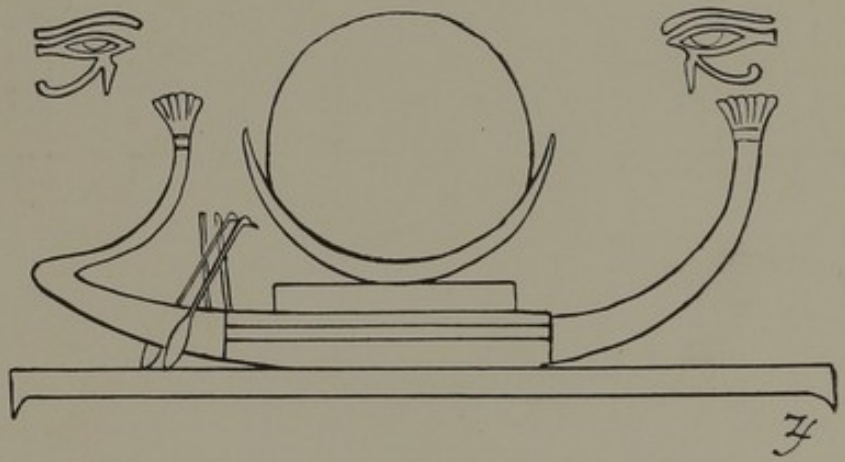
THE LIGHT OF DAY.



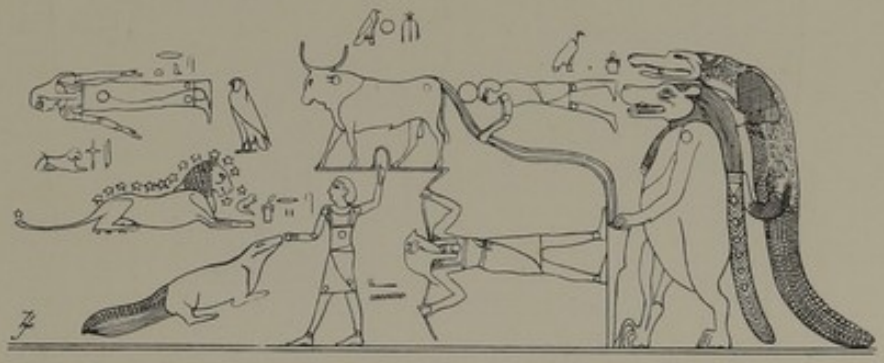
THE WHOLE DAY.

The Twelve Stages in the Life of the Sun, and its Twelve Forms throughout the Day.

THE SUN EMBARKING FOR HIS JOURNEY AT THE FIRST HOUR OF THE DAY.



THE MOON IN HER BARK UNDER THE PROTECTION OF THE TWO EYES



EARLY EGYPTIAN CONCEPTION OF THE CHIEF CONSTELLATIONS OF THE NORTHERN SKY.

In the centre is the Haunch, represented here as a bull and now known as the Chariot, the Plough, or the Great Bear. Two lesser stars connected it with thirteen others, which recalled the form of a female hippopotamus, standing erect and carrying on her shoulders a monstrous crocodile.

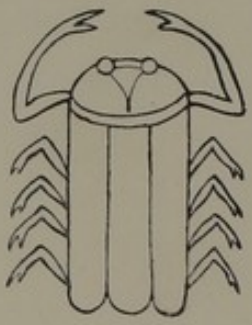
Virgin.

Snake.

Cowherd. of Isis.

Fish.

Ship.



Crab.

Water Carrier.

Capricorn.

Janus.

Lion.

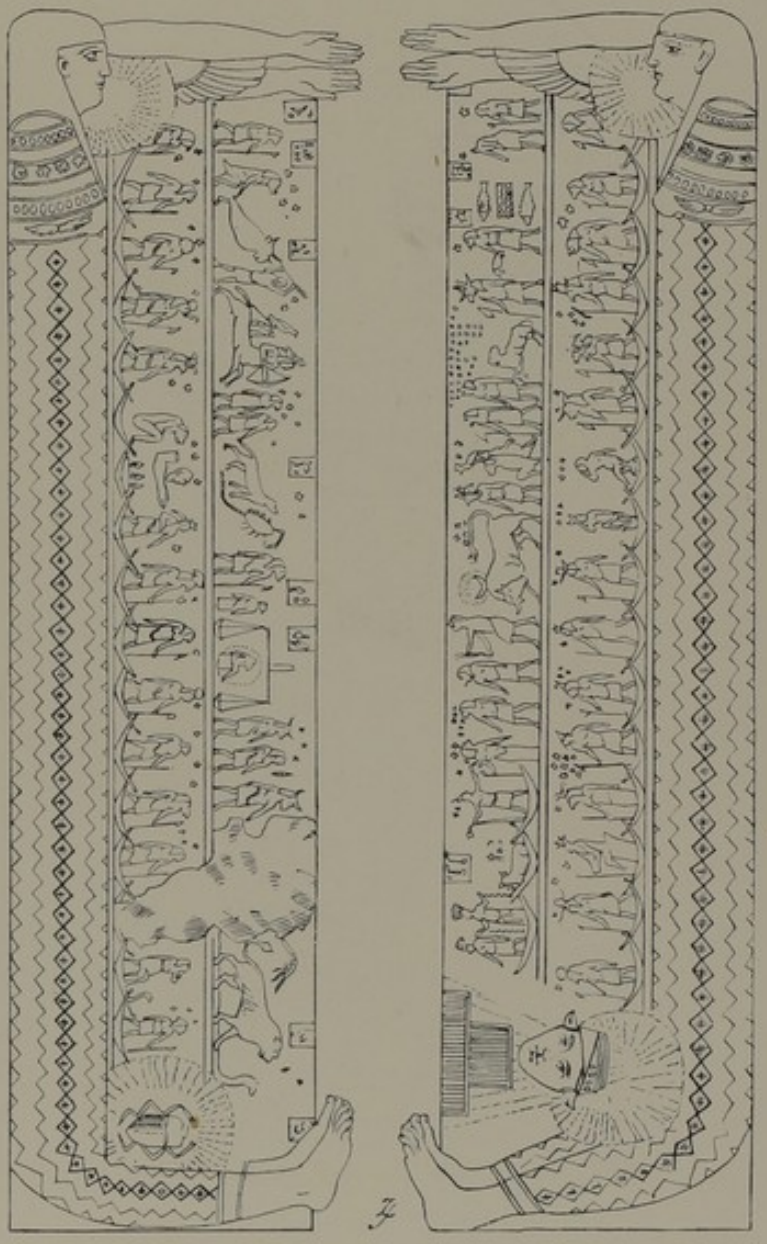
Dragon.

Scales.

SOME OF THE CONSTELLATIONS AS REPRESENTED BY THE EARLY EGYPTIANS.

A SPHERICAL EGYPTIAN ZODIAC.

The Egyptians believed in the power of the zodiac and its constellations to influence man in health and disease. Diseases were supposed to be cured by invoking the zodiacal regent of the part affected. It was thus they cried to the affected deity: "Come efflux from the eyes of Horus! Come thou effusion from the eyes of the god Tum! Come, ye stuffs, ye who proceed from Osiris! Come to me and take from me the water, the pus, the blood, the pain in the eye, the blindness, the flow of matter, which are worked there by the god of the inflammations."



AN EGYPTIAN ZODIAC.

The Egyptian Zodiac is essentially the zodiac of an agricultural nation, and is supposed to have been largely founded on the Babylonian. The early Egyptians regarded the heavens as the abode of the gods, and adapted the zodiac and its constellations to their own pantheon. They apportioned the human body into twelve divisions, each of which was presided over and influenced by a certain deity, generally symbolised by some animal form.

ISIS.

ISIS, who represented to the early Egyptians the female element in creation, is here depicted giving nourishment to her child HORUS. On her head she bears a fish the emblem of fecundity.

NILUS.

NILUS, the deity representing the river Nile, to which the land of Egypt owes its fertility. The children playing about him correspond to and denote the several annual risings of the great river to the height of sixteen cubits.

SOME REMINDERS OF THE ANTIENT

SEATS OF LEARNING ON THE NILE.

The Nile was from a remote period and for long ages a cradle of the sciences and famous for its seats of learning.

The magnificent and wealthy sacerdotal schools associated with the temples included departments where medicine, astronomy, astrology, geometry and other branches of science were studied and cultivated, and to these antient universities students flocked from distant parts of the then known world. They combined, as our universities do, all the essentials of higher training, and according to Puschmann "subserved not teaching only, but also research."

The chief of these institutions was situate at Thebes with its hundred gates, and was founded about 3000 years B.C.

Then came Heliopolis, where dwelt the priests of the sun, which was regarded as especially the school of applied medicine.

Other schools were established at Memphis, Saïs, and Chennu.

In many respects the life of the Egyptian student 3000 years ago was similar to that of the student of to-day.

"Here," according to Baas, "they were provided with libraries, laboratories, and other aids to research."

THOT.

THOT, "he who conferred enlightenment upon doctors," was the earliest known Egyptian deity associated with medicine. The Egyptians also attributed to him the invention of the sciences and magic, of which he was believed to be the first exponent.

The students received practical guidance in the examination and treatment of the sick.

Instruction was founded upon the "sacred books" in which, it is said, "all the wisdom of the Egyptians was contained."

THOT, "who conferred enlightenment upon doctors," was looked upon as their author.

To these centres of learning in the later ages of Egypt's glory came Plato, *i.e.*, between 600 and 400 years B.C., who graduated at Heliopolis; Pythagoras, the disciple of Sonchês the Egyptian arch-prophet; Eudoxus and other Greek sages, to study the wisdom of the Egyptians.

In the course of the thousands of years that have elapsed since the Nile witnessed the attainment of those ideals in art, architecture and science, which are still unparallelled wonders of the world, we know that most of their precious arts have been lost.

But our records of their achievements in science are so incomplete, that we can for the most part only vaguely estimate what great scientific problems the savants of the Nile had revealed for the enlightenment of the world, only to pass back into the realm of darkness and mystery.

There remain noble monuments created by noble minds to tell us by their surpassing grandeur and graceful lines, of the lofty thoughts, and ambitions, which inspired the mighty makers and breakers of nations—who ruled the sacred river.

The country has passed through political upheavals and revolutions, the language is different and the religions have vastly altered, yet there linger many traces of their primal cults: their habits, customs, foods and implements are little changed. The people cling to their antient remedies, and they still cherish a belief in the power of the stars above to control the health and destiny of man. Where the antient Egyptian used the great scarabæus beetle, baked in snake fat, as a remedy for hæmorrhoids, his modern descendant employs a black beetle, baked in oil, for the same complaint. He still consults his astrological chart and performs rites indicative of certain constellations which he desires to call to aid the operation of the medicament employed.

The simples of the drugsellers in the Bazaar at Khartoum to-day are probably identical with those of the days of Rameses I.

ALCHEMY.

There is little doubt that Egypt was the birthplace of alchemy.

All the early alchemical MSS. agree with a remarkable unanimity that HERMES TRISMEGISTUS was the father of that science.

PRIEST WEARING THE PANTHER'S SKIN,
His Insignia of Authority.

He is supposed to have lived 2000 years B.C., or about the time of Moses.

He was the deified intellect and most probably the Egyptian god of letters.

He may have been identical with THOT, or possibly an emanation from that deity.

Alchemical Symbols, and antient sign of Hermes, probably of Egyptian origin, from an MS. written about 1100 A.D.

On the Rosetta Stone, HERMES is called "the great and great" or "the three times great."

His name is curiously perpetuated at the present day in connection with chemistry. To enclose a substance securely in a glass tube by fusing or sealing, was called in antient times securing with "Hermes his seal," from which we have the present expression—"to seal hermetically."

But it is impossible to state with anything like exactitude when alchemy took its rise.

Its origin is lost in the mists of antiquity.

But Egypt is rich in traditions of long past ages—traditions confirmed by various papyri—concerning the mysterious art of transforming metals. There is distinct evidence that the Egyptians tried to transmute the base metals into the noble, and called the art by which they hoped to achieve it "chemia." This term with the Arabic prefix "al" very soon became naturalised as al-chemic.

The Leyden papyrus written about 300 B.C. gives some most interesting particulars of early Egyptian chemical processes, and contains a hundred and one chemical and alchemical recipes.

Herein are found various methods of purifying lead, recipes for the making of gold and silver for artistic purposes, a process for making tincture of gold and methods of preparing an imitation of gold called *Asem*, an amalgam of copper and tin.

The Egyptians stand out from among the earlier civilised nations, as having usefully applied their knowledge of chemical processes for their everyday needs.

They must have possessed at a very early date a considerable

HERMES TRISMEGISTUS.
"The thrice great.")
Supposed to have lived about 2000 years B.C. Believed by the early Egyptians to have been the originator of alchemy.

knowledge of methods of smelting metals, forming alloys, dyeing and the manufacture of glass. The Sudanese are to-day clever artificers in metal, and so well temper their swords and spears, that they easily hack in two our blades and bayonets. They are also expert and deft in working the precious metals and artful in making deceptive alloys. They smelt in crucibles fashioned by themselves from a porous native clay.

2,500 B.C. they obtained gold from quartz by crushing, fusing and washing.

They knew the effects of acids on colouring matters, and were acquainted with mordaunts, were, and are to-day, expert in tanning, preserving and working leather.

They used oxide of copper as a pigment and understood the art of enamelling on metals.

According to Lepsius they have employed arsenic, cadmium, antimony, natron and sulphide of mercury, for over 5000 years.

Berthelot believes that the doctrines of alchemy probably originated in the practical experiments of the early Egyptian goldsmiths occupied in making fraudulent substitutes for the precious metals.

However, alchemy was enshrouded in secrecy and fostered by the priesthood, the sons of kings alone being permitted to learn its higher mysteries.

It was in fact widely believed that Egypt owed her riches to the art of alchemy.

ASTRONOMY AND GEOMETRY.

The priests of Ra were the chief astronomers of antient Egypt.

They were called the "watchers of the night."

The story of the development of their ideas and conception of the universe (see illustration) presents a marvellous example of the wrestling of the human mind with the hidden mysteries of nature. Their systems, ever progressive, were elaborate, complex and picturesque.

They made charts of the constellations, and tables showing the position of the stars.

The plan of these was very curious.

In the course of the development of their theories they imagined, that under the centre of the sky a human figure sat upright, and that the top of his head was placed below the zenith.

The stars which were approaching the zenith were situate over a portion of this figure and their position was indicated in the table.

They knew at least five of our planets, and their characters, colours, and appearances were carefully noted.

Herodotus ascribes the origin of geometry to the Egyptians.

IMHOTPOU

IMHOTPOU or "He who comes in peace," was the earliest known Egyptian genius of medicine and healing. A prototype of the Grecian Asklepios

The charts of the heavens, as arranged by the early Accadian shepherds in the days of breaking light, were added to and further developed by the Chaldeans during the ages of their intellectual supremacy. Chaldea appears to have influenced Egypt, as she also after elaborating her system of astronomy, influenced Greece.

The Egyptians were renowned throughout the then known world for their wisdom in "telling the stars."

ASTROLOGY.

Astrology, or the art of predicting future events from the heavenly bodies, was largely practised by the Egyptians and employed by them in the treatment of disease.

They believed the planets and stars to represent living forces which were daily manifest throughout the universe and in the health and destinies of man.

Each portion of the body was influenced by a certain constellation.

The future was also predicted by the oracles, of which Latona, Besa, the Theban Jupiter, and the oracle of Ammon were the chief.

They foretold future events of a private and public nature, for which purpose they took advantage of their arithmetical skill, this being of the highest importance to them in he study of astrology.

"For," said Diodorus, "the Egyptians observe the order and the movement of the stars, preserving their remarks upon each for an incredible number of years. They most carefully note the movements and positions of the planets as they pass through the Zodiac, as well as the influence by each, for good or evil, upon the body of man."

MEDICINE.

The art of medicine, more or less associated with astrology, was known and practised by the Egyptians from the dawn of their civilisation, and they appear to have given great attention to the preservation of the health of mankind.

They received many of their traditions and much of their knowledge from the Chaldeans. who understood medicine and astrology at a still earlier period. From the Egyptians we have our most antient medical records.

The Egyptians had several deities who protected the health of mankind.

The principal of these was ISIS.

She demonstrated her eminent medical skill by recalling her son HORUS to life.

SOKHÎTNIÔNKHÛ
(and his wife).

Sokhîtniônkhû, chief physician of the Pharaoh Sahurî of the fifth dynasty, "whose nostrils he made well." He wears the panther's skin denoting a priest-physician of high rank. Probably the earliest known regular physician in the world's history.

THOT then appeared and was regarded as the inventor of the arts in general, especially that of healing. He is supposed to have been the author of the earliest Egyptian medical works. They were first carved on pillars of stone, and subsequently collected into the book termed Ambre. He revealed himself to man as the first magician and became in like manner the first physician and surgeon.

IMHOTPOU, whose name has been beautifully translated as "he who comes in peace," was the Egyptian prototype of the Grecian Asklepios. A temple in his honour stood at Memphis.

APIS and SERAPIS were also regarded as skilled in the healing art.

The medical records of Egypt arise out of that early period of civilisation of which the pyramids, those mighty witnesses of a legendary past, speak to us. They stand forth in pictorial representation on the walls of temples and tombs, in implements (such as surgical instruments) and in papyrus rolls.

The medicine of early Egypt was distinctly characteristic.

It was divided into the science of higher degree and ordinary medical practice.

The highest class of priests, who studied the first 36 Hermetic or Sacred Books, were the physicians of the higher science, while the priests of the lower grade practised ordinary medicine.

They carried specialism to such an extent, that it is recorded there were "physicians for each part of the body."

It is doubtful if there were ever any real hospitals in antient Egypt. It is recorded that the sick were exposed in the streets so that passers-by might impart advice to them and tell them how they themselves had been cured.

Those who were able, went for advice to the temples, but there is no evidence that they underwent treatment there or remained for the healing of their complaints.

As already indicated, the Egyptians have from the earliest times paid the greatest attention to health, and particularly to their regimen and diet. It is stated that on three successive days every month they took a purgative and an emetic, on principle.

They were acquainted with a considerable number of drugs and had numerous formulæ for their preparation.

They were the first people to employ actual chemical preparations for medicinal purposes.

Their prescriptions show evidence of a cultivated pharmacy, and from the fact that apothecaries are mentioned in the books of Moses, it may be inferred that a distinct class of apothecaries existed in antient Egypt from whom Moses borrowed his regulations.

In operative surgery the physicians of the warlike Pharaohs had considerable skill.

They practised venesection and cupping, while in ophthalmic surgery, as might be expected, they were especially proficient.

Mental diseases were attributed to demoniac possession and treated by the use of amulets. The amulet to-day, prepared by the holy fakirs, who care for both body and soul, is held in high estimation throughout the Sudan, as a means of warding off dangers from disease and from evil spirits.

ANTISEPTICS.

Antiseptic processes were extensively employed in Egypt from primitive times. Necessity would suggest much, and observation of the habits of animals and insects were doubtless helpful.

Many members of the animal kingdom are endowed with protection from the destructive influences of septic matter. For instance, a vulture will eat in one day and without apparent injury, enough diseased and putrefying flesh to prostrate an army corps. Other living things protect themselves in various ingenious ways. Should a moth or other insect make its way into a hive of bees it will be killed and ejected. If this be impracticable, owing to its position, the carcase will be first stung, and then carefully walled up with wax, so that, excluded from the air and preserved by the formic acid secretion of the sting, decomposition is prevented and the bees are protected from septic influences.

From early times man appears to have been slow to recognise the grave dangers that menaced him from the proximity of putrefactive organic matter. Primitive methods of preserving fish and animal tissues by drying, smoking, curing with natural chlorides and nitrates were employed in Egypt from an early date. There is no evidence to show how far the early users of these processes understood the properties of the substances employed, the principles involved or the causes of decay, although their methods were effective.

The smoking of meat was practised by them, and it is probable that they recognised the value as an antiseptic of creosote, which is present in the smoke of wood fires. The torrid sun of the desert is a powerful steriliser—it not only destroys bacteria but it renders the land untenable for vermin.

The early Egyptians often protected their meats from the attacks of putrefactive bacteria by rapid drying, thus sealing them with an impervious outer coating. Amongst the scientists of ancient Egypt, who discovered and developed processes of embalming, there may have been a Pasteur or a Lister, and they may have introduced antiseptic methods into the operative surgery of their day, but of such we have no records. Whoever discovers the method by which the vulture renders himself immune, will solve an interesting problem and may confer a lasting benefit upon mankind.

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This document received by CMAC 16.6.1993 from Peter Williams who got it from Tony Duggan (ex Wellcome Medical Museum)

It consists of the speeches made at the dinner for Dr Andrew Balfour before he left to take up his appointment as Director of the Wellcome Tropical Laboratories, Khartoum, 1902

[Pages 13 onward are annotated, 13-15 heavily so. Possibly by Sir Henry Wellcome.]

DINNER TO DR. ANDREW BALFOUR

at

PRINCES RESTAURANT, PICCADILLY

December 8th 1902

SPEECHES

Please return to Mr. Linstead, Snow Hill Buildings.

DINNER [redacted] TO DR. ANDREW BALFOUR

at

PRINCES RESTAURANT, PICCADILLY

December 8th 1902

before Dr. Balfour left to take up his appointment as
Director of the Wellcome Tropical Research Laboratories, Khartoum.

Toast - "HIS MAJESTY THE KING".

The Chairman: Gentlemen, - I ask you to drink to the King. Long live the King in health and happiness to rule over this Great Empire ! (Cheers).

Toast - "RESCUERS AND ADMINISTRATORS OF THE SUDAN."

J.H.Balfour Browne, K.C., J.P., D.L. : Mr Chairman and Gentlemen - it gives me very great pleasure to be here tonight to say good speed to Dr Andrew Balfour, who is going to take up this important work in Egypt.

I think that everybody, every man and woman, should have some real work to do in the world, and I am glad to see Dr Andrew Balfour taking up really serious life work. The object of this life is conduct, and not pleasure; books which merely make for the passing of time seem to me to steal our hours and days, and while we think we are pursuing culture we are really wasting our time and losing our opportunities. Gentlemen, I would like to see fewer novels read, and fewer written, and I say that although I have great admiration for some of Dr Andrew Balfour's works of fiction, I have still more regard for his scientific work. The greater the talent, the more I desire to see it devoted to good earnest work, and the less I want to see it supplying that public which hangs upon the superficialities of the Circulating Library.

Now, Gentlemen, to address myself to the toast. It is a comprehensive toast, because although there are three great names mentioned, there is also added that beautiful category "and others" after the names of Lord Cromer, Lord Kitchener, and Sir F.R.Wingate.

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Well, I like to include the health of "the others" because they very seldom have their health drunk. Lord Cromer, Lord Kitchener, and the Sirdar have had their health drunk a thousand times, and well deserved it. I am not in a position to say much about the great work done in Egypt except in a general way, but there does seem to me to be one thing worth special remark - we won the Sudan by the sword - I suppose we still call it the x sword, although it is the rifle - but we are administering the Sudan with the scales of justice - (hear, hear) - and I am bound to say from all I have learnt of that great country that although the natives were struck by our prowess, they were more struck by our locomotive engines, and I believe they are still more struck by our moral qualities, and they feel that we hold the scales even - (hear, hear). Well, gentlemen, that is all I mean to say (Cheers).

The Chairman: Gentlemen, I will now call upon a gentleman to speak to you who has the first right in the world to speak of Africa, the first right to speak of the revival of learning on the Nile. He who sent us the first tidings of Lord Napier's great success, the fall of Magdala; the one who found Livingstone; the first to send us tidings of the crushing of King Coffee, when Lord Wolseley captured and destroyed Coomassie; the one who first circumnavigated Victoria Nyanza and penetrated the dismal forests of the Dark Continent; the one who tracei the Congo from its sources to the sea; Founder, and really the Creator of the Congo Free State; the one who discovered the southernmost sources of the Nile, discovered the Mountains of the Moon; he who had arranged with Gordon to crush the Central African slave raiders, and at the intimation of Mr Gladstone that he wanted Gordon to go to Khartoum to save the Sudan, released our National hero from his engagement; he who went to the rescue of Gordon's last Governor, Emin Pasha; he who has done more than any man of our day or of any past age to bring light into Africa who better can speak on the revival of seats of learning upon the Nile ! I call upon Sir Henry Stanley.

Toast :- "SUCCESS TO THE GORDON MEMORIAL COLLEGE, KHARTOUM."

Sir Henry M. Stanley, G.C.B., D.C.L., LL.D., Mr Chairman and Gentlemen - It really seems as if in the fulness of time Africa had come to its destiny. Things that were startling propositions twenty-five years ago, mentioned in connection with that Continent, now are accomplished facts. We are here tonight to drink success to the Gordon Memorial College at Khartoum. You hear of a cathedral some 300 and odd feet long, by 80 feet wide, established in the capital of Uganda, and some hundreds of churches built in that country, and of a railway costing five million pounds connecting Uganda with the sea. You hear of a Congo Railway passing the Livingstone Falls, of a large fleet of 250-ton and 500-ton steamers ascending and descending that mighty river which a few years ago was unknown; and in that dark forest where I laboured for 160 days in trying to see the sun only a few years ago, actually the navvies are there now laying the earthworks for the new railways to the Lakes. Then you hear of cathedrals on the shores of Nyassa, and of the British Association going to see the Victoria Falls in 1905, and of our young friend here going to make bacteriological researches at Khartoum, and to assist in astonishing the natives of the Upper Nile with the forms of the wonderful creatures that can be found in their drinking water. You must all admit, gentlemen,

without any allusion - even the most distant - to your ages, that not very long ago a very profound pessimism reigned in respect to Africa, and perhaps you may have ebquired occasionally of your own monds as to what was the cause of this profound pessimism with regard to Africa. It was simply that you were following the examples of the members of the historical nations, of all the peoples who passed by the highways of commerce east and west, they all gave Africa the go-by. Isolated by the Ocean and unpenetrated by any man, a veritable cul-de-sac leading nowhere but to dismal swamps, how could it possibly be that Africa could be anything else than what she was, savage, savager, savagest; dark, darker, darkest ! What people there were, they could not possibly see anything to imitate or learn in that country. The great Aryan race that started the population of the earth and made us what we are, passed them by in supreme contempt, and all the nations followed suit. Why, the Aryans even went so far as 'Caledonia stern and wild', but they left the richest parts of Africa. The Romans despised Britain for a cold, chilly, unstable climate; they might have seen a paradise had they only had a little more persistence, a little more courage than Nero the Centurion had when he ascended the Nile. And now, as I say, the fulness of time seems to have come upon Africa, the ages of silence have passed, and the white men who can shew by their example, persuade by their tongues, urge by their prospects, and shew by their manners what other people

who desire to live better and nobler could do, and how they could do it. In South Africa among the pioneers there came some men who built a place called Lovedale (?) and I hope this Memorial College at Khartoum will gain at least as great a reputation as that in South Africa. Then other people struck in from the West, and threw light upon the dark regions there, and then other white men came in from the East and they saw the natives of Africa, people who had been doomed to neglect since the beginning of time, ready with dispositions to absorb anything that might be instructive, to absorb anything that was told them, to imitate anything that was shewn to them, even to the imitation of a Lee-Metford. I remember a most astonishing thing with regard to these people; when I first visited Uganda, King Mtessa (?) shewed me an iron stool that ~~Speak~~ Speke had given him as a curiosity, and he said my people made a hundred like that as soon as ~~Speak~~ Speke turned his back, and you may take one home to shew the white man what the black men can do; and I have got it still. (Cheers). And now, just in the same way, just such white men as those who made South Africa what it is, who have 90,000 docile pupils in Uganda, who have about 25,000 docile school children attending school daily on the Congo, who can shew such civilisation on the Nyanza are going to attempt the Sudan - the impracticable, incorrigible, Sudan. I remember John Morley's jeremiad in the House one night when he prophesied death and disaster to the British Force that was about to invade the Sudan, and I remember with what unction

Leonard Courtney rose to support his honest friend John Morley, and I said then, because it really seemed - well, I won't say what - but I was so struck that I was confined to saying simply that there was no more danger that the British Force would fail to take Khartoum than there was that I should not get from Parliament to my house about 200 yards off. I have even been asked, this evening, whether there was any possibility that these people in the Sudan would ever come to anything. Oh, Mr Chairman and Gentlemen, if you will only think a little, you would see that there was no reason to answer that question! The children of the Sudan, why they are the heirs of the ages - (hear, hear) - the children of those people who conquered Egypt, who followed to Jerusalem, who built 88 Pyramids, the ruins of which lie not very far from Khartoum now, who established themselves in that land between Atbara and the Blue Nile until it was the Granary of inner Africa - those people can they ever be anything ? Such a question! Of course they can be anything. Whatever their fathers were, they can be; and it is a magnificant thing that this Memorial College should be established right amongst them, the junction of the rivers the White and Blue Niles, with its eye looking towards those pyramid relics, those noble architectural monsters of the past - will these people be anything ? Will we be anything ? Given the proper men - (hear, hear) - given that persistence which is a characteristic thank heaven! of the Anglo-Saxon character, given that continuity of

policy, given that steadiness of government which is required, those people will become anything that you may wish. Just in like manner as the potter fashions his clay, so can you mould those people. Why, when the Bangali who attacked me on the Congo with 63 canoes in 1887, - 2500 people against our little band - trying to get our bodies in order to carve them as good roast meat, I said, even while I was fighting - by Jupiter, those fellows if they only get a chance, would become men! And they are actually making the steamers on the Congo to-day - riveters and engineers. There are now some 200 steamers on the Congo. If those cannibals can do such things, can be the best servants, the most honest policemen on the Congo, fitters of boilers, builders of steamers - what must these Sudanese be with their traditions of the past, who have the legends of their forefathers, and who nourish these traditions just as you nourish the traditions of England. What may these people not attain to ? That is the reason why I take such an enormous pleasure in everything that tends to report (?) good to the Gordon Memorial College at Khartoum, and that explains why I hope for it an immense success, a long career of prosperity and benefit to the students, and I especially wish every success to the important work of the Research Laboratories, and I ask you to join with me in heartily drinking this toast, and associating with it the name of Mr Hugh Colin Smith, one of the Trustees of the College (Cheers).

Response.

Mr Hugh Colin Smith: Mr Chairman and Gentlemen - When Lord Kitchener returned to England after the battle of Omdurman he had a meeting in the City, at Messrs Glyn, Mills' Bank of the principal people in the City, and he asked whether the people of the Empire would be prepared to find a hundred thousand pounds for the establishment of a Memorial College to General Gordon. I was at that meeting, not because I am one of the principal men in the City, but because at the time I happened to be Governor of the Bank of England. The matter was taken up warmly in England, and the Bank of England did its best to support Lord Kitchener. Lord Kitchener asked for a hundred thousand pounds, stating that he thought £10,000 would build the College, and £90,000 would be sufficient endowment for it. We were fortunate in collecting for him £123,000. We then fell into the hands of the architect, and instead of the College costing £10,000 it cost £32,000. That, of course, was to be expected. At all events, we were able to secure for Lord Kitchener, the £90,000 which he required. We have not yet received the report from the head of the College for this year, but we received the one for last year, and most interesting it was. So interesting was it that I nearly made up my mind to go to Khartoum, and I hope yet to make a call upon Dr Balfour in Khartoum before I have done. In his report, the Director of Education stated, I think, that there

were five Elementary Schools started in Khartoum and the neighbourhood, and there were something like 250 boys receiving preliminary education in order to avail themselves of the advantages of the College when it was opened, and I think you will agree with me, gentlemen, that that is a most encouraging fact. The College is now very nearly completed and has been formally opened by Lord Kitchener. Our dinner tonight shews that everything is ready for the young men and boys at Khartoum to avail themselves of the splendid gift of Mr Wellcome, of Chemical and Bacteriological Laboratories to the College. But, gentlemen, one of the reasons why I take such a very great interest in this College is the fact that I happen to be one of the Trustees, and I think it is a matter which does this country such enormous credit, and it shews how qualified we are for the colonisation of various countries abroad. We have conquered these people, and the first thing we do within a month of the return of the conqueror is to get up a fund of more than £100,000 for the education of the people we have conquered. I venture to say, gentlemen, when we look how other nations colonise we have no reason to regret the effort that we make for the improvement of those nations whom we have conquered and added to this Empire. I imagine, and I am informed, that this College at Khartoum will not only be a centre for the pacification of the country, but it will be a centre for the people to learn what it is to their interest to cultivate, and what commerce can best be developed in the country, and I am sure, gentlemen, that nothing can tend more to the

improvement of that country, to the welfare of the populations there, than to be brought into intimate relationships with the commerce of the world.

Toast : THE GUEST OF THE EVENING - Dr ANDREW BALFOUR.

The Chairman : Gentlemen, During my recent visit to the Sudan, it was with profound interest and emotion that I viewed the scene of that great tragedy, the spot made sacred by the blood of Gordon, when the powers of darkness extinguished the

Toast to Dr Balfour

light of civilisation on the Upper Nile. This rose I plucked from the favourite rose-tree of Gordon within a few yards of the spot where he fell. Mr.Hugh Colin Smith has referred to the school in connection with the College. I had the pleasure of visiting the various ~~schools because~~ not only in the College building at Khartoum is this ~~institution~~ being carried on but branches of it in the various towns. Already marvellous progress has been made. It was perfectly amazing to me to find ~~that what~~ were wild dervishes a few years ago already shew the moulding of the clay. There is an element ~~that will be a~~ force, ~~in time, and~~ they recognise the justice of the Briton who ~~is~~ ruling them. In visiting the College I was struck by the fact that no provision had been made for laboratories, and I was informed that the funds were so arranged that no ~~provision~~ could be made from them for ~~the establishment of laboratories. I thought it was~~ a very exceptional field for research work - (Hear, hear) - ~~There~~ In Khartoum ~~we~~ have one of the most beautiful climates on the face of the earth; ~~not only is it~~ exhilarating and delightful to anyone ~~who can take~~ physical exercise - it is only the lazy man who ~~goes~~ to the wall - but anyone who takes abundant

physical exercise will find it one of the most delightful ~~climates on earth~~. Yet near at hand are some of the most deadly ~~climates~~ where tropical diseases ~~are at their best.~~

~~Within~~ about a day's journey from Khartoum ~~where I spent the winter~~ - ~~I got~~ a native boat and visited all the villages on the ~~Nile~~ and the desert villages ~~having~~ exceptional opportunities and ~~making~~ a point of ~~being as~~ friendly with the natives ~~as I could~~, and ~~these trophies you see here are my relics from the trip.~~ A little more than day's journey below Khartoum I visited ~~an~~ island something less than a square mile, ~~where~~ every soul on the island was absolutely paralysed with malaria so that they could scarcely rise. ~~It struck me what an opportunity!~~ On the mainland and ~~in~~ the neighbouring islands everyone was well and vigorous. What an opportunity for a ~~Doctor~~ Manson or a Ross! How they would ~~have given~~ us the real cause ~~for~~ this striking-down! ~~I have found~~ abundant evidence ~~in the~~ extraordinary ~~cases~~ of ~~typhoid~~ and dysentery ~~and~~ enteric and ~~many~~ other maladies that ~~have local interest~~. I found abundant material for research ~~and I also took an intense interest~~ in the remedies of the people. We know from the earliest times by the study of the stars, ~~astrology and alchemy~~, these people are rich in these traditions. I found in the hands of one of the Fakirs a remedy which he told me was perfectly marvellous for any case of

people possessed with devils, ~~and~~ the remedy was only ~~applied~~ by the ~~performing~~ of ~~a~~ certain rite, taking certain steps ~~after being placed in the hands of the~~ censer ~~which~~ he explained to me, according to the traditions handed down from his forefathers, ~~that~~ that represented certain ~~conditions~~ in astrology, and he attributed virtues to ~~them~~. I found that a crocodile hunter with whom I made friends collected the testes of the crocodile as a very wonderful and powerful remedy, and the other glands of the crocodile were used for certain nervous disorders. The Fakir of all the Fakirs was kind enough to write me out from his knowledge of astrology a charm which would take me safely and guard me from all evil throughout my journey in the Sudan. Those, gentlemen, are amongst the subjects of interest on the island which is known by the enticing title of Murderers' Island, and my crew endeavoured to persuade me not to go there because the people had a bad name. I visited the island, and I found a most interesting pathological case of multiple ~~c~~ It is most unique; the feet, ~~were~~ like mushrooms; the development was most extraordinary and throughout the whole of the Sudan I found most interesting subjects for study. I long wondered over that bird, which is such a blessing to Egypt, the scavenger, the vulture. What a wonderful bacteriologist he was! If we only knew as much as he did! He can eat ~~p~~etrified matter with the greatest

impunity. If we could only learn his secret! And I ask Dr. Balfour as one of his most earnest studies to find out the secret of the vulture; it may confer a great blessing upon mankind. Amongst the white man's burden is that of caring for the health of the natives, and there are great problems in Africa with regard to those diseases, and the African is even more ~~subject~~ susceptible to them than the white man. There is the sleeping sickness that has been creeping across Africa, taking away something like 50,000 in the region of Victoria Nyanza in the last two years. There are many questions of that kind for the white man, and it is a part of his duty to deal with those problems. I found the Sudan had been ~~swept~~ devastated almost from end to end by the cruel Kalifa, that evil genius of the Sudan who had swept from it almost everything except durra and dates. It might have simplified their diet but there was practically nothing left. There I thought, was a most interesting work in industrial chemistry. The minerals - While in Berber a man brought to me a beautiful emerald, a charming stone, but on close examination I diagnosed it as phosphate of lime. It was a beautifully pure phosphate of lime, probably almost perfectly pure, and I believe there are deposits of that. I believe there are many rich deposits in the Sudan that may enrich this land as well as the Sudan. That was another thing we were leaving

that impressed me - the need of research and investigation, and I found the minds of the people were turned to the material wants. They want no more war. Kitchener gave them enough, and it is that splendid chastisement and then following in its train a beneficent thing like this Gordon College that has so valuable an effect upon the minds of the people. I found many of these spears they took from the hands of the people, and that they were veritably turning the sword into the ploughshare, for they were digging the earth with it and planting the soil. Techinical instruction - I was very greatly struck by the intellectuality of many of these young natives. I believe we have a great force, and many of them can be trained in this College, and in the technical works which Dr. Balfour is going to undertake. Considering all these points, I thought what a splendid opportunity for some one who will make it a life-work to come here and conduct research. (Hear, hear). I was sent there by my friends Mr. Wallis, Sir Frederick Treeves and Mr. Fletcher because I was not feeling quite fit. I went up there and I was completely revived and made well again and I believe, by the way, that tuberculocis will find there a perfect cure. I had a cook who was a mere shadow, I was told in Cairo, and when I found him he was as hearty and as fat and rugged as a man could be. I saw many instances of the wonder-

ful effects of that climate. But the effect as a quickener of the intellect is simply marvellous. Problems that have troubled me for 10 or 15 years I solved there, ~~and coming back, put them into force~~. I felt that if a man could work there under such favourable conditions and yet have all the elements for research at his fingers' ends it would be a great advantage. I offered these laboratories to the Gordon College through the Sirdar with one condition only, and that was that they should provide an efficient staff and maintain the laboratories. No effort has been spared to complete them for a wide range of work. Amongst the candidates for the Directorship we had many distinguished and many able men, but none seemed so specially qualified for the work as Dr. Balfour - (Hear, hear) Not only has he shown himself possessed of rare gifts of mind, but he has an energy, an enthusiasm, a zeal, and withall a patience, from which I anticipate that he will stalk some of these great mysteries, some of these great problems, and will confer not only a great benefit upon Europeans and natives in the Sudan, but will confer a great benefit upon mankind in general. (Cheers) I ask you to drink to the health of Dr. Andrew Balfour.

RESPONSE.

DR.ANDREW BALFOUR: Mr.Chairman and Gentlemen, - I confess I feel myself somewhat overwhelmed, not by the sound of the pipes, gentlemen, because I am used to the pipes which I have had the pleasure of hearing both in peace and in war; but, gentlemen, by your very kindly greeting. I feel myself also in somewhat of an invidious position because I look around me and I see here men whose names are household words in medicine and science, men who have made their mark, and have won their spurs. I confess, gentlemen, in spite of what Mr.Wellcome has truly said and Mr.Balfour Browne has untruly said, I have yet to win my spurs. Indeed, gentlemen, when I heard the project of these gentlemen mooted, I recalled to myself very forcibly the scriptural text: " Let not him that girdeth on his armour boast himself as he that putteth it off." But I perceive this was not intended as an occasion for boasting, but that it was the intention of MrWellcome to give me a kindly send off and to enable me to meet those who were interested in this undertaking, an undertaking which is entirely due to Mr.Wellcome's far sightedness, his scientific enthusiasm and his princely generosity. (Hear,hear) It is further, gentlemen, my duty, in the first place, to thank Mr.Wellcome for his hospitality and for the kind words which he has said which I wish I deserved more fully; and in the second place, to thank you all for the very

kind way in which you responded to the Toast of my health. I have always, gentlemen, since ever I was able to take an interest in such matters, been interested in Tropical Medicine. In the first place, no doubt for the same reason that is inculcated in the Latin Proverb 'quod ignotum pro magnifico'. But, gentlemen, latterly it has been stimulated, as I think everybody must be stimulated, by this wonderful induction process of Dr. Manson's, with whose presence we are honoured to-night, and the pains-taking investigation of Major Ronald (? Ross), and it was also stimulated by what I saw in South Africa of dysentery, of sunstroke and of malaria. But when I had the honour and privilege - and I deem it a great one - to be appointed to this post I felt I knew something of the matter theoretically but not much practically, and on receiving the appointment I betook myself to a well-known Institution, namely, the School of Tropical Medicine in London, and there, gentlemen, under the able tutorship of Dr. Daniels, who is also here to-night, I gained a certain grasp of the subject which I certainly did not possess before. And let me here for a moment digress. We have a proverb in the North, that it is an ill bird that fowls its own nest, and it is not a pleasant thing for a Scotchman to decry the work of his own School, nor does that work need to be decried, but I think in one particular it has fallen behind. In London and Liverpool there are great Institutions for the

teaching of Tropical Medicine; but with regard to my own School, a School which is second to none, we are certainly under some difficulties. Instruction is given on certain points, but we have not perhaps the material. Well,I think more might be made of it. Leith is the port of Edinburgh, and cases of malaria last year were more prevalent than is supposed. But I don't think the same excuse can be made for Glasgow. Glasgow is a port that rivals Liverpool, and surpasses in some respects London itself, and I think much might be done in Glasgow to further this great and important subject. Something similar might also be done in Dundee, and I think it would be of great value, because in Edinburgh we have a very large number of colonial students, and no School has sent so many men all over the world as Edinburgh. Further, we have a great many of what I may call, without offence, coloured gentlemen. We may almost liken it to Christ's College, Cambridge, which is famous for the number of its coloured students, so much so that the story is told of a graduate who was wrecked upon an Island, and who was saved from passing into the interior ~~of the Chief~~ by his blazer which was recognized by the King's son. Those men are doing good and useful work all over the world; and there was a good number of them at the London School of Tropical Medicine, but it is a pity they should have to come to London. Edinburgh I think is a more salubrious place, and I have no doubt they would stay there if we could keep them. I trust you will pardon

that digression. I would just like to say I feel, when I look at what these Laboratories and the Gordon College are intended for, I feel somewhat overwhelmed. It seems to me that the proper person to take up the work would be the Admiral Chichton who is at present figuring in London, because there are a very large number of things to be done. But by one thing I am comforted. I have had the pleasure of inspecting the equipment which Mr.Wellcome is sending out, and I can assure you no trouble or expense has been spared. Mr.Wellcome's motto has been "Ask and ye shall receive",- for the best kind of equipment has been sent out. Some has arrived, the rest is on its way. If when the undertaking is taken over by Government, Government is half as enthusiastic, is half as interested, and is half as generous as Mr.Wellcome, there will never be a complaint on that score. (Hear,hear) I feel that the work will be troublesome and hard; I feel that in many ways I am not fitted to undertake it. I am not a special chemist; but like Mr.Balfour Browne, I know something of bacteriology, perhaps - (laughter) - and have done a good deal of public health work, but beyond that I cannot say that I am intimately acquainted with many of the problems which have to be solved, or the way of solving them rather. But, gentlemen, I can only do my best, and no man, not even a Scotchman, can do more. I trust that ere long I shall

not be the only medical man, or at least - I won't call myself a man of science - but a man interested in science in the College, because I hope someone interested in such a subject as toxicology for instance, willcome to the College and give us the benefit of their experience. However, that may be, I feel it is a great work and one not to be lightly undertaken. I have been reading Murray's Guide to Egypt, and it seems to me there are something like 20 dynasties, and it also seems to me that a dynasty which we may call the Wellcome Dynasty is going to be established. (Hear, hear) I believe it is one that will not only gratify Mr. Wellcome, but will be welcomed in the scientific world. Gentlemen, you have heard of the climate of Khartoum; what place could be better adapted to a jaded brain worker? I don't think gentlemen look particularly jaded to-night, but I would invite you when you become jaded tocome to Khartoum. I don't ask you all at once, but, gentlemen, if you would come in relays, I am sure we should be glad to see you, and give you a hearty Scottish welcome. We have there a Distinguished Visitors' Book, and I am sure every gentleman here is fitted and not only fitted but welcome to write his name in it. I can only thank you very heartily again, gentlemen, and Mr. Wellcome also for the extremely kind way in which you have received the Toast. (Cheers)

TOAST: "TROPICAL MEDICINE".

THE CHAIRMAN: Gentlemen, I have to explain to you that Surgeon General Sir William Taylor, Director General of the Army Medical Department is stricken down to-night, and so is unable to be here, and I call upon Dr.James Cantlie to propose this Toast of "Tropical Medicine".

DR.JAMES CANTLIE,M.A., M.B., C.M., F.R.C.S., D.P.H.R.C.P.: Mr.Wellcome and Gentlemen, - I am asked to propose a Toast, not to make a Speech. We have just heard that the General who was to have proposed the Toast is unable to be present on account of ill-health. He represents the Army Medical Department, and is one of the most able men we have ever had in that Department, and also one of the ablest after dinner speakers. I am sorry we are deprived of his eloquence. The subject of Tropical Medicine is one on which he could dilate and enlarge to a great extent. Of course Tropical Medicine means the medicine suitable for the treatment of diseases in the tropics and not that in use by the natives. We have heard a greatdeal from Mr. Wellcome of the sources from which the natives derive many of their medicines, and it may be we have a great deal to learn from them in the future,as we have learnt a great deal in the past,on the subject of Tropical Medicine. But Tropical Medicine is altogether a new subject in after dinner speeches,and it has

come to light quite in the last few years; and the gentleman who is to reply to the Toast, Dr.Patrick Manson, is the embodiment of all that has taken place in Tropical Medicine during the last few years. (Hear,hear) He has been concerned in the foundation of Schools, not on the scale that we are proud to know the Gordon Memorial College in Khartoum is to be founded, but Dr.Manson had a large share in the foundation of a School of Medicine in Hong Kong, and he laid the foundation there of what might one day be a very great School. He has done a great deal more than that. He has laid the foundation and conceived the idea of laying the foundation of a Tropical School in London, which is not only the first Tropical School in London, but the first on the face of the earth. But the subject of Tropical Medicine and the various diseases that within the last few years have been dealt with, such as malaria, yellow fever and this disease which we have heard of to-night, "sleeping sickness", which until very lately ~~Dr. Manson~~ Sir Henry M. Stanley will tell us he met with on the banks of the Congo, but now it has wandered beyond the banks and has crossed to the watershed of the Nile, and is round about Uganda and round about Victoria Nyanza Lake, and has spread in a most serious manner and threatens to invade the waters of the Upper Nile, so that it is very important we should have a Station at Khartoum so as to be able to inform the civilized world of the advances of this very virulent disease. But

Tropical Medicine in this country would have been nothing without such a man as Mr.Henry Wellcome, and the efforts that have been made in that direction and the money that has been spent by private individuals in this country. And when we look at Dr.Jones in Liverpool we see what he has done, but now we are able to put up a London representative to Dr. Jones in the form of Mr.Wellcome. London is such a huge place, we might call it a collection of cities, that it is difficult to raise enthusiasm in the same way as can be done in a comparatively small town such as Liverpool. People can get an enthusiasm for Liverpool as Liverpool, but it is very difficult to get men in London to subscribe their money as they do in smaller towns. Mr. Wellcome is a pioneer in this respect, and we hope others will share his enthusiasm,and so be able to add lustre to London by still further granting aid to the subject of Tropical Medicine. There is no danger in supporting such Schools. We hope to turn out men of good calibre, and send them to the four corners of the earth to prosecute the subject. I ask you to drink to the Toast of "Tropical Medicine" coupled with the name of Dr.Patrick Manson. (Cheers)

RESPONSE.

DR.PATRICK MANSON,C.M.G., F.R.S., F.R.C.P.: Mr.Wellcome and Gentlemen, - It is a matter of great pleasure to me to have my name associated with this subject, the subject of Tro-

pical Medicine, particularly on this occasion when a new missionary is going out into a practically unfilled field of tropical pathology. When I came to London, now some 13 years ago, the subject of Tropical Medicine received no adequate recognition either from my own profession or from those who had the destinies of our country in their hands - our politicians. I remember very acutely my own ignorance on the subject when I first attempted to save men's lives,- or rather to take their lives on many occasions,- and I determined that if ever opportunity should offer I should raise a voice in favour of ~~the~~ more complete education on this subject of Tropical Medicine. I had a little difficulty at first in getting a hearing, but from the kindness of one or two individuals, I had a chance of raising my voice, and I am very glad to say I raised it with some effect; at all events, I was heard, and was heard by one of the most able and sagacious of our rulers, the Colonial Secretary. (Applause) He is a man who knows what he wants, and he knows how to get it, and when this subject of Tropical Medicine came under his notice he said, "It is a good thing, how shall we get it?" I proposed certain measures, and to these he gave effect, in spite of a great deal of very painful opposition; but I am glad to say he backed me up through thick and thin with the result that the London School of Tropical Medicine became established. But this fresh development, this sending forth of

missionaries into the pathological field is quite a new feature, and for the present instance we are indebted to the intelligent perception of what was wanted by, not the Colonial Secretary, but by one who in another field takes his place, Mr.Wellcome. The London man perceived the opportunity, and he knows how to carry the opportunity through. I wish there were more Pharaoh's in Egypt whose names were Wellcome. (Cheers) I think he belongs to the last, latest and best dynasty, and I hope he will meetwith many successes, for we in the London School of Tropical Medicine were something like the children of Israel when they went into the Wilderness and left the land of Goshen, we fared very badly,and unfortunately there are very few people who send us quails and manna in the Wilderness. If any of you here are disposed to help us, there are plenty of maws willing to eat receive your quails and plenty of sons willing to take up your manna. I think if there is one man at the present moment in the pathological field who is to be envied it is Dr.Balfour. He is a man with splendid capacities. Although I have not spoken to him much, I see a great deal out of the corner of my eye, and while he was at the ~~Technical~~ Tropical School I perceived his sterling qualities. He has first rate abilities and splendid apparatus, and now in the Sudan he has a magnificent opportunity, and I have no doubt in the future we shall have excellent results of his labours. But one thing I would beg of you, gentlemen, do not be impatient of results. (Hear,hear) There is a certain

element which has cropped up on the field of tropical pathology which is exceedingly distasteful to me, and that is the desire to appear to have arrived at results a long while before they have been really arrived at. I deprecate, however useful it may be in other departments of industry, however useful it may be in mercantile affairs and so forth, but I deprecate in science, advertisements. (Hear, hear) Sweet are the uses of advertisements, certainly - (laughter) -but most pernicious are they to the true scientific spirit, and to the true position that science should take before the world. (Hear, hear) We shall never attain any permanent results by saying we have a result, therefore I beg of you gentlemen to in no way try to jog Dr. Balfour's elbow, and send advertisements in the shape of announcements of discoveries which are of no moment. Give him time, and I have not the slightest doubt you will get magnificent results. How useful this Institution at Khartoum is to be, one has very little difficulty in perceiving. It is a very easy thing to conquer a country, so to speak, by the sword. To fight a few poor helpless black men with shields and spears by means of Martini-Henry's and Maxim Guns is a simple affair, but to conquer a people is certainly not to possess the land. Other means must be used , such means as Dr. Balfour is going to carry with him into Khartoum and the Sudan, methods of Christianity and civilisation, these are the only means by which we shall make a permanent and successful conquest of Khartoum

and the Sudan. If you can show the black man how he can be better, if you can show him how he can be more comfortable, then you will be able to occupy the position of conqueror in the true sense of the word. The Romans did not conquer simply by the force of the sword, the Greeks did not occupy Greece merely by the force of their military ability and power, they occupied it by their civilisation. This is the only way of retaining a permanent influence in a country. (Hear,hear) But beyond that consideration, turning to the more limited field of pathology, Dr Andrew Balfour's opportunity I say is unique. Just now Africa is not only undergoing political and social changes, but is undergoing an enormous pathological, shall I say, revolution. The introduction of European ways, of methods, of travel, of rapid communication, is upsetting the whole pathological arrangement of Africa. Diseases which at one time were confined to a limited district are now becoming diffused all over the country, other diseases are becoming exterminated, and the vices of civilization are becoming introduced . There is no better illustration of what I say of the European methods of communication than the introduction of that troublesome, but not very serious insect, the jigger. The jigger originally came from America. We get a few good things from America, but some bad. That feeble looking flea has contrived to hop his way

across the sea and has appeared on the East Coast. That no doubt by means of travel introduced by European methods. Then there is that awful calamity of "sleeping sickness." Undoubtedly, that disease has been introduced into East Africa - I am afraid to mention by whom - directly or indirectly by Sir Henry Stanley. Had he not travelled that dark forest, I do not believe that the natives would be dying by tens of thousands on the shores of Lake Victoria Nyanza at the present day. He is not morally responsible, but he undoubtedly in my opinion is the actual cause of this terrible mortality that is going on on the shores of Lake Victoria Nyanza. That is a serious indictment; but I do not think, Sir Henry, you are to blame in the matter. I do not think considerations of that sort should interfere with the progress of civilization; but if civilization is to bring to the dark Continent evils of that sort, it should do its best to stay them and remedy them. Now, that is the sort of mission I conceive to be the principal ~~mission~~ object of Dr. Balfour. We in a humble way in the London School of Tropical Medicine are endeavouring by one means or another to counteract these unfortunate effects of civilization, and in this matter of "sleeping sickness" we have done so already to a certain extent. I do not know that I am betraying any very important secret when I say that the commission sent out by the Royal Society, the Foreign Office, and the London School of Tropical Medicine, to study the "sleeping sickness" of Uganda has already succeeded in

discovering the germ and cause of the disease. A student of the London School of Tropical Medicine, Dr.Costellani (?) - we are polyglot there, we embrace all nations there - an Italian has found the parasite that causes the disease. And to know your enemy, to see your enemy, is certainly the first and perhaps the most necessary step towards conquering and overthrowing him. I believe that by and by in consequence of this discovery, in not a very long time, will come remedial measures of an effective character. But there are other diseases I might speak of; but I have said sufficient to illustrate one important function of pioneers such as Dr.Andrew Balfour is to be. Speaking in the name of the London School of Tropical Medicine, I wish him every success in his onerous and very responsible task. I can see by his experience, and I know by his speech, that he is a good man, a safe man, that his ideas of duty are on a very high platform. (Hear,hear) I know a good man when I see him. In this matter, at the London School of Tropical Medicine, it has devolved upon me to select men who are to take a leading part in the management of Institutions, and I flatter myself I have been very successful in my choice. And using this faculty of judging character and discriminating, I think I am right when I say Mr.Wellcome has been exceedingly fortunate in securing Dr.Balfour as pioneer of this Institution which he has founded. Mr.Wellcome I desire to add one word of thanks to

you, sir, for asking me here this evening and also for having set so grand an example to the philanthropists of this country in doing what it is really our first duty to do, guard against the interests of the people over whom we assume rule. I hope, sir, that your efforts will be crowned with success; indeed, I have no doubt of it, and I hope your example will be followed by many others. (Cheers)

THE CHAIRMAN: Gentlemen, just one word. I omitted an important reference in proposing the Toast of Dr.Balfour. The first thing I wanted to express to you to-night was to wish him God speed in his work, and the second to bring you in touch with him, you who are in sympathy with his work, in order that there might be an interchange of information between you and him. In that country he has not much access to current literature and libraries, and I will ask you gentlemen when any of you come into contact with matter which is likely to be useful to him in Books or Journals to kindly cut it out, or you might even send him the Book. And any of you gentlemen who are authors - and there are many here to-night - if you will kindly send a copy of your books to this Library the Sabaragamuwa at Khartoum it would be greatly appreciated and most useful. And if any of you gentlemen can do anything to help the Gordon Memorial College, you will be doing good work to these people and to humanity in general.

TOAST: "CHEMICAL RESEARCH".

SIR DYCE DUCKWORTH, M.D., F.R.C.P.: Mr.Wellcome and Gentlemen, - I think that everybody around this table to-night may well be satisfied as to the wisdom and propriety of the Toast which has been entrusted to me, a Toast which is quite impersonal - the Toast of "Chemical Research". I suppose we are surrounded at this table by many persons who are authorities on the subject of Chemical Research. I spoke, sir, of your wisdom and the propriety which you have shown in putting this Toast on the List, but I am not so sure that you have shown wisdom in appointing me to be the exponent of the Toast, and when you have heard my speech you will perhaps feel that you have been guilty of an impropriety in asking me to propose the Toast ("No,no"). Well, sir, my knowledge of Chemical Research is not large. My studies were carried on for forty years, and I studied pharmaceutical chemistry, and I think I had the honour of winning a prize, and that prize was a three volume book by Professor Miller of King's College. Fownes Chemistry was our hand-book, and we had great opportunities there. Amongst our demonstrators was a man who is very famous to-day, Professor Dewar of the Royal Institution. And coming from Edinburgh to London I found myself associated with colleagues like Dr. Matheson (?) whose name is well-known in the commercial world. But from that time my studies took me on from Chemistry into

studies much more in connection with bed-side work, and therefore my chemical studies may be said to have come very much to an end, though I have never ceased to feel an interest in the marvellous advance of Chemical Research that has gone on from that time to this. And if I call myself an old scientific chemical fossil, it is very true, because the researches that have gone on in the last forty years have been so vast and enormous that even a small part of the study of chemistry is enough I believe now to satisfy the desires and aspirations of the work of a whole life time. We have seen these marvellous advances in chemistry in relation to whole series ofmatters. Take the coal-tar series, and parafine series, and many others which have afforded work for scientific research which has been fruitful and productive of agents which come to help us every day in our bed-side work, which have been carried on by enthusiastic students at home and abroad and which is of a very laborious character and only fit to be carried on by men who have had opportunities and used them carefully and who have been wisely and well taught. The first thing that one has to say is this, that the opportunities for Chemical Research in this country, though no doubt large, are certainly not commensurate with those which are to be found on the continent of Europe. The reason for that is not very far to seek: the study I refer to is not always immediately prolific in worldly gain. Those who study

and work in these subjects are for the most part not very wealthy men. We find that in Germany especially all great manufacturers employ scientific chemists to aid them in their work. That is done in this country to some extent, but by no means to the extent it is done in Germany. And when we look to the matter we find that Chemical Research is not possible without endowment. Now we have some endowments in this country, but they are not large. The magnificent researches that have been made by Professor Dewar in the Royal Institution have been carried on entirely by private enterprise, but we look in vain in this vast metropolis for adequate endowments that are worthy the greatest city of the world. The fact is that nobody loves London. Dr.Cantlie has told us so to-night, but I would qualify his statement and say no one appears to love London. We find in provincial towns and cities that there are wealthy men whose heart strings are pulled towards their native place and who of their wealth endow research; but in London we find nobody's heart strings are pulled to endow research at all. For the most part, and at this moment, I may say, that the great University of London, which is endeavouring vigorously to adapt itself to the needs of this great Empire, is now starved and in want of Funds for aiding research and encouraging research in all departments. We are here to-night by the munificence and

generosity of one of the most munificent men in our midst, whose example might be followed in many directions, because whatever London may be it is a city of wealth. We have men who are able to endow research munificently and adequately so as to make it worthy of the British Empire; but it is not done. We have a Carnegie, and we have a Lord Strathcona who of their wealth are endowing various things, but it never occurs to them to endow Chemical Research, and we could wish that the example we have so nobly set before us to-night might be followed again and again, as it well might be so that these researches could be carried on adequately and in a manner worthy of this great Empire. Wehave an example set us in Germany where the State takes paternal care of all these matters. We pride ourselves on our private enterprise; it is very good so far as it goes, but it does not go far enough. If we cannot look to the State, we must trust to private enterprise, and we do make an appeal on behalf of the University of London for adequate assistance in order to encourage Chemical and other research. I speak now as a physician. We are glad and happy to avail ourselves of the product of Chemical Research. The agents which are brought before us day after day and week after week are certainly numerous enough, and it would require more than an ordinary life time in order to familiarize ourselves with the services and benefits that

may be derived from them. But every now and then we attain some thing amongst the fruits of this research which helpsus very materially in our work. And helpsus to assuage the sufferings and needs of humanity, and therefore we regard Chemical Research as equivalent in its prospects looking along the great vista which lies before it, as great as that which lies before the astronomer. There seems to be no end to the work carried on by men who are equipped and trained for it. We wish them well, and we thank them for the products they give us. And what we wish for them, and what it is our duty to ask, is that they shall be equipped and adequately endowed with the means for carrying on these researches. There is a call for aid to encourage such work as that I am now speaking of, and especially to-night we think of the work which lies before that eminent young man who is now going forth adequately equipped by the beneficence and the munificence of our kind host, whose generosity I have long before been aware of, and whoseefforts quietly and usostentatiously made reflect the highest credit on his honour; and we tender to him the warmest gratitude we can and recognize him, as it is our duty to do, for his goodness and munificence and generosity in doing this noble work, and we can only wish that his efforts may be seconded and others stimulated to do likewise, so that we may raise up in this school in this England of ours an adequate means of promoting chemical research,

which at present are most inadequate and perfectly unworthy of this great capital and unworthy of our British Empire. I ask you to drink prosperity to "Chemical Research", and especially to thank our munificent host for his efforts in that direction. (Cheers).

R E S P O N S E.

PROF.H.E.ARMSTRONG, Ph.D., LL.D., F.R.S; Mr.Chairman, Sir Dyce Duckworth and Gentlemen, - I think there are very many here to-night who will agree with me that this is a most extraordinary Dinner Party, and one which in the next edition of "Alice in Wonderland" must be described in a special appendix. (Laughter) I say extraordinary because of the very remarkable speeches that we have listened to from Sir Henry Stanley, from the Chairman and from Dr.Manson, because of the surroundings, and the way in which the colour is laid on in broad patches, and because Chemical Research has been proposed at a Dinner Party. I have had Chemical Research on the brain for about thirty years past, but it has never entered into my dreams that it could be spoken of at a Dinner Party, still less that it could have been exported into the Sudan. Gentlemen, I mean that very seriously. I ask you to ponder over the meaning of what has happened here to-night. Sir Dyce Duckworth has told you something of the importance of the subject. We have heard

a great deal about tropical medicine and the interest these matters have for Egypt; but I venture to think, gentlemen, that the time has come now when we should bear in mind that "Charity begins at home", and we should think of what has been going on, and what it is important should go on in this country. Sir Dyce Duckworth has already alluded to that to some extent; he has spoken of the way in which these things are done abroad, and he has implied that we relatively are at a disadvantage. Now I am one of those people who after saying a good deal from that point of view have also begun to say a good deal from the other point of view, and thinkwe are not so bad after all as may be supposed. I think we can prove that more or less from to-night's proceedings. It is an unfortunate fact that the President of the Royal Society was not able to be present with us this evening; no doubt he would have had something to say on the subject. But I happen to have in my pocket the Address which he delivered last Monday evening at the Royal Society, and I will read a few words from that. He referred to a Report recently issued by the Committee of the Technical Education Board of the London County Council which has been enquiring into the condition more particularly of the chemical manufacturing industry in this country, and to the way in which all the witnesses had come to one conclusion, which was practically

this, that we were not so much in force on the scientific side as on the chemical side, that it was possible - and I think this gathering proves it - to bring together if need be a large number of capable scientific workers if only the use can be found for those men, that the direction in which the shoe pinches more particularly in this country at the present time is in the direction of finding employment for capable men . It is not the difficulty we have in producing them. I venture to think we have unlimited proof that we can produce men in this country equal ~~to~~, if not superior, to those that can be produced anywhere abroad. (Hear, hear) The change which has taken place within the last 25 years in that respect is altogether remarkable. Take the transactions of the Chemical Society for instance, and you will find you have a variety of Chemical Researches carried on there which on account of their variety, on account of their importance will bear comparison with any published anywhere else. We can challenge the world so far as the quality of our work is concerned. The difficulty is as regards the quantity. Now, gentlemen, if I may refer to the Address of the President of the Royal Society, he says, speaking of this smallness of demand for men who have a scientific training: "This is the necessary consequence of a wider and more serious state of things which is affecting injuriously all our

national activities, namely, the absence, speaking generally, of a sufficiently intelligent appreciation on the part of the leaders of the nation, whether as legislators, capitalists, manufacturers, or merchants, of the supreme importance of scientific knowledge and scientific methods, not only for the successful carrying on and improvement of all industrial enterprises, but also, and not less so, for the working out of all national problems whatever, whether of education, of economics, of hygiene, or especially of national defence in the construction of our armaments by sea and by land, and the training of our soldiers and sailors." Gentlemen, what I want to point out is this, that as regards Chemical Research what is needed in order to carry it forward in this country is not so much what Sir Dyce Duckworth is pleading for, the intelligent appreciation of our manufacturers. Our Chairman to-night is a manufacturer, and there is no manufacturer in this country who has shown the same intelligent appreciation of scientific work as Mr. Wellcome has done. (Hear, hear) It is customary, as Sir Dyce Duckworth has told you, in Germany for the manufacturers to employ scientific men who carry on researches. Those men, gentlemen, almost invariably are made use of for the narrow purposes of the Firm; they are cabined and cribbed in every way, they are not allowed to speak among themselves, and they are not allowed to say a word outside the Works. But what has Mr.

Wellcome done? The members of Mr.Wellcome's scientific Staff are well-known to the scientific world. Dr.Power, Dr.Jowett, and other Members of the Staff have communicated to the Chemical Society during the past few years important scientific work which is recorded as of very great value indeed. Those men undoubtedly must be doing far better work within the Works than they are doing without, otherwise Mr.Wellcome is a good enough man of business not to keep them in his employ. Gentlemen, what we want in this country is the example which a man like Mr.Wellcome is setting, taken up by the manufacturers generally. Directly that is done, there will be an immense demand for scientific workers, funds will be forthcoming for the London University and other bodies, and it is in that direction, I believe, that Chemical Research needs pushing at the present day. Mr. Wellcome should become a missionary in this country, not merely in Africa, but he should be in some way or other made to go round and convert his fellow manufacturers, and when that is done, then I think Chemical Research will be recognized in a way it needs to be recognized in London. (Cheers)

TOAST: "BACTERIOLOGICAL RESEARCH".

SIR DOUGLAS POWELL, BART., K.C.V.O., M.D., F.R.C.P.,M.R.C.S., Mr.Wellcome and Gentlemen, - I think that if Bacteriology were to become a common subject of after-dinner oratory, a new terror

would be added to the sufferings of diners out, and particularly to those amongst us who have to talk and who whilst eating their Dinners have to ruminate over the somewhat suggestive subject of "microbes." But while I have been thus ruminating, it has occurred to me that, after all, these bacteria are not such a bad lot as they are reported to be. I think there is a great deal of prejudice and of unjust enmity towards these innocent beings. They are very worthy members of a sister kingdom, mostly; they are it is true of lowly birth, but they have very large families and they do their best to earn their own living and to promote the welfare of those large families, and in this I take it they are worthy of our deepest respect. ("Hear, hear" and laughter). And it is a fact that in doing their duty in this way ~~that~~ they do not in all cases interfere with our comfort and happiness . I have observed this evening some dishes handed round, very savory, in some ingredients of which I thought I could detect a microphitic source; and in regard to the liquid excellencies which we have imbibed, I will venture to say they are entirely due to a bacteriological source. And if it be the case occasionally that we have imbibed a bacterium of the wrong sort, a veritable bacterium diabolicum - (laughter) - I feel that it will not be the fault of the bacterium. We must look beyond that to the watchers of our oyster beds, the caretakers of our food stuffs, and beyond and behind them all, to the

bacteriologists who are or should be at the elbows of these bodies to look after the purity of their goods. There is all the difference in the world between a bacterium being in the right place and in the wrong place. The typical representative of our country, the noble and the patient bull,—the four-legged beast I mean - when he is enjoying himself in his own pastures, say in a very nice cowfield, is a very respectable person, and pursues his duties with great satisfaction to himself and great advantage to his friend the farmer who looks after him; but if he be introduced into a place which is foreign to him, for instance a china shop, he is greatly affronted, and he expresses his resentment in a very determined manner to the detriment of his surroundings. Well, gentlemen, similarly in a sense, we have bacteria, such as the bacillus of anthrax, the bacillus of tetanus, the bacilli of putresence and the like, who, whilst they are dwelling in their natural habitation, mother earth, are harmless and necessary and even useful beings and administer doubtless to the fertility of the surrounding soil; but if one of these creatures become introduced into the wrong place, into one of ourselves for instance, well, sir, in brief he plays the devil, and so I venture to think that it is one of the main purposes of the bacteriologist to keep a strict watch over him, to study and know the habits of all these creatures, and, so to speak, to keep them in the right paths, to police the

bacteria; and this duty is indeed of a very wide and far reaching character in this our crowded and complex civilization. Then another duty of the bacteriologist is to help his colleagues, the physicians and surgeons, in solving many of the conundrums that come before them, and by studying, not only helping them in the diagnosis of diseases, but by studying and teaching them the habits of these creatures, to add many suggestions in the way of the treatment of disease. The researches of bacteriologists in the last 20 years have shown us that every acute disease is really a specific disease. Well then, the third duty we should have, if we have any time to devote to further work, the third duty of a bacteriologist is to go hand in hand with the chemist, and to teach us of those mysteries of healthy and morbid fermentations, to teach us in fact much of the physiology of health and much of the pathogeny of disease. Now, I am desired to couple with this Toast the name of my friend and colleague, Dr. Foulerton, and I can boldly say that there is no one in London who has done more already to advance bacteriological research than Dr. Foulerton who is in the enjoyment of such a magnificent field of work, work which must take a long time, but which must soon be useful, and who is so well equipped for making the best use of those opportunities at the Middlesex Hospital, especially in the Cancer Wards. I have much pleasure in coupling this Toast with the Name of Dr, Foulerton. (Applause)

R E S P O N S E.

DR.G.R.FOULERTON, F.R.C.S.,D.P.H., F.R.S.:Mr.Chairman and Gentlemen, - I feel rather awkward in having to reply to this Toast. In the first place,I did not know what was in store for me, and in the second place,I thought Dr.Cobbett would say every thing. So far as bacteriology goes,I think you have had as much as anybody wants after dinner from Mr.Balfour Browne, so I do not propose to say any more about that. But as I am responding for Bacteriological Research,I should like to say one gets rather tired of hearing it said that in this country nothing is done, or little is done, because research is not helped by the State. So far as I can see,in this country research is very largely a matter of individual work. Sir Dyce Duckworth would not have had very far to look for a man who has done work which every English authority is proud of, without the help of the State - Dr.Manson - and I do not think a system which can produce a man like that can be very far wrong . With regard to speaking of bacteriologists,I have very little to say; but I should like to give Dr.Andrew Balfour the very best wishes of all of us . (Hear,hear) His chance is a splendid one; Mr. Wellcome has found the means, those who made the appointment knew where to go for a good man on the other side of the Tweed, and they have one of the best, and I can only offer him on behalf of other bacteriologists our very best wishes for the work

he is going to do. Those who know the work he has done have a very good idea of the work he is going to do in the future. (Applause)

TOAST: "SCIENCE APPLIED TO INDUSTRIES - MAY THE EMPIRE 'WAKE UP'."

MR.A.GORDON SALAMON, A.R.S.M., F.C.S: Mr.Chairman and Gentlemen, - I feel sure that I shall secure your indulgence when I say that I have been called upon at short notice to take the place of my friend, Prof.Attfield, who is unfortunately through indisposition unable to be amongst us this evening; and I think I shall further secure your indulgence when I call your attention to the Toast which has been committeed to my care, the title of which is "Science Applied to Industries - May the Empire 'Wake up'." Gentlemen, that is a large subject to deal with at so late an hour, and I take it that those who are engaged in the application of science to industry are assumed to deal with science from a business aspect, which means, as our Chairman will readily grant, neither more nor less than applied science from a common sense point of view. And if we take this Toast and bring it to bed-rock, I think we adjust it by asking ourselves, "Wherein is it that we are wanting? Why is it, - if it be true that we are wanting?" Now I am going

to deal with this very briefly, and yet I must claim your attention for a minute or two very earnestly because it is a subject that is very dear to my heart. If we are wanting, we must be wanting in two places, we must be wanting in leaders, and we must be wanting in the power of application. Now, if we are wanting in leaders, we are wanting in individualism. Is that true as applied to what we have produced in the last century? Can that be said of a country that in my own particular branch of science has produced its Doultons, its Daveys, its Listers, its Dewars, its Ramseys, and if I may say so, its Armstrongs. (Hear, hear) I have not exhausted the List, but if we take the list of those who are individualists in the progress of science, can it be said that we are lacking in them? I say in this country regarding its brain power as designated by leaders of science, it is second to none. I say we have produced an army of leaders who are leaders throughout the world, no matter what difficulties they have to compete with. But when we come to the application, there is the difficulty, there is the problem that will set us all thinking. Are we in a position to give the best effect to those who have given us original thoughts? Are we best equipped to apply those thoughts and to give them life? That problem we have to think over; that is the problem we have to face if we wish to keep in the van of progress. Now let me give you just one application of that which has occurred within

my own personal experience. I have had to work in the industry of fermentation, which is a great industry. It is an industry in which our legislature has had to take its part quite recently, and there came before the House of Commons for several years in succession a measure which was ill-conceived, as I ventured to think, and which denied, or sought to deny, to the manufacturer, the right to avail himself of that which had been done by research in the domain of science as applied to fermentation. Misrepresentation, and a desire to retain seats in Parliament, were responsible for many of the views that were held by those who were about to vote, and there came one man who grasped the subject and who put it before the House of Commons. The House of Commons, I know, was ready to vote in favour of a measure which would have meant the extinction of science as applied to the great industry of fermentation in this country, and it would have meant that our American cousins would have brought beer into this country at a price with which our own people would have been quite unable to compete . Mr.Fletcher Moulton grasped that problem, and I know from the highest sources that he turned the House of Commons, because he made them understand the point. (Hear,hear) It seems to me that we ought to take that lesson to heart. We have to make our people, from the legislature downwards, understand the requirements of science, and when once they understand them they will vote for them.

Sir, I am overwhelmed when I think of the subject which I have to propose for your acceptance. Science as applied to industry means that we have to make such men as Professor Armstrong come to common terms with those who have to translate his views into the practice of ordinary life, and that is where we are wanting. The Professor is not a manufacturer, and the manufacturer is not a professor. If we could only effect a compromise between the two and bring them into closer contact we should make them see that they are working for the common good and for common ends. (Hear,hear) I have worked for some years in connection with industry; I have never found the professor do justice to the manufacturer, and I have never found the manufacturer do justice to the professor. I have been educated mainly abroad where I have found the conditions far different. But, sir, I venture to turn to that country where Dr.Balfour is about, as we all hope and know, to establish his reputation; and there I have had recent experience of pioneers who seem to me not to be imbued with that conservatism, as it is called, which I believe to be a form of nervousness born of want of education, and quite recently I have had problems submitted to me which is sufficiently peculiar to warrant me mentioning it to you this evening. It is said and believed by those who are responsible now for the development of the Transvaal, that great building schemes are in the air, that much will be required in

the way of structure, and I have had submitted to me a very curious problem by one of the great leaders of the industry in Africa. They sent me a series of clay; they said that large buildings were going to be erected in Johannesburg, the Transvaal, and subsequently in Rhodesia, and that they believed they had clays wherewith they might make the bricks for these buildings, and it would save them sending out cement from this country or from America, and that they would be able to make good buildings with these bricks; but before they ventured upon that problem they wished to know whether the clays were really suited for the making of good bricks, and whether they could erect houses with these bricks and establish the industry of brick-making in Africa. Well, sir, that was a problem which of course demanded exceptional study. When a man gets a problem of that kind, he must work carefully. I studied it carefully, and I found these clays were underlying the coal measures of the Transvaal, and I found that they in all respects corresponded to those clays which underlie our coal measures in Durham and other parts of the north of England, and I then said the analysis showed that they were identical with those clays, but I desired to have a practical opinion in respect of what they were like when converted into bricks. I got the best practical man in England for making bricks, and the result was he arrived at the conclusion that he would like some

tons sent over to him, as he thinks they will constitute good building material and will make bricks as good as any that can be produced in this country. These men had the common sense to take not merely scientific opinion, but to associate that opinion with that of a practical man who was guided by the analysis that had been submitted to him, who had sufficient intelligence to appreciate the meaning of the analysis, and the result is the clay which had been hidden for centuries will be used for the building of houses which will be second to none. It appears to me, sir, that shows how, with the right men to direct industry, with those men who know how to give scientific xx aid and then associate it with the practical man, good results may accrue. When, sir, I look at the scope which is to be given Dr.Balfour, which is not merely bacteriological work, but which includes testing and assaying of agricultural, mineral and other substances of practical interest in the industrial development of the Sudan, I cannot but think that many such problems will await him, and that he will have the proud privilege of bringing forth for the use of mankind many of those substances which have been hitherto hidden under the surface of the earth, and that he will show that country how by the aid of science combined with true industry and common sense he will make it a healthful, prosperous and self-supporting country. I must apologise for speaking at such length at this

late hour, and I will now content myself by thanking you for having permitted me to speak to such a Toast, and associating with it the name of one who is not sufficiently known, though perhaps known to all of us, is not sufficiently recognized as one who has largely and mainly helped to constitute that great Society which has brought theoretical science in this country into common touch with industry. I give you, gentlemen, the Toast of "Science applied to Industry", and as regards " May the Empire 'Wake up' " I will merely say that it is very easy to make political epigrams, but it is very difficult to make workable programmes. The gentleman whose name is coupled with this Toast has made a workable programme, for he was one of the pioneers of working chemistry, his name is Mr.Thomas Tyrer. (Cheers)

RESPONSE.

MR.THOMAS TYRER:

(Take in Speech)

RESPONSE.

MR.THOMAS TYRER, F.I.C., F.C.S.: Mr,Chairman and Gentlemen, and Mr.Gordon Salamon, - At this very late hour it would seem almost like a crime to detain you, but I venture to think, notwithstanding the importance of all that has been said, there has been nothing so important as the Toast with which my name has been associated. That is a piece of egotism for which I beg pardon. But the theme of the whole evening has been the application of knowledge. I do not understand science except in the sense of being knowledge which has to be applied. It is of precious little use unless it is so. You, Mr.Chairman, have been referred to to-night in many capacities, and none will appreciate more than your fellow-manufacturers the work which you have done. You, at a very early stage in your business career, felt the necessity not only of scientific knowledge, but of the application of it; and ~~you~~ at a period at which many men, many manufacturers, many capitalists would hardly have dared to have done what you have done in connection with your business, feeling that its success depended upon the application of science and all its details, science, not only chemical, but in the broad sense of the term, and you established research Laboratories which are associated with your very welcome

name. In those Laboratories which I have had the pleasure at a very early stage of visiting, and which may I respectfully venture to say as a pupil of Hofmann, possessing enthusiasm as a humble follower of the great master, and yet having some knowledge based upon, not only his instruction, but the application of science, I have visited over and over again those Laboratories which you have fitted up and which are associated with your name, and I have never found anything there but the most earnest work. Professor Armstrong has referred to that part of the work which is of a more scientific charecter and fitted to be laid before the Chemical Society, but undoubtedly you, as a business man, were not content with the ornamental merely, but you were anxious that the useful, from a scientific point of view, should be presented to the world, the common sense point of view, to adopt a phrase from my friend Mr.Salamon; this has been the work to which the Laboratory bearing your name has been devoted. It says much for your enterprise. And may I refer to the Press Reports of the Address of the President of the Royal Society, where if I mistake not, he lamented the want of enterprise and of go amongst the capitalists of this country. I venture to think that he did not fully appreciate the amount of enterprise, nor did he appreciate to the full the amount of go. One could talk for an hour on the causes; but I may mention one or two very briefly, and one of those

has been mentioned incidentally by Professor Armstrong and others, and that is the amount of State patronage. Everything has been done, practically, in the Golden Age of this country, and the Golden Age has not passed, gentlemen, The Golden Age of this country was made by individual effort. India was won by individual effort; all sorts of things have been done by individual effort, and I for one, shall lament the day - I am yet young enough to do good work, and hope I may, but I am old enough to look back and I think even that individualism had its part and helped to build up this great Empire, and long may the day be when we shall find wanting confidence in ourselves! And if I may incidentally refer to that fact, it is a good thing that Consols are 2¼; it is a very good thing that men do not find in getting out of business they get more money; and I think there is a reaction coming when men getting out of business - to use an Irish bull - will mean staying in it. Let them get out of it, but let them look on; let them not withdraw their influence and their money. And the time is coming when the intelligent and the bright and clear headed and far-seeing will say, "I will look on, I will advise if you will ask me; I will guide you; there is my money, I shall get a better investment than by taking it out of my business." And I say I believe that with honest workers, with intelligent men, clear-headed and well-trained, there is a better future for us as manufac-

turers than there has ever been before. That is my opinion. The other day Mr.Salamon reminded us of this on a special occasion to which I need not refer: that the patent laws of this country had been not only a hindrance, but more than a hindrance, but that now the cloud had been removed , the new Patent Bill had been passed and he has had a measure behind the scenes - perhaps before the scenes - but certainly he has done his part as a man who knows what manufacturers want, has done his part in influencing the legislature and pointing out the difficulty there was. This is the dumping ground for the world; but it is the dumping ground not only for the world's products, but for the world's minds, and if the world's mind is interpreted in its Patent Laws no German or French Patents could be to be taken out here with no compulsion to work them. The work of the world should be at the service of the world ; therefore, it is a grand thing to think that henceforth in due time every patent must be worked; that is to say, if called upon. There have been many farcical things about working Patents, but it is a fact that in the future he who will, seeing the public demands and the public need, may call upon the inventor who ever he may be to grant upon reasonable terms without going to something like £8,000 expense to compel him that he has a right to use the brains of the world. What are the Patents taken out for, but to leave us this, the dumping ground. No longer will this

be, and therefore, in that way we have a stimulus to science, and those who are ready - because it is not supposed they will place at your disposal everything they know - the well-trained scientist will be greater in the future than he has beenin the past. When I found I was honoured with this Toast, I thought of one or two things that I remembered reading in that admirable Paper, the Weekly Edition of the Times, and one of them was this, that the German Emperor— wise and clever and astute man, one of the ablest men of the day who demands our respect because he knows the needs of his country - he actually tells his country and his countrymen, who are lauded and applauded a little more than they deserve, I think, he tells them plainly that on the occasion of the opening of a Hall of Fame and Museum he says this, that he cannot help thinking that the present generation does not respond fully to the duty of carrying on the work bequeathed to it by its forefathers. Why, believe me, that is the very thing we say. And if the German Emperor sees that need in that nation which has become consolidated and become one great nation, if he sees that need, how much more we? And then again in one of the trade Journals we find some account of hisperformances which we do not see written in "The Times" or any of the other Papers with the same eclat or to the same extent as we do the theoretical representations. We find they had a little theoretical representation oftrade spirit

and one of these gentlemen after describing the use of curling irons, warming apparatus, motors and a number of other things in this Trade Journal goes on to make use of a pious aspiration: Would that our King - better give him a hint - would that our King would become a commercial traveller too! Very well, our King is a very good man; but the limits of his work are not in the way of an Imperial commercial traveller. Nevertheless, there is wisdom in all thathas been said and all that has been done; and that reference to spirits brings me to this, that the very kindly work of my friend to every medical man in laying down the line of exempting spirits for chemical use, has now culminated in the matter of spirit, and I may briefly refer to that factthat in the last Session of Parliament we were exhilarated, we manufacturers were made happy in the hope that we had duty free spirit. But when the Finance Act came out we who do not follow Hansard or the little sentencesin the "Times", we found that there was interpolated one delightful little clause inspired by the Treasury and accepted for the sake of the great principle of duty-free spirit, a few words which involved this , that provided the differential duty of 5d. - if I may mention it although it is not mentioned in the Act - hitherto imposed, must stand. Now, gentlemen, that means this, that if spirit costs 5d. in Germany, and you have to pay 10d. it makes it from 42% to 25% dearer than in Germany. Now, such is our legislature.

What can we do? Get behind the legislature? No; but we can use the immense force behind you gentlemen, the immense force of such a body as the Chamber of Commerce, the immense impetus of a Society of 4,000 members and say, "Here we are, gentlemen, with our British industries hampered and hindered, and there are scores of things which could be made here, not brought from abroad, if we had the spirit." Now then, how are we to get over this? Simply by showing the legislature,-and we are taking the means to do it - showing the legislature first the Customs, and the Excise next that we welcome supervision, that we are prepared to give bonds as to our integrity to any extent, but we do want to be placed on an equality with those who use this spirit for important manufactures. Medical gentlemen are aware, scientific men are aware how necessary alcohol is for the production of the very things which Sir Dyce Duckworth and other gentlemen have referred to, how necessary for their professional work. They are made abroad, not because of the superiority of their chemists or the immense capital they possess, or their researches, but they are made abroad simply because we have not in many cases this particular agent which would assist us very very largely in production. But, gentlemen, the great point is this, according to the terms of the Toast, it is science as applied to industry. I am with Dr.Armstrong, that we have clever chemists if we want them , teachers in abundance, men whose

names are honoured all over the world, and it is on record as the testimony of the President of two years ago that the technical productionsand contributions to the Journal of the Chemical Society are equal to anything in Germany. Therefore, gentlemen, it is but a very simple matter to say that it needs but the encouragement of capitalists on the one hand, of the State eye on the other, and the energy of individuals to do all that is required. So far as I am concerned as a manufacturer I venture to say - and I think my friend Mr.Salamon knows something about it, - I venture to say I have never yet built up a wall of British insularity, or any other wall whatever. Knowledge seems to me to be a sort of prophet, and I cannot understand anybody imagining that science was made either for himself or for anybody else, but for the whole world, and I have yet to learn that our teachers and Institutions are not equal to all that is required of them . It is late, but one could descant upon this subject for a long time, but I scarcely know why I occupy the position of responder to this Toast, except if I may say so, that I am honoured as one of those in whom your Chairman and his Firm think it well to do business with. You may be pretty sure that he would not ask me to use my science to help him if he could get it done better anywhere else ; and as there are others besides myself, I may say the same of them. And I

can only congratulate him upon the success of such a Dinner party as this, and hope he may long be spared to be the head of the Firm, the stimulus and encourager of a band of workers such as he has around him. (Cheers) I thank you, gentlemen.

TOAST: "THE CHAIRMAN".

DR.HARVEY LITTLEJOHN; M.A., M.B., B.Sc., F.R.C.S.: Gentlemen, - I have an exceedingly pleasant task to perform, and that is to propose the health of our host to-night. (Hear, hear) When I was told a short time ago, by a gentleman who said that after carefully looking over the List he had come to the conclusion that I was the person who must undertake this little duty, I confess I was a little at a loss as to what my qualifications were. I think it must be that coming from Scotland he looked upon me as a seasoned cask who would be able to do justice to the Toast after the feast, or on the other hand he must have regarded me as a confirmed teetotaler. Gentlemen, I am not the latter, and I leave it to you to say whether I am the former; but all I would like to say is this, that I think our heartiest thanks are due to Mr.Wellcome for his magnificent hospitality to-night. (Hear, hear) And, gentlemen, I think will serve another purpose too, because I think that it will be an excellent lesson to our future host, Dr.Balfour, when he receives those relays of us in the future at Khartoum. But gentlemen, I do not base our thanks to Mr.Wellcome simply upon this feast which he has given us; I base them upon very much higher grounds than that, namely, the magnificent generosity which has inspired him to give to Khartoum a Laboratory which I believe will not only benefit the Egyptians, but which in the future will lay us all under a very deep obligation to him

(Hear,hear) Gentlemen, I give you the health of Mr.Wellcome. (Cheers)

RESPONSE.

MR.WELLCOME: Gentlemen, you have had enough of my voice to-night, and I will not inflict another speech upon you at this late hour of the evening. I have been asked who this gentleman on the cover of the Programme is. It is suppose to be General Gordon. If any of you have more time and leisure and would like to see the objects I have collected in the Sudan I shall be pleased. I thank you most heartily.

The proceedings then terminated.

HSU FRIENDS. BALC 2.