

Islamic science : crossroad of cultures. An exhibition at the Wellcome Institute for the History of Medicine ... 19 June to 12 November 1985 / [compiled by Nigel Allan].

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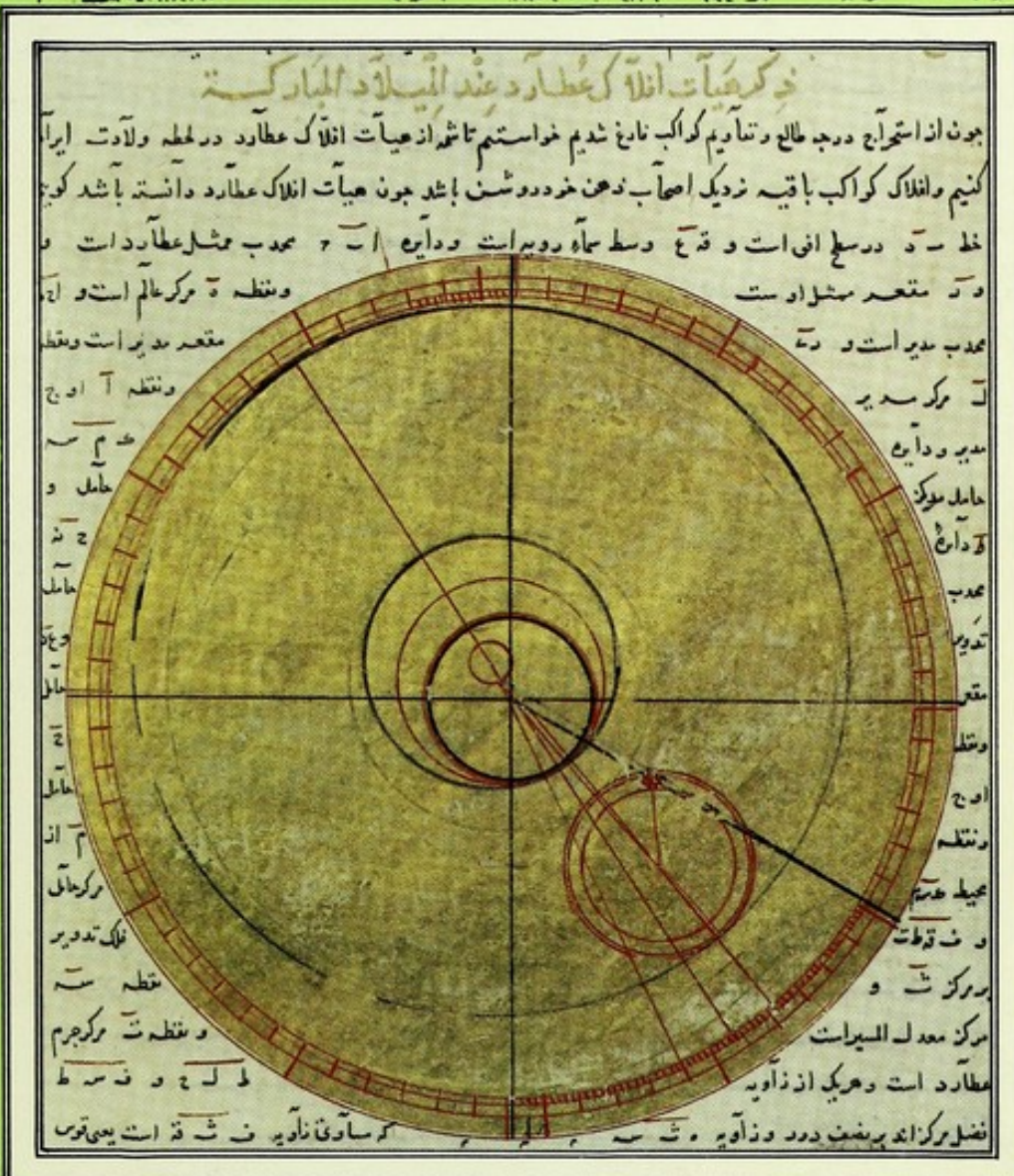
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ISLAMIC SCIENCE

CROSSROAD OF CULTURES



AN EXHIBITION

at the
The Institute for the History of Medicine

WELLCOME COLL.

/(45)



22501691443

The motions of the planet Mercury from the horoscope of the Tīmūrid prince Iskandar, copied in 1410 A.D. is featured on the cover against a background of various scripts found in the Islamic world.

Persian MS. 474 f.5^v.

ISLAMIC SCIENCE
CROSSROAD OF CULTURES

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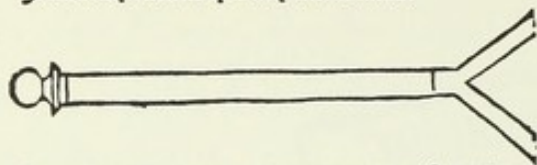
Crossroad of Cultures

An exhibition at the
Wellcome Institute for the History of Medicine
183 Euston Road, London NW1 2BP

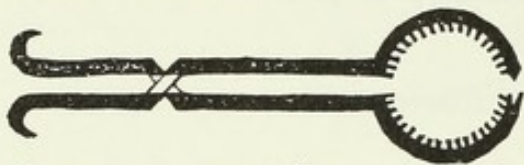
19 June to 12 November 1985
Monday to Friday 9.45am to 5.15pm

Abucasis

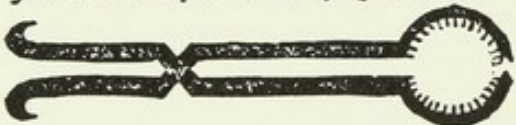
Forma impellentis quo impellitur fetus.



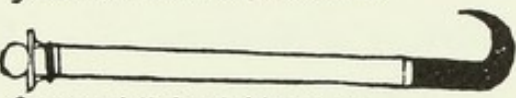
Forma almisdac qua pteritur caput magrū: et assimilāt forpici: cui sunt dētes in extremitatē sicut vides. Et quāq; sit oblungum sicut forpices sūm hanc formāz sicut vides cui sunt dētes sicut dentes ferre quo incidit et pterit.



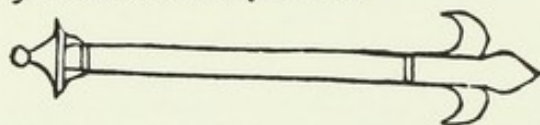
Forma almisdac quo conterit caput paruum.



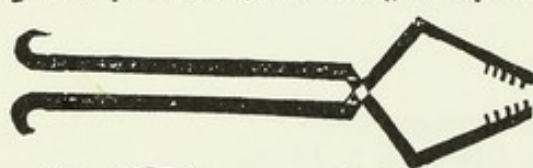
Forma yncini habentis spinam ynam.



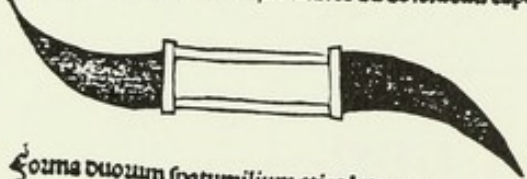
Forma yncini habentis spinas duas.



Forma forpici cui sunt dētes ferre cū q̄ pterit caput feti



For^a spatūlis bñel duas extrēitates ad abscidēdū caput



Forma duorum spatulium etia; latozum.



Ista instrumēta omnia exercētur: et quāto plus multipli cantur species eorum: et p̄parata sunt apud artifices est velocior ad operationē suam: et altior apud homines p̄pter quātitatem suam. Non ergo despicias ex eis instrumētum quin sint apud te p̄parata. Inexcusabilis est enim necessitas eorum.

De extractione secundine. CAP. LXXVIII.



Quando retinet secundina apud partus, tunc op̄s ut p̄cipias infirme ut retineat anbelitus suum. Deinde fac eaz sternutare cū cōditi: et stringe manū tuā super os ei⁹ et nares ipsius. si ergo egrediē p̄ h bonū ē. Si nō. tūc accipe ollā et p̄fora in coopertoio foramē: et pone in ea herbas aperientes os matricis: sicut calamentū rutam: et anetū: et camomillaz: et scbā: et cassiā lignēā: et cecataures. accipe omnes istas herbas: aut quasda; earum: et submerge eas cum aqua: et pone eam super ignē: deinde pone embulā arundinis super foramen coopertoii olle: et extremitatē aliam in os matricis: et teneat eā donec perueniat vapor ad concauitatem matricis. deinde fac eam sternutare sicut diximus. secundina enī egredietur cū facilitate. Si autem remaneat post hanc curationē et non egredietur: tunc p̄cipe obstetrici ut submergat manū suā in oleo sisamino: aut mucillagine altee. deinde intromittat in vuluam: et querat cum ea secundinam. Cum ergo inuenierit eam: tunc accipiat eā et extendat ipsam paulatim. Si autem fuerit annexa in profundo matricis: tunc intromittat manū sūm qd̄ narrauimus. donec quando intuerit secundinam et extrahat eaz paulatim sūm rectitudinē: ut non cadat mat̄r apud attractionēz vehementēz: im̄mo oportet ut permutetur cum facilitate ad latera dext̄ra et sinistra. deinde addatur in quātitatēz attractionis. Ipsa enī obedit: tunc et seruatur: et euadit ab adherētia.

De si os matricis est coartatum sicut nos iam narrauimus: cura eam cum sternutatione: et ex medicatiōe olle cum herbis. Si autem non egreditur cum omnibus que narrauimus: tunc caue ne fatigeris super eam in iteratione extractionis. Verū oportet ut qd̄ egreditur ad os matricis ex ea liges ad corā mulieris. deinde clisteriza eam cum ynguento tertrafarmacon. Ipsus enim putrefaciet eam post dies et dissoluetur et egredietur. Verumtamen quando putrefit eleuatur ex ea odor malus ad stomacū et caput et ledit illud: infirmam. Oportet ergo ut administrentur suffumigationes conuenientes ad illud. Quidā autem antiquozū iam experti sunt suffumigationēz nasturcy et ficuum siccarum. Forma instrumēti quo suffumigatur mulier apud retentionē secundine et menstruum. Fiat ex vitro sise alcama: aut ex zere: et ponat extrēmitas ampla super ignē: et suffumigatio sit posita super p̄unas teneat eam donec consumatur illa suffumigatio et itera aliam.



De curatiōe ani nō perforati. CAP. LXXIX.



Alcun ē multi puerorū et ani corū sunt nō p̄forati: quos iāz opilaui sifac subtile. Op̄s ergo obstetrici ut p̄forat illud sifac digito suo: et si nō perforat ipm cū spatulili acuto et cancat lacertū ne tangat eū: deinde pone super ipm

Cirurgia cum cauteriis et aliis instrumentis. The Latin translation of an Arabic work on surgery composed by Abulcasis. Printed in Venice in 1500, the opening shows a selection of forceps, probes and other surgical instruments.

No. 3017 f.25 .

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All items exhibited are drawn from the Wellcome Institute for the History of Medicine except where otherwise stated. Rugs have been lent by the Wellcome Museum of the History of Medicine at the Science Museum, London.

INTRODUCTION

A crossroad has been defined as a point of intersection between two or more roads. It is therefore appropriate that "crossroad of cultures" should be the subtitle to an exhibition devoted to Islamic science for Islam stands at a point of contact between Judaism, Christianity and Islam, between the ancient cultures of the east and west which in turn produced Islam's own distinctive science and culture. A crossroad however, is not a convergence of roads from different places to a termination at one point but rather continues across the point of convergence to many different destinations. By the same token the synthesis that took place at Islam's crossroad of cultures diverged again to many destinations in South East Asia, India, the Near East, North Africa and Southern Spain. By this convergence of ideas Islam both preserved and developed the sciences of the ancient world until such time as the western world had emerged from semi-barbarism and was fit to receive and further develop them into the scientific knowledge of the twentieth century. This is the debt the western world of our own day owes to the Islamic world of medieval times.

This synthesis of ideas was a process which began before the rise of Islam as the inevitable result of contact between different peoples through commerce and trade. With the decline of the Roman Empire and the rise of Christianity the burden of Greek learning passed from the former to the latter. The intermediaries between ancient Greece and the Arabs were Christians whose language was Syriac, a Semitic language in many respects similar to Arabic but containing much Greek vocabulary, hence a suitable vehicle of transmission from the Hellenistic to the Islamic world. Under the 'Abbāsīd Caliphs Baghdād became the centre of Islamic science largely due to Christians acting as translators from Greek into Syriac and Arabic at the famous Bayt al-ḥikma "House of Wisdom" established by the Caliph al-Ma'mūn (d.218/833) and directed by Ḥunayn ibn Ishāq (d.260/873), a Nestorian Christian and physician who had studied at the famous Christian university in Gondishapur in South West Iran. Rhazes (d. c. 313/925), a Moslem from the Iranian city of Rayy, in his great medical compendium quotes the writings of Perzoes the monk sent by Anūshīrwān (d.579 A.D.) to India to collect drugs. Avicenna (d.428/1037), born near Bokhārā in Turkestan, philosopher, statesman and physician brought together all medical knowledge of his time in his K.al-Qānūn. This work was studied by students of medicine both east and west until late in the medieval period.

Science in the Islamic world transcended cultural and religious differences. Maimonides (d.601/1204), the 850th anniversary of whose birth in Moorish Cordova is celebrated this year, although the greatest Jewish philosopher and also a physician of distinction, was a pupil of distinguished Islamic philosophers. Later in Egypt he was appointed physician to the Caliph. Ibn Buṭlān (d.458/1066), a Nestorian priest and physician wrote medical and theological works and organised hospitals in Aleppo and Baghdad; 'Alī b. 'Īsā (d.c. 400/1010), a physician and secretary to the Catholicos Johannes, changed his allegiance from the Nestorian to the Greek church while Ibn Jazla (d.493/1100) also a physician converted from Christianity to Islam.

The great Tīmūrid family of Mongol rulers contributed much to the arts and sciences in the Islamic world as witnessed by the exquisite artistry of the horoscope of Iskandar Sultān (d.817/1414). His cousin, Ulugh Beg, (d.853/1449) established his celebrated observatory at Samarkand and composed the astronomical tables that bear his name while Mansūr, (d. after 826/1422) the Iranian anatomist, dedicated his anatomical work Tashrīḥ-i Mansūrī to another Timurid prince, Sultān Diyā al-Dīn Amīr-zāda Pīr Muhammad Bahādur Khān (d. after 812/1409). These drawings attributed to ancient Alexandria reflect the convergence of Hellenistic medicine with Islamic and its divergence again to east and west. Many of the topics chosen to illustrate Islamic science are connected with the healing art which is the most strongly represented of all the sciences in the Wellcome collections. The variety of languages contained in the manuscripts displayed represent the many different cultures of Islam.

During the 12th and 13th centuries Europe's contact with the Islamic world increased, especially following the Crusades, and interest was aroused in Islamic science and the Hellenistic learning it preserved. Many works were translated from Arabic and introduced to the west resulting in an intellectual summer of Islamic influence in medieval Europe. In this work of translating from Arabic into Latin, Spanish Jews who were fluent in Arabic were the natural intermediaries. The advent of printing and the invention of moveable type in the 15th century gave added impetus to the study of the writings of Islamic scientists both in translation and in their original languages. During the following century the new learning of the Renaissance together with the Reformation stimulated a fresh interest in the original languages of the Bible. Hebrew was studied and some attention paid to the other Semitic languages especially Arabic. Chairs of Arabic were established in the universities of Oxford and Cambridge in the 17th century, and an increasing interest in Islam was further aroused by expanding trade with the Near East and travel in the lands of Islam, the collecting of manuscripts, and the teaching of grammar and history.

This exhibition has been organised to support the series of research seminars currently being held during the academic term at the Wellcome Institute in conjunction with the Department of the History and Philosophy of Science at University College London which are devoted to "Sources of Medicine, Science and Technology in Islamic Civilization." The exhibition has been the idea of Dr. Gül Russell the organiser of this successful series of research seminars. I am much indebted to Dr. Russell for her unfailing support in every stage of the exhibition's planning and for her assistance in areas of her particular expertise especially Turkish. I should also like to record my debt to Dr. Fatime Keshavarz for her generous help in so many ways especially with the Persian exhibits and to draw attention to the forthcoming publication of her magisterial work, A descriptive and analytical catalogue of Persian Manuscripts in the library of the Wellcome Institute for the History of Medicine, an event eagerly awaited by scholars in Iranian studies both here and abroad.

We have been fortunate in procuring a loan of four manuscripts from the British Library and one from the Institute of Ismaili Studies along with a number of items from the Science Museum and the Wellcome Museum of

the History of Medicine at the Science Museum. I am grateful to their respective curators for making this material available and supplying the relevant information. I am also grateful to my colleagues and staff at the Wellcome Institute especially to Mr. Tony Bish and his team of conservators, Mr Huw Geddes who has helped erect the exhibition, and Miss Grainne Driscoll for typing this catalogue and the exhibition captions.

It is hoped that this exhibition will illustrate something of the diversity and magnificence of Islamic science and at the same time display the richness of the Islamic collections in the library of the Wellcome Institute for the History of Medicine.

Nigel Allan
Curator of Oriental Books & Mss.

✓ CASE 1. A GREEK PHYSICIAN IN THE ISLAMIC WORLD: GALEN
(129-199 A.D.)

Known in Arabic as Jālīnūs, Galen was born in Pergamon in 129 A.D. and died in Rome aged 70. In the annals of medicine in antiquity he occupies a place second only to Hippocrates and from his numerous dissections and observations advanced the knowledge of his time in anatomy, physiology, embryology, pathology, therapeutics and pharmacology. He was also a distinguished philosopher relating medical practice to philosophical concepts by means of the logic of Aristotle (384-322 B.C.). Galen's medical works were particularly admired by all later Islamic physicians who translated them in their original form as well as in summary commentated on them and wrote works based on them so ensuring that the authority of Galenic medicine should remain unimpaired until the 16th century.

As in the case of philosophy and other sciences, Islamic medicine follows the late Greek syllabus almost without a gap. This is largely due to the translations made in the Christian Orient of Greek works into Syriac and Armenian which ultimately passed into Arabic translation. Sergius of Rash'aina (d. 536 A.D.), a Christian priest and physician in Mesopotamia was one of the earliest translators of Galenic works whose translations can still be identified. Job of Edessa (early 3/9th century), also originating in Christian Mesopotamia, is credited with the translation from Greek into Syriac and Arabic of thirty different scientific works. Ḥunayn ibn Ishāq (192/808 - 260/873), a Nestorian priest, was the most distinguished translator of all; through his translations Islamic physicians became the worthy successors of their Greek antecedents. Proficient in Greek, Syriac and Arabic he was set in charge of the Bayt al-ḥikma, an academy established in Baghdād by the Caliph al-Ma'mūn for the translation of Greek scientific works into Arabic. In this way the complete curriculum of the medical school of Alexandria was made available to Arab students in their own language. These translations were of a high standard carried out in a methodical and scientific way with recourse to the best manuscripts available.

Many philosophical and medical texts were translated from Greek into Armenian at an early date so preserving in Armenian translation many Greek scientific texts long since lost in their original language or in the translation of other languages

A selection of medical texts from Galen's works are displayed in Arabic, Armenian and Syriac translation and in Greek.

Definitiones medicae, "Medical definitions". Undated (late 16th century) Greek manuscript transcribed in a semi-current hand and containing 479 medical terms for students, a selection of which are shown
WMS 289 ff. 5^v, 6^r

al-A'qā' al-ālīma, "The diagnosis of diseases of the internal organs". Undated (7/13th century) Arabic manuscript copied in fine Naskh by a physician Abū Naṣr b. 'Abd al-Salām b. Abī Maṣṣūr al-Isrā'īlī and previously owned by Sham'ūn b. Yaḥyā Ishāq b. 'Abd al-Kāfī b. Abī al-'Izz al-Isrā'īlī, 'Alī b. Ḥamza al-Mutaṭabbib, 'Ala' al-Dīn b. Walī al-Dīn al-Mutaṭabbib and Muḥammad Karīm (1269/1852). This work was

translated from Greek by Ḥunayn ibn Ishāq (192/808 - 260/873) and comprises six treatises. The beginning of the first treatise is shown. Arabic Ms. WMS. OR 14a ff I^V, 2^r.

Ilā Ighlūqun, "To Glaucon". Undated (10/16th century) Arabic manuscript copied in the Naskh style. This work comprises two treatises relating to therapy (Summaria Alexandrinorum) which were translated by Ḥunayn ibn Ishāq (192/808 - 260/873). Ḥunayn states that the Greek physicians of the school of Alexandria classified Galen's sixteen books into seven categories for study by medical students. The first category was regarded as an introduction to medicine the fourth part of which was Ilā Ighlūqun, a general treatise on medicine, which Galen wrote for his friend Glaucon who was about to travel abroad, c. 175 A.D. Arabic MS. WMS OR 62 ff. I^V, 2^r.

Tafsīr Jālīnūs li-fuṣūl Buqrāt, "Galen's treatise on the aphorisms of Hippocrates". This work containing seven treatises was translated by Ḥunayn b. Ishāq (192/808 - 260/873). The manuscript is undated (11/17th centuries) and copied in clear Ta'liq. The opening displayed is concerned with gynaecology and obstetrics including observations relating to the miscarriage of children. Arabic MS WMS OR. 64 ff. 59^V 69^r

Fragment of chapter 24 from Ars medica in Syriac translation (f. 14^V) dealing with respiration followed by a fragment from de Alimentorum facultatibus, Book 2, chapters LVIII - LXI in Syriac translation (f. 15^r) which deals with various plants including asparagus. Copied c. 8th century A.D. in a fine regular Estrangela script on vellum, these fragments may possibly have been translated from Greek by Sergius of Rash'aina (d. 536)

British Library Ms. Add. 17156. ff 14^V, 15^r.

Lent by the British Library, Department of Oriental Manuscripts & Printed Books.

De simplicium Medicamentorum Temperamentis ac Facultatibus in the Syriac translation of Sergius of Rash'aina (d. 536) and addressed to his pupil, Theodore, Bishop of Merw. The manuscript, copied in the Estrangela script on vellum during the 6th or 7th centuries A.D., contains Books 6, 7 and 8 of the work. The opening taken from Book 7 describes the medical properties of various herbs.

British library Ms. Add. 14661 ff. 34^V, 35^r.

Lent by the British library, Department of Oriental Manuscripts & Printed Books.

Armenian manuscript containing Hēk'imaran, "Medical Encyclopaedia", composed by the Armenian physician Amirdovlat Amasiac'i (d. 1496 A.D.). The manuscript was copied in 1481 on vellum in a small fine Bolorgir or round hand in vulgar dialect instead of the customary classical Armenian. On f. 3^r displayed, beneath the head-piece is written and given here in English "If you are scientific, then make use of this work. The name of the book is Angēl Anpēt [Useless for the ignorant]." Then follows in gold, blue and red capitals "by the grace of the Lord and the mercy of the Creator and immortal God who is Bestower of all blessings ..."

This work, which is an encyclopaedia of medieval Armenian pharmacology (with the names of drugs given in five languages:- Armenian, Greek, Latin, Arabic and Persian) containing the names and synonyms of more than 3500 medicinal plants, animals and minerals, represents Armenia's medieval medical tradition at its best. Much of the content is drawn from the medicine of ancient Greece including Dioscorides and Galen.

Amirdovlat Amasiac'i was the last great Armenian physician in the classical tradition of ancient Greece. Born in Asia Minor early in the 15th century A.D., he eventually settled in Constantinople and was appointed personal physician to Sultān Muḥammad II. He wrote a number of important medical works and in all displays a wide knowledge of Greek and Islamic medicine. In his work on the usefulness of medicine completed in 1469 he wrote "Remember brothers that this book is not my work, it is the work of ancient sages that of Hippocrates and Galen, Ḥunayn ibn Ishāq and Ibn Sīnā ... it is from their books I have gathered data and written it ... in my own hand".

British library Ms. OR. 3712 ff. 2^v, 3^r

Lent by the British library, Department of Oriental Manuscripts & Printed books.

Composite Armenian manuscript containing treatises on the formation and structure of the human body. The manuscript is copied in four different Notengir, or notarys' hands of the 17th or early 18th century. One of the copiests gives his name, place and date i.e. Paul the monk, Iṣfahān, 1625 A.D. The opening displayed on f. 22^r in English translation begins:- "Towards an understanding of the veins Galen says ... "

British Library Ms. OR. 6798 ff. 21^v, 22^r

Lent by the British Library, Department of Oriental Manuscripts & Printed Books.

Greek ointment pot, possibly Cretan, dating from c. 300 B.C.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 608634

Glass stirring rod, possibly Roman, with a hoop at one end and flattened at the other; a spiral pattern is picked out in green and white paint down the rod.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 96793

Glass flask possibly used as an infant feeder, dating from c. 200 A.D.; probably of Roman origin.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 85614

CASE 2. AN EARLY IRANIAN PHYSICIAN: RHAZES (c.251/865-313/925).

Abū Bakr Muḥammad b. Zakariyyā al-Rāzī, commonly known in the west as Rhazes, was born in the city of Rayy near Teheran in the middle of the ninth century. Initially he worked as a physician in his native city but later moved to Baghdād where he became chief physician. He was

both a physician and physicist, as well as an alchemist of distinction. Of his many writings, the most important is the K. al-Ḥawī, "Continens", an enormous encyclopaedia of medicine containing many extracts from Greek and Hindu authors and also observations of his own. Many contributions to gynaecology, obstetrics and ophthalmic surgery can be traced back to him. Towards the end of his life his work was much impeded by increasing blindness. He died c.313/925.

K. al-Ḥawī, "Continens". This important Arabic manuscript transcribed in minute Ta'liq was copied in 669/1170 in Tabriz. The work, comprising four books, is incomplete possibly due to the premature death of Rhazes: parts of it appear to be the author's private notes and experiences jotted down, doubtless drawn from case histories of patients under his care. These were recorded posthumously by his disciples. The subject matter and presentation of the four books in K. al-Ḥawī bear a strong resemblance to that found in K. al-Qānūn of Ibn Sīnā (370/980-428/1037) and suggest a relationship between the two. Shown here is the beginning of the third book al-adwiya al-murakkaba "Pharmacopoeia" (ff.86^v ll.18ff.) preceded by the end of book II al-adwiya al-mufrada "Materia Medica".

Arabic Ms. WMS. OR. 123. ff.86^v, 87^r.

K. al-Ḥawī, "Continens". Undated (8/14th century) Arabic manuscript written in Naskh with diacritical vowels and transcribed by the famous biographer Khaṭīb b. Aybak al-Ṣafadī who died in Damascus in 764/1363 while occupying the position of chancellor. He wrote an entry on f.1^r the English translation of the Arabic being "...this volume together with those preceding it, sixteen in all, belong to Khaṭīb b. Aybak al-Ṣafadī..." The opening shown displays the section on urine from book I. Fī al-'uṣūl al-ṭibbiya "Principles of medicine".

Arabic Ms. WMS. OR. 160. ff.41^v, 42^r.

An undated (7/13th century) Arabic manuscript copied in clear Naskh containing selections from K. al-Ḥawī "Continens". The opening displayed contains a treatise on simples from Book II al-adwiya al-mufrada "Materia Medica".

Arabic Ms. WMS. OR. 159. ff.113^v, 114^r.

Bur'a al-sā'a. "Healing within an hour". Composite Arabic manuscript copied by Ghulām Muḥammad Pīr Surūrī in 1174/1760 with rubrications. The beginning of the work is exhibited.

Arabic Ms. WMS. OR. 31. ff. 7^v, 8^r.

Bur'a al-sā'a. "Healing within an hour". Undated (13/19th century) composite Arabic manuscript written in excellent Naskh style with rubrications opened at the beginning of the treatise.

Arabic Ms. WMS. OR. 67. ff.329^v, 330^r.

Man lā yaḥḍuruhu al-ṭabīb. "Who has no physician to attend him". Composite and undated (12/18th century) Arabic manuscript copied in clear Ta'liq and containing medical prescriptions for the poor. The opening displays the beginning of the work.

Arabic Ms. WMS. OR. 28. ff.136^v, 137^r.

6/12th century Iranian pharmacy jar.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum London. A42880.

9/15th century Iranian pharmacy jar.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A121043.

6/12th century Iranian pharmacy jar.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 42880

9/15th century Iranian pharmacy jar.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 121043.

CASE 3. "THE PRINCE OF PHYSICIANS", AVICENNA (370/980-428/1037).

Abū 'Alī al-Ḥusayn b. 'Abd-Allāh ibn Sīnā, known in the west as Avicenna was born in 370/980 near Bukhārā. From an early age he displayed an extraordinary intelligence and by the age of twenty-one had written his first philosophical work. To earn a living he entered the administration where his judgement was soon appreciated and his counsel sought both on medical and political matters. Following a court intrigue he was forced into hiding and earned his livelihood by medical consultations, but he spent his final years in relative peace at the court of Iṣfahān where he became court physician and lecturer on medicine and philosophy. He died at Hamadān in 428/1037, allegedly from overwork and riotous living.

The corpus of Avicenna's works that have survived is considerable although incomplete. Primarily a philosopher and physician, Avicenna also contributed to the advancement of all science known in his time. The most famous of his medical writings is K. al-Qānūn which is the clear and ordered summation of all medical knowledge of the time augmented with some of Avicenna's own observations. Until comparatively recent times this work formed the basis of medical teaching in both Europe and the east and appears in the oldest known syllabus of instruction given to the school of medicine at Montpellier. Chaucer reminds us in the prologue to the Canterbury Tales that no doctor should be ignorant of it. A selection of manuscripts containing this work along with commentaries on it are displayed.

al-Qānūn fī al-tibb, "Canon of Medicine". This fine Arabic manuscript in excellent Ta'liq was transcribed by Ni'mat-Allāh in Iṣfahān in 1042/1632. Shown here is the beginning of Book III, al-Amrād al-Juz'iyya, "Head to Toe Diseases". It begins with diseases of the brain, and ends with pains of the joints, sciatica, and finally diseases of the nails. The manuscript is bound between two finely lacquered papier-mâché boards each exquisite examples of Safavid lacquer work. A print of one of them is displayed in Case 6.
Arabic Ms. WMS. OR. 155. ff.218^v, 219^r.

al-Qānūn fī al-ṭibb, "Canon of Medicine". Undated Arabic (7/13th century) manuscript copied in beautiful small Naskh by Aḥmad b. Ibrāhīm al-Tabrīzī. It was previously possessed by the library al-Khizāna al-'Āliya al-Amīriyya and contains the date of an owner who lived in Mardin, Turkey (737/1336). Subsequently it was owned by Everardus Scheidius (dated 1769), the Dutch orientalist. Shown here, the end of Book I, al-Kulliyāt and beginning of Book II, al-Adwiya al-Mufrada, "Materia Medica". Arabic Ms. WMS. OR. 16. ff.69^V, 70^R.

Ha-ḳānūn of Ibn Sīnā, "Canon of Medicine". Undated (c. 17th century) Hebrew manuscript written in a cursive oriental hand. Section three of the third book of the "Canon" concerned with diseases of different parts of the body begins on the middle of f.15^V which is displayed. Hebrew Ms. A.9 ff 15^V, 16^R.

Urjūza fī tadbīr al-ṣiḥḥa fī al-fuṣūl, "Poem on treatment during the four seasons" composed by Ibn Sīnā. Composite undated (12/18th century) Arabic manuscript copied in the naskh style by Muḥammad b. 'Umar al-Maydānī. Arabic Ms. WMS. OR. 17. ff.49^V, 50^R.

Sharḥ al-Qānūn, "Commentary on K. al-Qānūn" by 'Alā' al-Dīn Abū al-Ḥasan 'Alī b. Abī al-Ḥazm al-Qurashī ibn an-Nafīs (d.687/1288). The first complete commentary on Ibn Sīnā's celebrated work al-Qānūn fī al-ṭibb and by far the most original is the Sharḥ al-Qānūn of Ibn an-Nafīs. Physicians considered this work to be the guide that illuminated all the obscurities of K. al-Qānūn. Few manuscripts of Sharḥ al-Qānūn contain the section Sharḥ al-Tashrīḥ "Commentary on Anatomy" because Ibn an-Nafīs had published separately his "Commentary on Anatomy" on K. al-Qānūn. For this particular reason Sharḥ al-Tashrīḥ has been considered a separate work rather than a section of Sharḥ al-Qānūn. It however appears in this manuscript in its proper place in accordance with the author's introductory remark regarding the contents of his book. Undated (11/17th century) Arabic manuscript in excellent Naskh which belonged to Désiré Tholozan, physician to the Shāh of Persia, Nāsir al-Dīn Shāh (1829-96). The opening shown displays the section dealing with the anatomy of the bladder towards the end of Book III. Arabic Ms. WMS. OR. 51 ff.437^V, 438^R.

Sharḥ al-Qānūn, "Commentary on K. al-Qānūn" by 'Alī b. 'Abd-Allāh Zayn al-'Arab al-Miṣri. This work contains a critical study of K. al-Qānūn, in which the author also selected from the works of Ibn an-Nafīs and Ibn al-Quff al-Masiḥī the two commentaries he considered the best. Shown here, Zayn al-'Arab's explanation of the pulmonary circulation based on Ibn an-Nafīs. This Arabic manuscript was copied in 758/1356, during the author's lifetime in the Naskh style with rubrications by 'Aṭallāh b. Muḥammad al-Kalsaharī. Arabic Ms. WMS. OR. 119. ff.136^V, 137^R.

Sharḥ Qānūn'ca, "Commentary on K. Qānūn'ca," a resumé by al-Jaghminī of K. al-Qānūn. This once popular medical work written by Maḥmūd b. 'Umar al-Jaghminī (d. 745/1344) is largely dependent on K. al-Qānūn.

The Arabic commentary shown here was written by 'Alī b. Kamāl al-Dīn Maḥmūd al-Āstarabādhī al-Makkī and copied in 1174/1760 by Muḥammad Ṭahīr of Constantinople. It is transcribed in naskh and dedicated to the Ottoman Sulṭān, Bāyazīd Khān b. Muḥammad Khān b. Murād Khān. Arabic Ms. WMS. OR. 26. ff. 1^v, 2^r.

Undated (16/17th century) composite Hebrew manuscript written in cursive Spanish hand showing on the right (f.7^v) the final page of excerpts of Gentilis de Foligno's extracts from Avicenna's Canon, Book. 4, and on the left (f.8^r) questions relating to fever quoting Avicenna and Galen. Gentilis de Foligno, known as "L'anima di Avicenna" is chiefly distinguished for some ninety Consilia on general subjects such as fevers and various other ailments a capite ad pedes. He frequently quoted his sources which included among others Galen, Rhazes, Haly Abbas, Avicenna and Maimonides reflecting the breadth of his learning. During his career he lectured at the universities of Perugia and Padua and occupied the position of personal physician to Ubertino de Carrara (ruler of Padua 1338-45) finally dying of plague in 1348. Hebrew Ms. 12A. ff. 7^v, 8^r.

CASE 4. PHYSICIANS AND SCIENTISTS FROM THE 10TH TO 12TH CENTURIES A.D.

A selection of manuscripts drawn from the Wellcome Collection, composed by Moslem Jew and Christian are shown to illustrate the multi-religious background of Islamic scientists. The 10th century writer Haly Abbas is represented by his work al-Malakī in Arabic and Judaeo-Arabic translation forming a nexus between the two giants of Islamic medicine and science, Rhazes (d. 925 A.D.) and Avicenna (d. 1037 A.D.), featured in the preceding two cabinets. Ibn 'Isā, a Christian physician of the late 10th/early 11th century along with the Ibn Jazla and Ibn Buṭlān, the former a convert from Islam to Christianity the latter a Christian cleric, represent the Christian contribution to Islamic science in their time and a continuation of Christian physicians as exemplified by Ḥunayn ibn Isḥāq (d. 260/873) and the distinguished Bukhtishū' family, court physicians at Baghdād for three centuries. Ibn al-Tilmīdh and Maimonides, neither of whom were Moslems represent different parts of the Islamic world of the 12th century. Ibn al-Tilmīdh, a Christian physician lived in Baghdād and Maimonides, the greatest medieval Jewish philosopher, theologian and physician was born in Cordova but lived most of his life in Egypt.

Kamil al-ṣinā'a al-ṭibbiyah, "Complete art of medicine" also known as al-Malakī "the royal book" by 'Alī b. al-'Abbās al-Majūsī (fl. 4/10th century). Undated (8/14th century) Arabic manuscript copied by Ḥannā a physician in Naskh and containing Book 1 (treatises one to five inclusive). The last three owners named in the manuscript, i.e. Ḥannā, a physician of Aleppo (1115/1703), Yūsuf a physician son of Ḥannā a physician (1157/1744), and Aspīr son of Yūsuf (1193/1779) appear to be three generations of one family.

'Alī b. al-'Abbās al-Majūsī, commonly known in the west as Haly Abbas, came from Iran and studied medicine in Shiraz dedicating his opus

magnum Kāmil al-ṣinā'a to its ruler 'Adud al-Dawla (reigned 338/949-372/982), the greatest ruler of the Iranian Buwayhid dynasty. From its dedication the work earned for itself an alternative title al-Malakī "the royal book" and medieval Latin translators called it the Liber Regius. It was immediately recognized as a masterpiece although a century later it was overshadowed by the al-Qānūn fī al-tibb of Ibn Sīnā. However it remained sufficiently popular to be translated into Latin by Stephen of Antioch in 1127 whose translation was subsequently printed in Venice in 1492 and in Lyons in 1523. The surgical section of the work had already been translated by Constantine the African in the 11th century and was used by the school of Salerno. Shown here is the table of contents from the fifth book which is concerned with the effect of environment on health.
Arabic Ms. OR 55A ff.132^v, 133^r.

Fragment of Kāmil al-ṣinā'a al-tibbiyyah, "Complete art of medicine" also known as al-Malakī "the royal book" by 'Alī b. al-'Abbās al-Majūsī (fl. 4/10th century). Undated (11/17th century) Judaeo-Arabic manuscript in cursive script. A section dealing with the throat is shown.
Hebrew Ms. A16 ff.32^v, 33^r.

al-Aqrābādīn, "Pharmacopoeia" by Ṣa'id b. Hibat-Allāh b. Ibrāhīm Abū al-Ḥasan Amīn al-Dawla, ibn al-Tilmīdh. Undated (12/18th century) composite Arabic manuscript copied in clear Naskh with rubrications. Ibn al-Tilmīdh was a Christian and held the position of court physician to the caliph al-Muqtadī. He died in Baghdād in 560/1165 having almost attained the age of a hundred years. Shown here is the beginning of his pharmacopoeia (f.79^r) and the conclusion of his work Maqāla fī al-faṣḍ, "A treatise on bloodletting" (f.78^v).
Arabic Ms. WMS. OR 9. ff.78^v, 79^r.

Taqwīm al-abdān fī tadbīr al-insān, "Treatment by regimen" by Abū 'Alī Yaḥya b. 'Isā b. 'Alī ibn Jazla al-Baghdādī (d. 493/1100). Undated (9/15th century) Arabic manuscript, copied in Naskh with rubrications and tables and containing previous owners' entries:- Ṣa'id b. 'Alī (935/1518) and Yūsuf b. Ḥannā, a physician (1157/1744). Of Christian parentage, Ibn Jazla embraced Islam under the influence of his teacher the Mu'tazilī Abū 'Alī ibn al-Walīd in 466/1074. He was secretary to the Ḥanafī Qādī of Baghdād and studied medicine with Ṣa'id b. Hibat Allāh, court physician to al-Muqtadī. He died in Sha'ban in 493/1100. The work shown here was translated into Latin by the Sicilian Jewish physician Faraj b. Sālīm (Magister Farachi) in 1280 under the title of Tacuini aegritudinum (printed in Strasbourg in 1532); this work comprises 44 tables describing 352 maladies and indicates the appropriate diets for them. It is possible that the author was inspired by the Taqwīm al-siḥḥa of Ibn Buṭlān.

The opening shows tables relating to diseases of the cornea, their symptoms and treatments.
Arabic Ms. WMS. OR 54 ff.28^v 29^r.

Tadbīr al-amrāḍ al-'āriḍa 'alā al-akthar bi-al-aghḍhiya al-ma'lūfa, "Treatment of current diseases by the administration of common foods" or Kunnāsh al-adyira "compendium for use in monasteries" by al-Mukhtār b. al-Ḥasan b. 'Abdūn b. Sa'dūn ibn Buṭlān (d. 458/1066).

Undated (12/18th century) composite Arabic manuscript. The author was most certainly a Nestorian cleric, probably a priest, and taught medicine and philosophy in Baghdād. Ibn Buṭlān travelled extensively and while in Aleppo advised the governor on the location of a hospital to be built there and was appointed to regulate the working of the Christian community. In Cairo he became the target of the hostility of his Egyptian colleague Ibn Riḍwān and there ensued a remarkable medico-philosophical controversy in which the two adversaries tried to exhibit their entire erudition particularly in Greek medicine and philosophy. After three or four years in Cairo, Ibn Buṭlān went to Constantinople, his arrival in 446/1054 coinciding with the crisis which led to the schism between the Greek and Latin churches. There he was asked to write a treatise on the doctrine of the Eucharist. Later in 455/1063 he supervised the building of a hospital in Antioch finally retiring to a monastery there where he died in 458/1066.

The literary production of Ibn Buṭlān is distinguished by its originality. The example shown is one of the author's lesser known works - a treatise on homely remedies particularly for the use of monks. The opening exhibited shows the end of chapter seventeen dealing with the respiratory organs and the beginning of chapter eighteen which describes disorders of the stomach.

Arabic Ms. WMS OR. 118 ff.12^v, 13^r.

Tadhkirat al-kaḥḥālīn, "The oculist's memorandum" by 'Alī b. 'Īsā (fl. first half of 5/11th century, d. after 400/1010).

Undated (7/13th century) Arabic manuscript written in clear Naskh with diacritical vowels. Previous owners recorded in the manuscript are Jabbūr b. Ya'qūb (1134/1721), 'Alī 'Abdu Muḥammad 'Alī b. 'Uthmān (a physician in Aleppo, Syria), and 'Alī 'Abdu Ibrāhīm b. 'Abd an-Nūr (a physician). 'Alī b. 'Īsā, a Christian physician, was a pupil of al-Ṭayyib (d. 435/1043) secretary to the Catholicos Elias I in Baghdād. Following a dispute with the Catholicos Johannes, 'Alī b. 'Īsā changed his allegiance from the Nestorian to the Greek church.

This classical text deals in detail with every important and frequent disorder of the eye in individual chapters. Shown here is the fourth chapter which is concerned with disorders of the eyelid.

Arabic Ms. WMS. OR. 59 ff.41^v, 42^r.

Tadbīr al-ṣiḥḥah, "The regimen of health" alternatively called Tadbīr yu 'tamad 'alayh fī shifā' amrāq ḥadathat li mawlānā, "Reliable treatment of diseases which affected our ruler" or al-māqala fī tadbīr al-ṣiḥḥa al-Afdaliya "A treatise on the treatment of al-Afdal's health" composed by Abū 'Imrān Mūsā b. 'Ubayd-Allāh ibn Maymūn al-Isrā'īlī al-Qurtubī (529/1135-601/1204). Composite undated (12/18th century) Arabic manuscript copied in Naskh.

Ibn Maymūn known in Hebrew literature as Moses ben Maimon and in the west as Maimonides, the celebrated Talmudist philosopher and physician, was born in Cordova in 529/1135 and received his rabbinical instruction from his father himself a scholar of high merit. At an early age, he was placed under the most distinguished Islamic scholars who initiated him in all branches of learning at the time. When Cordova fell to the fanatical

Almohades, Maimonides and his fellow co-religionists chose exile in preference to embracing Islam and settled in Fostat (Cairo) where he established a school for the study of the Talmud. Compelled by family and financial misfortune Maimonides had to work for a living and considering it a sin to earn a living from religion he adopted the medical profession. After several years of practising, Maimonides' authority in medical matters was finally established and he was appointed private physician to Saladin's vizier, al-Qādī al-Baysami, who recommended him to the royal family and bestowed upon him many distinctions. According to al-Qiftī, Maimonides declined a similar position offered to him by the King of the Franks in Askelon (Richard I of England). The work exhibited is dedicated to the Sultān al-Malik al-Afdal of Damascus and is opened at the beginning.

Arabic MS. WMS. OR. 27 ff.55^v, 56^r.

Islamic cupping glass which was heated internally with rags and applied to the skin so drawing the blood to the surface.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 608650

13/19th century brass divination bowl engraved with Arabic texts from the Qur'ān.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 155162

Islamic glass molar tooth bottle.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 628596

CASE 5. QAZWĪNĪ (c.600/1202-682/1283), AN ENCYCLOPAEDIST FROM IRAN

Zakariyyā b. Muḥammad b. Maḥmūd Abū Yaḥyā al-Qazwīnī, although of Arab extraction, was born in Qazwīn in Iran c. 600/1202. He travelled extensively spending some time in Baghdād and Damascus and occupying the office of Qādī in Wāsiṭ and al-Ḥillah during the reign of the last 'Abbāsid Caliph al-Musta'ṣim (640/1240-656/1258). After Baghdād had been taken by the Mongols in 656/1258 he retired from public life to devote himself entirely to scientific activities and died in 682/1283. Qazwīnī is distinguished by his two celebrated works, a cosmographical one and a geographical one. The first, commonly named Cosmography which bears the title 'Ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt' "Prodigies of things created and miraculous aspects of things existing" comprises two parts, the first of which treats supernatural things and the second terrestrial. The Cosmography was the first systematic exposition of cosmography in Islamic literature and enjoyed considerable popularity throughout the Islamic world. This is witnessed by a great number of manuscripts representing several Arabic versions, by Persian and Turkish translations and by revisions of the work. Qazwīnī's second work commonly called Geography is known from several manuscripts belonging to two different versions. The oldest entitled 'Ajā'ib al-buldān' "Prodigies of the countries" was composed in 661/1262. The second completely revised version dates from 674/1275 and carries

the title Āthār al-bilād wa-akhbār al-'ibād "Monuments of the Countries and the History of their inhabitants."

Besides cosmography and geography, Qazwini was knowledgeable in astronomy, geology, mineralogy, botany and zoology and synthesized all the facts known in his time about these subjects to exert a great influence on Islamic cosmographers and geographers of later periods.

'Ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt, "Prodigies of things created and miraculous aspects of things existing".

Undated (12/18th century) Persian manuscript transcribed in Nasta'liq. The opening shown forms part of the section on animals: the illustrations represent different varieties of fish and at the bottom left hand side King Anūshīrvān is depicted receiving thanks from a horseman coming from the sea for building a dam.

Persian Ms. 84 ff.27^v, 28^r.

'Ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt, "Prodigies of things created and miraculous aspects of things existing".

Arabic manuscript dated 1254/1838 copied by Muḥammad b. Muḥammad Fādil in Naskh with rubrications and containing an owner's date 1308/1890 and stamp. The beginning of the work is displayed which treats of the supernatural world.

Arabic Ms. WMS OR. 18 ff.1^v, 2^r.

'Ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt, "Prodigies of things created and miraculous aspects of things existing".

Persian manuscript copied in Nasta'liq by Aḥmad Kātib Ardistānī in 863/1458 as recorded in the colophon, a photographic print of which is displayed adjacent to this copy. This manuscript has the distinction of being the earliest known dated copy of Qazwīnī's celebrated encyclopaedic work. The illustrations, of inferior quality, have been added later by different hands. The opening displayed belongs to the second part of the work concerned with earthly things and deals with different varieties of birds.

Persian Ms. 135 ff.234^v, 235^r.

'Ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt, "Prodigies of things created and miraculous aspects of things existing". Undated (12/18th century) Persian manuscript transcribed in Nasta'liq. The opening displayed belongs to the first part of the work concerning things supernatural: the occupants of the fifth, sixth and seventh skies are depicted here.

Persian Ms. 478 ff. 99^v, 100^r.

'Ajā'ib al-makhlūqāt wa-gharā'ib al-mawjūdāt, "Prodigies of things created and miraculous aspects of things existing".

Persian manuscript dated 1046/1636 transcribed in Naskh. The opening displayed is from the second part of the work concerned with terrestrial things and depicts trees as part of a chapter devoted to plants.

Persian Ms. 250 ff.143^v, 144^r.

'Ajā'ib al-buldān, "Prodigies of the Countries". Undated (late 12/18th century) manuscript transcribed in Naskh within double line border with rubrications. The opening displayed describes the countries lying within

the fourth clime of latitude stretching from China in the east to Andalusia in the west.

Arabic Ms. Ismaili Institute 1 ff.99^V, 100^R.

Lent by the Institute of Ismaili Studies, London.

CASE 6. ISLAMIC BOOK BINDING

The earliest bindings were wooden boards tied around stacked pages; alternatively documents were written on strips of parchment or paper, stuck together in lengths of sometimes several metres, and rolled up. In the 7th century sheets were sewn together in codex (bound) form. According to al-Muqaddāsi, a book-binder in the 10th century, the sections were sewn, then glued together and the case stuck on with wheat starch. Craftsmen who specialized in decorating book covers worked near the warrāqūn who made and sold paper inks and pens, copied and sewed books.

Pages were squared up with the pagination from right to left. Covers were decorated in many ways. A cover made of wooden boards covered in leather could have a design tooled and stamped directly on to the moistened leather. Covers of open-work cut leather with coloured strips behind were made before the book was assembled. Sometimes a design was made in ink, or the cover was lacquered and then elaborately decorated.

A selection of Islamic book bindings from the Wellcome Collection are displayed in this cabinet.

11/17th century Ottoman leather binding showing the lower cover which comprises a border of gold decorated fillets. The inner panel in gold consists of a central obloid panel stamp with scalloped edge. The stamp's bisymmetrical relief pattern painted in black is composed of cloud ribbons forming a central lozenge and a finer secondary pattern of vines with small leaves and flowers weaving among the cloud ribbons. The outer contours of the panel stamp are outlined in gold with gold lines from which gold sprigs sprout. The points of the panel stamp on the vertical axis extend into gold painted flowers.

A photographic print of an 11/17th century Persian lacquer binding showing the lower cover. This exquisite example of Safavid lacquer work shows a physician taking the pulse of a noble patient. Two servants stand, one by the physician the other behind the patient while in the foreground two herbalists prepare a prescription. The scene is set in a beautiful garden of trees, plants, fruit and birds against a red background and surrounded by a black margin of gold tendrils set between gold rules. The manuscript within the binding is the al-Qānūn fī al-ṭibb of Ibn Sīnā copied in 1042/1632 and displayed in Case 3.

Arabic Ms. WMS. OR. 155.

12/18th century Qajar Persian lacquer binding showing the upper cover. A pale bronze lacquer ground has been achieved by the application of lacquer over gold leaf which is clearly visible where the lacquer is damaged. Within a border of yellow and red, flowers and birds are painted in various pigments, red and yellow predominating, among profuse foliage in different shades of green.

Persian Ms. 224.

12th/18th century Kashmiri lacquer binding showing the upper cover. Against a black background a mango shape is painted outlined with a thin green margin within which is a double margin of small dots and between them a wide margin of green with red and yellow petals. Within the mango shape another margin of dots separates an inner margin of green foliage from more green foliage in the interior of the mango shape. The background to the central panel has green leaves and foliage and the whole is contained within an outer margin of orange background and black flowers and an inner yellow margin of black flowers.
Persian Ms. 249.

12/18th century Kashmiri lacquer binding of great beauty. The central panel with green background comprises gold and red flowers and vines with a bird at each corner. In the centre is a gold obloid panel with scalloped edge outlined in red, green and gold pigments and within flowers and foliage. The central panel is surrounded by three margins a wide one with green background and gold compartments and two narrow margins all containing flowers and foliage.
Persian Ms. 247.

13/19th century red leather binding showing the lower cover. Within the double frame at each corner there are panel stamps of flowers and foliage impressed with metal. The central medallion with scalloped edge and painted in gold shows a central flower in full bloom with interweaving vine garlands and an outer ring of full blown and smaller flowers and leaves. Triple headed sprigs surround the medallion at intervals outlined in black. The points of the central panel stamp on both horizontal and vertical axis extend to small panel stamps in gold each with an impression of a flower and foliage.
Persian Ms. 342.

13/19th century green leather binding showing lower cover with flap. A central lozenge within tooled borders is stamped with symmetrical and flower designs with inset of embossed pink paper. A similar panel stamp appears on the flap.
Arabic Ms. WMS. OR. 377.

SCREENS. CALLIGRAPHY

The Arabic script, referred to in Arabic as khatt which according to tradition was used as early as the lifetime of Muḥammad for setting down the sacred text of the Qur'ān, subsequently underwent a diffusion corresponding to the expansion of the Islamic faith and to the development of Islamic civilization. The Arabic alphabet benefited in its diffusion outside Arabia from the rapid propagation of Arabic as a liturgical and cultural language of the Arabo-Islamic empire. In this way the Arabic script became the script of the Iranian and Turkish languages, a variety of languages of the Indian and the Malayan peninsulas, North Africa, medieval Spain, Slavonic Europe and Black Africa. The various mutations of the Muslim world provoked constant modification in the parallel developments of language, religion and scripts

whose contour lines did not necessarily coincide. This is especially evident in modern times where areas converted to Islam at an early date in which Arabic retained its prestige as a religious language, have now witnessed a decline in the use of the Arabic script in favour of the phonetic notation as for example Turkish, Malay, Malagasy or the African languages which now use the Roman and sometimes the Cyrillic alphabet.

The various usages, profane as well as religious for which the Arabic script was used, was also a factor in the enlargement of its territorial scope. The writing practised by government scribes in their compilation of archives or their official documents differed from that of calligraphers working to satisfy the luxurious tastes of an aristocratic patron. The writing of scholars making rough drafts or taking down speeches and discussions as dictation differed from that of merchants writing private letters and statements of accounts which again differed from the makers of amulets and magical diagrams. Other types may have taken shape from the influence of the many different regional milieux and national temperaments which coexisted in the world of Islam and whose heritage it is difficult to define with certainty. The development of paper and its widespread manufacture in the lands of Islam from the 3/9th century facilitated both the transmission of science and the art of writing in providing the most convenient medium that was durable and inexpensive. The practice of writing became a science reserved for skilled experts judged worthy of the double distinction of artist and respected sage and this has remained for centuries the general rule in every Muslim society.

A selection of examples drawn from the fine collection of calligraphy in the Wellcome Institute are displayed and described below.

Kūfī

The Kūfī style of calligraphy flourished from the early period of the Islamic era until the middle of the 4/10th century. It was reserved for copies of the Qur'ān, works of erudition and pious texts of all kinds which were written on parchment while monumental inscriptions owed to it their astonishing decorative quality. Simple Kūfī became diversified up to the turn of the 6/12th century in the form of various styles often bearing the names of regional dynasties which had favoured them individually and each in its particular embellishments corresponding to the many historical and geographical stages in the context of an immense and soon fragmented Islamic empire.

A selection of examples of Qur'ān leaves in Kūfī script are displayed. They are transcribed on vellum with diacritics in red and date from c. 4/10th century.

Naskh

The Naskh (meaning "act of cancellation or abrogation") style of calligraphy gradually developed from the square "static" and later triangular cursive forms of Kūfī script. After a period of temporary decline it revived during the Mongol period attaining much beauty in the period of Tīmūrid rule but receded again in the 18th and 19th centuries. The script has a distinctive angular appearance with the relatively fine verticals of the letters rendering it particularly beautiful. It is generally used for transcribing the Qur'ān. Some fine examples in Arabic are displayed.

Ta'liq

This style of calligraphy called Ta'liq means "suspension, hanging together" because its letters are connected to one another. It is alleged that the sinuous style of the letters of the Pahlavi and Avestan alphabets played a rôle in its formation. It was used for writing books and letters and also in the dīwāns for official correspondence. By the 7/13th century it emerged in its definite form but was not much in use until the following century after which it gradually declined. The example displayed shows characteristics of the Nasta'liq style in Persian.

Nasta'liq

This script is said in works on calligraphy to have been formed by joining Naskh and Ta'liq, the resulting compound gradually coming to be pronounced Nasta'liq. Although it is said to have been invented by Mīr 'Alī Tabrizī (d. 850/1446) the existing manuscripts contradict this view and show that the invention of the script to be as early as the 7/13th century. In Turkey and the Arab countries it is erroneously called Ta'liq. Several fine examples in Persian and one in Turkish are displayed.

Shikasta-nasta'liq

This script came into existence at the beginning of the 11/17th century under the Safavids in Iran, as a result of writing Nasta'liq rapidly and of calligraphers being under the influence of Shikasta-ta'liq, itself developed from writing Ta'liq rapidly. While Nasta'liq was used in writing literary works Shikasta-nasta'liq was generally used in writing letters as the examples displayed written on gold sprinkled paper, and for official correspondence. Today it is sometimes used for writing poetry in an artistic fashion.

Rayḥānī

This script used in Iran and meaning "the aromatic plant of basil", "having fragrance" is a smaller version of the Muḥaqqaq script. Like Muḥaqqaq, Rayḥānī was used for copying Qur'āns. It started to go out of circulation after the 11/17th century. An example in Arabic is shown.

Riqā'

This style, used by the Turks, was a simplified form of the Dīwānī style usually employed for transcribing official documents. The main characteristics of Riqā' are that its letters are less rounded and more straight. Like the Persian Shikasta-nasta'liq, it also became a standard form of handwriting amongst Turks, used for letters and every type of correspondence. In Iran it was used for writing the final pages of Qur'āns and learned books. An example in Arabic is shown.

CASE 7. ASTROLOGY AND ASTRONOMY

Astrology is the study of heavenly bodies with respect to their supposed influence on human destiny. It enjoyed widespread popularity throughout the ancient world particularly in Babylon where the name Chaldaean became synonymous with astrologer. Astronomy was closely related to astrology particularly in antiquity being also the study of the

universe, its constituent parts and how they interact; it was from these astronomical studies that calendars were drawn up. The astronomical work of Ptolemy (c. 140 A.D.) known by its Arabic title al-Mijistī had much influence in Islamic lands where in Baghdād a line of distinguished astronomers beginning in the 2/8th century and lasting for four centuries developed the astrolabe into an instrument of high precision. It is to them we owe the names of many of the brightest stars and various astronomical concepts. Through Latin translations of their work scientific consciousness was awakened in medieval Europe.

The horoscope of Iskandar Sultān.

The personal horoscope of Iskandar Sultān, grandson of Tīmūr (d. 807/1405) compiled by Maḥmūd b. Yaḥyā b. al-Ḥasan al-Kāshī, called 'Imād al-Munajjim (d. 832/1429).

Iskandar, who ruled Fars from 812/1409 to 817/1414 is best known for his interest in the arts and sciences and for his patronage of the celebrated Shiraz school of painting, of which this manuscript is an exquisite example. Apart from its undoubted artistry, the manuscript throws considerable light on the development of Islamic astrology prior to Ulugh Beg's observations in Samarkand. It also allows the exact date of Iskandar's birth, so long disputed, to be fixed with certainty for the first time to 3 Rabi' I 786/25 April 1384, and as a result permits scholars to determine the authenticity of other manuscripts reported to have been commissioned by him. The manuscript dated 813/1411 is transcribed in Naskh on paper. The opening displayed shows the motions of Mercury. Persian Ms. 474 ff.5^v 6^r.

See F. Keshavarz "The Horoscope of Iskandar Sultan", Journal of the Royal Asiatic Society, 2, 1984 pp. 197-208.

Print showing a lively duck, one of 499 unique marginal decorations. f. 30^r.

Print showing a phoenix outlined in black ink and filled with faint grayish blue, pink and shades of gold. The four outer corners of the illustration are decorated with smaller drawings of plants and birds in the same style. This illustration, coming at the end of the manuscript along with a similar drawing at the beginning show the influence of Chinese art on Persian painting of the period f.86^v.

Print showing the position of the heavens at the moment of Iskandar's birth painted on a double page illustration. In the four outer corners of the painting four angels appear bearing presents including a golden crown. Within a large circle twelve sections are painted representing the astrological houses, and within each section nearer the centre is painted a conventional drawing of a sign of the zodiac. The detail, precision and beauty of the painting speak for themselves. ff.18^v, 19^r.

Undated (10/16th century) Persian manuscript containing Zīj-i Ulugh Beg, "Tables of Ulugh Beg" copied in Nasta'liq with elements of Naskh. Ulugh Beg (796/1394-853/1449), a grandson of Tīmūr (d.807/1405) and therefore a cousin of Iskandar Sultān, became governor of Turkestan and then emperor in 830/1447. Two years later he was murdered by his son. In 823/1420 he established an observatory northeast of Samarkand,

an ancient and cosmopolitan city once occupied by Alexander the Great and now capital of the Uzbek Soviet Republic. This observatory soon became the main centre of astronomical research in the world. Its existence however was short lived; it is regarded as the last major centre of Islamic astronomy. The tables, also known in their original edition as Zīj-i Khāqānī, "Tables of the Great Khan", were composed no earlier than 841/1437. Although Ulugh Beg supervised, three other mathematicians collaborated; Jamshīd ibn Mas'ūd al-Kāshī (d.832/1428) who it has been suggested was the grandson of Maḥmūd b. Yahyā b. al-Hasan al-Kāshī, the compiler of the horoscope of Iskandar Sultān and who was the first director of Ulugh Beg's observatory; Qādī-Zāda al-Rūmī (d. c. 835/1431), the second director; 'Alī ibn Muḥammad al-Qushchī (d.879/1474-5) who died in Constantinople.

The opening shows the table of the rising signs of the zodiac in certain latitudes from the second maqālat.

Persian Ms. 489 ff. 157^v, 158^r.

Sharḥ-i zīj-i jadīd-i sultānī, "commentary on the astronomical tables of the King" i.e. Ulugh Beg, compiled by 'Abd al-'Alī ibn Muḥammad ibn Hasan Birjandī (d. 934/1527-8).

This undated (late 11/17th century) Persian manuscript transcribed in Nasta'liq is a commentary on Ulugh Beg's astronomical tables. The opening is from the third section dealing with the pre-Islamic Persian Calendar.

Persian Ms 400 ff 29^v 30^v

Composite Armenian manuscript copied in small Bolorgir (round-hand) script by the scribe Khachatur dpir in 1795. The principal text displayed is a scientific treatise Yaghags erkdayin sharzhman, "Concerning the heavenly movements" composed by the 13th century Armenian philosopher Hovhannēs Erznkac'i (of Erindjan) on the request of Baron Vaghtank. The illuminated page represents an astronomer gazing through a telescope. The sun and the moon are depicted just below a band of cloud which supports the signs of the zodiac and above it a starry sky.

Armenian Ms. 63373 ff.32^v, 33^r.

Ruznamē-i Dāirevī. Ottoman astronomical tables for both the Arabī and Rumī (Julian) calendars. These calendars provide a detailed chronological account of seasonal change, entry of the sun into signs of the zodiac, the times for sunrise and sunset, etc. At the same time they also include an agricultural almanac in the marginal notes, specifying the tasks to be done, the weather, as well as the date for religious festivals.

Ruznamē-i Dāirevī copied by Muḥammad Emīn Hilmī in Riqā' and dated 1225/1810.

Turkish Ms. 151.

Ruznamē-i Dāirevī copied by Ketebe Muḥammad Shemseddīn in Riqā' and dated 1227/1812.

Turkish Ms. 388.

Ruznamē-i Dāirevī undated (13/19th century) almanac copied in Riqā'.

Turkish Ms. 74780

'Ilm-i ferasēt wa 'ilm-i qiyāfet, Turkish manuscript on physiognomy which claims to be a translation of 'Imam Shāfi's treatise. Copied in 923/1517 by al-Muhammed, a scribe, within gold rules.

The opening relates how Plato (Eflātūn) sent a description of his features to Indian physicians for an evaluation of his character. Their judgement was so negative however that Plato's disciples, outraged at such a denigration of their master's character, accused the Indian physicians for being skilled not in physiognomy but in falsehood and deceit. Plato reassured them that the judgement was indeed accurate but he was able to reform his character by self discipline and knowledge.

Turkish Ms. 66622 ff.6^v, 7^r.

Undated (c. 11/17th century) Indo-Persian astrolabe made of brass with four plates for use at latitudes between 14° and 43°. A list of towns is inscribed in the inner surface of the umm; they include Dehli, Benares, Lahore, Mecca and Medina.

The astrolabe is the most important instrument of medieval Islamic and western astronomy. Thought to originally have been invented by Hipparchus around 150 B.C., it was developed into an instrument of high precision in the Islamic lands and used in astronomy and geography to measure altitudes, determine the hour of the day and night, and to cast horoscopes. These are but a few of its uses in solving various astronomical and geographical problems.

Lent by the Science Museum, London. Inv. 1963 - 264.

CASE 8 ALCHEMY

Alchemy was the chemical science and speculative philosophy the main purposes of which were the transmutation of the base metals into gold, the discovery of the universal cure for diseases and the means of indefinitely prolonging life. It is said that the ancient Egyptians discovered chemistry as well as astrology, the derivation of the word being associated with the Egyptian kem meaning black, hence the reference to sorcery as black magic in our own time. Once the alchemists realized they were unsuccessful in producing precious metals or panacea many turned to pharmacology. There was hardly a by-product of metal refining that could not be used as a drug at least on an experimental basis. The pharmacopoeia which originally comprised drugs from animal and vegetable sources was now steadily enlarged with drugs of mineral origin. Many mineral products may have proved toxic and so the obvious course was to use them in combination as formulated drugs with each individual component present in subtoxic amounts. Other discoveries included previously unknown forms of administration, the chief of which was the electuary widely used in the ancient Orient.

Undated (11/17th century) Arabic manuscript - considerably damaged - copied in Naskh and containing Asrār al-ḥikma, "Secrets of wisdom" composed by Mu'ayyad al-Dīn Abū Isma'il al-Ḥusayn b. 'Alī b. Muḥammad al-Isfahānī al-Tuḡhrā'ī (453/1061-515/1121).

This is one of a number of alchemical works written by al-Ṭughrāʾī who although born in Isfahān wrote in Arabic. He is best known for his poetic work Lāmīyat al-'Ajam. The Saljūq Sultān Mas'ūd ibn Muḥammad appointed him vizier in Mūsul but he was subsequently executed on pretext of atheism when he was over sixty years old. The opening displayed shows diagrams of spiritual strength being conveyed to elixirs. Arabic Ms. WMS OR 38 ff.117^r, 118^v

Arabic manuscript copied in 1040/1630, transcribed in Ta'liq with rubrications containing Mafatih al-raḥma wa-masābil al-ḥikma, "Keys to mercy and lamps of wisdom" composed by Mu'ayyad al-Dīn Abū Isma'il al-Ḥusayn b. 'Alī b. Muḥammad al-Isfahānī al-Ṭughrāʾī (453/1061-515/1121). The opening of this alchemical work shows a description given by Jābir ibn Ḥayyān, the most eminent of Arab alchemists, of the nine strengths of elixir with the comments of the author.

Arabic Ms. WMS OR 21 ff.20^v, 21^r.

Arabic manuscript copied in 1029/1619 by 'Abd al-Fattāḥ b. Shams al-Dīn on paper in Naskh with rubrications containing Nihāyat al-ṭalab fī sharḥ al-muktasab fī zir'at al-dhahab "End of search, a commentary on 'knowledge acquired concerning the cultivation of gold'" composed by Aidamur b. 'Alī b. Aidamur al-Jildakī 'Izz al-Dīn (d.743/1342). This is an extensive commentary on the important alchemical work of Abū al-Qāsim al-'Irāqī (fl. late 7/13th century). Al-Jildakī's commentary is also important in its own right, the works of many earlier alchemists being quoted in it. The opening exhibited discusses the main topics involved in alchemy.

Arabic Ms. WMS OR. 177 ff.1^v, 2^r.

Undated (13/19th century) Arabic manuscript transcribed in Naskh containing al-Burhān fī asrār 'ilm al-mīzān "Demonstration of secrets of the science of the balance" composed by Aidamur b. 'Alī b. Aidamur al-Jildakī 'Izz al-Dīn (d.743/1342). The manuscript of which comprises only book I of this work was transcribed from a copy which contained an Ijāzat samā', i.e. "the book was read before a scholar and approved by him."

al-Jildakī was the last important Muslim alchemist to write in Arabic but came too late to influence western science. Some twenty treatises are ascribed to him including the work exhibited which is divided into four parts dealing with natural history, physics and metaphysics as well as alchemy. The fourth part is represented by Arabic Ms. WMS 29b. The opening is from the eleventh bāb (on heavenly bodies) from the first juz' (on the unity of Allah). It shows the relationship between the heavenly bodies and the earth depicted by the letters of the alphabet.

Arabic Ms. WMS OR. 29a. ff. 225^v, 226^r.

Arabic manuscript copied in 1012/1603 in Naskh containing al-Burhān fī asrār 'ilm al-mīzān, "Demonstration of secrets of the science of the balance" composed by Aidamur b. 'Alī b. Aidamur al-Jildakī 'Izz al-Dīn (d.743/1342). The manuscript exhibited comprises only book 4 of this alchemical work and the opening displayed shows the beginning which deals with plants.

Arabic Ms. WMS OR. 29b ff.1^v, 2^r.

Preparation of a medicine. Medieval Europe learnt much from Arab pharmacognosy which not only passed on the knowledge of classical antiquity but helped systematize and catalogue it. The Islamic world at this time concerned itself not only with the actual drug but also with its dosage form. Fundamental concepts such as a "potentiation" were discovered and more pleasant forms of administration elaborated. The most common form of administration today, the dragee, can be traced back to medieval Islamic pharmacology.

Part of an illustration from a manuscript in the Goloubew collection at the Boston Museum of Fine Art.

12/18th century fitted box of Persian scales and weights containing:- two pairs of steel-beam equal-arm balances with brass pans suspended by red silk cords; gallows suspension with knife-edge fulcrum, and set of seven small engraved steel weights, octagonal shaped with knob handles. Lent by the Science Museum, London. Inv. 1954-684.

CASE 9 MATERIA MEDICA

Materia medica and the whole area of pharmacopoeia attained great distinction in the Islamic world and became the standard authority on the subject throughout medieval Europe. Even in modern times the eminent medical scholar William Osler (1849-1919) has remarked "that the heavy hand of the Arabian" is sensed in the enormous bulk of present day pharmacopoeias. Much of this material was derived from the Greeks, especially Dioscorides (fl.50 A.D.), the first to write on medical botany as an applied science. His work was translated into Arabic at Baghdad in 240/854, at Cordova in 340/951 and again into Syriac by the Christian writer and historian Bar Hebraeus in the 7/13th century, so influencing the whole practice of medicine among the Islamic peoples. Many major Islamic medical writers included a section devoted to materia medica in their work or wrote specifically on the subject. The principal storehouse however, of Islamic materia medica is the Jāmi' of Ibn Baytār, a large compendium of the 7/13th century describing some fourteen hundred drugs, of which three hundred were claimed to be new.

Undated (11/17th century) Arabic manuscript transcribed in Naskh containing al-Jāmi' li-mufradāt al-adwiya wa-al-aghdhiya, "Compendium of simple drugs and foods" composed by Diya'al-Dīn Abū Muḥammad 'Abd-Allāh ibn Aḥmād al-Andalusī al-Mālaqī, known as Ibn al-Baytār (d.646/1248).

Ibn al-Baytār was born in Malaga and studied in Seville collecting botanical specimens from the surrounding countryside. He subsequently travelled to the east where he was appointed chief herbalist in Cairo by Ayyūbid al-Malik al-Kāmil and finally settled in Damascus. He wrote a number of medical works, his Jāmi' being the most important. This work lists in alphabetical order 1400 simples, animal, vegetable and mineral based on his own observations and those of many others including al-Rāzī, Ibn Sīnā and al-Ghaffiqī. The opening displayed shows the

section za' in which the difference between white, yellow, red and green zajat, i.e. zaj a simple medicine, is made.
Arabic Ms. WMS OR 174 ff.31^V, 32^R.

Undated (11/17th century) Arabic manuscript transcribed in beautiful Nasta'liq with rubrications containing Aḥkām al-adwiya al-qalbiya, "Rules about medicines of the heart" composed by Abū 'Alī al-Ḥusayn b. 'Abd-Allah ibn Sīnā (370/980-428/1037). See cabinet 3 for information on Ibn Sina. The manuscript opened at the beginning shows an exquisite gilded headpiece.

Arabic Ms. WMS. OR. 73 ff.1^V, 2^R.

Composite undated (12/18th century) Arabic manuscript copied in Naskh with rubrications and containing al-Adwiya al-mufrada, "Materia medica" composed by Abū al-Ṣalt 'Umayya b. 'Abd al-'Azīz al-Andalusī (460/1068-529/1134).

Abū al-Ṣalt 'Umayya came from the Levant and spent some time in Alexandria and Cairo where in consequence of an unsuccessful attempt to refloat a sunken ship he was imprisoned by the vizier. Exiled from Egypt he spent the rest of his life in al-Mahdiyya. He wrote a number of works on various scientific topics including the materia medica displayed which was translated into Latin by Arnold of Villanova (1235-1312).

The opening displayed shows the conclusion of a section on general medicine followed by a section concerned with simple medicines to cure diseases of the bones.

Arabic Ms. WMS. OR. 57 ff.15^V, 16^R.

Undated (8/14th century) Arabic manuscript copied by various hands in Naskh with rubrications containing Minhāj al-dukkān wa-dustūr al-a'yān fī a'māl wa-tarākīb al-adwiya al-nāfi'a lil-insān. "Manual for the dispensary, being a canon for the learned actions and compositions of useful drugs" composed by Abū al-Munā b. Abī al-Naṣr al-Isrā'īlī, al-Kūhīn al-Attār. The opening displayed shows the beginning of the fifth chapter containing recipes for compound medicines preceded by jam making recipes at the end of Chapter 4.

Arabic Ms. WMS. OR. 52b ff.48^V, 49^R.

Undated (10/16th century) Arabic manuscript copied in Naskh with tables and previous owner's entries - Abū Bakr Rustum b. Aḥmad b. Maḥmūd and Muḥammad Wāṣif b. Ḥasan, a physician. The manuscript contains Taqwīm al-adwiya, "Tabulation of drugs" composed by Abū al-Faḍl Ḥubaysh b. Ibrāhīm b. Muḥammad al-Tiflīsī (fl.7/13th century). The opening shows tables giving the names of different medicines, their origins, nature and properties, side effects and the comments of various celebrated physicians in history.

Arabic WMS. OR. 53 ff.18^V, 19^R.

Undated (late 9/15th century) composite Persian manuscript containing Miftāḥ al-khazā'in, "The key to the treasures", composed by Zayn al-Dīn 'Alī b. al-Ḥusayn al-Anṣārī (730/1329-806/1403) physician for sixteen years to Sultān Shāh Shujā' (765/1364-786/1384) himself the author of a work on birds of prey shown in Cabinet 11. The work which was

completed in 760/1359 comprises three parts dealing with simple medicaments in alphabetical order, exchanging and improving them also in alphabetical order and a third section on compound medicaments. The manuscript is copied in Naskh and the opening displayed describes drugs beginning with the Arabic letters ta', tha' and jim. Only one other copy of this work is known to exist in Europe and is at the Bodleian library Oxford.

Persian Ms. 524 a ff.4^v, 5^r.

Persian manuscript containing Ikhtiyārāt-i Badi'i, a *materia medica* composed by Zayn al-Dīn 'Alī b. al-Ḥusayn al-Anṣārī (730/1329-806/1403) and completed in 770/1368-9. It is dedicated to an unidentified princess, Malika Badi' al-jamāl, and is divided into two parts; the first on simple medicaments in alphabetical order, the second on compound medicaments in sixteen sections. The manuscript displayed was copied in 1081/1669-70 in Naskh within gold rules. The opening exhibited is from the first section and describes simple medicines beginning with the Arabic letter ṣin.

Persian Ms. 54 ff.121^v, 122^r.

The preparation of an antidote against tarantula bite. The medicine is prepared in a mortar according to instructions read from a book resting on a book stand. In medieval times the pharmacist as a distinct profession was still unknown, the dispenser of medicines being the physician himself who as a rule maintained his own pharmacy. Print of an illustration from an Arabic manuscript of the Baghdād school of a pseudo-Dioscorides work copied in 621/1224. The Freer Gallery of Art, Washington.

8/14th century octagonal bronze mortar from Iran in which drugs would have been prepared.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 41580.

Islamic pharmacy jar bearing an illustration of two kneeling female figures framed by floral patterns.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 112952

Islamic pharmacy jar bearing an illustration of two kneeling female figures flanked by foliage with two structures in the background.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A 112954

CASE 10 ANATOMY

Due to the dictates of the Qur'ān Moslems did not undertake dissection of the human body. They did however continue the researches of the Greeks and made important advances which were almost entirely the result of animal studies. It was from such studies that Ibn an-Nafīs during the early 7/13th century was able to describe the circulation of the blood between the heart and lungs. Rhazes, Haly Abbas and Avicenna all included sections devoted to anatomy in their major medical

works while Mansūr ibn Muḥammad Ilyās, writing in the late 8/14th century, composed an illustrated treatise on anatomy in Persian. This treatise contained a group of anatomical drawings whose derivation has been attributed to ancient Alexandria. They would appear to represent the ultimate result of the kind of compression of Galenic works that we know went on in medical teaching in late antiquity and the early Middle Ages. It is significant that Galen wrote introductory texts on five anatomical topics, the arteries and veins combined into a single treatise, the nerves, the muscles and the bones. These treatises formed part of the so called "sixteen books" of Galen as used in the school of Alexandria. According to Ḥunayn ibn Ishāq the Alexandrians divided the single treatise on arteries and veins into two and gave the single title "on anatomy for students" to the collection of five treatises. A further four figures have also been identified and related to the next group of Galen's hierarchy of structure having "function" in place of mere action, and taught to students after the similar parts. The gravid uterus shown here would appear to derive from this group.

This anatomical tradition is reflected in the east as demonstrated by a print from a Tibetan anatomical diagram and in the west as shown in a medieval English manuscript.

Undated (late 12/18th century) Persian manuscript Tashrīḥ-i Mansūrī, "Anatomy of Mansur" composed by Mansūr ibn Muḥammad ibn Aḥmad ibn Yūsuf ibn Faqih Ilyās (d. after 826/1422). This work was dedicated to Sulṭān Diyā al-Dīn Amīr-zāda Pīr Muḥammad Bahādur Khān (i.e. probably P.M. b. 'Umar Shaykh b. Tīmūr ruler of the province of Fars 796/1394-812/1409), a grandson of Tīmūr and brother of Iskandar Sulṭān whose horoscope is displayed in Case 8. The work is divided into an introduction (muqaddima), five chapters (maqālat) and a conclusion (khatimā) dealing with respectively:- the description and division of the organs, bones, nerves, muscles veins, woman's body with womb containing ripe foetus. The manuscript is transcribed in Shikasta-nasta'liq and the opening displayed shows the venous system on the left, the nervous system on the right.
Persian Ms. 449 ff.21^v, 22^r.

Undated (early 13/19th century) Persian manuscript Tashrīḥ-i Mansūrī, "Anatomy of Mansur" composed by Mansūr ibn Muḥammad ibn Aḥmad ibn Yūsuf ibn Faqih Ilyās (d. after 826/1422) transcribed in Naskh. The opening shows the conclusion of the maqālat describing the nervous system and the beginning of the maqālat on the muscles.
Persian Ms. 612 ff.9^v, 10^r.

Undated (late 12/18th century) group of four Persian broadsides from Tashrīḥ-i Mansūrī copied on western paper and showing:-
arterial system.
gravid uterus.
muscles.
skeletal system.

Persian broadside copied on western paper depicting the "zodiac man" Tierkreiszeichenmann in which different parts of the body are shown to be influenced by various planetary conjunctions. The appropriate times

and places for different treatments are indicated by the signs of the zodiac. Astrology was a feature of medicine in both the east and west as is illustrated in similar diagrams such as the "bloodletting man" Aderlassmann whose body is tattooed with marks indicating the best site for venesection under the signs of the zodiac.

Print of a section from a 19th century Tibetan anatomical chart painted on linen and used to give instruction on anatomy to Tibetan students of medicine. Originally discovered in 1904 by Col. Waddell of the Younghusband expedition in the medical college at the lChags po-ri monastery in Tibet, these drawings have a centuries old history of transmission. The squatting position bears a similarity to the post-Alexandrian figures reflected in Mansur's drawings and suggests their transmission to Tibet through India and China.
Tibetan Ms.119.

Undated (mid 15th century) English manuscript copied on vellum in a gothic hand containing Anatomia, a pseudo-Galenic work. The opening displayed shows an anatomical drawing of a pregnant female. The squatting position and the employment of the entire figure to illustrate visceral anatomy have a marked similarity to the anatomical drawings of Mansur and probably reflect a common Alexandrian antecedent.
WMS. 290 f.52^v.

CASE 11 VETERINARY MEDICINE

Although dissection of humans was forbidden to Islamic physicians, they continued the investigative analogical approach of the Greeks in anatomy making important advances regarding the eye, the liver and heart: these advances came almost entirely from animal studies. The Arabs have always been great lovers of the horse. The early 8/14th century work Kitāb al-Nāṣirī composed by Abū Bakr ibn Badr al-Dīn Ibn al-Mundhir al-Bayṭar, veterinary surgeon to the Mamlūk sultān, al-Nāṣir Nāṣir al-Dīn Muḥammad ibn Qalā'ūn (684/1285-741,2/1340), was unequalled in equine medicine both in Europe and the east before the 18th century. Avian medicine is said to have had its genesis in the Islamic world many early physicians and scientists having written on the subject.

Arabic manuscript copied in 1193/1779 in Maghribī script containing al-aqwāl al-kāfiya wa-al-fuṣūl al-shāfiya, "Sufficient accounts and aphorisms on healing" composed by 'Alī b. Dā'ūd b. 'Umar b. Yūsuf b. 'Alī b. Rasūl al-Rasūlī, al-Malik al-Mujāhid (reigned 721/1321-764/1362) and copied by al-Sharīf Muḥammad al-Sunūsī b. 'Abd-Allāh al-Suhaylī al-Maghribī.

The author of this work was the fifth sultān of the learned Rasūlī dynasty of Yemen. It is divided into six parts dealing with the breeding, maintenance and training of domestic animals and includes information of interest to zoologists and veterinary scientists. The opening shows part of the table of contents relating to the characteristics of horses.

Arabic Ms. WMS. OR. 107 ff.5^v, 6^r.

Persian manuscript containing Faras-nāma-yi Hindī, "Indian book of the horse" copied in 1051/1641 in Nasta'liq and containing the autograph of the translator 'Abd Allah Khān Bahādur Firūzjang, veterinary surgeon to Shāh Jahān (1037/1627-1068/1657) a print of which is displayed adjacent. The work describes the different breeds of horse - a miniature of one which is displayed - and the illnesses they are susceptible to.
Persian Ms. 47a ff.6^v, 7^r.

Persian manuscript containing Faras-nāma-yi Hindī, "Indian book of the horse" copied in 1218/1803 in Nasta'liq and containing 57 miniatures of the horse, two examples of which are displayed.
Persian Ms. 559 ff.17^v, 18^r.

Undated (late 12/18th century) composite Persian manuscript copied in Nasta'liq with elements of Shikasta containing an anonymous Faras-nāma, "Book of the horse" followed by Faras-nāma-yi Hindī, "Indian book of the horse". The opening shows the end of the former and beginning of the latter work.
Persian Ms. 557 a&b ff.91^v, 92^r.

Undated (12/18th century) Persian manuscript copied in Nasta'liq, written in verse and containing Shāh-Shujā', a work on falcons and birds of prey. This work is called after its author the Muzaffarid Sultān Shāh Shujā' (765/1364-786/1384) as indicated in line five of folio 2^v displayed.
Persian Ms. 358 ff.2^v, 3^r.

Urdu manuscript copied in 1251/1835 in Nasta'liq of Faras-nāmah, "Book of the horse" composed by Sa'adat Yar Khān Rangīn (1168/1755-1251/1835). This work, written in verse, is a different composition to the Persian text of the same name and was composed in 1210/1795 for Miyan Qādir, brother of Muḥammad Bakhsh, 'urf Miyan Macchū who had given shelter to Rangīn when he was in Lucknow. The opening displayed gives descriptions of different kinds of horse.
Urdu Ms. 1 ff.7^v 8^r.

CASE 12. THE USE OF AMULETS IN PREVENTIVE MEDICINE

Amulets, charms and other objects were worn for magical use to protect against witchcraft, the evil eye, sickness, accidents and all other conceivable dangers or maladies. Their use can be traced to remote prehistoric times down to the modern age throughout the world including the world of Islam among Christian Jew and Moslem alike. The belief in the prevalence of occult evil influences engendered trust in amulets and similar preservatives which survived along side the rational study of science and medicine.

Among Moslems the use of amulets ḥamā'il is widespread. They are found written on a variety of materials from gold and silver to bones and shells. The prayers and signs inscribed on them are of infinite variety including divine names, names of angels, verses from the Qur'ān, astrological symbols, Cabbalistic letters, magic squares and signs of geomancy. The Hebrew scriptures preserve references to these customs in the Mosaic injunctions to bind portions of the law upon the hand and

as frontlets between the eyes as well as to write them upon the door posts and the gates (Ex 13:16; Dt 6:8;11:18). Amulets were used in the early Christian church hence the emphatic protests of Chrysostom, Augustine and others against them.

A selection of amulets from the Islamic and Semitic language collections in the Wellcome Institute are displayed.

Undated (c.18th century) Hebrew manuscript copied on vellum in square script comprising an amulet for protection of Moses David, son of Esther from plague above which is a mystical permutation of Hebrew letters contained in the Hebrew word for plague in the left hand column. Displayed with the amulet is the case in which it is enclosed.
Hebrew Ms. A.27 f.1^r.

Undated (c. 18th century) Hebrew manuscript copied on vellum in square script, comprising an amulet for the protection of Bela daughter of Rachel from plague above which is a mystical permutation of Hebrew letters contained in the Hebrew word for plague in the left hand column.
Hebrew Ms. A.26. f.1^r.

Undated (c. 17th century) Hebrew manuscript copied on paper in cursive Italian hand comprising a fecundity charm.
Hebrew Ms. A.25. f.1^r.

Undated (c. late 19th century) Malay manuscript comprising amulets for invulnerability and safe child delivery in the Arabic or Jawi script of Malaya, written on western paper. The manuscript forms part of the Hervey Malay collection in the Wellcome Institute, once the property of a British administrator in the Straits Settlements during the late 19th century. Dudley Francis Amelius Hervey (1849-1911) was the son of the Revd. Lord Charles Amelius Hervey, rector of Chesterford and grandson of the first Marquis of Bristol. He joined the Straits Civil Service in 1867 and was the first "cadet" of the service, which was established when the Colonial Office assumed control of the Straits Settlements following their separation from India. Like many scholar officials of his time he collected local information concerning the area relying heavily on his Malay writer Munshi Muhammad Jaafar.
Well. Mal. 2E ff.5^v, 6^r.

Undated (18-19th century) Ethiopian manuscript composed of a scroll in two strips of vellum clearly written in black and red ink and containing amulets and prayers against evil eye comprising the legend of the witch seen by the Apostles on the shore of the Sea of Galilee, protection against the evil eye, malaria, colic, a prayer to Phanuel the expeller of devils, and charms for blacksmiths.

Undated (13/19th century) Turkish manuscript written on paper in Riqā' script containing certain prayers and "seals" of the prophets (mūhr-ū nubuvvet) for use in daily affairs as well as in treatment of various diseases. The diagram shows the "seal" of Moses which, according to the text, he carried into battle against Pharaoh!
Turkish Ms. no. 55809. ff.101^v, 102^r.

Undated (19th century) Arabic manuscript of an amulet inscribed with ink on wood and containing verses from the Qur'an. It was presented to Sir Henry Wellcome (1853-1936) in 1913 while supervising a programme of excavation at Jebel Moya, an archaeological site midway between the Blue and White Nile. This programme of excavation was set up by Sir Henry in response to Lord Kitchener's request for help in providing for the welfare of the Sudanese. The finds from Jebel Moya, dating from 1000-400 B.C., have made a significant contribution to the history of the Middle East and North Africa.

Digging Lemnian earth (Terra Lemnia). Terra lemnia called Terra sigillata in older European pharmacopoeias, is the red coloured clay (Bolus rubra) found on the Greek island of Lemnos in the northern Aegean Sea; the name also designates similar substitutes of various origins. The Terra sigillata (sigillum = seal) was impressed with a seal containing a pious text for use as an amulet and was recommended in ancient times as an antidote against poisoning. Both in the Orient and Europe during the Middle Ages the use of Terra sigillata in one form or another was highly regarded in medical practice.

Print of an illustration from a 13th century Materia Medica of Dioscorides in Arabic translation at the Freer Gallery of Art, Washington.

Five red Terrae sigillatae each stamped with the Maltese cross and surmounted with a crown within a circular depression; c. 14th to 19th century.

Lent by the Wellcome Museum of the History of Medicine at the Science Museum, London. A656733.

CASE 13 ISLAMIC SCIENCE IN THE MEDIEVAL WEST.

"Ther was also a doctor of phisik,
In al this world ne was ther non him lyk
To speke of phisik and of surgerye;
For he was grounded in astronomye.

.....
Wel knew he the olde Esculapsius,
and Deiscorides, and eeke Rufus;
Old Ypocras, Haly and Galien;
Serapyon, Razis, and Avycen
Averrois, Damescen, and Constantyn;
Bernard, and Gatisden and Gilbertyn".
General Prologue 1,411-414, 429-434.

All the medical writers mentioned by Chaucer [c. 1340-1400] in his description of the physician in the General Prologue were standard authorities used by European medical students and were often to be found in both university libraries and curricula and in the private collections of physicians. It will be noted from the above quotation that a number of Islamic physicians were well established as medical authorities in the west by Chaucer's time.

The school of Salerno, distinguished for medicine in the 11th and 12th centuries, is said to have been founded by four westerners, "a Greek, a Latin, a Jew and a Saracen", which may symbolize the synthesis of

cultural influence that began to take place between east and west in the early Middle Ages. Islamic medicine was introduced to Salerno by Constantinus Africanus (c. 1020-1087) and by the 13th century Islamic culture was securely grafted on to European medicine by means of Latin translations. Writers on the practice of medicine were sometimes called "Arabists" on account of their attachment to the writings of Galen as transmitted through Islamic sources. The great centre of this translating activity was Toledo which, after falling into the hands of Christians in 1085, was sought by all for its rich store of Arabic manuscripts. In this work of transmitting Hellenistic culture from Arabic into Latin, Spanish Jews who were fluent in Arabic were the natural intermediaries.

A selection of medieval western manuscripts comprising Latin translations of Islamic medical authors are displayed.

Undated (14th century) Latin manuscript copied on vellum of Book 5, (the Pharmacopoeia) of the Canon of Avicenna (Ibn Sīnā 370/980-428/1037) in the translation of Gerard of Cremona (c. 1114-1187) This celebrated work formed the basis of medical teaching in both the east and Europe where it was studied in universities as far north as Scotland.

The translator, Gerard of Cremona, who lived most of his life in Toledo was a prolific transmitter of scientific and philosophical works from Arabic into Latin during the Middle Ages making them available to scholars in medieval Europe.
WMS. 104 f.1^r.

Undated (mid 14th century) Latin manuscript in a neat gothic hand, probably of Italian origin, copied on vellum of Liber divisionum. Antidotarium, Synonima, the pharmaceutical section of the Kitāb al-Ḥawī composed by Rhazes (d. c. 313/925). This encyclopaedic work devoted to medicine contained many extracts from Greek and Hindu authors along with observations of his own and earned for Rhazes in both the Islamic world and the west the distinction of being the greatest clinician in medieval Islam. The list of synonyms has been ascribed to Yūhannā ibn Maṣawayh (Mesu^h c. 160/777-243/857) and also to Yaḥya ibn Sarāfyūn (Serapion the Elder fl. 3/9th century). The translation of the first treatise is ascribed to Gerard of Cremona (c. 1114-1187). The opening exhibited shows a list compiled by the scribe of the work which he has completed and the number of letters he has illuminated.
WMS. 679 ff. 33^v 34^r.

Undated (early 16th century) Latin manuscript transcribed on paper in several hands and comprising a commonplace book put together by an Italian physician Antonio Giovanni Scandolisti (fl. late 15th/early 16th century). The opening displayed contains extracts from the Colliget on materia medica by Averroes (Ibn Rushd 520/1126-595/1198). This encyclopaedic work written before 1162 is arranged in seven sections treating anatomy, health (physiology), general pathology, diagnosis, materia medica, hygiene and general therapeutics. It is however much

more limited in its scope than the Canon of Avicenna corresponding to only the first book of that work.

Averroes belonged to a distinguished Cordovan family, the grandson of a celebrated Mālikite theologian, Qāḍī and Imām of the great mosque of Cordova. In 578/1182 the Almohad caliph summoned him to replace Ibn Tufayl (d. 581/1185-6) as court physician but his court career was a chequered one. Averroes was regarded as the greatest Muslim philosopher of the west and one of the greatest of medieval times; as a result his distinction as a physician has been entirely eclipsed. At one time he was the teacher of the famous Jewish philosopher Maimonides (d. 601/1204).

WMS. 730 ff. 28^v, 29^r.

Undated (late 15th century), Italian manuscript transcribed on paper in several hands comprising a treatise on simples, Kitāb al-adwiyā al-mufrada, "Liber de simplici medicina; De medicamentis simplicibus; De temperamentis simplicium" composed by Ibn Sarābī or Serapion the Younger (c. early 6/12th century).

Little is known of this physician who may possibly have been a Christian. He is not to be confused with Serapion the Elder, Yaḥyā ibn Sarāfyūn (second half of 3/9th century). His treatise on simples in Latin translation enjoyed much popularity throughout medieval Europe and according to Chaucer was well known in England. The original was translated into Latin by Simon Januensis, with the assistance of Abraham ben Shem-Tob and was first published in Milan in 1473.

The opening shows the end of the prologue (line 16 col. 1, f. 1^v) and the beginning of the corpus of the work.
WMS. 746 ff. 1^v, 2^r.

Undated (mid 14th century) Latin manuscript transcribed on vellum in a fine semi-round gothic hand comprising Breviarius qui dicatur Viaticus with glossa by Gerard of Cremona (c. 1114-1187) the distinguished and prolific translator of scientific and philosophical works from Arabic in the Middle Ages. The Viaticus is the translation by Constantine the African of the Zad al-Musāfir composed by Ibn al-Jazzār (d.c. 395/1004-5). Ibn al-Jazzār, the famous physician of Qayrawān, was born into a family of physicians and studied at the feet of the celebrated Jewish scholar Ishāq b. Sulaymān al-Isrā'īlī (Isaac Judaeus c. 243/855-343/955). Much of his writings have been lost but the Zad al-musāfir "Viaticum" survived being translated into Greek during the author's lifetime.

Constantine the African (d. 480/1087) who first introduced medicine into Europe was born in Tunis in the early 11th century and died at Monte Cassino in 480/1087. What is known of his life is due to the fanciful account of Peter the Deacon of Monte Cassino. It would appear that after many travels Constantine arrived at Salerno where he became a Christian and finally a monk at Monte Cassino. It is certain however that he made Latin paraphrases (sometimes claiming them as original work) from Islamic writings. He is regarded as the first swallow of the intellectual summer of Arabic influence on European learning and, although not a great scholar, his life indicates a slow growth across the Mediterranean of Islamic learning.

The opening shown displays the end of part one and beginning of part two of this medical compendium.

WMS. 207 ff. 16^v, 17^r.

CASE 14. THE ADVENT OF PRINTING

The gradual increase in the transmission of Islamic culture including Hellenistic it had absorbed throughout the Middle Ages was given added impetus at the end of this period. The fall of Constantinople in 1453 and the resulting emigration of many Byzantine scholars to the Italian peninsula gave rise to a full scale revival of interest in Hellenistic culture in the west and marked the beginning of the Renaissance. Perhaps of even more importance to the dissemination of Islamic science in the west was the printing of the Gutenberg Bible in 1454, the date referred to as the beginning of the use of moveable type which revolutionized the world of learning and for the first time brought the knowledge of science and scholarship to a much larger public. This in turn provoked the development of independent thought characteristic of the age.

Presses were set up in Strasbourg (1460) and Bamberg (1461), while Johann Speyer and Nicolas Jenson began to print at Venice in 1469; by the end of the century presses had been set up in many towns throughout Europe. The Renaissance versions and editions of these early presses are not only remarkable for the excellence of their typography but are usually furnished with good tables of contents, sometimes even with subject and author indices at the end giving accurate paginations.

A selection of examples from the Wellcome Collection are displayed.

al-Qānūn fī al-ṭibb composed by Ibn Sīnā, "Canon" of Avicenna. Printed in Rome at the Typographia Medicea in 1593, this is the first printing of the Arabic text of this celebrated Islamic medical work. In the west several physicians learned Arabic to obtain a better understanding of the works of Ibn Sīnā. The first known influence appears in the works of a Dane, Henrik Harpestraeng, a royal physician who died in 1244, and at the University of Bologna anatomy was still being taught in Arabic terms in the 14th century.

The opening displayed shows the title page.

Medical Society of London Purchase f.1^r.

Ha-ḡānūn of Ibn Sīnā, "Canon" of Avicenna in the Hebrew translation of Joseph Lorki and Nathan ben Eliezer ha-Me'ati. Printed in Naples by Asher ben Perez Minz and Abraham ben Jacob Landau at the printing establishment of Azriel ben Josef and completed on the 9th November 1491, this is the first printing of a medical work in Hebrew.

Of the first of the two translators we know little but the second, Nathan ben Eliezer ha-Me'ati was the earliest member of a distinguished family of translators who flourished in Rome during the 13th and 14th centuries. Nathan called "Prince of Translators" lived in Rome from 1279 to 1293 but his native place seems to have been Cento hence his name "Me'ati" which is the Hebrew for "Cento" (100). After acquiring many languages during his long wanderings, he settled in Rome where he translated

scientific, particularly medical works from Arabic into Hebrew. Ha-ḳānūn is perhaps the best known of his translations. Asher ben Perez Minz was a German printer and typesetter in the printing works belonging to Azariah ben Joseph at Naples; nothing is known of his colleague but his name suggests he too was of German extraction. The volume displayed contains part of the first book and Books 3 and 4 of Ha-ḳānūn and the opening exhibited shows a section from the fourth book dealing with fevers. No. 573 ff. 146^v, 147^r.

Canon of Avicenna in the Latin translation of Gerard of Cremona (c.1114-1187), the distinguished medieval translator of scientific and philosophical works from Arabic. Printed at Padua by Johannes Herbort and dated 19th August 1479.

Although the Canon was printed in both Arabic and in translation during the 15th and 16th centuries, there was a strong reaction against it during the Renaissance. Leonardo da Vinci (1452-1519) rejected the anatomy of Avicenna but for want of another vocabulary used Arabic terms. Paracelsus (1493-1541) burnt the Canon at Basle and Harvey (1578-1657) dealt it a severe blow by publishing his discovery of the major circulation in 1628. The volume displayed contains only the first book of the Canon and the opening exhibited shows the end of the table of contents and the beginning of Book I with an illuminated capital bearing the date 1482. No. 569 Sig. a iii^v, a iv^r.

Cyrurgia cum cauteriis et aliis instrumentis in Latin translation, composed by Abulcasis (Abu al-Qāsim khalīf ibn 'Abbās al-Zahrāwī c.325/936-404/1013) and printed in Venice for the publishing house of Octavianus Scotus with the date 27th January 1500/1.

Abulcasis, a native of Cordova lived during the golden age of Moorish Spain when intellectual activities including the natural and the mathematical sciences reached their peak. Cordova and al-Zahra', from where Abulcasis took his epithet, formed a metropolitan area which, apart from Constantinople, was unmatched for intellectual excellence in Europe. His important work in thirty treatises entitled Kitāb al-taṣrīf li-man 'ajiza 'an al-ta'līf, a general medical compendium, comprised a work devoted to surgery in its final treatise which was the first complete and illustrated treatment of its subject. The declared purpose of the author was to revive the art of surgery as taught by the ancients. It contains illustrations of surgical and dental instruments and was the leading text on surgery during the Middle Ages.

Bonetus Locatellus began printing in 1487 and before the end of the century had become the regular printer for the publishing house of Octavianus Scotus and his heirs, a connection which accounts for nearly all his production after 1500. His work on their behalf was of an exclusively learned character chiefly in the fields of medicine, philosophy, law and theology. His name disappears after 1509 when he may either have died or retired, and there is an interruption in the publishing activities of the Scotus firm which resumed again during the 16th century using the services of other printers.

The opening exhibited from the second section concerns midwifery and shows a selection of gynaecological instruments including forceps, hook or crochet and probes.

No. 3017 ff.25^v, 26^r.

Liber totius medicinae necessariae continens, quem...Haly filius Abbas...edidit regique inscripsit composed by Haly Abbas ('Alī b. al-'Abbās al-Majūsī fl.4/10th century).

This great treatise concerned with the theory and practice of medicine and entitled in its original Arabic as Kāmil al-sinā'a al-ṭibbiyah "Complete art of medicine" or al-Malakī "the royal book" was first translated in part into Latin by Constantine the African. Subsequently the whole work was rendered into Latin in 1127 by Stephen of Antioch with annotations by Michael de Capella. This translation was first published under the title Liber regalis dispositio nominatus ex arabico venetiis (Venice, 1492). A subsequent reprint which is shown here appeared under the title Liber totius medicinae necessariae continens... printed in 1523 by J. Mynt at Lyons. The title page is displayed of a volume successively owned by Leonardo Botallo of Asti physician to Francis I of France, Turquet de Mayerne (1573-1655) physician to James I of Great Britain, and John Channing the distinguished 18th century editor of Abulcasis.

Medical Society of London Purchase f.1^r.

CASE 15. ISLAMIC STUDIES IN ENGLAND FROM THE 16TH TO EARLY 18TH CENTURIES.

The impetus for the study of the languages of the Islamic world came from the continent under the combined influence of the Renaissance and the Reformation. The study of the Bible in its original languages stimulated an interest in Hebrew which following an Act of Parliament in 1536 was taught at Oxford and Cambridge. James I ordered a new translation of the Bible which was published in 1611 as "Newly translated out of the original tongues and with the former translations diligently compared and reuised by his Majesties speciall Commandment". In the 17th century chairs of Arabic were established at Oxford and Cambridge, manuscripts were collected, grammar, history and travel books pertaining to Islam were printed. This, along with increasing expansion of trade with the Islamic world, gave rise to a small but distinguished group of English savants concerned with the study of Islam, its culture, history and languages.

Grammatica Arabica written by Thomas Erpenius and printed in Leiden at the Raphelangius Press in 1613. Thomas Erpenius (1584-1624), the distinguished Dutch orientalist, studied at Leiden and travelled in several European countries including England. While in Paris he took lessons in Arabic from an Egyptian and perfected his knowledge of Turkish, Persian and Ethiopian in Venice. In 1613 he was appointed professor of Arabic and oriental languages except Hebrew in the University of Leiden, and in 1619 the university authorities instituted a second chair of Hebrew in his favour. He had new Arabic characters cut at great expense and created a press in his own house. Erpenius

published a number of works relating to oriental history and grammar; the fourth enlarged edition of Purchas his pilgrimage published in 1626 includes a section entitled the Saracenical Empire translated from Arabic by him. His Grammatica Arabica was often reprinted and much used in teaching Arabic in England and elsewhere. The opening shows a table of the Arabic alphabet with the numeric values, names, pronunciation and forms of the individual letters.

No. 7198 p.1.

Geographica Nubiensis, id est accuratissima totius orbis in septem climata divisi descriptio... Recens ex arabico in latinum versa a G Sionata et J. Hesronita written by al-Sharīf al-Idrīsī (d.c. 560/1165) and printed in Paris by H. Blageart in 1619. This work is an abridgement of a descriptive geography originally written in Arabic with the title Kitāb nuzhat al-mushtāq fī ikhtirāq al-āfāq which was composed by order of Roger II, the Norman king of Sicily as a key to a large silver planisphere which the author himself had made. Al-Idrīsī's work represents the best example of Arab-Norman scientific collaboration in geography and cartography of the Middle Ages. For several centuries the work was popular in Europe as a text book. The abridgement was among one of the first secular Arabic works printed by the Medici Press in Rome in 1592. It was subsequently translated into Italian in 1600 and was published in the Latin translation of two Maronite Christians, Gabriel Sionita and Joannes Hesronita in Paris in 1619.

The copy displayed is distinguished by having the annotations of Edward Pococke (1604-1691) the celebrated orientalist and collector of oriental manuscripts now in the Bodleian Library Oxford. He was at one time the pupil of William Bedwell (1561/2-1632), the father of Arabic studies in England, and was the first occupant of the chair of Arabic established by Archbishop Laud at Oxford. During the Commonwealth period Pococke suffered much political harassment but continued his studies while vicar of the parish of Childrey in Berkshire finally returning to Oxford as professor of Hebrew at the Restoration.

The opening shows the third part of the first clime with Pococke's annotations and corrections.

No. 3387. pp.12,13.

A geographical historie of Africa written in Arabicke and Italian ... wherein ...[is] described ... the regions cities, townes, mountains rivers ... throughout all the north and principall partes of Africa; ... Translated and collected by John Pory. This work was originally written by Leo, the African (c. 890/1485 - after 962/1554) also known as al-Hasan ibn Muhammad al-Wazzān al-Zayyātī al-Gharnāṭī.

Leo was born in Granada, some five years before the fall of the kingdom and his family's exile to Fez where he was educated. His geographical knowledge was based on the medieval Islamic geographical corpus and on direct observations collected from four journeys, the last of which, as Moroccan ambassador to the Ottoman court, took him to Constantinople and then to Egypt, Arabia and Tripoli. Here he was captured by Italian pirates, transported to Italy and given as a slave to Pope Leo X. He converted to Catholicism under the aegis of the Pope whose name he took

upon baptism. In 1529 he returned to Tunis and was reconverted to Islam.

In Italy Leo wrote his geographical treatise in Italian entitled Della descrittione dell' Africa which was a substantial addition to the impoverished knowledge of African geography inherited from the Middle Ages. John Pory (1570-1630) at the instigation of his friend Richard Hakluyt (1553-1616) translated Leo's work into English adding some of his own notes. The translation was printed in London by George Bishop in 1600, a copy of which is exhibited. John Pory represented the borough of Bridgwater, Somerset in Parliament between 1605 and 1610. He was a traveller and geographer familiar with Europe, the Ottoman Empire and America where he was secretary to Sir George Yeardley, governor of the colony of Virginia. In his early days he had been a pupil of Hakluyt who in vol. 3 of his Voyages conceived of him possessed of "special skill and extraordinary hope to performe great matters in the same, and beneficial for the common wealth". The opening displayed shows the map of Africa and the beginning of a general description of the continent.

No. 3729 p.1.

The principal navigations, voyages, traffiques and discoveries of the English nation ... written by Richard Hakluyt (1553-1616) and printed in three volumes in London by George Bishop, Ralph Newberie and Robert Barker in 1599, 1600. Richard Hakluyt was the leading advocate and chronicler of English overseas expansion during the reigns of Elizabeth I and James I. His cousin, a lawyer in the Middle Temple, introduced him as a schoolboy to maps and books on cosmography so firing his life long interest in the new and rapidly developing subject of geography. With Spain and Portugal already in possession of rich empires in America and Asia he saw the need for England to establish her own routes to the coveted regions of the Orient and to acquire her own sphere of influence in lands not yet annexed. Hakluyt's major contribution to geographical knowledge lay in three great collections of voyages the third which is displayed. This work, an enlargement of a previous similar work, was based on such original sources as the journals of explorers, sailing directions, and reports by merchants and seamen many received by Hakluyt himself. It was a handbook of Elizabethan discovery and exploration acclaimed as the prose epic of the modern English nation. The opening exhibited shows a letter in Latin and English translation from Elizabeth I to the Great Sophy of Persia sent in 1561 by her emissary Anthonie Jenkinson, for the purpose of opening up trade and granting safe conduct to the emissary and his servants. It is interesting to note that the letter was also written in Italian and Hebrew.

No. 3046 pp. 340,1.

Purchas his pilgrimage. Or relations of the world and the religions observed in all ages and places discovered ... with briefe, descriptions of the countries, nations, states, discoveries ... written by Samuel Purchas (c. 1575-1626) and printed in London by William Stanley for Henrie Fetherstone in 1613. Samuel Purchas was the author of three travel books the best known being Hakluytas Posthumus or Purchas his Pilgrimes, contayning a History of the World in Sea Voyages and Land

Travells by Englishmen and others Its intrinsic value is due to its record of early voyages otherwise unknown. He inherited many of Hakluyt's manuscripts from which he doubtless drew for his own work.

In the opening displayed Purchas describes the Saracens and the derivation of their name.

No. 5292 pp. 192, 193.

The history of the Saracens ... illustrating the religion, rites, customs and manner of living of that people ... collected from the most authentic Arabic authors ... written by Simon Ockley and printed in Cambridge by Henry Lintot for Miss Anne Ockley daughter of the author in 1757. This is the third edition of what constitutes Ockley's single title to fame. The work, based on manuscripts in the Bodleian Library, although not completely accurate, adopted a popular method which made the history of the early Saracen conquests attractive to the general reader and stimulated the student to further research.

Simon Ockley (1678-1720), an impecunious vicar of Swavesey in Cambridgeshire, was a pioneer in oriental scholarship, and a disciple of Edward Pococke (1648-1727) son of Edward Pococke first occupant of the Laud chair of Arabic at Oxford. It was to Edward Pococke he dedicated his work Improvement of human reason exhibited in the Life of Hai ebn Yokdhan in 1708. In 1711 he was appointed to the chair of Arabic in Cambridge. The opening exhibited shows an illustration of the Ka'ba in Mecca from the section on the life of Muhammad.

No. 39038/B p. 4.



[illegible]