~~Osler 6~~

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7652. ' The Evolution of modern Medicine' ; 1913.

MS. of no. 6259 (see notes), including some unpublished sections. On fol. 43^{v} is an unfinished letter to The Times on ' Housing & Tuberculosis '.

7652

FROM
THE LIBRARY
OF
SIR WILLIAM OSLER, BART.
OXFORD

No 7652

Material for and final typed draft to
of the Evolution of Modern Medicine
A Series of Lectures Delivered at Yale
University on the Silliman Foundation
in April, 1913.

Published New Haven, Yale University
Press, 1921.

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2

The Evolution of Modern Medicine
a course of six lectures

1 The soil in preparation
The healing art – Conditioned everywhere by the state of existing knowledge. Primitive medicine. Egyptian, Babylonian, Semitic. Chinese. –

2 The seed
The birth of science. Man as part of nature. The Greek mind – how it inf

3 Germination
~~why Greek failed~~, Medd ages. a

4 Leafage & blossom
The resurrection of Greece. The three great books that made Modern Medicine
Vaesal, Harvey, Morgagni

5 Fruitage
The French Renaissance
... batt. vi. Harvest

78
1

Evolution of Scientific Medicine

I
The soil
Man & nature. Primitive man – struggles of 3 fold relations, cost of. Sickness nature of – Grad. dev of knowledge of herbs (celsus) Modern natives – illustrate prim. practice. Evolution along three lines – thaumaturgic, dietetic, empirical. Knowledge of simple drugs & treatment, med & surgical. Sketch of Prim. med in the ancient people. Resume outlook in ne. Long ages of preparation of the soil.

II
The seed
The birth of science. A new outlook on the world. Man as a part of nature. The phenomena of the world. The rise of Greek medicine. Its characters. Its development. Hippo. The alexandrines. Galen

III
The long germination – The middle ages 17 y loss
The loss of book – Here & there a flower of the characters of med. med. – The rise of the arabian school. The 13th cent. Renaissance. Bacon – Surgery.

IV
Leafage & blossom
The Renaissance gave medicine three things: a new anatomy, a new phys. & a new chemist

V
Fruitage

VI
Harvest

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From the Regius Professor of Medicine, Oxford.

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21

Lowell Lectures
address

The Evolution of Modern Medicine

a course of six lectures

78
2

1 The soil in preparation

I The healing art – conditioned everywhere by the state of existing knowledge. Primitive medicine. Egyptian, Babylonian, Semitic. Chinese. –

2 The seed

II The birth of Science. Man as part of nature. The Greek mind – how it met

III

3 Germination

~~Why Greeks failed~~ Middle ages. a

4 Leipzig & Salerno

IV The resurrection of Greek. The three great books that made Modern Medicine Vesalius, Harvey, Morgagni

5 Malaga

V The French Renaissance

voyage but VI. Harvard

78
3

as we look across the continent the objects that arrest attention are not systems or man who rise out of the darkness as lighthouses to guide us.

The gospel I have to preach – the application of science to the greatest – of human needs, as unfolded through the centuries, slowly & with difficulty till since previous papyrus roll, the fragments of which contain a message legible enough to those with seeing eyes

– Our anchorage is not in tradition, not in authority, both blind & treacherous but in the rocky ground of

– "Hearing ears" or Judicious Hooker reminds, free from the shackles of prejudice, the stillness & docility & simplicity of a little child

May the mystical winds

propitiated. In the ~~conspicuous~~ ~~the~~ manifestation ~~of~~ ~~God~~ ~~Jehovah~~ ~~Zeus~~ ~~Apollo~~ ~~Athene~~ ~~Hermes~~ ~~Dionysus~~ ~~Aphrodite~~ ~~Artemis~~ ~~Hephaestus~~ ~~Ares~~ ~~Hera~~ ~~Demeter~~ ~~Hestia~~ ~~Hades~~ ~~Persephone~~ ~~Hecate~~ ~~Nemesis~~ ~~Eros~~ ~~Hermaphroditus~~ ~~Pan~~ ~~Satyrs~~ ~~Nymphs~~ ~~Muses~~ ~~Graces~~ ~~Fates~~ ~~Furies~~ ~~Sirens~~ ~~Centaurs~~ ~~Tritons~~ ~~Nereids~~ ~~Oceanids~~ ~~Naiads~~ ~~Dryads~~ ~~Oreads~~ ~~Hamadryads~~ ~~Oceanus~~ ~~Tethys~~ ~~Nereus~~ ~~Proteus~~ ~~Triton~~ ~~Glaucus~~ ~~Phorcys~~ ~~Ceto~~ ~~Thaumas~~ ~~Electra~~ ~~Iris~~ ~~Harpies~~ ~~Gorgons~~ ~~Graeae~~ ~~Typhon~~ ~~Echidna~~ ~~Chimaera~~ ~~Sphinx~~ ~~Nemean lion~~ ~~Hydra~~ ~~Cerberus~~ ~~Scylla~~ ~~Charybdis~~ ~~Geryon~~ ~~Antaeus~~ ~~Talos~~ ~~Argus~~ ~~Pegasus~~ ~~Chimaera~~ ~~Bellerophon~~ ~~Perseus~~ ~~Andromeda~~ ~~Cassiopeia~~ ~~Cepheus~~ ~~Atlas~~ ~~Prometheus~~ ~~Deucalion~~ ~~Pyrrha~~ ~~Minos~~ ~~Rhadamanthus~~ ~~Aeacus~~ ~~Tantalus~~ ~~Niobe~~ ~~Pelops~~ ~~Tantalus~~ ~~Atreus~~ ~~Thyestes~~ ~~Agamemnon~~ ~~Menelaus~~ ~~Helen~~ ~~Paris~~ ~~Hector~~ ~~Andromache~~ ~~Priam~~ ~~Hecuba~~ ~~Cassandra~~ ~~Aeneas~~ ~~Anchises~~ ~~Ascanius~~ ~~Dido~~ ~~Odysseus~~ ~~Penelope~~ ~~Telemachus~~ ~~Laertes~~ ~~Circe~~ ~~Calypso~~ ~~Nausicaa~~ ~~Alcinous~~ ~~Arete~~ ~~Polyphemus~~ ~~Aeolus~~ ~~Lestrygonians~~ ~~Laestrygonians~~ ~~Scylla~~ ~~Charybdis~~ ~~Sirens~~ ~~Wandering Rocks~~ ~~Cattle of the Sun

Introduction 78 4

e with me to ~~some spot in~~ the Pacific
the tiniest island
in farthest from any other land ~~known island~~ to ~~a~~
where one vast sea reflects or
never before seen by man, out of which on
surface of the vast ocean, ~~there~~ has really
rged a little coral reef — a mere speck it may
fringed with green, built during countless ages
minute living creatures.

you could go a voyaging through vast
with Shelly's Alastor — quotation — system in system
ny,

might perchance in a far off corner in infinity
a green speck, smaller indeed ~~than the~~ in proportion
to the earth
the little coral reef — but you would see again

Ray Lankester Introduction 78 3
Lecture

Position of man in the Universe

4

II

Man & Nature

Medicine arose out of the primal sympathy of man with man
out of the desire to help those in sorrow need & suction.

In his upward path man has wrought out for
himself a triple relationship — with the Gods,
with his neighbor & with nature — out of which
have evolved his religion his laws & his science.
at first He ~~has~~ manufactured Gods wholesale, deifying
largely objects in nature, charging them with
benign or malign spirits to be invoked or
propitiated. In the animistic stage he manu-
factured Gods wholesale & in his own image, endowing them with
human faculties & attributes, ~~till to repletion~~
~~the Pantheon of the race~~ bearing rich testimony
not less to the fertility of his imagination than
to the hopes & fears for which he has sought in
his Gods ~~them his Exodus~~ a pillar of fire by night & a pillar
of cloud by day, as guides ~~him~~ in his wonderful
Exodus from barbarism. (over)
God by God flits past in thunder till his glories turn to shades,
God by God bears wondering witness how his Gospel flames & fades.
More was each of these, while yet they were, than man their servant seemed
Dead are all of these, and man survives who made them while pedreams (Swinburne)

and if the dark chapters of the early religions
make us cry out with Lucretius
O genus infelix humanum talis divis
Cum tribuit facta atque ira's adjunxit acerbas!
Quantos tum gemitus ipsi sibi, quanta nobis
vulnera, quas lacrimas peperere minoribus nostris.
and though ~~[illegible]~~ in every age and with every religion

78 21.

From the Regius Professor of Medicine, Oxford.

The ~~Roman gods of dis.~~ & of Med
~~see Walter Pater~~

Leave 4 lines

Introduction

78
4

Fact
~~Come~~ with me to ~~some spot in~~ the Pacific ocean to the lowest island farthest from any other land ~~known island~~ to ~~a~~ spot never before seen by man, where one vast sea reflects on, out of which on the surface of the vast ocean, ~~there~~ has recently emerged a little coral reef — a mere speck it may be a tiny atoll fringed with green, built during countless ages by minute living creatures.

Now if you could go a voyaging through vast
with Shelly's Alastor — quotation — system or system
say,

You might perchance in a far off corner in infinity
see a green speck, smaller indeed ~~than the~~ in proportion to the universe than is the little coral reef to the earth — but you would see again the inorganic basis, the life in countless succession & and you see it capped or crowned with something you perhaps had not before met with around the voyaging worlds — a curious fringe of intelligence, you would see that the last of the generations of early polygonies were sentient creatures, infinitessent, ultra-microscopic particles of their tiny fragment of the universe yet — unlike anything else from out of the primal substance, self conscious being,

78
5

gradually softened the hard race of man — mollescere cœpit.
tum genus humanum primum In that marvellous sketch of the evolution of man nothing illustrates more forcibly the prescience of Lucretius than his picture of the growth of sympathy — "When with ~~broken cries~~ cries & gestures they taught by broken words that 'tis right for all men to have pity on the weak." I heard the well known medical historian, the late Dr Payne remark "that the basis of medicine is sympathy and the desire to help others and whatever is done with this end must be called medicine" The first lessons came to primitive man by injuries, accidents, bites of beasts & serpents, for long ages not appreciated by his child like mind but little by little such experiences crystallized into useful knowledge. The experiments of nature ~~taught him~~ made clear to him the relation of cause & effect, and while it is not likely as Pliny suggests that he picked up

78
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78
21.

From the Regius Professor of Medicine, Oxford.

The ~~Roman gods of dis.~~ & of Med
see ~~trotter Paten~~

Leave 4 lines

78
6

his earliest knowledge from the observation of certain practices in animals, as the natural plebotomy of the plethoric hippopotamus or the use of emetics from the dog or of enemata from the , it is ~~highly~~ very probable that Celsus is right in his account of the origin of rational medicine." Some of the sick on account of their eagerness took food on the first day some on account of loathing abstained; and the disease in those who refrained was more relieved. Some ate during a fever, some a little before it, other after it had subsided and those who had watted to the end did best. For the same reason some at the beginning of an illness used a full diet others a spare and the former were made worse. Occurring daily such things impressed careful men who noting what had best helped the sick, ~~and~~ then

78
5

Introduction

Origins

Medicine arose out of the primal sympathy of man with man, out of the desire to help those in sorrow need and sickness. As Woordsworth puts it

In the primal sympathy
Which having been must ever be;
In the soothing thoughts that spring
Out of human suffering

The instinct of self preservation, the longing to relieve a loved one & above all the maternal passion – for such it is – for the offspring gradually softened the hard race of man – tum genus humanum mollescere cepit. In that marvellous sketch of the evolution of man nothing illustrates more forcibly the prescience of Lucretius than his picture of the growth of sympathy "when with ~~broken cries~~ cries & gestures they taught by broken words that 'tis right for all men to have pity on the weak." I heard the well known medical historian, the late Dr Payne remark "that the basis of medicine is sympathy and the desire to help others and whatever is done with this end must be called medicine" The first lessons came to primitive man by injuries, accidents, bites of beasts & serpents, for long ages not appreciated by his child like mind but little by little such experiences crystallized into useful knowledge. The experiments of nature ~~taught him~~ made clear to him the relation of cause & effect, and while it is not likely as Pliny suggests that he picked up

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~~But~~ In his upward path man was not content to work out for himself a relationship with his neighbor & with nature but very early in his career he sought in the supernatural an explanation of the pressing phenomena of life. and so it came about that together with his laws & his primitive science was evolved religion (over)

Slough of despair
The South in Prin
The dawn was as lovely as the dog - - a belief in man - in himself - as half Whitman says - came again with the awakened life of the 13th century - The University - Roger Bacon - Grosstete

Roger Bacon wrote - Experimental science has three great prerogatives over other sciences: - it verifies conclusions by direct experiment, it discovers truths which they never otherwise would reach; and it investigates the secrets of nature & opens to us a knowledge of the past & of the future

- Errors only pave & maple smooth the pathway of truth. - Error is a way station on the road. a truth itself may be hugged too closely

- Bacon says "the true & lawful goal of the sciences is none other than this - that human life be endowed with new discoveries & powers (Organon)

The long fallow periods of the human mind follow the expansion of the

over

From the Regius Professor of Medicine, Oxford.

In fact priest philosopher & physician grew up together in the natural man struggling, on the one hand, for the recognition of certain practices forced on him by experience, and, on the other, for the recognition of agencies mystical & supernatural which he believed controlled the world about him, and were responsible for everything he could not understand, and particularly for the mysteries of disease. He peopled the world about him with spiritual beings, deifying the objects of nature and assigning to them benign or malign influences which might be invoked or propitiated. In the earliest stages these supernatural agencies relating to disease were (i) independent disease demons, (ii) human enemies who may act through the spirits of disease or by their own supernatural powers, (iii) the spirits of the dead; (iv) the spirits of animals killed in hunting (Withington. History of medicine, p 11). In the animistic stage he manufactured gods wholesale, & largely in his own image, endowing them with human faculties & attributes. ~~When~~ ~~He comes when~~ ~~Early~~ Early in the stage of history ~~with~~ we find a Pantheon full to repletion

4. 78 8

...note of Humanism, and their
...y & manycidedness, and upon
...ain of these characteristics we shall
...l in the brief sketch of the rise of
...tific Medicine

...ave seen ~~how close~~ that in the
...tive man and in the Great civilization
...pt & Babylonia the physician evolved
...n the priest - in Greece he ~~took~~ had a dual origin,
...m philosophy and from religion

...e VI.

...ing illustrates ~~to~~ closely the interdependence
...sciences that the stimulus which the
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...

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From the Regius Professor of Medicine, Oxford.

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Lecture III 78 7

Darkness & Dawn.

There are waste places of the earth that fill me with terror not because they are ~~in~~ themselves waste, one has no such sensation in the desert. The illimitable Sahara arouses the same feelings as the ocean - of the vast ever shifting - ? see. This very different is it where the desolation ~~has~~ makes is of waste what was once a brilliant & flourishing ~~civilization~~ product of mans heart & head. - ~~to~~ ~~where~~ to ~~see~~ know that the Lion & the Lizard keep

The courts where Jamshyd gloried & drank deep sends a chill to the heart and gives one pause and with a shudder the sense of human instability fills the mind. And this is the sort of feeling with which we cross into what are called the middle ages. The sun has seen blacker - Benedict - a feudal landed aristocracy (Kitchin, p 151) see Erasmus in the Benedict

Lifes night began - In sicking a heavenly horse man lost his bearings on the Earth

What happened - Slough of despond

The souls in Prison

The dawn was as lovely as the day - - a belief in man - in himself - as half Whitman says - came again with the awakened life of the 13th century - The University - Roger Bacon - Grosstete

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over

In fact priest philosopher & physician grew up together in the natural man struggling, on the one hand, for the recognition of certain practices forced on him by experience, and, on the other, for the recognition of agencies mystical & supernatural which he believed controlled the world about him, and were [illegible] he could not under-

The re-[illegible] symptom

~~Sun~~ Darkness & Dawn Sinning

With Galen the end — — the sects Alexandria

The broad stream of Greek culture sank into the sands of the middle ages — . what happens

Factors 1 - Arabians . 2. Byzantine - 3 south Italian

The Dawn . 13th century.

(iii)

The Renaissance

Hippocrates redivivus - Galen & Lucian - The Dislocation of Stud. Arabs - Vesalius & the resorts of anatomy. Leonardo - [illegible] - The Experimental spirit - Galen - Sam. Harvey - Decartes - Surg - Lechuga - Paré

IV

The study of morbid anatomy - The rise of Experimental pathology - The birth of clinic med. Laennec.

Seeds of disease

V

Causes

VI

~~Prevention~~ The 20th century - the promise of the

Six great epoch in the history of the human mind (1) To 500 ad - (2) To 1300 ad. (3) to 1600 4 - To 1830 (5) to 1910 - 6 - 20th century

the note of Humanism, and their Sanity & Many-sidedness, and upon certain of these characteristics we shall dwell in the brief sketch of the rise of Scientific Medicine

We have seen ~~how close~~ that in the primitive man and in the Great civilization of Egypt & Babylonia the physician evolved from the priest - in Greece he ~~took~~ had a dual origin, from philosophy and from religion

Lecture VI.

Nothing illustrates so closely the interdependence of the sciences that the stimulus which the new researches in medicine have given to the study of Entomology & the relation of insects to disease. In 18 when a group of my students under Dr Thayer were working at Malaria we began experiments in the possible cultivation of the parasites, and true teacher & Mosquitoes. A tramp who had been a medical student offered himself as a subject, ~~and we~~ but before we began the experiments Dr Thayer ~~went~~ sought at the Bureau of Ann Industry Wash. ~~to take seen~~ information as to the varieties &c of Mosquitoes - and sought in vain. Then came Ross's brilliant work which opened a new chapter in a book of golden deeds of which the profession may be justly proud. The demonts of the brain of n

bright morning of Greece & ... of modern life, together have grown up these two diametrically opposite views of mans relation to nature and more particularly of his personal relation to the agencies of disease

It will be the purpose of this course of lectures to sketch the main features of the growth of these two dominant ideas, to show how they have influenced man at the different periods of his evolution, how they ~~have at times~~ lamp of reason so early lighted in ~~darkened his path, at others~~ his soul ~~has~~ burning now bright now dim, ~~but~~ has never even in his darkest period been wholly extinguished but retrimmed & refurnished by this indomitable energies now shines more & more unto towards the perfect day. It is a glorious chapter in Mans history in which ~~in written large~~ those who have eyes to see may read the fullfilment of the promise of Eden that one day he should ~~have dom~~ not only possess the earth but that he should have dominion over it

From the Regius Professor of Medicine, Oxford.

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~~Prevention~~ The 20th century - the promise of the

Six great epoch in the history of the human mind (1) To 500 ad - (2) To 1300 ad. (3) to 1600
4 - To 1830 (5) to 1910 - 6 - 20th century

Study of Med

78 H

It is strange that we single contributors & awakening
zeal to the period
man was observed enough to have speculated & have
had capacity of filling that, while the [illegible] of wide
prevalence of disease the eye recognised ophthalmic signs
would unite modes of practice we owe the Egyptian
& the records
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In fact

Study of Med

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... it is strange that no single contribution, & analogous
...ed to the period.
...sion was advanced enough to have specialists & their
...ulists capable of filling ~~that~~, while the ~~[illegible]~~ of wide
prevalence of ~~[illegible]~~ disease of the eye necessitated ophthalmologists
world wide modes of practice we owe to the Egyptians
...otherapy & magic. The use of parts of the animal
...a medicine was very prevalent. The secretions & ...
...ecens, parts of the body dried & powdered, worms
...ts snakes & were most important ingredients
...pharmacopoeia. The Ebers Papyrus gives
... use spread to the Greeks & Romans & was main-
...d through the middle ages & ~~has been~~ it has
...ained for modern science & show that the practice
...ne & rational basis as in the use of the
~~[illegible]~~ glands which give the in-
...al secretions. As Sir Thos Browne says Mummy
...chandise, mumiam cures wounds, and Pharaoh is sold for
...l was the "horse of magic" Balsaamum" (in Burial)

modern conflagration is as of yesterday

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Growth of Science Notes

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"Indirectly Pasteur solved the famous mediaeval problem "How many angels can stand on the point of a needle" altering the word "angels" to "devils" he had found that of one of the deadliest of all diseases that had ever scourged mankind 500 of the malefacent microbes - veritable devils - could without over crowding, find place in the point of a needle" Sir W. Crookes - (Times I 27.13 Synthetic chem for the pure.

— "Porphyry goes as far as any modern humanitarian in preaching our duty towards animals" (W R Halliday. G R Div p 5

— all development is characterized by increased specialization

Like Karshish ~~I am but~~ a picker up of learnings crumbs I have dished a meal

From the Regius Professor of Medicine, Oxford.

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21

In fact
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prach
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heat
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1 Service

Hippocrates. Cos

There is ~~probably truth~~ a basis for Pliny's suggestion that he experienced by the receipts found written in the temple of the god, registered there by the sick cured of any disease afterwards "he professed that Course of Physicke which is called, Clinice, when by physicians found such sweetnesse that afterwards there was no measure nor end of fees" N.H. Bd 29. 9

Study of Med

78
11

of the organs it is strange that no single contribution to anatomy can be traced to this period.

The profession was advanced enough to have specialists & their were dentists capable of filling teeth, while the ~~[illegible]~~ of wide spread prevalence of ~~[illegible]~~ disease of the eye necessitated ophthalmologists.

~~The~~ Two world wide modes of practice we owe to the Egyptians organotherapy & magic. The use of parts of the animal body in medicine was very prevalent. The secretion & Schoa wrote bile feces, parts of the body dried & powdered, worms insects snakes & were most important ingredients of the pharmacopoeia. The Ebers Papyrus gives

Then use spread to the Greeks & Romans & was maintained through the middle ages & ~~has been~~ & it has remained for modern science to show that the practice has sometimes a rational basis as in the use of the ~~extract of the thyroid~~ glands which give the internal secretions. As Sir Thos Browne says Murray is become merchandise, Moriam cures wounds, and Pharoah is sold for Balsaams" (in Burial)

Egypt was the home of magic

Our modern civilization is as of yesterday compared with the ten thousand years during which man (see Vol XXXII Legends of the gods. Budge. Keagan Paul 1912

Enter the Greek - (see The Works of Man. L M Phillipps. Duckworth. 1912. (Spec. May 18th 1912

With Harvey we reach the parting of the ways

Murray as medicine - Sir T Browne

Pharoah was became merchandise

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are common and

~~Rabelais when~~ But a greater than Regio-montanus or any of the authors of the ephemeral almanacs, ~~was~~ dabled in astrology. Rabelais issued almanacs from Lyons

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From the Regius Professor of Medicine, Oxford.

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1 Service

Hippocrates. Cos

There is ~~probably truth~~ a basis for
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Physicians which is called Clinice, when
by physicians found such sweetness that
afterwards there was no measure nor end
of fees" N.H. Bd 29. 9

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Notes - (Helmholtz - not verbal

that bind & loose the action of the chemical &
real forces acting within the body

dominating ideas

aw of facts, abstracted from the facts and to be
nfirmed again by facts" as Helmholtz says of the
aw of cons of ?

riment is the ~~very~~ basis of all sciences

vapourings & wild hysteria which have followed
le wake of Bernard

purposeful activity

ws to which there are no exceptions are found only in the
chemical & physical sciences

nspirional attitude

flex motion may ~~at~~ present be defined as everything
physiology which we cannot explain". Helm

lain eternal principles

~~to [illegible]~~ The struggle for the actual fact
the exact knowledge for which consequ

elsus remarks the art of healing began
branch of philosophy.

ominant view of the nature of disease
... celsus ...

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...n Experiment
...; Mahon
...& other
...tools of
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Astrology

Let us take ~~but~~ two ~~famous~~ illustration. ~~in famous men~~
of Konigs'berg (1436-1476)

Johannes Müller - Regiomontanus, ~~was~~ one of the
great figures in science in the last quarter of
the fifteenth century, ~~one~~ a famous student of
mathematics & of astronomy, & a precursor of
Copernicus in heliocentric views. ~~of the~~ He was of
his day the ablest exponent of these subjects. The title
of one of his books will indicate his position in regard
to astrology "Temporal, nat. Kunst der astron.
Frankfurt. 1560)

It was the custom of many of the universities
to issue almanacs - Ephemerides - or Prognos-
tications. I show one of these of the date They
are common and

~~Rabelais when~~ But a greater than Regio-mon-
tanus or any of the authors of the ephemeral
almanacs, ~~was~~ dabled in astrology. Rabelais
issued almanacs from Lyons

From the Regius Professor of Medicine, Oxford.

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In fact

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13

Notes – (Helmholtz – not verbal)

Agents that bind & loose the action of the chemical & physical forces acting within the body

– The dominating ideas

"A law of facts, abstracted from the facts and to be confirmed again by facts" as Helmholtz says of the law of cons of E

Experiment is the ~~very~~ basis of all sciences.

The vapourings & wild hysteria which have followed in the wake of Bernard

The purposeful activity

Laws to which there are no exceptions are found only in the mathematical & physical sciences

The empiricist attitude

– "Reflex motion may at present be defined as everything in physiology which we cannot explain". Helm

Certain eternal principles

"~~The rising dis~~ The struggle for the actual fact" for the exact knowledge for which consequ

As Celsus remarks the art of healing began as a branch of philosophy.

The dominant view of the nature of disease has always controlled treatment. – Celsus p 6

"He will treat the disease properly whom the first origin of the cause has not deceived" Celsus

How far we have departed from the faith of our fathers is well illustrated by the section on Tuberculosis in Babcocks excellent work in Dis of the Lungs of 23 pages devoted to treatment only 2½ are given to Drug therapy & these largely to an apology for – Drug Therapy is the last resort of the ignorant and the doom of the consumptive"

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78
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bits of wood & iron seem to serve him for the greatest discoveries"

Speaking of English work says "they do things purely from instinct not in the best methods & their work is often spoilt by ignorance of the most ordinary matters

"I have often been in the predicament of having to wait on inspiration – never comes to the wearied brain in at the writing table."

"Reflex motion (a Int seen) is everything in physiology which we cannot explain"

a traffiking in hypothesis

"The work of the man of science often seem poor & unimportant in comparison with the great concepts of philosophers & thinkers." Cont. Lothering & Haben

a mind of keen acumen capable of penetrating the new & unknown depths of Nature, & capable of combining & perfecting in one harmonious whole half digested imperfect knowledge which we have today

From the Regius Professor of Medicine, Oxford.

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The promise of Eden has been at last fulfilled
Man has dominion for

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...Harvey's
...Hunters

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...precision
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...; Mahon & Allen for
...tions of

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78 14

Helmholtz -

The laws to which the particular processes in the body may be referred - laws which may be as constant as those for the reflection & refraction of light or those relating to the volume of gases.

~~"Law of facts~~ The law must be a law of facts abstracted from the facts and confirmed again by the facts as it remarked of the Law of the Conservation of Energy. Facts before laws

Hel. tells of a celebrated Prof of Physiology when asked to see an exper in Optics said "a physiologist had nothing whatever to do with experiments, though they might be well enough for the physicist"

Speaking of Faraday, "a few wires and some old bits of wood & iron seem to serve him for the greatest discoveries"

Speaking of English work says "they do things purely from instinct not in the best methods & their work is often spoilt by ignorance of the most ordinary matters

"I have often been in the predicament of having to wait on inspiration - never comes to the wearied brain or at the writing table."

"Reflex a Int seen motion is everything in physiology which we cannot explain"

"a traffiking in hypothesis.

"The work of the man of sense often seem narrow & poor & unimportant in comparison with the great conceptions of philosophers & thinkers." Cont. Lothering & Haben

a mind of keen acumen capable of penetrating the new & unknown depths of Nature, & capable of combining & perfecting in one harmonious whole half digested imperfect knowledge which we have today

From the Regius Professor of Medicine, Oxford.

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E. of Mod. medicine. Introduction.

Few indeed of the great men the past four projections can be said to really live as do the great men in literature & in art. Aristotle and Plato of the Greeks are still in the flesh, and rule in the schools as they have done anytime then 25 centuries from Hippocrates. Hippocrates has but a shadowy immortality, Galen stalks a great figure among the dead, Avicenna is in a dim far away Elysium. ~~as belong~~ on all mortality hung's Dewy. — notes in back of Contents

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; Mahan
& Allen
thoughts of

From the Regius Professor of Medicine, Oxford.

of men -

A fixed correct determination, energy, the iron will (ma)
the inflexible purpose —
These and a long list of other qualities you are told
lies the secret of success. I confess there are a few
iron headed iron handed men who compell success
by but this is not the plan for you or for me
Such hickory-fibred men are generally sports - the
happy & unexpected outcome of series of ancestral combinations
but for the ordinary every day fellow whose
name pulls & whose wings are wings of pleasantness
There are wayfarers stranded in every community - there are
Tomorrow's gods
Platoes den
Each one of you will have a character of his own - stamped
Physical disabilities - ill health - too much smile too
much drink too much food. sex will 4 ers
You are here to learn to recognize the best things put
within the reach of men

The Medical Renaissance in Italy

78
17

...urne as in philosophy & theology the
...e ages were dominated by tradition and
...ore by a period religious respect for the past
... the great men who had made it. ~~Aris-~~
~~...ppocrates, Galen~~ The great masters had
...d height of thought unattainable ~~and~~ to what the
...nt could but look up and wonder. Their
...rity was like that of the Church - sacred,
...e appreciate this feeling of a 15 century
...t as they were identical with those
which the Bible was (& still is) revered as
...y word of God, and those of us saturated
...e old verbal inspiration belief can ~~appreci-~~ realize
veneration with which the student of the
...dle ages regarded the workings of Aristotle
...rates & Galen

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16

Mod. Med. Evolution of

There is only one great and ~~permanent~~ enduring cause which enters the sym which
Gall without duty of race is cred
neither ~~weakens nor grows old with~~ with human weakness nor
persists with human life - the betterment of the race,
the advent of that day for which the prophets & kings of have
long - when to each individual is born into this fleeting
world ~~has~~ with a full chance of a free life of health & of
happiness. Towards this blessed consummation the race
has toiled painfully through ages of wrong & oppression

From the earliest days of which we have any records
beside the sick & the sorrowing the physician has stood
as a friend & brother. The limitations which hampered
him were those of his generation, the feelings which inspired
him ~~have~~ always been those of tender compassion for
his fellows - and more than this he has wrestled
with the deep problems of nature and has prevailed
& his victories have brought new hope to the children
of men -

A fixed cruest determination, energy, the iron will (m a)
the inflexible purpose

There and a long list of other qualities you are told
lies the secret of success. I confess there are a few
iron headed iron hearded men who compell success
by but this is not the plan for you or for me
Such hickory-fibred men are generally sports - the
happy & unexpected outcome of series of ancestral combinations
but for the ordinary every day fellow whose
... name ... whose ways are ways of pleasantness

There are wayfarers stranded in every community - there are
Tone-fuss got
Stalvesden
Each one of you will have a character of his own - stamina
Physical disabilities - ill health - too much smoke too
much drink too much food. sexual excess
You are here to learn to recognize the best things put
within the reach of men

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...Harveys
...Hunters
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...tions of & Allen
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From the Regius Professor of Medicine, Oxford.

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The Medical Renaissance in Italy

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17

In medicine as in philosophy & theology the middle ages were dominated by tradition and even more by a period religious respect for the past and for the great men who had made it. ~~Aristotle, Hippocrates, Galen~~ The great masters had reached height of thought unattainable ~~and~~ to what the student could but look up and wonder. Their authority was like that of the Church – sacred. We can appreciate this feeling of a 15 century student as they were identical with those with which the Bible was (& still is) revered as the very word of God, and those of us saturated in youth with the old verbal inspiration belief can ~~appreciate~~ realize the veneration with which the student of the middle ages regarded the workings of Aristotle Hippocrates & Galen

Typhoid my paper.

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It was perhaps one of the needful things in the world of the race. Christianity brought new ideals & new motives into the life of men. The world's desire was changed & in the lust of the flesh the lust of the eyes & the pride of life were dross in comparison with the desire for the kingdom of heaven ~~which became~~ a master – motive such as never before had swayed the minds of men. What need has simplest man for knowledge other than that which matters him wise unto salvation of his soul ~~The~~ a keen zeal to save other souls occupied every moment not devoted to the perfection of their own souls for the kingdom of heaven.

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From the Regius Professor of Medicine, Oxford.

Notes Evolution mod. Medicine

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What would have been the fate of Europe had Roger Bacons ferment ~~been permitted to work~~ ~~on~~ the mind of Europe, had been ready for, if men had turned to the profitable studies of physics astronomy & chemistry instead of wasting centuries over the scholastic questions (quote) & the subtleties of Duns Scotus, Abelard Thomas aquinas. Make no mistake about the ~~character~~ type of these men, giants in intellects who have had their place in the evolution of the race, from the standpoint of man as struggling for mastery of this world but, they are like the members of Swift's famous college in distinguishing sunshine from Cucumber I speak from the standpoint of the earthly man who sees for his fellows more hope from the experiments of Roger Bacon than from the disputations of Scholastic Philosophy, the "Instants Formalities, Quiddities & Relations" of which so passed the scorn of Erasmus

"[illegible] also claim the attention

E. of M. M. Notes

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From what sources for example did such a master as Galen draw matter for thought & contemplation?

— Into the content of medieval thought no one can enter with full sympathy who has not a mystic mind, which has had a

— No century no set of centuries is a plain of even experiences. — Perhaps no one has seen such upheavals as the one from which we have just emerged — — What can we see in the distant perspective

— From century to century may be traced a restatement of facts & theories of Greek medicine

— The tragedy of non-arrival ... n

— The intellectual stump — how explained see Taylor 58. (Med. Mind.

It was perhaps one of the needful things in the evolution of the race. Christianity brought new ideals & new motives into the life of men. The world's desire was changed & the lust of the flesh the lust of the eyes & the pride of life were drives in comparison with the desire for the kingdom of heaven ~~which became~~ a master — motive such as never before had swayed the minds of men. What need has sunfish man for knowledge other than that which matters him wise unto salvation of his soul ~~The Keen~~ a Zeal to save other souls occupied every moment not devoted to the perfection of their own souls for the kingdom of heaven.

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TD Raised the scorn of Erasmus

"But health & disease also claim the attention of the scientist and not merely of the physician in so far as an account of their causes is concerned" Aristotle - see also in Med Principles. De Respiratione end of Chapt xxv" opp edit

The first man to look out in the world with modern eyes

For heading of a chapter

"A golden thread has run through the history of the world, consecutive, continuous, the work of the best men in successive ages. From point to point it still runs and when near, we feel it as the clear & bright and searchingly irresistable light which Truth throws forth when great minds conceived". Mox in Pilocerus senilis

faith - ... purpose which runs thro organic life, the golden thread of evolution in which are strung as pearls the epoch - &c. - which have culminated in man.

Specialization Dispersed thro physics chemistry & biology the thousands of workers find it hard to keep in touch ~~with each other~~ - Each so engrossed in his own that he cares not for the other's work.

To understand the ancient writers one must see as they saw, feel as they felt, believe as they believed - and this is hard or impossible

The long fallow periods of the human mind - the soil exhausted by over-production

In the service of humanity there is much work which brings nor fee nor fame but it has its reward all the same - & all its own in the

against this roaring tide of detraction Vesalius took Plato plan - shelter under a wall - retired to the section of court

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From the Regius Professor of Medicine, Oxford.

You can put the yeast into a solution of [illegible] sugar, give it the proper temp but it will not work ~~Put the yeast~~ into a mash of half ripe grapes ~~[illegible]~~ ~~[illegible]~~ the best of yeast will work but not to the full. You must have the matured [illegible] ~~[illegible]~~ grapes or to get the foaming [illegible] of Carlan Prime - and so it is with these great ferments of the race - these Promethean ~~[illegible]~~ minds.

Man

From other animals man is distinguished by ~~two~~ ~~things~~ character a bicipital mind - ~~[illegible]~~ with the two [illegible] (1) a ~~God-title reason~~ the reflects on the nature of things ~~with which [illegible] [illegible] to [illegible] before & after~~ ~~and~~ (2) a ~~bicipital mind~~ with the other he strives to - stretching lance hands of faith into the unknown

~~ural statement of~~ the influence of Experiment on
e development of medical science is part of the
ger question of the complete transformation of
world by what Harvey calls seaching out nature
part of what Boyle, ~~refers to~~ the
t 17th century exponent of research, speaks of
the Extension of Mans Dominion

~~line~~ offers no exception to the other sciences -
ernment has been the motive & the motor in
ing us to reach our present position
vation had carried the profession as far as it
the hands of Hippocrates, Sydenham, Morgagni
Harveys
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from Laennec
of precision
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From the Regius Professor of Medicine, Oxford.

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E of Mod Med

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- Much will depend on our readiness to accept new modes of thought to restate old truths in a new way, to rechabilitate Hippocrates & Galen & to vindicate their claims to moral guides as lights

So long as man regarded himself as a straight celestial, a little lower than the angels progress was impossible. The Evolution of science has given him a knowledge of himself and has put in his hands an instrument for his physical, mental & moral regeneration - but he must put away his pride and recognize his place - at the top but not apart from the long series

Science is creedless but it has the salt of all creeds faith - an abiding faith in the unceasing purpose which runs thro organic life, the golden thread of evolution in which are strung as pearls the epoch - &c. - which have culminated in man

Specialization Dispersed thro physics chemistry & biology the thousands of workers find it hard to keep in touch ~~with each other~~ - Each so engrossed in his own that he cares not for the others work.

To understand the ancient writers one must see as they saw, feel as they felt, believe as they believed - and this is hard or impossible

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---

Man

From other animals man is distinguished by ~~two~~ characters a bicipital mind - ~~[illegible]~~ with the one [illegible] (1) a ~~God-title reason~~ the reflects on the nature of things ~~with which [illegible] to [illegible] before & after~~ with the other he strives to ~~and~~ (2) a ~~bicipital mind~~ - stretching lance hands of faith into the unknown

1 ~~General statement of~~ the influence of Experiment on the development of medical science is part of the larger question of the complete transformation of the world by what Harvey calls seaching out nature by part of what Boyle, ~~refers to~~ the great 17th century exponent of research, speaks of as the Extension of Mans Dominion

Medicine offers no exception to the other sciences. Experiment has been the motive & the motor in enabling us to reach our present position

Observation had carried the profession as far as it could in the hands of Hippocrates, Sydenham, Morgagni & others; modern medicine dates from Harveys experiment on the circulation, from John Hunters experiments on, from Jenner, from Laennec introduction of ~~an instrument~~ instruments of precision almost every one of which has been based on Experiment

Experiment has taught us

1 The etiology of disease

2 The methods of prevention; Madam & Lister for

3 ~~Methods~~ Has given us definite methods of cure, vaccine, serum, inter, secretion

From the Regius Professor of Medicine, Oxford.

II certain helpful measures which experience had taught

III a knowledge of the structure of the machine

IV an intelligent appreciation of its working

V a knowledge of the causes which put it out of order or destroy it

VI means whereby by it was repaired

VII Means wh prevented its dis

Phrases.

78 ~~22~~ 23

Summon all the Fathers Alcmean, Empedocle Hippocrates, Galen, Arcelaus ~~celsus~~ & the rest of them — one after another and Summon the great Alexander

crooked crags — shuled & dwarfed, warped & growth in uprightness & independence.

no soundness in him

a friendly & congenial spirit

"a gracious aid to thought" in Platonic lungs

~~The~~ answer seems rather intended to stimulate them & satisfy enquiry.

may see in some ~~fact of vision~~ a science that in

med med

78 ~~23~~ 22

1 a restitement from century to century of the facts & theories of greek medicine — modified here & there by arabian practice

In the centuries that had passed from from the death of Hippocrates to the appearance of the de motu cordis man had learned the objective features of many diseases & ~~he had discovered~~ many ~~medicines~~ empirical cures he had obtained a knowledge of the structure of the human body and he had in his hand firmly at last the key to a knowledge of its function.

Seven grades or stages of knowledge in connection with man as a piece of physical machine to be kept in good working order,

I a general recognition of the objective features of disordered action — the primitive mother knew when her child had been

II certain helpful measures which experience had taught

III a knowledge of the structure of the machine

IV an intelligent appreciation of its working

V a knowledge of the causes which put it out of order or destroy it

VI means whereby by it was repaired

VII means wh prevented its dis

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78 37

78 38

p 593

coexist with deep religious person & a type of

[illegible] the reading of the [illegible]

Property of the Chicago Public Library

Phrases.

Summon all the Fathers Alcmean, Empedocle Hippocrates, Galen, Arcelaus, Celsus & the rest of them — one after another and summon the great Alexander

crooked ways — shuled & dwarfed, warped & growth in uprightness & independence.

no soundness in him

a friendly & congenial spirit

"a gracious aid to thought" in Platonic lungs

The answer seems rather intended to stimulate them & satisfy enquiry.

may see in some ~~part of vision~~ of a science that in the words of the son of Sirach will bring peace & mankind

right opinion of not true knowledge, an opinion which is a sort of guessing or divination resting in no knowledge of causes and incommunicable to others (Jowett)

Probability is the guide of life.

The spirit of the profession, not the letter of the law

a physician may have practice & no theory art & no science.

The ~~same truth~~ has latent in the mind of the ancient philosopher

amid all the varieties & incongruities

By the ordinary law of association I cannot

evolution, of the germ origin of disease, of radio activity and of the score, or more of first class advances which my generation has seen

medicine as a sleeper factor in the state

The dough of a nation's mind — the state of the chinese — turn the ferment — thought.

There was a time when the chinese were the most progressive nation in the earth, the far off period when block printing, gunpowder, the laxicab & the compass were invented. — death of an Obscen curved at elagnation

coexist with sleep religious period & a life of [illegible] the [illegible] of the [illegible]

The Alexandrian, Roman & Byzantine days, the stream is lost in a wide marsh

The similarities between ~~Asian~~ Greece & mid med are greater far than the differences

p 25. vol 2.

The torpedo's touch

ages which were slowly learning what we are hurrying - tho not too fast - to forget.

as our great Exemplar of the cult of & a big pin Sir

But there are Thoughts of things which Thoughts but leaderly lunacy" R. M. p 216. and action

new " and

Narrowness - whole. prejudice.

Opprobrium scoff & The partisan spirit

The art of intellectual detachment by which a man can separate himself for the trapping

tolerance of opinion & the suit of woe. & it can be done

& which are

forbearance of without sacrifice of that love & sympathy ~~without~~ for his fellow man without which.

The status of the profession is with him, his

~~What we shall be doth not yet appear~~
~~Even living [illegible]~~
~~and there is the very [illegible]~~
~~the sense of all~~

Ev of Mod. Medicine Notes

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The message to his generation was,

— With the new freedom of the Renaissance new powers of expression were given to man

— Realization of a growth & development from century to century is not easy, but we must interpret each period by the authors

— The type of is preserved & though developed it is the same man — Aristotle who observed the heating heart in the chick embryo before the blood vessels were laid down, the same spirit in Galen — the same in Harvey — same in Malpighi

— My story is of men and of movements — of men who have consciously or unconsciously initiated great movements and of movements in which whether they willed it or not, the men of the time were moulded and controlled — Let me give an illustration

— An immense advantage is that the problems of medicine, as of all same are universal, not parochial. Who cares a rap beyond the confines of this state whether your legislature passes a law to prevent the distillation of alcoholic liquors but who so dull for Vilibarajo & Moscow who is not stirred to a ~~man in~~ from one of your laboratories announces that he has the germs of cancer or of from another comes the a process to make as good and cheaper than Para rubber

For those who like, who Dr Johnson love biographical literature

— In an age turbid with the verbiage of the Scholastics he shines to us as a clear soul a blithe spirit ~~rising~~ singing from above the clouds of the day

R.B

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27

Characters of medicine

(1) Recasting Restatement of old material

2 Difference & anchorage of the past alleguat

3 Dominance of the 16

78
26

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25

Evolution, of the germ origin of disease, of radio activity and of the score or more of first class advances which my generation has seen

(3) Medicine as a sleeper factor in the state

The dough of a nation's mind — the state of the chinese — mind the ferment — thought.

There was a time when the Chinese were the most progressive nation in the Earth, the far off bound when block printing, gunpowder, the laxicab & the Compass were invented. — Death of an Obsen [illegible] at Alexandria

Books for Reference

Religion & Astrology . Current

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Characters of Medieval Medicine

(1) Restatement of old material (recasting)
2 Difference & authority of the past (alleged)
3 Dominance of the 14

78
26

well Known English Historian told me

78
25

Evolution of Modern Medicine.

(1) Periods of Stagnation alternating with ~~bright~~ tumultuous progr.

(2) ~~much of~~ "The pelly dine the medicine rest" must still be ~~then~~ motto of the 20th century. ~~There are~~ Numerous of discontent that so little remains – only the gleaming come from those whose perspective is warped to form generation as to mine. The gleaming of the grape of Ephraim may be better than the vintage. I know there are some who speak already of a Chinese stagnation – of the rills of discoveries ~~which~~ to which the splendid streams have sank from our laboratories – those who ask what possible hope for discoveries of such brilliance as ~~match the~~ Evolution, of the germ origin of disease, of radio activity and of the score, or more of first class advances which my generation has seen

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487. In the simple mind [illegible] coerst with deep religious person & a life of [illegible]

Books for Reference

Religion & Astrology . Cumont

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Characters of Medieval medicine

(1) Restatement of old material (recasting)
2 Difference to authority of the past (argument)
3 Dominance of the 16

487. In the simple mind the grossest superstition may coexist with deep religious fervor & a life of

78
26

A well known English Historian told me that as a young man studying in Paris Tanie had urged him to spend two years with Charcot studying ~~humanity~~ man en masse, diseased & infirm, as a preparation for his life work. At first sight such advice seems akin to the famous reply of Fydenham ~~to Blackmore~~ when to read Don Quixote when Blackmore asked him what to study as preliminary to medicine ~~In both~~ as for historian so for physician the strength (key) of the paradox lies in the fact that for both success means a knowledge of humanity

Then Decartes quotation

16th & 17th

In the case of mental disease the treatment was that of in as you take it "a dark house & a whip"

In the 16 & 17 centuries the Physician ~~had~~ was beset ~~disentangle himself from theology~~ by the clergy in the one hand and ~~from astrology~~ by the quacks & astrologers in the other. He was a man of cultivated taste & habits —

The Surgeon was still lumbered with the Barber & in Paris in. In London the separate did not take place until

Books for Reference

Religion & Astrology. Cumont

Lauchert Gesch. des Physiologus, Strass 1889

Taylor

Phrases

man became for the greek the measure of all things – just as he is for us – put in

From century to century

restatement of old material – nothing new

a feature of human growth –

The saints & poet & the artist craftsmen who built the cathedrals

The shadow seer of Platos cave – ambiguous the middle ages

The miserable pessimism of a converted Carthaginian rake – – read his de civitate dei – & dark & gl

Vol 1 p 75 physiologus –

The creation of the earth, the fall of man, the need of redemption of a p 80

Miracles were expected & seen & have never been lacking.

Periods – – not renaissance

They could not build with the materials received from the past

p 260 Scire Deum satis est, quo nulla scientia major"

Body & Soul not the ascetic life

§ 35 Who is once washed in christ needs not wash again. Jerome

336 Regula of St Benedict – daily round of occupt

487. In the simple mind the grossest superstition may coexist with deep religious fervor & a life of

[illegible] the parting of the ways

Characters of Medieval Medic

(1) Restatement of old material (recasting)

2 Deference to authority of the past (allegiant)

3 Dominance of the th

22 Photo of the Theatrum Hospital

Books & art for Reference

Int. Jr. of Ethics July 1911 good art on Duty & Pleasure

The Nation. London - The sign Sept 16th 1911

78 29

78 37

78 38

912. I p 583

write &

theus end

78 28

Memo.

Lecture I p 2. Enemata from the ? see Lothington

" 4 The med. gods - Rom. Pater - Lothington

" 5 - Prim medicine

" Egypt. charras - med. inter sec. add.

" Aristotle & astrology.

Lecture II Childe Roland. see Browning Rd legend

2. Legend in the ~~Greek~~ temple in Egypt

14 Chapman's Homer

18 Cos. mus. & fig

19. Inscription

22. Rome ch of Theodore - Baumb

28.

31 Translation of Phr

38 Date of Aristot Bart Hist gen Ad

III 2. Analysis of the incunabula

2. Lounsbury's Browning

3. Med & the church - p 19 see

~~p 4~~.

22 Photo of the Theatrum Hospital

Books & art for Reference

Int. Jr. of Ethics July 1911 good art on Duty & Pleasure

The Nation. London. The Sign. Sept 16th 1911

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It has been said that
The world weighs in

Mother prove now blame

Cordeaux to organ appeal

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It has been well said that
The world weighs in a false balance

"Neither praise nor blame are to be accepted at par"

...asm, days & years by the Hebrews

& their dominion upon Earth

...ormancy. & belomancy are all forms

– Necromancy. Oneiromancy

Cordeaux to organ appeared

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...1912. I p 583

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Let our teachers hold up for reverence to our young men the masters of the healing art in this country - such men as Nathan Smith, Jamie Jackson, Jacob Bigelow, W W Gerhard, Elisha Bartlett, Austin Flint ~~and others~~ men men who not only knew disease, who ~~studied it~~ who knew the subjects of it - men with strong heads & kindly hearts -

1624
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Astrology, Hastings Dictionary

Heavenly bodies were for signs & season, days & years by the Hebrews

Sweet influence of the Pleiades

They sought "the ordinances of heaven." & their dominion upon Earth

Divination: Rhabdomancy or Xylomancy. & belomancy are all forms of diving by a tree God. – Necromancy. Oneiromancy

GR Med in Rome

1. Roman Folk Lore. –

1 Statute greek of the south

2. The Alexandrian

For 1. see Plinys. – cabbage & wine

Plinys story of the arrival of

Asclepiades. 130 BC

In Alexan. humoral ideas organized & the exponents were

called ~~[illegible]~~ λογικὸς – dogmatici

Coans the general state of the patient & ext. condit

Cnidians to organ affected – & local measures

Let our teachers hold up for reverence to our young men the masters of the healing art in this country — such men as Nathan Smith, Jamie Jackson, Jacob Bigelow, W W Gerhar[illegible]
~~and others~~ men, me[illegible]
who knew the subjects of [illegible]
hearts —

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Gk med in Rome Allbutt. Lancet. 1909. II. p 1565

1. Roman folk lore. – those fresh tributaries with theurgic & magical rites

1 Italiote greek of the south & south.

2. The Alexandrian

For 1. see Phny. – cabbage & wine –

Phny's story of the arrival of Archagathus 220 BC.

Asclepiades. 130 BC very full in him Bythinian

In Alexan. humoral ideas crystallized & the exponents were called ~~[illegible]~~ λογικοὶ – dogmatici

Evans the general state of the patient & ext. condit

Cnidians to organ affected – & local measures

opposition.

than nature powers

less prominence of Magic

the Hellenic & Mesop. are independent

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1912. I p 583

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often mentioned

it is in a

cat – & cabbage

& publisher

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Greece & Babylon. Farnell 1911.

Mesop. anthropomorphic & theomorphic.

In Greece ethereal personalities rather than nature powers.

In Greece less humidity of consc. & less prominence of magic.

On the matter of dream-oracles the Hellene & Mesop. are independent.

Incubation not practised.

Luke the Phy. Ha

appendix 1. when

his professi

aim & idea

2. Marked

& inclaph

bears the

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I 28.8 πυρετοῦ

that the co

The Serpent

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Lane n

(Hibart"

* His med. professio

in the convention that by

Evol. Mod.

Medicine

Luke the Phy. Harnack. Eng Ed. 1907.

Appendix 1. When phy writes an hist work it does not necess follow that his profession shows itself in his writing. (1) Points of view more aim & ideals more or less medical. (Dise & its treatment)

2. Marked prefer for healing stories (3) Technic terms &c & metaphors. All these three groups in the hist work wh. bears the name of Luke (4). Partic cases of dis show traces of med diagnosis (5) Lang color by med phrases &c

I 28.8 πυρετοῖς καὶ δυσεντερίῳ (Attacks of Gastric fever) & fr 28 9.1. that the author himself practised in Malta as a physician

The Serpent θηρίον – καθῆψεν translated seized is a tech term

καθαπτεῖν uses word as a poison wh. invades the body

used med terms

Lame man acts 14. 7. exactness of detail remarkable

(Hobart "The Med. Language of St Luke 1882)

* His med. profession seem to have led him to Xeamg. for he embraced the regular of us the convention that by its means and by gentle new methods he would be enabled to heal [illegible] diseases and drove out evil spirits & above all to become an Effec Phy of the

Bernoulli. München 1901, erster Theil

in the coast & islands of

[illegible]hrace, said to have died at

& athens offering were made

man perosa. The B. [illegible]

[illegible] Folio Ed. Tafl. 57. 9

[illegible] a Photo. from a codex

78 34

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[illegible] 1912. I p 583

[illegible] – write &

[illegible] athens end

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[illegible] bound up

[illegible] med & surg

[illegible] often mentioned

[illegible] is in a

[illegible] heart – & cutting

[illegible] next publisher

Hippocrates Griechische Ikonographie J J Bernoulli. München 1901, erster Theil

p. 164

H. Princeps medicinae (Plinij. N.H. VIII (171)). Pract. in the coast & islands of the northern archipel. He is Thessal. Macedon & Thrace. Said to have died at Larissa. He was esteemed as half god & at Cos & others offering were made to him.

B gives des of 7 heads practically all for Roman peroxs. The B in Valum & Villa albanie good.

Coins for Cos. given. 2 on Plate 11. 89

Dee Visconti Icinograph I Tafl. 32. In Folio Ed. Tafl. 57. 9

for picture of Hipp. - worth having a Photo. from a codex in Bib. Nat. 14th cent. MS.

Dee

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1912. I p 583

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- med & surg
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heat - & cutting
rex publisher

Herzog. Arch. fur. Religionswissenschaft. 1907. Bd. X. Hft 1.

good picture of Kos.

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Lancet. 1912. I p 593

...ary Records. 1 Prof. Ohler of Wien – wrote &
published. – 90 over 1000 years. Earliest athens end
...BC. ἡ ἰατρικὴ ἐπιστήμη the profession was called
...pire State Doctor might be hereditary. Sex penuals
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Die Kellenische 1 Kultur 3 auf. (Teubner

Mehren (A. 7) Arab. C. 2

Leyde 1889 fol

Traités mystique - v. Ibn Sina

v. 2. Ibn Khallikan

Biograph Delmarg Hautbole

4 Barn w Przeguskim de Slane

Miss Watts

5 Whitehall Gardens

S.W.

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37 78
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Lancet. 1912. I p 593

GK Lapidary Records. Prof. Ohler of Wien – wrote & ask where published. – go over 1000 years. Earliest athens end of 6th cent. B.C. ἡ ἰατρικὴ ἐπιστήμη the profession & was called Under Empire State Doctor might be hereditary. Sex females Drs are spoken of in the Inscrip. see for. med. cing. scientists & med. poets. same abs. Many med. men at the Chromes express gratitude & the god for guidance in the cure of cases. Imp. of inscrip. indicate that lectures were given.

– GK. Municip. Hospital. 5 Cent. B.C. Lancet 1908. 1. 1161

Monuments & memoirs of the Paris Academy. M Pottier

On vases many representations of wounds being bound up. Gives instances. Public places supported for the med & surg needs of the poor. Cost by a special impost. Phy. tax often mentioned in GK – roman papyri. In the vase the scene depicted is in a hospital of some city probably athens

7 persons. Probably depicts the bleeding of a patient – & cupping glass

Order thro Boulanger from M Ernest Leroux publisher Monuments & memoirs

NOTES.

Books to be got from Library at Yale for Lecture VI.:-

Manson - Linnaean Society's Transactions, 1879. Vol.XIV.

Theobald Smith; Medical News, Philadelphia, Vol.LV. 1889.

Smith & Kilborne; Texas Fever. Governm. Report; Washongton,1893

Laveran; Compte rendu; Acad. des Sciences, Paris, 1880.T.XCIII. pg.627

Ross; B.M.J. 1897, Vol.I. pg.251 & Vol.II. pg.1786.
Lancet,1898, Vol.II. pg.488.

McCallum; Lancet 1897, Vol.II. pg. 1240.

Schaudinn; Arbeiten aus der Reichsgesundheitsamt, Berlin, 1905. Bd.XXII.

Koch Etiology of Anthrax

Michael Angelo. Anatomical Sketch

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Lecture I

Introduction.

Sail to the Pacific with some ancient mariner, and traverse day by day that silent ~~sea~~ until you reach a spot never before furrowed by keel on which a tiny island a mere speck on the vast ocean, has just risen from its depths, a little coral reef capped with green. This atoll ~~is~~ a mimic earth, fringed with life and through countless ages built up by life on life that has passed away. And now with wings of fancy mount with Janthe the magic car of Shelly, pass the eternal gates of the flamming ramparts of the world and see his vision:

Below lay stretched the boundless universe!
There, far as the remotest line
That limits swift imaginations flight,
Unending orbs mingled in mazy motion

Immutably fulfilling
Eternal Natures laws,
Above below around,
The circling systems formed
A wilderness of harmony.

And somewhere as "far and far the Chariot flew" amid the mighty globes would be seen a ~~distant~~ tiny speck, 'earth's distant orb' one of "the smallest lights that twinkles in the heavens. Alighting Janthe would find something she had probably not seen elsewhere in her magic flight - life, everywhere encircling the sphere. And as ~~in~~ the little coral reef of the ~~[illegible]~~ over the change. A large proportion of our fellow creatures still regard ~~the~~ nature as a playground for demons and spirits to be exorcised or invoked.

Times

t p. 6]

out of ~~the~~ a vast depth, had been built up by myriads of generations of ~~living~~ polyzoa ~~things~~ ~~had~~ she would see that so, on the earth itself through illimitable ages successive ~~series~~ generations of ~~living~~ ~~creatures~~ animals & plants had lived & dying & left in slow ~~their~~ their imperisable records. And at the top of the series the thinking breathing creature known as man. Infinitely little as is the architect of the atoll reef in proportion to the earth on which it rests the polyzoon is ~~probably~~ I doubt not much larger than is man in relation to the vast systems of the Universe, in which he is ~~probably~~ represent an ultramicroscopic atom, less ~~than~~ ten thousand times than the tiniest of 'the gay motes that people the sunbeams. Yet with colossal audacity this thinking atom regards himself as the pivot around which revolves the eternal purposes of the Universe! Knowing not whence he came, why is here or whether he is going man really feels himself of importance, and is of interest — to himself. Let us hope too he has a potency & importance out of all proportion to his relative insignificance. We know of toxins of such strength that an amount too infinitesimal to be gauged may kill, and we know that "the unit adopted in certain scientific work is the amount of emanation produced by one-million-millionth of a gram of radium which itself has a volume of less than a million-millionth of a cubic millimetre, and weighs a million million times less than an exceptionally delicate chemical balance will turn to" (Soddy) Man may be the radium of the Universe. At any rate let us not [illegible] his [illegible] for us he is a very potent creature full of interest whose story we are beginning to unravell.

On the verso of the next leaf is a draft of a letter to the Editor of The Times entitled "Housing and Tuberculosis"
[Not published but see The Times 1912, Aug 16th p. 6]

Out of this spiritual protoplasm of Magic ~~95~~ 41 has evolved philosopher & physician as well as priest. Magic & religion ~~was~~ to control the unchartered sphere, the supernatural, the superhuman science seeks to know the world, & thro knowing to control it. Lankester remarks that Man is Nature's rebel. ~~Lankester~~ and goes on to say (copy p 21 in pamphlet) It was ~~has been~~ a slow gradual growth until within the past century. Now science - organized knowledge - has searched out the secrets of Nature and is able to control her powers, limit her scope & transform her energies. The victory is so recent that the mental attitude of the race ~~average man~~ is not yet adapted to the change. A large proportion of our fellow creatures still regard ~~the~~ Nature as a playground for demons and spirits to be exorcised or invoked.

[illegible]

out of the vast depth had been built up by myriads of generations of polyzoa ~~living~~ ~~things~~ ~~had~~ she would see that so, on the earth itself through illimitable ages successive generations ~~series~~ of ~~living~~ ~~creatures~~ animals & plants had lived & dying & left in stone their imperisable records. And at the top of the series the thinking breathing creature known as man. Infinitely little as is the architect of the atoll reef in proportion to the earth on which it rests the polyzoon I doubt not is ~~probably~~ much larger than is man in relation to the vast systems of the Universe, in which he is represents ~~probably~~ an ultramicroscopic atom, less ~~than~~ ten thousand times than the tiniest of the gay motes that people the sunbeams. Yet with colossal audacity this thinking atom regards himself as the pivot around which [illegible] the eternal purposes of the Universe.

Dr. the Greeks

in the primitive man is

Magic, the selling in motion a supernatural power to help or hurt the individual, and in its primitive form may still be studied in native race. This power or mana as it is called while possessed in a certain degree by all men may be increased by practice and certain individuals may come to possess it in a high degree over. This hoodoo of the negro of the South to day is ~~an excellent~~ rarely of magic. At a plantation ~~was since one day at a station~~ in the valley of Virginia the lady of the house apologized for its condition as the ~~servants~~ colored servants had been hoodooed by some one on a neighboring plantation and many of them had fled but she had sent for a mighty powerful man who could take the hoodoo off. Magic ~~a [illegible]~~ has taught to control the demons in force causing disease and in a way it may thus be regarded as "a lineal ancestor of modern science certain (Lokelhaim) which too seeks to control forces no longer regarded as supernatural. ~~But~~ ~~it~~ but medicine only ~~that~~ came from magic but religion also took its origin in that "spiritual protoplasm" as Russian Hamsin calls it

1. Dolor sec.
2. Chemist - new phen
Volat. Slam
Ambrose Paré

On the verso of the next leaf is
a draft of a letter to the Editor of The Times
entitled "Housing and Tuberculosis"
[not published but see The Times 1912, Aug 16th p. 6]

Sept 19. This comes after Harvey 43 ~~96~~

~~An extraordinary impetus~~ Harvey caught the experimental spirit in Italy where Galileo had already laid the foundation of modern Mechanics & astronomical investigation. Brain, Eye, & hand were his only instruments but now a new era opens in which medicine was to derive an enormous impetus from the discovery of instruments of precision – Copy & translate p. 7. Bd II of Dannemann + +

~~Let me again commend to you this & especially the section of Dannemann dealing with Galileo and his work.~~

It was a ~~friend &~~ fellow Professor ~~at Bologna~~ of the great genius Galileo who attempted to put into practice the experimental science of his friend. With Sanctorius begin the studies on temperature respiration & the physics of the circulation. The memory of this great investigator has not been helped by the English edition of his ~~aphorisms~~ De medicina statica, ~~which is a feeble~~ not his best work, with a frontispiece showing the author in his dietetic balance. Full justice has been done to him by Dr Weir Mitchell in an address as President of the Congress of Physicians & Surgeons 18 –(1). Sanctorius worked with a pulsilogue devised for him by Galileo with which he made observations on the pulse, and he is said to have been the first to put in use the clinical thermometer and ~~the~~ experiments on insensible perspiration & mark him as one of the first of modern physiologists – Then copy from pamphlet. Evolution of the idea of Exh

p 4 + +

(1) see Transactions. Vol

~~Man in sorrow need & sickness has turned~~ for help to his god for help or to his fellow man.

Housing & Tuberculosis

To the Editor of the Times

Sir. That we know the germ of tuberculosis, that, we know the avenues of infection, that we can detect the disease ~~early~~ in its early stages, that we can cure many cases, that the mortality from the disease has fallen nearly fifty percent in fifty years. - all these are gratifying results of sanitation & of science, but there is one ally of the disease to be put out of action before we can ~~enter upon~~ begin 'the fight to the finish'. ~~Here are tell-tale facts & figures collected by the good women who are doing so much in this warfare.~~

The other day I visited the new tuberculosis out-patient department of St Thomas Hospital. and asked Miss in charge of the . Northcote social service work of she ~~had any~~ could give me ~~any~~ a reports upon the ~~housing~~ housing conditions ~~under~~ of ~~life~~ the cases of Phthisis - undoubted cases with the bacilli in the sputum.. The recently issued report contains ~~information~~ tell-tale facts & figure collected by the good women who are doing so much for us in this warfare

To October 1st 1912

E of M. Med. 43 ~~98~~

~~The problems of~~ Each generation has its own problems face and looks at truth from its own standpoint does not see it with the same outlying lines as any other

For example men of the present generation have grown up under influences very different to those which surrounded us in the 70ths of the last century when Virchow and his great contemporaries laid the sure & deep foundations of modern

Lecture VI. 1 44 ~~99~~

I have so far told you a story of men and of movements of men who have consciously or unconsciously initiated great movements and of movements in which, ~~[illegible]~~ nolens volens, the men of the time were moulded & controlled

Hippocrates in the tractate on Ancient Medicine has a splendid paragraph on the ~~our~~ attitude of mind towards the men of the past. My attention was called to it by Commendatore Boni who quoted it as one of the great sayings of antiquity. (Copy that paragraph from Hippocrates)

Man in sorrow need & sickness has turned for help to his god for help or to his fellow man

Housing & Tuberculosis

To the Editor of the Times

E. of the Med.

2

over Obey

I have tried to tell you what these men knew to show you their point of outlook on the things that interest us. We may get near them by asking the spirit of the age in which they lived to enter in and dwell with us. Literary criticism is not literary history – we have no use here for the former – we have had enough of it of late – but to analyse the literary history is to get as far as we can behind the doors of mans mind, to know his knowledge, not appraised by our standpoint, mark you, but from that of his contemporaries, his predecessors & his successors. I have tried to illustrate this particularly in the case of the circulation of the blood, – how our knowledge of it grew from generation to generation. There are three aspects about this increase in our knowledge upon which I should like to dwell – quoting here from myself. (Growth of Truth Alab. 56 – 296

~~Take that interesting character Fracastorius of Verona, author of the poem (& of the word) Syphilis. An enormous body of literature has to be surveyed before one can appreciate at its real worth the striking contribution of F. to the history of infection. He did not spin a web of pure Verona fabric when he put forward his very modern views on contagion & infection. He put in paper what had been in mens minds. It is a long call from Fracastorius to Pasteur.~~

To understand the old writers one must see as they saw, feel as they felt, believe as they believed – and this is hard; indeed impossible

~~The problems of~~ Each generation has its own problems to face and looking at truth from its own standpoint does not see it with quite the same outlying lines as any other. For example men of the present generation have grown up under influences very different to those which surrounded us in the 70ths of the last century when Virchow and his great contemporaries laid the sure & deep foundations of modern pathology. Which of you now knows the Cellular Pathology as we did? ~~Too~~ To many of you it is a closed book. – To many more of you Virchow may be thought a spent force. – But no he has only taken his place with ~~the~~ in the great galaxy, ~~and~~ We do not forget the magnitude of his labors but a new generation has new problems, his message was not for you, but that ~~and~~ medicine today runs in larger moulds ~~than is due~~ & turns out finer castings is due to the technique which he made possible. It is one of the values of lectures in the history of medicine to keep alive the good influence of a great man even after his positive teaching is ~~super~~ antiquated. Let no man be so foolish as to think he ~~&~~ his colleagues have exhausted any subject for their generation. Virchow was not happy when he saw the young men pour the new wine of bacteriology into the old bottle of cellular pathology. Lister could never understand ~~why~~ how aseptic surgery arose out of his work. Ehrlich will not recognize his epochmaking views on immunity when the rising generation has finished with them. I do not remember ~~the~~ which philosopher ~~who~~ said ~~that~~ that all progress was a series of negations – the denial ~~by~~ to day of what we had accepted yesterday, the contradiction by ~~these~~ each generation of some part at least of the philosophy of the last – but a ~~nucleus~~ the germ plasm remains, (all is not lost), ~~and~~ ~~the~~ a nucleus of truth ~~to~~ to be fertilized by ~~the very~~ men ignorant even of the ~~to whom the~~ body ~~may be anathema~~ from which it has come. ~~The evolution of~~ Knowledge ~~progresses~~ evolves but in such a way that its possessors never feel in sure possession. It is because science is sure of nothing that it is always advancing" (Duclaux)

46 ~~99~~

47a ~~100a~~

49 ~~102~~

13, NORHAM GARDENS,

OXFORD.

1800. ~~Pinel~~ Bichat - Traité des membranes

1801 Pinel

1804 Dalton.

1811 Bell in Nerves.

1819 Laennec

1827 Bright

1828 Wohler

1832 Faraday - galvanism & mag. induct

1833 Marshall Hall - reflex action

1833 Beaumont.

1837 Gerhard.

1838 Schleiden

1839 Schwann

1842 Mayer

1843. Puerperal fever. Holmes

1845 Virchow & pyaemia

1846. anesthesia

1848 Bernard.

1853 Florence Nightingale. 1859 notes

1859 Darwin

47 ~~100~~

DENS,

RD.

von Sinn

1901 De Vries

1905 Schaudinn

13, NORHAM GARDENS,

OXFORD.

47a ~~100a~~

47 ~~100~~

Matthews

13, NORHAM GARDENS,
OXFORD.

1861 Pasteur
1865 Villemin
1867 Lister
1878 Koch.
1881. Laveran
1883 Lawson Tait & Lt. pres Maron Sims
1893 Roentgen
1893. Theobald Smith
1898 Radwin
1899. Reed & Carroll
1901 De Vries
1905 Schaudinn

13, NORHAM GARDENS,

OXFORD.

13, NORHAM GARDENS,

OXFORD.

[illegible] pecorts before swine he had [illegible]
[illegible] fused the 'rending' [illegible] so many innovators & discovers.
→ over and the detractors of the [illegible] [illegible] to contest to [illegible] [illegible] on the
book – not on the man.

same year
1542 saw a very different picture in the far famed city of Padua
"nursing of the arts". The central figure was a young man not yet in the prime of
life, partly full of its pride, as you may see in his portrait, like Aristotle & Hippocrates cradled & nurtured
~~among~~ in an Aesculapian family. Vesal was from his childhood a student of nature, now wandering scholar
far from his Belgian home; but in Italy he had found what neither
Louvain nor Paris could give freedom in his studies & opportunities
for research & teaching. What an impression he must have
... may judge from the fact

48 +01

Vesal. 1

Equally in the history science and of medicine is
1542 a starred year ~~in the history of science, and in the~~ marked by a revolution in our knowledge of Macrocosm & microcosm
~~history of the medical profession~~. In Frauenberg the town physician
and , now nearing the Psalmist limit & his end had
sent to the press the studies of a life time - de revolutionibus
orbium celestium. Picture It was no ~~the~~ new thought, no new demonstration that Copernicus gave to his generation. ~~Eighteen~~
centuries before men of the keenest scientific minds had worked out ~~before~~ the heliocentric theory ~~had been~~ as fully promulgated by Aristarchus and generally accepted by the brilliant
investigators of the Alexandrian school; but in the long
interval man, ~~had~~ lapped ~~into~~ in an oriental had
been content to acknowledge that the heavens declared the
glory of God & that the firmament shewed ~~his~~ handy
work. There ~~were~~ had been great astronomers before Copernicus (over)
and in the 15th & 16th centuries there were
but 1542 marks an epoch in the
history of the intellectual development since ~~for~~ all time
Copernicus in the words of Lucretius.

It was to a thankless generation that the great de revol
atonibus appeared.

Nor did Copernicus announce a truth perfect and complete, not
to be modified, but there were many contradictions & lacunae which
the work of subsequent observers had to reconcile & fill up. For
long years Copernicus had brooded ~~upon~~ the great thoughts
which his careful observations had compelled. We can imagine
the touching scene in the little town when his friend Osiander
brought the first copy of the precious volume, hot from the press, a
well enough printed book and .
~~But~~ The old man ~~was~~ already on his death-bed stricken with
a long illness knew the thankless generation ~~into~~ the swine before whom which little
pearls before swine he had thrown his pearl. Fortunately death
~~was~~ saved the 'rending' ~~of~~ so many innovators & discovers
→ over ~~and the detractors & the Holy Church~~ ~~has~~ to content to ~~spend them~~ realise on the
book - not on the man.

The other great reformer of his day,

Luther + pressed the common view & the fact will turn topsy-turvy the whole art of astronomy; but the Bible says that Josua commanded the sun + stand still – not the Earth; and the scholarly Melanchthon, himself an astronomer would have the Gottesbook "zu Unterdrucken empfahlen" (p 325, [illegible]

—

Around Earth was his footstool. (Sellech in the circle of the Earth.) but the besorge was out his throne

The same year
1542 saw a very different picture in the far famed city of Padua
"nursing of the arts". The central figure was a young man not yet in the prime of
life, partly full of its pride, as you may see in his portrait, like Aristotle & Hippocrates cradled & nurtured
~~among~~ in an Aesculapian family. Vesal was from his childhood a student of nature, nor wandering scholar
far from his Belgian home; but in Italy he had found what neither
Louvain nor Paris could give freedom in his studies & opportunities
for research & teaching. What an impression he must have
made on the student bodies at Padua we may judge from the fact
that months after his graduation, at the age of he was elected
to the chair of anatomy & surgery. Two things favored him - an
insatiate desire to see handle for himself the various parts of the human
frame and an opportunity such as never before had been offered a
leather of material for the study of anatomy. Learned with all
the learning of the Grecians - and of the Arabians Vesal, grasped
as no modern before him had done the cardinal fact - that to
know the human machine & its working it is necessary first to
know its parts - its fabric.

Over

over

And now after years of incessant labour he was prepared to leave his much loved Padua - the Venice and his devoted students. ~~The manuscript~~ He had accomplished an extraordinary work - the Mss was ready, ~~the~~ drawings had been made with infinite care, the blocks of the wood-cuts ~~were~~ ready. He knew I feel sure what he had done - he knew that his mss. & cuts contained something that the world had not seen since the great Pergamite sent the rolls of ~~this~~ among his friends ~~[illegible]~~ too precious to entrust to any printer but the best. - and the ~~part~~ in the middle of the 16th century was Cis-alpine, he was preparing to go north with his precious burden. We can picture the ~~student~~ youthful teacher - he was but 28½ - among his students in the University which they themselves controlled - some of them perhaps the very men who had years before elected him - at the last meeting with his class, perhaps giving a final demonstration of the ~~beautiful~~ wood-cuts of an accuracy & beauty not seen before by students eyes, & reading his introduction. There would be sad hearts at the parting for he ~~never~~ had any one taught anatomy as he had taught it. - no one had ever known anatomy as he knew it. But the strong confident look was on his face, with the courage of youth & sure of the future, he would ~~[illegible]~~ a happy return to ~~work at~~ help them with new and untried problems. Little did he dream that his happy days as student & teacher were finished, that his work was over, that the most brilliant and epoch making career as a Professor was a thing of the past. A year or more was spent a Basel with his friend Oporinus supervising the printing of his great ~~book~~ work which appeared in 1543 with the title De humani corporis fabrica. The worth of a book, as of a man, must be judged by its results & so judged the de Fabrica is one of the great books of the world. ~~[illegible]~~ & would come ~~we make a~~ in any century of volumes which embraced the richest harvest of the human mind. In medicine it represents the full flower of the renaissance. And as a book it is a sumptuous

Sept Pag

51 ~~104~~

Paracelsus gave an extraordinary stimulus to the study of chemistry. and more than any one he put the old alchemy on modern lines I have already quoted his same remark that its chief service is in seeking remedies. But there is another side to this ~~But men sought the Philosophers stone,~~ a ~~universal medicine~~, an elixir of life, the ~~perpetuum mobile or~~ ~~aurum potable. that~~ would cure all disease. Of as seems not

Vesal 4 50 ~~103~~

tome, a worthy setting of his jewel - paper, ink, illustrations to match, as you may see for yourselves in this folio - the chef-d'oeuvre of any library

And now after [illegible] labour he was prepared to leave

Sept Pag

Paracelsus gave an extraordinary stimulus to the study of chemistry, and more than any one he put the old alchemy on modern lines. I have already quoted his same remark that its chief service is in seeking remedies. But there is another side to this ~~But men sought the Philosophers stone, a universal medicine, an elixir of life, the perpetuum mobile or an aurum potable. that would cure all disease.~~ Of as seems not improbable ~~the mythical~~ that Basil Valentine ~~the mythical Benedictine monk~~, whose writings were supposed to have inspired Paracelsus was a hoax and that his works ~~attributed to him~~ were made up ~~really~~ ~~from his~~ in great part from the writings ~~borrowed from Paracelsus & others~~ of Paracelsus — if the ~~to~~ the case to ~~the~~ our medical Luther and not the mythical Benedictine monk must be attributed a great revival in the search for the Philosophers stone, for the elixir of life, for a universal medicine, for the perpetuum mobile & for an aurum potabile (1). I ~~copy also~~ reproduce almost at random two pages from the 5th & last part of the last testament of Basil Valentine (London MDCLVI) by which you will see what the ~~the~~ chemical spirit was after ~~of the day~~.

+ I am afraid too that out of the mystic doctrines of Paracelsus arose the famous Brothers of the Rosy cross. ~~+~~ "The brotherhood was possessed of the deepest ~~science~~ knowledge & science; the transmutation of metals, the perpetuum mobile and the universal medicine were among their secrets; they were free from sickness & suffering during their lifetime, though subject finally to death" (1)

A school of more rational kind, ~~arose the iatro-chemists~~ followed ~~arose as a~~ directly ~~result of~~ upon the work of Paracelsus, among whom the first of any importance was Van Helmont. The Paracelsian Archaeus was the presiding ~~& controlling~~ spirit in living creatures which works through special (local) ferments by which the functions of the organs are controlled. Disease in any part represents a stricke ~~row in the whole~~ on the part of the local Archaeus who refuse to work. Though ~~he had~~ full of ~~[illegible]~~ fanciful ideas Van Helmont had the experimental spirit and was the first chemist to discover the diversity of gases. Like his teacher he was

(1) See Prof. Stillman on the Basil Valentine Hoax. (Over) Pop. Science Monthly. 1912.

2 Ferguson, Bibliotheca chemica. Vol II. p 298. For an account of Fludd &

ation of Egypt and Chaldea, in the bright morning of Greece

nd in the full noon-tide of modern life, together have grow n

o these two diametrically opposite views of man's relation to

---

i) ?
ii) Lucretius

in revolt against the Faculty, and he has bitter things to say ~~against~~ ~~about~~ ~~bleeding~~ of Physicians. He got into trouble with the church about the magnetic cure of wounds as no fewer than twenty seven propositions incompatable with the catholic faith were found in his pamphlet (Ferguson). The Philosophus per ignem, Toparcha in Rozenborgh ~~is a hard man to tackle~~ as he is styled in certain of his writings is not an easy man to tackle. I show you the little page of the Ortus Medicinae, the collection of his works by his son. As with the abundant pages of Paracelsus there are many gems to be dug out. The counterblast against bleeding ~~was a courageous~~ was a useful protest and to deny in toto ~~its~~ utility in fever ~~was in those~~ required courage, a quality never lacking in ~~but~~ the Father of Modern Chemistry as he has been called ~~was a man of strong convictions~~

A man of very different type, a learned academic, a Professor of European renown, was Daniel Sennertus, of Wittemberg, ~~was~~ the first to introduce the systematic teaching of chemistry into the curriculum and tried to harmonize the Galenist & Paracelsians

Franciscus Sylvius a disciple of Van Helmont, ~~was~~ established the first ~~to establish a~~ chemical Laboratory in Europe at Leyden and to him is due the introduction of modern clinical teaching (Copy p 312 Willington)

Glauber, Willis, Mayow, Lemery, Agricola & Stahl led up to Robert Boyle with whom modern chemistry may be said to begin

Descartes - Discourse on the Method. p 120. Camb. Trans. 1911. Vol. 1.
For the mind depends.

the English Rosicrucians see Cravens Life & ~~[illegible]~~ Kirkwall 1902

It is marvellous the long line of ~~deities & saints~~ superhuman powers, major & minor that man has ~~fashioned for his~~ invoked against sickness - In Swinburne's words -

"God by God flits past in thunder till his glories turn to shades
God by God bears wondering witness how his Gospel flames and fades.
More was each of these, while yet they were, than man their servant seemed
Dead are all of these, and man survives who made them while he dreams."

Them have been are benign & helpful gods. Into the dark chapters relating to demonical possession & to witchcraft - we cannot here enter

~~And if the dark chapters of the early religions~~ They make ~~us~~ one cry out with Lucretius:-

V. 1194

(ii) "O genus infelix humanum, talis divis
Cum tribuit facta atque iras adjunxit acerbas'.
Quantus tum gemitus ipsi tibi, quanta nobis
Vulnera, quos lacrimas peperere minoribu'nostris."

~~and though~~ In every age and in every religion there ~~is~~ has been justification for his bitter words "tantum religio potuit suadere malorum" - "Such wrongs religion in her train doth bring" - yet ~~the~~ one outcome of this ~~search~~ belief in spiritual beings - as Tylor defines religion - has been that man has built an altar of righteousness in his heart. The comparative method applied to the study of his religious growth has shown how man's thoughts have widened in the unceasing purpose which runs through his spiritual no less than through his physical evolution.

× newbit & Lankester

Side by side, as substance and shadow,- in the dark backward and abyssm of time, in the dawn of the great civilization of Egypt and Chaldea, in the bright morning of Greece and in the full noon-tide of modern life, together have grow n up these two diametrically opposite views of man's relation to

(i) ?
(ii) Lucretius

53 106

nature, and more particularly of his personal relation to the agencies of disease.

~~It will be~~ The purpose of this course of lectures is to sketch the main features of the growth of these two dominant ideas, to show how they have influenced man at the different periods of his evolution, how the lamp of reason so early lighted in his soul, burning now bright, now dim, has never, even in his darkest period, been wholly extinguished, but re-trimmed and refurnished by his indomitable energies, now shines more and more towards the perfect day. It is a glorious chapter in ~~man's~~ history, in which those who have eyes to see may read the fulfilment of the promise of Eden, that one day man ~~he~~ should not only possess the earth, but that he should have dominion over it.

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A section on "Indian Medicine"
[not published with the Lectures]

Lectures 1910

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I N D I A N M E D I C I N E .

Though full of interest and corresponding to brilliant attainments in philosophy, mathematics, astronomy and art, Indian medicine cannot be said to have had any deep influence on the development of modern medicine.

Tradition assigns a two-fold mythical origin, in Ātrya the physician, and Susruta the surgeon. The former flourished in the 6th century B.C.; the latter was a younger contemporary. The third great name is Charaka, about whose date there is much dispute, but he was probably of the 2nd century A.D.

"As with the Semites, Hamites, and Mongols, in spite of a natural endowment little inferior to that of the Greeks, the intellectual impulse was lacking in the Aryan Hindu races. Under the oppression of dogmatism, individual development too soon gave place to a condition of stagnation culminating in trivial speculation, subtle formalism and bizarre fantasy". ~~traits also expressed in a grotesquely imaginative art often far removed from beauty and harmony.~~ (1)

Anatomy was practiced, at any rate in the school of Susruta, and the bones were ~~fairly well known; they recognized as many as~~ described to the number of 360, counting in the teeth, nails, and cartilages. Hoernle's monograph[2], ~~(Medicine of Ancient India, pt. 1 - Osteology, Oxford Press, 1907)~~ which gives a full account of the Osteology, is a good introduction to the subject of Indian medicine

(1) History of Medicine - Neuburger, Oxford Univ. Press, 1910.

2. Medicine of Ancient India Pt. 1 Osteology. Oxford Press 1907

66 108

The early Vedic medicine was Theurgic, ~~and~~ consisted largely ~~in the use~~ of magic and spells against the demons of disease. In the Brahmanistic period a highly esteemed caste of Hindu physicians arose, whose knowledge in some directions reached a high level. The centre of medical ~~interest~~ Education was at the holy city of Benares, and the code of ethics was of a high standard. A humoral physiology and pathology dominated their conception of health and disease. Air, phlegm, and bile were the three primary constituents, from the derangement of which disease arose,. Natural and supernatural diseases were recognized. Diagnosis was carefully considered, the pulse was studied elaborately, and much attention was paid to the art of prognosis. The hygienic and dietetic regulations were excellent; the materia medica was enormous, chiefly of vegetable origin, ~~but~~ and organo-therapy was extensively practiced. Elixors, antidotes, aphrodisiacs, were in great vogue, and anesthaesia for surgical purposes was effected by soporific drugs. There were many shrewd observations, for example, on diabetes mellitus, and the attribution of malarial fever to the mosquito. Hypnotism was in vogue for centuries before Mesmer, and it is interesting to note that James Esdale, a Presidency surgeon, before the introduction of ordinary anesthaesia, ~~had~~ performed 261 operations on subjects ~~placed~~ in the hypnotic trance.

The surgical technique reached a high grade; lythotomy, Caesarean Section, cataract operation, rhinoplasty were practiced with great success. It has been much discussed how far Greek medicine was influenced by knowledge brought from India.

Winterbotham 1910

57 +09

It is not easy to say, but ~~even~~ before the time of Alexander, Indian ~~there appears to have been a good deal of intercourse~~ influences had travelled westward.

With the Arab conquest, about 1000 A.D., came a third period in Indian medicine. The important writings of the Indian physicians were translated into Arabic, and many ~~important~~ Indian remedies were incorporated for the first time into the pharmacopoeia, which in a few years was to dominate European practice. In spite of the ~~important~~ development of surgical and technique, ~~achievement~~, the aquisition of much valuable empirical knowledge, Indian medicine had not in it the germs of true science; and as Neuburger very truly remarks "As in the long silent past, so even to-day, the edifice of Indian medicine stands unaltered, lonely, apart, far from the ever-flowing stream of progress."

Pediatrics 1910

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Philology 1910

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is hym to the Deity ~~is inspired by~~ might have been written by Plato and rivals the famous one of Cleanthes!(1). ~~One gets~~ A casual reader of ~~medical~~ ~~history~~ gets ~~an~~ a very favorable impression of Avicenna, ~~from the~~ and the story of his dominion over the schools in the middle ages is one of the most striking in our history. Perhaps we feel that Leclerc exaggerates when he says "Avicenne est un phénomène intellectuel. Jamais peut-être on ne vit une intelligence précoce, facile et étendue se prolonger et se soutenir avec une aussi étrange et aussi ~~indefal~~ infatigable activité" (Translate). The touch of the man never reached me until I read ~~the "Traites~~ some of his mystical and philosophical writings translated by Mehren(1). It is Plato over again. The ~~story~~ beautiful allegory ~~of the Bird~~ in which men are likened to birds snared and caged until set free by the angel of death might be met with anywhere in the immortal Dialogues

Plato on Love is ~~another Platonic essay, and the~~ a commentary on the Symposium; and the essay on Destiny is Greek in spirit ~~as the concluding~~ without a trace of oriental fatalism as you judge from the concluding sentence which I leave you as his special message. Observe les limites de ta capacité, et alors ~~de~~ tu arriveras à la connaissance du vrai. Combien est vrai l'adage "Travaillez toujours et chacun sera favorisé du succès de tout - pour lequel il a été crée par la nature"

(1) L'Elegie du Tograi par P. Vattier Paris MDCLX
~~Analecta orientalia ad Poeticam Aristotelicam~~
~~Edidit D Margoliouth Londini 1887~~
Traités Mystique ~~de~~ d'Abou Ali Al-Hosain b. Abdallah b. Sînâ ou d'Avicenne par M A F Mehren. Leyde a J. Brill. Fasc. I - IV 1889 - 1899

Philology 1910

ROMAN MEDICINE.

No people have more keenly appreciated the value of an abundant supply of good water than the Romans. The remains of their aqueducts supplying the imperial city still excite our wonder, and some of them are still in use. The Pont du Gard supplying Nismes in "lightness of structure combined with such prodigious durability produces the strongest sense of science and self reliant power in the men who designed it". (i)

The Campagna was a fertile and prosperous district because of the good drainage and the abundant water supply. Only within this generation have we reached the Roman standards in these vital matters relating to public health. Could Galen revisit the worls, he might well make a tour of this country as sanitary expert to many outlying districts still lacking the two great elements of civilization - good drains and a pure water supply. (ii)

(i). Quoted by Sir C.P.Lucas in "Greater Rome & Greater Britain" 1912

(ii) For organisation of public medical service, in the Roman Provinces see Dill's Roman Society; and for the Campagna see Pelham's Essays.

Lecture II

The Greeks

367
17
384

Clinical teaching There are several references to the practice of physicians taking students on their rounds - Martial and later in the Apollonius of Tyana by Philostratus (Phillimore Edition Vol II. p 231 when Apollonius wishes to prove an alibi he calls the physicians, his sick friend Seleucus & Stratocles to witness who were attended by their clinical class to the number of about thirty students

LECTURE III. MIDDLE AGES.

After flowing for more than a thousand years through the broad plain of Greek civilization, the stream of scientific medicine which we have been following is apparently lost in the morass of the Middle Ages; but, checked and blocked ~~as it was~~, like the White Nile in the Sud, three channels may be followed thro' the ~~wilds~~ weeds of theological and philosophical speculation.

~~The first~~ A wide stream is in Italy, where the "antique education never stopped, antique reminiscences and traditions never passed away, and the literary matter of the pagan past never faded from the consciousness of the more educated among the laity and clergy"(i). The cathedral and monastic schools served to keep alive the ancient learning. ~~and among these~~ Monte Casino ~~in the south of Italy~~ stands pre-eminent as a great hive of students and to the famous Regula of ~~from its connection with the great~~ Saint Benedict,(2) ~~to whose famous 'Regula'~~ we are indebted for the preservation of ~~so much important ancient literature~~ many precious manuscripts.

~~Situated~~ miles from Monte Casino, ~~about~~ 30 miles south-east of Naples ~~was another famous centre~~, (ay Salernum) which for centuries kept alight the lamp of the old learning - ~~Salernum, a favorite health resort of the Romans~~, and became the centre of medical studies in the middle ages, ~~so much so, that it received~~ well deserving the name 'Civitas Hippocratica'. The date of ~~its~~ foundation is uncertain, but Salernian physicians are mentioned as early as the middle of the ninth century, and from this date until the rise of the universities it was not only a great medical school, but a popular resort for the sick and wounded,

(i) H.O.Taylor, "The Mediaeval Mind", Vol.I. pg.251.

It is said that he caused to be painted the astronomical figures in the great hall of the Palace at Padua.

One characteristic of mediaeval medicine is the reunion with theology, and this is not remarkable, beaause the learning of the time was really in the hands of the clergy. One of the most popular works in medicine the 'Thesaurus Pauperum' was written by Petrus Hispanus, afterwards Pope John XXI. We may judge of the pontifical practice from the page here reproduced (Fig.) which probably includes under the term 'iliac passion' all the varieties of mediaeval appendicitis.

But two divines above all others represent the science of the Middle Ages -

There are a great many Alberts in history - the Good, the Just, the Faithful - but there is only one to whom the name of 'Great' is justly given. A student at Padua, a teacher at the University of Paris, Head of the Dominican Order in Germany, Bishop of Regensburg, Albertus Magnus was an encyclopoedic student and author, who took all knowledge for his province. His great work, and his great ambition was to interpret Aristotle tohis generation. Before his day the Stagirite was only known in part, but he put within the reach of his contemporaries the whole science of Aristotle, and imbibed no small part of his spirit. He recognized the importance of the study of nature, even of testing it by way of experiment, and in the long years that had elapsed since Theophrastus no one else, except Dioscorides, had made a thorough study of botany. His paraphrases of the natural history books of Aristotle were immensely popular, and served as a basis for

How close ~~Van Helmont~~ they came to modern views of wound infection may be judged from the following - "Upon the solution of unity in any part the ambient air ..... repleted with various evaporations or apporrheas of moxt bodies especially such as are then suffering the act of putrefaction, violently invadeth the part, and thereupon impresseth an exotic miasm or noxious diathesis, which disposing the blood successively arriving at the wound, to putrefaction, by the intervention of fermentation" (Chaffeous Introduction to a Ternary of Paradoxes)

instruments through which it acted. ~~The original description given by Paracelsus is in the 'Archidoxes'~~ ~~(i)~~. The magnetical cure of wounds became the vogue. Van Helmont adopted these views in his ~~in published a~~ famous treatise "De Mag. Vulnerum Curatione"[1], in which he asserted that cures were wrought through ~~special~~ magnetic influence, ~~and~~ He was rash enough to go further and say that the cures effected by the relics of the saints were also ~~might possibly be~~ due to the same ~~natural~~ cause~~s~~. a statement which ~~This~~ led to a ~~great~~ discussion with the theologians and to Van Helmont's arrest for heresy. And small wonder when he told statements as "Let the swine enquire only concerning God, the Naturalist concerning nature", and "God in the production of miracles does for the most ~~[illegible]~~ part work hand in hand with nature"

That wandering genius, Sir Kenelm Digby, did much to popularize this method of treatment by his lecture on the Powder of sympathy.(ii) His powder was composed ~~made up~~ of copperas alone or mixed with gum tragaganth. He regarded the cure as effected through the subtle action of the sympathetic spirits, and the remedy could be applied to the would itself, or to a cloth soaked ~~wrapped~~ in the blood or secretions, or to the weapon that caused the wound. One factor leading to success may have been that in the directions which Digby gave for treating the wound (in the celebrated case of James Howell, forinstance) ~~he said~~ it was to be let alone and kept clean. The practice is alluded to very frequently by the poets. In the "Lay of the Last Minstrel" we find the following:-

" But she has ta'en the broken lance,
And wash'd it from the clotted gore,
And salved the splinter o'er and o'er.
William of Deloraine, in trance,
Whene'er she turns it round and round,
Twisted, as if she gall'd his wound,
Then to her maidens she did say,
That he should be whole man and sound."

~~(i)~~ An English translation by Walter Charlton appeared in 1650 - A Ternary of Paradoxes

(ii) French edition, Paris 1658, English translation, same year. For a discussion on the author of the Weapon Salve see Van Helmont, who gives the various formulas

And in Dryden's "Enchanted Island" Ariel says:-

"Anoint the sword which pierced him with this
Weapon salve, and wrap it close from air
Till I have time to visit it again ."

Van Helmont comes the famous story of the new nose that dropped off in sympathy with the dead arm from which it was taken - and the source of the famous lines in Hudibras. As I have not seen the original story quoted of late years it may be worth while to give it (copy p. 13 - Charlton

This is the new piece E. Int. Mod. Med. 13th. Century. 64a 110a

For our purpose two ~~men will tell us serve as landmarks~~ beacons ~~in the 13th century, two giants~~ who reflect the spirit of the 13th century ~~so far as the~~ in its outlook on man & nature, Better than Abelard & St Thomas Aquinas or much better than any physicians Albertus Magnus and Roger Bacon represent the ~~types of~~ men ~~of minds~~ who ~~in that a~~ were awake to greet ~~when~~ the dawn of the sun of science ~~appear~~. What a contrast in the titanism & in their works! The great Dominicans long life was an uninterrupted triumph of fruitful accomplishment - the titanic task he set out to do was not only completed but appreciated to the full by his generation - a life ~~devoted~~ not only to study & teaching but to practical piety and as Provincial of his order & Bishop of Regensburg of wide ecclesiastical administration; and in death a memory only equalled by one or two of his ~~generation~~ century & only excelled by his great pupil Thomas Aquinas. There are many Alberts in history - the good, the just, the faithful but there is only one ~~Albertus~~ we call Magnus and ~~he~~ who richly deserved the name. What is his record? Why do we hold his name in reverence today?

Lecture IV 1 115b 64b

"reconquest of the classic world of thought was by far the most important achievement of the fifteenth & sixteenth centuries. It absorbed nearly the whole mental energies of the Italians ..... The revelation of what men were and what they wrought under the influence of other faiths & other impulses in distant ages ~~and~~ with a different ideal for their aim not only widened the narrow horizon of the Middle ages, but it also restored self confidence to the reason of humanity."[1]

(1) J. A. Symonds. - The Renaissance in Italy. - The Revival of Learning. 1877 p 52

Leoniceum. Sinacre. Champier
Fracastorius Ferriel Gontheir, Caius
Sylvius, Cornarius, Brasavola, Fuschus
Mathiolus and Conrad Gesser

This is the new piece Evol. Mod. Med. 13th. century. 64a ~~110a~~

For our purpose two ~~men will tell us serve as landmarks~~ beacons ~~in the 13th century, two giants~~ who reflect the spirit of the 13th century ~~so far as the~~ in its outlook on man & nature, Better than Abelard & St Thomas Aquinas or much better than any physicians Albertus Magnus and Roger Bacon represent the ~~types of~~ men ~~of minds~~ who ~~in that a~~ were awake to greet ~~when~~ the dawn of the sun of science ~~appear~~. What a contrast in the titanic & in their works! The great Dominicans long life was an uninterrupted triumph of fruitful accomplishment - the titanic task he set out to do was not only completed but appreciated to the full by his generation - a life ~~devoted~~ not only of study & teaching but of practical piety and as Provincial of his order & Bishop of Regensburg of wide ecclesiastical ~~Ad~~ Administration; and in death a memory only equalled by one or two of his ~~generation~~ century & only excelled by his great pupil Thomas Aquinas. There are many Alberts in history - the good, the just, the faithful but there is only one ~~Albertus~~ we call Magnus and ~~he~~ who richly deserved the name. What is his record? Why do we hold his name in reverence today?

divine became ...
under the leadership of the Montpellier school but it was a wrong battle all along the line. This group of medical humanists - men who were devoted to ~~the~~ a study of the old humanities - as Latin & Greek were called - has had a great, & beneficent influence in the

Man advances human

End of Sect VI - p 12. Greek med

Leoniceum. Sinacre. Champier
Fracastorius Ferriel Gontheir, Canis
Sylvius, Cornarius, Brasavola. Fuschus
Mathiolus and Conrad Gesser

~~The~~ Everywhere thoughout the middle ages learning was the bandmaid of theology. Even Roger Bacon with his strong ~~convictions of the need~~ appeal for new methods ~~&~~ accepted the dominant mediaeval convictions; ~~the entire truth of the Scripture; the absolute validity of revealed religion with its dogmatic for~~ That all the sciences did but minister to their queen theology. A new spirit entered mans heart ~~and~~ as he came to look upon learning as a guide to the conduct of life. A revolution was slowly effected in the intellectual world. It is a mistake to think of the Renaissance as a brief period which blasted out ~~with its thief~~ suddenly ~~bloom~~ in the North Italian cities. ~~A long dawn~~ So far as science is concerned the thirteenth century was an aurora followed by the ~~after which~~ darkness ~~again settled~~ of the 14th & early 15th centuries but the dawn of the 15th brightened more & more until the perfect day. Always a reflex or an index of its period, medicine joined heartily but slowly in the revolt against mediaevalism. How slowly I did not appreciate until recently. I have been studying the earliest printed medical works to catch the point of view of the men who were in the thick of the movement up to 1480 - which may be taken as about the first quarter of a century of printing. It is a startling record. The mediaeval mind dominates - of works blank, were by men of the 13th & 14 centuries - were editions of Arabian works. ~~Also~~ - were of the school of Salernum

only - were Greek, ~~Gale~~ Hippocrates, Galen or ~~was not slow to catch~~ gradually caught the new spirit

~~The Renaissance gave~~ The medical profession ~~three things. first a new spirit~~ It has been well said that Greece arose from the dead with the new Testament in one hand and Aristotle in the other. There was awakened a perfect passion for the old Greek writers, and with it a study of the original sources now available in many manuscripts. Hippocrates & Galen came to their own again. Almost every professor of medicine became a student of the manuscripts of Aristotle and of the Greek physicians and before 1530 the presses had poured out a stream of editions. A wave of enthusiasm swept over the profession and the best energies of its best minds were devoted to a study of the Fathers. Galen became the idol of the schools. A strong revulsion of feeling arose against the Arabians. Avicenna, the Arabian Prince, clothed with an authority only a little less than divine became anathema. The Arabians made a strong fight under the leadership of the Montpellier school but it was a losing battle all along the line. This group of medical humanists - men who were devoted to ~~the~~ a study of the old humanities - as Latin & Greek were called - has had a great & beneficial influence in the

~~Man advances human~~

End of Sect VI - p 12. Greek mind

the profession They were cultivated gentlemen with a triple interest — literature medicine & natural history. How important is the part they played may be gathered from ~~the~~ a glance at the lives given in Bayle, Biographie medicale (Paris) been the years and more than one half of them had translated or edited works of Hippocrates or Galen, many of them had made importance contributions to general literature and a large proportion of them were naturalists Leonicenus, Linacre, Champier, Fernel, Fracastorius, Gonthier Canis Sylvius, Brasavola Fuschius, Mathiolus, Conrad Gesner to mention only those I know best, form a great group. Linacre edited Greek works for ~~the Greek~~ Aldus, translated works of Galen, taught Greek at Oxford, wrote Greek grammars and founded the Royal College of Physicians. Canis was a keen Greek scholar, an ardent student of natural history and ~~[illegible]~~ his name is enschrined ~~at Cambridge~~ as co-founder one of the most important of the Cambridge colleges. Gonthier Fernel, Fuschius & Mathiolus were great scholars & greater physicians. Champier one of the most remarkable of the group founder of the Hotel Dieu at Lyons, and author of a series of characteristic Rewards books ~~of great interest~~ & of singular bibliographical interest. And in many ways greatest of all Conrad Gesner whose Mors inopinata at 49, is so touchingly & tenderly mourned by his friend Canis. Physician

anist, mineralogist, geologist; chemist, the first great modern Bibliographer ~~no man represented the spirit the individual~~ he is the very embodiment of the spirit of the age. ~~death removed him~~ In the fly leaf of my ~~[illegible]~~ of the Bibliotheca Universalis 1545, is pasted a fine tribute to his memory. I do not know by whom it is but I know from my reading it is true. Almost every one of the early 16th & 17 cent. ~~anatomists~~ naturalists & botanists were physicians

[illegible], Miall. Lond, 1917.]

MEDIAEVAL MEDICINE AND ASTROLOGY.

We have seen how the practice of Astrology spread from Babylonia and Greece throughout the Roman Empire. It was carried on into the Middle Ages as an active and aggressive cult, looked upon askance at times by the Church, but countenanced by the courts, ~~at first by~~ Encouraged at the universities, and always by the public

~~Astronomy made up with Music, Arithmetic and Geometry~~

~~With the foundations~~ In the curriculum of the mediaeval university Astronomy made up, with Music, Arithmetic and Geometry, the Quadrivium. In the early faculties Astronomy and Astrology were not separate, and at Bologna in the early 14th century we meet with professors of Astrology.(i) One of his duties, as a salaried professor, was to supply 'judgements' gratis for the benefit of enquiring students. ~~It was~~ A treacherous and delicate ~~Chair~~ Professorship, as that most distinguished occupant of the chair at Bologna found, Cecco d'Ascoli, who was burned at the stake in 1357, a victim of the Florentine Inquisition.(ii)

Roger Bacon was a warm believer in judicial astrology and in the influence of the planets, stars and comets on generation, disease and death.

(i) Rashdall, "Universities of Europe in the Middle Ages" Vol.I. p.240

(ii) Rashdall, l.c. Vol.I. p.244. - Rashdall also mentions that in the 16th centruy at Oxford there is an instance of a scholar admitted to practice in astrology. l.c. Vol.II. p.458.

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the strong school of the period, he went in 1533, and studied under two men of great renown, Jacob Sylvius and Guinterius. Both were strong Galenists and regarded the Master as an infallible authority. He had as a fellow prosector under the latter the unfortunate Servetus. The story of his troubles and trials in getting bones and subjects you may read in Roth's Life(i). Many interesting biographical details are also to be found in his own writings. He returned for a time to Louvain, and here he published his first book, the 'Almansor' of Rhazes, in 1537.

Finding it difficult either in Paris or Louvain to pursue his anatomical studies he dicided to go to Italy where at Venice and Padua the opportunities were greater. At Venice he attended the practice of a Hospital, (now a barracks) which was in charge of the Theatiner Order ~~among the members of which was Ignatius Loyola.~~ I show you a photograph of the building taken last year (Fig.) x and ~~when strolling round~~ in the court yard one could not help wondering at the strange destiny that brought together two such strong characters, the one destined to reform anatomy, the other to play so important a rôle in the history of the Roman Catholic Church. It was in this hospital that he made observations upon the Chyna root, on which he published a monograph in . The Padua school was close to Venice and associated with it, so that the young student had probably many opportunities of going to and fro. ~~What impression he made upon the student bodies may be judged from the fact that~~ On the 6th December 1537 before he had reached his 24th year and shortly after taking his degree he was elected to the Chair of Surgery and Anatomy

(i) Andreas Vesalius Bruxellensis, M.Roth, Berlin, 1892.
An admirable account of Vesal & his contemporaries is given by James Moores Ball in his superbly printed Andreas Vesalius, the Reformer of anatomy. St Louis MCMXX.

power of nature to restore the normal state, the 'Vis medicatrix naturae' ~~but he was also~~ A keen observer and an active practitioner, ~~whose~~ his views of disease, thus hastily sketched, dominated the profession for 25 centuries; ~~and~~ indeed, echoes of his theories ~~have~~ are still heard in ~~passed into our language,~~ in the schools and his very words are daily on our lips

If asked the ~~[illegible]~~ great 7 contribution to medicine of Hippocrates & his school one could answer - the art of careful observation

Phthisis

end page of Vesal

accentuated by the receipt of an anatomical treatise by ~~Philo~~ Fallopius, the successor to ~~his~~ Chair in Padua! She makes him say:-

> "There are two ways of spreading light; to be
> The candle or the mirror that reflects it.
> I let my wick burn out - there yet remains
> To spread an answering surface to the flame
> That others kindle."

In between Mundinus and Vesal anatomy had been studied by a group of men to whom I must in passing pay a tribute. The great artists Raphael Michael angelo and Albrecht Durer were keen students of the human form I show you here an anatomical sketch by Raphael which is in the Ashmolean Museum Oxford. Durer's famous work on ~~Human~~ Proportion ~~was~~ published in 1528 contains excellent figures but no sketches of dissections. But greater than any of these and antedating them is Leonardo da Vinci the one universal genius in whom the spirit of the new world was incarnate - the Moses who alone of his contemporaries ~~who~~ saw the promised land. How far Leonardo was indebted to his friend & fellow student della Torre at Pavia we do not know; nor does it matter in face of the indubitable fact that in the many anatomical sketches from his hand we have the first accurate representation of the ~~inner mechs~~ structure of the body. Glance at these three figures of the spine, which I have had ~~copied~~ photographed side by side, one from Leonardo, one from Vesal the other from Vandyke Carter who did the ~~gr~~ drawings in Greys anatomy (12th Edition 1859). They are all of the same type - scientific anatomical drawings & that of Leonardo was done fifty years before Vesal! ~~Look~~ Compare too ~~at~~ this figure of the bones of the foot ~~& compare it~~ with a similar one from Vesal. Insatiate in experiment, intellectually as greedy as Aristotle, painter poet, sculptor Engineer, architect, mathematician, chemist, botanist, aeronaut musician & with all a dreamer & mystic, full accomplishment in any one department was not for him! A passionate desire for a mastery of nature's secrets made him ~~like the~~ a ~~fierce~~ thing replete with too much rage! ~~and~~ In anatomy he was a daring ~~dar~~ pioneer with no immediate followers. ~~But~~ the record remains - he was the first of modern anatomists & Vesal fifty years later entered the breach he made (1)

(1) See Knox Great artists & Great anatomists. London 1852. and Mathias Duval in Fasciculus A

For a good account of Leonardo see novel, The Forerunner

70a 42

A section on "Medical Education"
and one on "Epidemics of Quackery"
[not published with the Lectures]

MEDICAL EDUCATION. Before a University audience, and one of a semi-public character I must refer to one other subject. Medicine is a very complicated study, and a still more complicated and difficult practice. An intelligent public demands a group of scientific men working at the still unsolved problems of disease, and a group of well trained physicians to care for the sick and injured and to carry out sanitary measures for protection against disease. In the older countries medical education has developed as a rule gradually in connection with the universities; in this country it has been too much in the hands of irresponsible bodies, with the result that for the greater part of the last century American medical schools were a bye-word for inefficiency and fraud. The last three decades of the century, however, saw an extraordinary revolution headed by Harvard and the University of Pennsylvania, stimulated by that great organiser, President Elliott, who was actively backed at Harvard by Henry P. Bowditch, and in Philadelphia by that brilliant genius William Pepper: & the Johns Hopkins foundations gave a demonstration of what a first-class modern medical school should be. But though much had been done by the older medical schools, much remained - ho much, the American public and the profession were made to realize by Mr. Abraham Flexner's report to the Carnegie Institution at Washington. It is not too much to say that no single medical document ever published in this country has had a more beneficial influence: it has been a moral leaven in the dough of self complacent inefficiency

MEDICAL EDUCATION. Before a University audience, and one of a semi-public character I must refer to one other subject. Medicine is a very complicated study, and a still more complicated and difficult practice. An intelligent public demands a group of scientific men working at the still unsolved problems of disease, and a group of well trained physicians to care for the sick and injured and to carry out sanitary measures for the protection against disease. In the older countries medical education has developed as a rule gradually in connection with the universities; in this country it has been too much in the hands of irresponsible bodies, with the result that for the greater part of the last century American medical schools were a bye-word for inefficiency and fraud. The last three decades of the century, however, saw an extraordinary revolution brought by Harvard and the University of Pennsylvania, ~~xxx~~ stimulated by that great organizer, President Eliot, who was actively backed at Harvard by Henry P. Bowditch, and in Philadelphia by that brilliant genius William Pepper. The Johns Hopkins foundations gave a demonstration of what a first-class modern medical school should be. But though much had been done by the older medical schools, much remained - ho much, the American public and the profession were made to realize by Mr. Abraham Flexner's report to the Carnegie Institution of Washington. It is not too much to say that no single medical document ever published in this country has had a more beneficial influence. It has been a moral lesson in the dough of self complacent ineffic[illegible]

and educational insincerity. There has been a rapid change all along the line, and so good have the best schools become, so well developed on the scientific and practical side, that there is now a constant stream of students from Europe to America. But what an immense levelling-up work is still needed is well known to every one familiar with the c nditions of medical education. President Pritchett's report for this year to the Carnegie Foundation lays bare many existing anomalies, particularly the existence side by side in the same cities of schools of the highest and of the very lowest types. Nevertheless, as extraordinary reform is in progress. Inefficient schools have been wiped out, increased preliminary qualifications are everywhere demanded, internal improvements in laboratories and scientific methods are everywhere visible, and three ,and three important things are becoming universal - first, that before entering upon the study of medicine a man should have a liberal education, secondly, that he should receive a thorough training in science, and thirdly, that, ina hospital, as a working unit in its wards and in the outpatient department, he shoud gain a thorough knowledge of what disease is, and how it should be treated.

Johnson's definition of a quack as "a boastful pretender to arts which he does not understand" is of perennial application. There are no arts to which pretenders do not boast an understanding not possessed and in a much wider application than that usually assigned to the term. Charlatans are the parasites of truth and live on her as the tick on the sheep or the flea on the cog. It is difficult to explain the place of the flea in the economy of nature: from the standpoint of the animal it is a useless and annoying interference with canine happiness - but a strong case could be made for the flea, if we take into account on the one hand the peculiar fitness of the skin of the dog for his residence, and on the other, the admirable admirable adaptation of the flea to his environment. As a stimulus to the dog's neuro-muscular energies he may be thought to serve a useful purpose, but unfortunately the liveliest of ranging curs are apt to most infected! The quack, as a parasite, adapts himself to the environment. Boastful pretenders are limited in their scope by the condition of the arts. Where are the successful charlatans in engineering or in architecture? The mathematical and mechanical sciences are too exact, and too clearly understood to be successfully infested. The quack astronomers still thrive, though in dimishing numbers. I have no doubt there are boastful pretenders in Theology and in the fine arts. The standards shift from generation to generation. Colenso, a shocking quack Divine in my youth, might be Dean of Westminster today. It is really in pretensions to the science and art of medicine that quacks thrive:

in a matter of illness it is only the manifest fool who would not give advice. This is a persistence of the mental attitude which a few years ago made the Babylonians expose the sick in a public place for the benefit of the advice of passers by. We have not outgrown this primitive feeling - we are too young - too childish. It is a sort of inherited reflex -and whether it is a sprain or a case of pneumonia of which one hears, the old instinct at once prompts the question "Has he tried Bunyon's Embrocation: which cured my grandfather's ankle in a month" or "Do ask them to use Mother Mellora's lung syrup which cured Johnnie Jones in twenty four hours after all the doctors had given him up." And it is not altogether the fault of the general public that lives in faith and has to be credulous, and whose current coin is the written or spoken word. Medicine has only in the last generation really emerged from the empirical stage. There have always been the technicians, who could do things, the skilled surgeon, the dexterous obstetrician, the trained oculist; but in the matter of internal disease there was so much uncertainty, sometimes of diagnosis, very often of treatment, that the public found it hard to discriminate between the physician and the boastful pretender - with a leaning very often towards the latter, who at any rate knew that he knew what he thought he knew, and was assertive. But the public has learned its lessons: it does not ask "Munyon" to investigate yellow fever or call upon a pery Davis to manage a tuberculosis campaign, or Lydia Pinckham to study epidemic poliomyelitis. The work of the past twenty-five years has put the profession in a position never before occupied with a debit account mounting by

millions year after year. But let us not be over-sanguine - many centuries of education may diminish the capacity for deception at present enjoyed by the public - nor let us be discouraged at wide-spread epidemics. Your benefactor, Bishop Berkeley, was more widely known throughout Europe during his life for his Tar Water than for his Philosophy, and

~~EPIDEMICS OF QUACKERY~~. Of Quackery perhaps no epidemic had a more successful 'run' than that which was started at the end of the 18th century in this State by Elisha Perkins, who ~~was~~ a student of this University and who settled in practice at Plainfield. It is the old story of the occult magnetic influence that we have already seen in Paracelsus. Believing that certain metals influenced, through their magnetic properties, the parts to which they were applied, drawing out by their subtle powers the pains and inflammations Dr. Perkins ~~finally~~ devised two pieces of metal, not unlike in shape to horse-shoe nails, which were known as his metallic tractors. They were utilized by gently drawing them over the affected part for from ten to twenty minutes. The use was made with great care according to the printed directions, and the only tractors that would effect the cure were those made under Dr. Perkins' directions and bearing a special trade-mark. They were sold at various prices - in England at five guineas a pair. This cure at once had a remarkable vogue in this country, and also in England and on the Continent. The studies on galvanism contributed not a little to its successful spread. In London a special Perkinian Institute was opened under the Presidency of Lord Rivers and there was also a Perkinian Society, and Many physicians and surgeons vaunted its claims, and reports of miraculous cures were published by the hundred. Within the first ten years of the 19th century the bubble burst, and now the metallic tractors are interesting only as Museum specimens. It has been truly said of Elisha Perkins that nothing in his life became him like the leaving of it, for, anxious to prove the virtue of a specific remedy which he had brought forward, he went to New York to test it upon yellow fever, of which he died a few weeks after his arrival in the city.

Lecture I,
List of Illustrations, Mottoes, etc.

Section I.

List of Illustrations, Maps, etc.

ILLUSTRATIONS.

Lecture I.

Copy of entry in Day Book, p. 193.
Hope Collection, Bodley
under March 26th 1913

78

ch 26 } Prof Osler. Ports. of

Pythagoras seen
Empedocles not found.
× Alcmaeon seen
× Theophrastus, seen
Herophilus, not found
Galen, seen
Salernum, picture of seen
Rhazes, not found
× Avicenna. seen
Trotula. not found
Constantinus Africanus, not found
× Bacon, Roger, seen
Albertus Magnus, seen
× Linacre, Thomas, seen
Caius, John seen
× Gesner, Conrad, seen
× Paracelsus, seen 1 print
× Copernicus, seen
Vesalius seen
× Descartes, René, seen

× Lemnertus (F. Sylvius) seen
× Boyle, Robert, seen
× Morgagni, seen
Sydenham seen
× Haller seen (Van Swieten) No.
× Lancisi, seen
× Baglivi seen
× Rutherford seen of Edin. Phys. 18th Cent.
× Cullen (Wm), seen.
× Brown, John, seen Edin physician
× Rush, Benjamin seen
× Hunter, John seen
× Jenner, Edward, seen
× Pasteur, seen
× Koch, Robert seen

× Mar 13. Taken out by Mr Griffin Photographer Univ. Press. & be photo'd for Prof. Osler.

W. W. F. 1922.

1913. Oct 8th Sir Wm Osler Portrait of Antonius Musa
or Mousa - not found
" Mar 10th Ports. of Paracelsus. Ph-Can-Th, seen

ILLUSTRATIONS.

Lecture I.

1. Step Pyramid. – Burgen
2. Imhotep (ask Miss Porter about) – Hollander pg. 9.
3. Ask Miss Porter if there is anywhere an old mural illustration of a doctor treating the sick. - anything like the pictures of weighing gold or the use of the blow-pipe.
   X Channel, picture of
4. Ebers Papyrus (Ask Miss Porter about good picture, coloured. ✓
   Figure of Pott's Disease in a Mummy. Rueffer's pamphlet
5. Hyeroglyph for the Horus Eye. Meaning of R
6. Photo. of clay model of Sheep's liver (Jastrow Pl.21)
7. Diagram of Sheep's liver with equivalent modern terms (Jast.Pam
8. Etruscan bronze model of liver. (Pl.21 Jastrow.)
9. Early Signs of the Zodiac. Brown. Hist. of Chem. pg. 10.
10. Pict. of Hammurabi Column (Jastrow or Comrie Pamph.)
11. ~~Exorcising demons of disease (Jastrow Pl.21)~~
12. ~~Prognosticon figure - title-page of one of Rabelais's Almanacks~~
13. Cardan's Horoscope.
14. Frontispiece of Nicholas Culpepper's book.
15. Lucas-Champonnière - rings.) Trephining.
16. " " Peruvian skull)

LIST OF ILLUSTRATIONS FOR

LECTURE II.

1. Pictures of Pythagoras & Empedocles. + Alcmaeon — Hope Coll.
2. Inscriptions relating to the State Physician at work — Sambon
3. Dr. Pottier's picture on Greek Vase. written abt. — "
4. Aesculapius from Epidaurus ~~or~~ Roma — Hollander
5. ~~Serpent symbol of Babylonia (Pl.IV. Jastrow)~~
6. Temple at Isle of Tiber. — Done
7.
8. Pictures at Epidaurus — Done
9.
10. Oldest coins representing the God at ~~Epidaurus~~ Cos — Done
11 " "
12. Pictures at Cos — Hertzog's papers
13. Votive tablets. — Grassland + Sambon
14. ~~Church at Rome - St. Theo~~ - (Baedeker
15. Hippocrates — B. M. — Done
16. Earliest Greek MS. of his writings — Done
17. ~~Hippocratic Oath~~
18. Aristotle — Danemann
19. Lyceum — stagira, see if picture of; see if pic. of
20. Theophrastus — Hope
21. Museum of Alexandria ?
22. Herophilus Erasistratus — see Hope
23. Pergamos — Hope — Done several
24. Galen portrait — Hope
25. ~~Junta Edition of Galen's works~~
26. Galenic circulation from Vesalius — Done

ILLUSTRATIONS TO LECTURE III.

Picture of Salernum — Hope Coll

Incipit of 1480 edition of the Regimen Sanitatis — my own

The Vienna Dioscorides — Bodleian

Map of Greeco-Roman Christian world at beginning of 7th century — Prof. Herbert

Map showing Arabian world in 9th century

Honein, or Joannitius' 'Isagoge'. — 1st Ed. — Bodley

Almansor of Rhazes — Portrait — Hope

Avicenna

Canon of Avicenna MS. — title page — mine

MS. of one of Avicenna's poems. — Bodley

~~Early edition of Canon~~

Tomb of Avicenna — Ch. Ch. Jacksons Book — Bodley

~~Portrait. Hope Coll.~~

~~MS. of Constantinus Africanus, or the Pantegni~~ — Bodley

Mundinus' Anatomy — title page 1478

" as Lecturer

" Monument

" Inscription

De Mondeville's Pathology

~~Pierre d'Abano - page of the Problems~~

Thesaurus Pauperum - page

~~A Prognosticon of Rabelais, if possible~~

Jerome Cardan's own Horoscope

Nicholas Culpepper - frontispiece.

Roger Bacon — Portrait — Hope

Title pg. De Erroribus [see list, Lect IV.

Albertus Magnus - Portrait — Hope

" "

Prognosticon

~~Cardan's Horoscope~~

~~Nich. Culpepper~~

ILLUSTRATIONS TO LECTURE VIV.

Roger Bacon — Portrait [See Hope Collection
Title-page of the "De Erroribus Medicorum.
Bodley 438, F 22b - 28.

Linacre — See Hope (or my pamphlet. — Bodley
Conrad Gesner — " or collected works.

Paracelsus — Portrait (Stoddart, Hope.)
. . . . . Chirurgia Magni

Sir K.Digby — Powder of Sympathy — pamphlets.

(Van Helmont — Ortus Medicinae
(Vesal — another
Copernicus .. Hope Collection - - - - - - — Bodley
Vesal — Portrait — Bodley.
Tabulae Sex. Bodleian
" " Plates of Liver and Heart
Cut of Title page
Epitome at B.M. — BM Prideaux X
Picture of blood vessels
" ~~of muscles~~ X
. . . . . Skeleton at Basel

Henri de Mondeville's cut of anatomy of body — Photo. for Mr Payne — Bodley
(Cut in Bodley Librarian's treatise on Medical Anatomy) X

Theatine Hopital, Venice.

(Leonardo da Vinci - figure of spine
(" of bones of feet
Michael Angelo. Anatomical Sketch. Ashmolean X — Ashmole

Fabricius - valves of veins
Two figures.

Harvey's shield
" portrait (Ask Power for Bright's) as Ver X
Notes
Frontispiece De Motu Cordis
Sanctorius in his Balance.

Page of Basil Valentine

Padua. Look up University Hist. in Bodleian. History of the — Bodley.
1. Pict. of old Town.
2. " Lecture Theatre.
3. " Quad. — Bodley

Descartes — Hope collection — " Hope
Gennertus — F. Sylvius Hope Coll. — " Hope
Robert Boyle — " " — " "

ILLUSTRATIONS TO LECTURE V.

Benevenini, 1506 Ed. B.M. ordered

done Morgagni — Title-page
portrait- young, Adversaria
" old , Hope Coll.

Sydenham — "

Boerhaave — My copy

Haller (Van Smieten) — Hope Coll.

Lancisi — "

Baglivi — "

Rutherford — "

Cullen — "

John Browne — "

Benjamin Rush — "

John Hunter — "

Edward Jenner, Portrait
1798 Edit.
Sarah Nelme's hand

Corvisart — French Faculty

Auenbrugger — Manual

Bichat — French Faculty

Laennec — Portrait — " "
Title page - mine.

Pasteur — Portrait — Hope Coll.
Lille Scient. Soc. 1857
Dôle, picture of

Robt. Koch, Portrait
out there — Etiology of Anthrax
" of Wound Infections, figure

Lister. — Mine.

out there — Lancaran (Practitioner London, 1901. Vol. 66.)
there — Schaudinn. Zool. Anz. Jena. 1906, Vol. 30.

Bailey

1853

12 pt caps

MOTTOES. (for inside of Order Title page.)

7a

But on that account, I say, we ought not to reject the ancient Art, as if it were not, and had not been properly founded, because it did not attain accuracy in all things, but rather, since it is capable of reaching to the greatest exactitude by reasoning, to receive it and admire its discoveries, made from a state of great ignorance, and as having been well and properly made, and not from chance. (Hippocrates, On Ancient Medicine, Adams, Edition Vol.1. 1849)

The true and Lawful goal of the sciences is none other than this - that human life be endowed with new discoveries and powers. (Francis Bacon, Novum Organon.)

A golden thread has run through the history of the world, consecutive, continuous,- the work of the best men in successive ages. From point to point it still runs, and when near you feel it as the clear and bright and searchingly irresistible light which Truth throws forth when great minds conceive it. (Walter Moxon, Pilocerus Similis.)

For the mind depends so much on the temperament and disposition of the bodily organs that, if it is possible to find a means of rendering men wiser and cleverer than they have hitherto been, I believe that it is in medicine that it must be sought. It is true that the medicine which is now in vogue contains little of which the utility is remarkable; but, without having any intention of decrying it, I am sure that there is no one, even among those who make its study a profession, who does not confess that all that

7b

men know is almost nothing in comparison with what remains to be known; and that we could be free of an infinitude of maladies both of body and mind, and even also possibly of the infirmities of age, if we had sufficient knowledge of their causes, and of all the remedies with which nature has provided us.

(Descartes; Discourse on the Method ... Translated by E.S.Haldane and G.R.T.Ross. (Cam.Univ.Press, 1911.) Pg. 120.

~~LECTURE~~ I.

INTRODUCTION. Sail to the Pacific with some Ancient Mariner, and traverse day by day that silent sea until you reach a ~~spot~~ region never before furrowed by keel from which a tiny island, a mere speck on the vast ocean, has just risen from its depths, a little coral reef capped with green, ~~This~~ Atoll, a mimic earth, fringed with life, ~~and~~ through countless ages built up by life on life that has passed away- And now with wings of fancy ~~mount with with~~ join Ianthe in the magic car of Shelley, pass the eternal gates of the flaming ramparts of the world and see his vision:-

"Below lay stretched the boundless Universe!
There, far as the remotest line
That limits swift imagination's flight,
Unending orbs mingled in mazy motion
Immutably fulfilling
Eternal Nature's laws,
Above, below, around,
The circling systems formed
A wilderness of harmony."

and somewhere, "as fast and far the chariot flew" amid the mighty globes would be seen a tiny speck, "earth's distant orb" one of "the smallest lights that twinckle in the heavens." Alighting, Ianthe would find something she had probably not seen elsewhere in her magic flight - life, everywhere encircling the sphere. And as the little coral reef out of a vast depth had been built up by generations of polyzoa, so she would see that on the earth ~~itself~~ thro' illimitable ages successive generations of animals and plants had ~~lived and~~ left on stone their imperishable records: and at the top of the series she would meet the thinking, breathing creature known as man.

Infinitely little as is the architect of the atoll ~~reef~~ in proportion to the earth on which it rests, the polyzoon, I doubt not, is much larger relatively than is man in ~~relation~~ proportion to the vast systems of the Universe, in which he represents an ultra-microscopic atom less ten thousand times than the tiniest of the "gay motes that people the sunbeams" Yet with colossal audacity this thinking atom regards himself as the ultro-poceulric pivot around which revolve the eternal purposes of the Universe! Knowing not whence he came, why he is here, or whither he is going, man ~~really~~ feels himself of supreme importance, and certainly is of interest - to himself. Let us hope ~~too~~ that he has indeed a potency and importance out of all proportion to his ~~relative~~ somatic in significance. We know of toxins of such strength that an amount too infinitessimal to be guaged may kill, and we know that "the unit adopted in certain scientific work is the amount of emanation produced by one million-millionth of a grain of radium, which itself has a volume of less than a million-millionth of a cubic millimetre and weighs a million million times less than an exceptionally delicate chemical balance will turn to." (Soddy) ~~Man~~ May not Man be the radium of the Universe? At any rate let us not worry about his size. For us he is a very potent creature, full of interest, whose mundane story we are only beginning to unravel.

That you may properly realize the position of Greek medicine. I must first say a few words on primitive medicine and on its position ~~with regard to~~ in Egypt and Babylonia.

Civilization is but a filmy fringe on the history of man. Go back as far as his records carry us, and the story written on stone is of yesterday in comparison with the vast epochs of time which modern studies demand for his life on the earth. For two millions (some hold even three millions) of years man lived ~~and moved and has his being~~ in a world very different from that upon which we look out. There appear, indeed, to have been various types of man, some as different from us as we are from the anthropoid apes. What upstarts of yesterday are the Pharaohs in comparison with the men who survived the tragedy of the glacial period! The ancient history of man - only now beginning to be studied - dates from the Pliocene or Miocene period, the modern history, as we know it, embraces that brief space of time that has elapsed since the earliest Egyptian and Babylonian records were made. This has to be borne in mind in connection with the present mental status of man, particularly in his outlook upon nature ~~and upon disease~~. In ~~his~~ thoughts and ~~in his~~ attributes mankind at large is controlled by inherited beliefs and impulses, which countless thousands of years have ingrained like instinct. Over vast regions of the earth today magic, amulets, charms, incantations, are his chief weapons of defence against a malignant nature and as to disease. The practice of Asa is a comparatively novel and unusual ~~procedure~~, and in days of illness many millions more still seek their gods rather than their physicians. In an upward path man has had to work out for himself a relationship with his fellows and with nature. He sought in

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the supernatural an explanation of the pressing phenomenon of life, peopling the world with spiritual beings, deifying objects of nature, and assigning to them benign or malign influences, which might be invoked, or propitiated. Primitive priest, physician and philosopher grew up together, struggling, on the one hand, for the recognition of certain practises forced on him by experience, and on the other for the recognition of mystical agencies which control the dark uncharted region about him - to use Professor Gilbert Murray's phrase - and were responsible for everything he could not understand, and particularly for the mysteries of disease. Pliny remarks that physic "was early fathered upon the gods", and to the ordinary non-medical mind there is still something mysterious about sickness, something outside the ordinary standard.

~~Modern anthropologists claim that~~ Both religion and medicine took origin in magic, "that spiritual protoplasm" as Miss Jane Harrison calls it. To primitive man magic was the setting in motion of a spiritual power to help or to hurt the individual, ~~and in its primitive forms it may still be studied in the native races.~~ Early This power, or 'mana' as it is called, while possessed in a certain degree by all, may be increased by practice, and certain individuals come to possess it very strongly: among native Australians today it is still deliberately cultivated. Magic in healing seeks to control the demons, or forces, causing disease, and in a way it may be this regarded as a "lineal ancestor of modern science" (Whetham), which, too, seeks to control certain forces no longer, however, regarded as supernatural.

A 3

Primitive man recognized many of those superhuman agencies relating to disease, such as the spirits of the dead, either human or animal, independant disease demons, or individuals who might act by controlling the spirits or agencies of disease. ~~We see this today among the negroes of the Southern States.~~ A Hoodoo put upon a negro may, if he knows of it, work upon him so powerfully through the imagination that he becomes very ill ~~in-~~ deed, and ~~it is~~ only through a more powerful magic exercised by someone else that can the Hoodoo ~~can~~ be taken off.

~~To primitive man, as to Marius the Epicurean,~~ To him life seemed "full of sacred presences" ("Pater") connected with objects in nature, or with incidents and epochs in life, which he began early ~~the practice of~~ to deifying ~~those~~, so that ~~his story~~ his story until a quite recent period is largely associated with a pantheon of greater and lesser gods, which he has manufactured wholesale. Xenophanes ~~was the earliest~~ philosopher to recognize man's practice of making gods in his own image and endowing them with human faculties and attributes: the Thracians, he said, made their gods blue-eyed and red-haired, the Ethiopians, snub-nosed and black, while he said, if oxen and lions and horses had hands and could draw, they would represent their gods as oxen and lions and horses. In relation to disease ~~then~~, all through early history we find this a pantheon full to repletion, bearing testimony no less to the fertility of man's imagination than to the hopes and fears which led him, in his exodus from barbarism, to regard his gods as "pillars of fire by night, and pillars of cloud by day".

Even so late a ~~The~~ religion as that of Numa was full of little gods to be invoked on special occasions - Vatican, who causes the infant to utter his first cry, Fabulinus, who prompts his first word, Cuba, who keeps him quiet in his cot, Domiduca, who watches over one's safe home-coming (Walter Pater), and ~~King~~ Numa ~~is said to have~~ believed that all diseases came from the gods and were to be averted by prayer and sacrifice. Besides the major gods, representatives of ~~as~~ Apollo, Aesculapius and Minerva, there were scores of lesser ones who could be invoked for special diseases. It is said that the young Roman mother might appeal to no less than fourteen goddesses, from Juno Lucina to Prosa and Portvorta (Withington). Temples were erected to the Goddess of Fever, and she was much invoked. There is extant a touching tablet erected by a mourning mother and inscribed:-

11 pt

Febri divae, Febri
Sanctae, Febri magnae
Camillo amato pro
Filio meli effecto. Posuit.

It is marvellous what a long line of superhuman powers, major and minor, man has invoked against sickness. ~~In Swinburne's words:-~~

11 pt

"God by God flits past in thunder till his glories turn to shades
God by God bears wondering witness how his Gospel flames & fades
More was each of these, while yet they were, than man their servant seemed;
Dead are all of these, and man survives who made them while he dreams."

Most of them have been benign and helpful gods. Into the dark chapters relating to demonical possession and to witchcraft we cannot here enter. ~~They make one cry out with Lucretius :-~~

"O genus infelix humanum, talis divis
Cum tribuit facta atque iras adjunxit acerbas'.
Quantus tum gemitus ipsi tibi, quanta nobis
Vulnera, quos lacrimas peperere minoribu' nostris."

In every age, and in every religion there has been justification for ~~his bitter words "tantum religio potuit suadere malorum~~" - "Such wrongs Religion in her train doth bring" - yet, one outcome of ~~this~~ 'a belief in spiritual beings' - as Tylor defines religion - has been that man has built an altar of righteousness in his heart. The comparative method applied to the study of his religious growth have shown how man's thoughts have widened in the unceasing purpose which runs through his spiritual no less than his physical evolution. Out of the spiritual protoplasm of magic has evolved philosopher and physician, as well as priest. Magic and religion control the unchartered sphere - the supernatural, the superhuman -: science seeks to know the world, and through knowing, to control it. Ray Lankester remarks that Man is Nature's rebel, and goes on to say: "The mental qualtities which have developed in Man, though traceable in a vague and radimentary condition in some of his animal associates, are of such an unprecedented power and so far dominate everything else in his activities as a living organism, that they have to a very large extent, if not entirely, cut him off from the general operation of that process of Natural Selection and survival of the fittest which up to their appearance had been the law of the living world. They justify the view that man forms a new departure in the gradual unfolding of Nature's predestined scheme. Knowledge, reason, self-consciousness, will, are the attributes of Man."[1]

[1] Sir E.Ray Lankester; Romanes Lecture, 1905, pg.21, Oxf.Pr.

It has been a slow and gradual growth, and not until within the past century. Now science - organized knowledge - has searched out the secrets of Nature, and as to control her powers, limit her scope, and transform her energies. The victory is so recent that the mental attitude of the race is not yet adapted to the change. A large proportion of our fellow creatures still regard Nature as a playground for demons and spirits to be exorcised or invoked.

Side by side, as substance and shadow - in the dark backward and abysm of time, in the dawn of the great civilizations of Egypt and Chaldea, in the bright morning of Greece, and in the full noon-tide of modern life, together have grown up these two diametrically opposite views of man's relation to Nature, and more particularly of his personal relation to the agencies of disease.

The purpose of this course of lectures is to sketch the main features of the growth of these two dominant ideas, to show how they have influenced man at the different periods of his evolution, how the lamp of reason, so early lighted in his soul, burning now bright, now dim, has never, even in his darkest period, been wholly extinguished, but retrimmed and refurnished by his indomitable energies, now shines more and more towards the perfect day. It is a glorious chapter in history, in which those who have eyes to see may read the fulfilment of the promise of Eden, that one day man should not only possess the earth, but that he should have dominion over it! I propose to take you an airplane flight - through the centuries, touching only on the peaks from which you may get a panoramic view of the epochs through which we pass

~~INTRODUCTION~~.

Origin of Medicine. italic

Practical Medicine arose out of the primal sympathy of man with man; out of the desire to help those in sorrow, need and sickness. ~~As Wordsworth puts is:-~~

11 pt

"In the primal sympathy
Which having been must ever be;
In the soothing thoughts that spring
Out of human suffering."

The instinct of self-preservation, the longing to relieve a loved one, and above all the maternal passion - for such it is - ~~for the offspring~~ gradually softened the hard race of man - ~~tum genus humanum primum mollescere coepit~~. In ~~that~~ his marvellous sketch of the evolution of man nothing illustrates nore forcibly the prescience of Lucretius than ~~his~~ the picture of the growth of sympathy: "When "with cries and gestures they taught with broken words that 'tis "right for all men to have pity on the weak". I heard the well-known medical historian, the late Dr. Payne, remark that "the basis

of medicine is sympathy, and the desire to help others, and whatever is done with this end must be called medicine".

The first lessons came to primitive man by injuries, accidents, bites of beasts and serpents, perhaps for long ages not appreciated by his child-like mind, but little by little such experiences crystallized into useful knowledge. The experiments of nature made clear to him the relation of cause and effect, ~~and while~~ but it is not likely, as Pliny suggests, that he picked up his earliest knowledge from the observation of certain practices in animals, as the natural phlebotomy of the plethoric hippopotamus, or the use of emetics from the dog, or ~~of enemata from the~~ On the other hand, ~~it is very probable that~~ Celsus is probably right in his account of the origin of rational medicine. "Some of the sick on account of their eagerness took food on the first day, some on account of loathing abstained; and the disease in those who refrained was more relieved. Some ate during a fever, some a little before it, others after it had subsided, and those who had waited to the end did best. For the same reason some at the beginning of an illness used a full diet, others a spare, and the former were made worse. Occurring daily such things impressed careful men, who noted what had best helped the sick, then began to prescribe them. In this way medicine had its rise from the experience of the recovery of some, of the death of others, distinguishing the hurtful from the salutary things." (Book I).

Observation came, and with it an ever widening experience. No society so primitive without some evidence of the existence of a healing art, which grew with its growth, and became part of the fabric of its organization.

The association of ideas was suggestive - the plant cyclamen was used for centuries in diseases of the eye because a black spot in the flower suggested the pupil of the eye; the old herbals are full of similar illustrations upon which indeed the so-called doctrine of signatures depends.

PRIMITIVE MEDICINE.

With primitive medicine, as such, I cannot deal at I must refer to

The oldest existing evidence of ~~a primitive medicine is of~~ a very extraordinary ~~character~~ practice, that ~~and relates to the practice~~ of trephining. Neolithic skulls with disks of bone removed have been found in nearly all parts of the world. Many careful studies have been made of this prodedure, particularly by the great anatomist and surgeon Paul Broca, ~~whose book on the subject is entitled~~ "and M.Lucas-Champonnière has recently published a monograph, "Trépanation néolithique, Paris, 1912. Broca suggests that the trephining was done by scratching or scraping, but it is more likely, as Lucas-Champonnière holds, that it was done by a series of perforations made in a circle with flint instruments, and a round piece of skull in this way removed; traces of these drill-holes have been found. The operation was done for epilepsy, infantile convulsions. headache, and various cerebral diseases believed to be caused by confined demons, to whom the hole gave a ready method of escape.

The practice is still extant, and Lucas-Champonnière saw a Kabyle thoubib who told him that it was quite common among his tribe; he was the son of a family of trephiners, and had undergone the operation four times, his father 12 times; he had three brothers also experts; he did not consider it a dangerous operation. He did it most frequently for pain in the head, and occasionally for fracture. The operation was sometimes performed upon animals, and shepherds trephined sheep for the staggers, so that we may say that the modern decompression operation, so much in vogue, is the oldest known surgical prodedure.

THE EVOLUTION OF SCIENTIFIC MEDICINE

EGYPTIAN MEDICINE.

Out of the ocean of oblivion man emerges in history in a highly civilized state on the banks of the Nile some sixty centuries ago. After millenia of a gradual upward progress, which can be traced in the records of the stone age, civilization springs Minerva-like, complete, and highly developed, in the Nile valley. In this sheltered, fertile spot, neolithic man first raised himself above his kindred races of the Mediterranean basin, and it is suggested that by the accidental discovery of copper Egypt "forged the instruments that raised civilization out of the slough of the Stone Age". (Elliot Smith.) However this may be, special interest to us lies in the fact that one of the best known names of this earliest period is that of a physician - guide, philosopher and friend of the King - a man in a position of wide trust and importance.

Leaving Cairo, one sees on the right in the desert behind Memphis a terraced pyramid 190 feet in height, "the first large structure of stone known in history" It is the royal tomb of Zozer, the first of a long series with which the Egyptian monarchy sought "to adorn the coming hall of death". The design of this is attributed to Imhotep, the first figure of a physician to stand out clearly from the mists of antiquity. "In priestly wisdom, in magic, in the formulation of wise proverbs, in medicine and architecture, this remarkable figure of Zozer's reign left so notable a reputation that his name was never forgotten, and 2500 years after his death he had become a God of Medicine, in whom the Greeks

who called him Imonthes, recognised their own Aesculapius"[3](i). He became a popular god, not only healing men when alive, but taking good care of them in the journeys after death.

The facts about this medicinae primus inventor, as he has been called, may be gathered from Kurt Sethe's study.[4](ii) He seems to have corresponded very much to the Greek Asklepios. As a god he is met with comparatively late, between 700 and 332 B.C. Numerous bronze figures of him remain. The oldest memorial mentioning him is a statue of one of his priests, Amasis, (No.14765 in the British Museum) Ptolemy V. dedicated to him a temple in the Island of Philae. His cult increased much in later days, and a special temple was dedicated to him near Memphis. Sethe suggests that the cult of Imhotep gave the inspiration to the Hermetic literature. The association of Imhotep with the famous temple at Edfu is of special interest.

(i)[3] Breasted: History of Ancient Egyptians.

(ii)[4] K.Sethe: "Imhotep, der Asklepios der Aegypter", Leipzig,1912.

Behind the Greeks stood the two great civilizations of Egypt and Phoenicia. What did they do for medicine?

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~~Ptolemies a small temple was erected to his honour at Philae.~~

Egypt became the centre from which civilization spread to the other peoples of the Mediterranean basin. ~~Egyptian views upon disease and its cure influenced profoundly the practice of medicine of the older civilizations of the Mediterranean basin.~~ To be learned in all the wisdom of the Egyptians' meant the possession of all knowledge, ~~and in many directions~~ We must come to the land of the Nile for the origin of many of man's most distinctive and highly cherished beliefs. ~~We have here not only~~ Not only is there a magnificent material civilization, but, in its records so marvellously preserved in stone we may see, as in a glass, here brightly, there darkly, the picture of man's search after righteousness, the earliest impressions of his moral awakening, the beginnings of the strife in which he has always been engaged for social justice, and for the recognition of the rights of the individual. But above all, ~~the Egyptians developed~~ earlier and more strongly than any other people was developed the faith that looked through death, ~~and~~ to which to this day the noblest of their monuments bear an enduring testimony. With all this it is not surprising to find a growth in the knowledge of practical medicine.

But Egyptian civilization illustrates how crude and primitive may remain a knowledge of disease when conditioned by erroneous views of its nature. ~~Medicine~~ never became fully dissociated from religion ~~and~~ At first the priest and physician were identified. Only in the later periods did a special group of physicians arise, who were not members of priestly colleges.[5] Maspero states ~~(i)~~ that the Egyptians believed that disease and death were not natural and inevitable, but caused by some malign influence which could

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[5] Foot note
"Life in Ancient Egypt", London, 1892, Pg. 118.
Maspero:

I

use any agency, natural, or invisible. Very often it belonged to the invisible world. - "Often though, it belongs to the " invisible world, and only reveals itself by the malignity of " its attacks; it is a god or spirit, the soul of a dead man, " that has cunningly entered a living person, or that throws it- " self upon him with irresistible violence. Once in possession " of the body, the evil influence breaks the bones, sucks out " the marrow, drinks the blood, gnaws the intestines and the heart " and devours the flesh. The sick man perishes according to the " progress of this destructive work, and death speedily ensues " unless the evil genius can be driven out of it before it has " committed irreparable damage. Whoever treats a sick person has " therefore two equally important duties to perform. He must " first discover the nature of the spirit in possession, and if " necessary its name, and then attack it, drive it out, or even " destroy it. He can only succeed by powerful magic, so he must " be an expert in reciting incantations and skilful in making " amulets. He must then use medicine (drugs and diet) to con- " tend with the disorders which the presence of the strange being " have produced in the body." (6)

~~In this way it came about that~~ diseases were believed to be due to hostile spirits, or caused by the anger of a god, so that medicines, no matter how powerful, could only be expected to assuage the pain; but magic alone, incantations, spells and prayers, could remove the disease. Experience brought much of the wisdom we call empirical, and the records, extending for thousands of years, show that the Egyptians were employing emetics, purgatives, enemata, diuretics, diaphoretics and

(6) Maspero: Life in Ancient Egypt. London 1892. p.118

even bleeding. They had a rich pharmacopoeia derived from the animal, vegetable and mineral kingdoms.
In the later periods specialism reached a remarkable development, and Herodotus remarks that the country was full of physicians;- "One treats only the diseases of the eye, another those of the head, the teeth, the abdomen, or the internal organs".

Our knowledge of Egyptian medicine is derived largely from the the remarkable papyri dealing specially with this subject. These are six or seven of the first importance. Of these the most famous is that discovered by Ebers, and which dates from about 1500 B.C. It is a superb document - one of the great treasures of the Leipzig library - it is in length, and in a state of wonderful preservation.
Others are the Berlin, Kahun, Hearst and British Museum papyri. All of these have now been published - the last two quite recently, edited by Wreszinski.(1) I show here a reproduction from which you can get an idea of those remarkable documents. They are motley collections, filled with incantations charms, magical formulae, symbols, prayers and prescriptions for all sorts of ailments. One is impressed by the richness of the pharmacopoeia, and the high development which the art of pharmacy must have attained. There were gargles, salves,, snuffs, inhalations, suppositories, fumigations, enemata, poultices and plasters; and they knew the use of opium, hemlock, the copper salts, squills and castor iol. Surgery was not very highly developed, but the knife and actual cautery were freely used.

(1) Leipzig, J.C.Hinrichs-sche Buchhandlung, 1912.

Ophthalmic surgery was practised by specialists, and there are many prescriptions in the papyri for ophthalmia.

One department of Egyptian medicine reached a high stage of development, viz.- hygiene. Cleanliness of the dwellings, of the cities and of the person were regulated by law, and the priests set a splendid example in their frequent ablutions, shaving of the entire body, and the spotless cleanliness of their clothing. As Diodorus remarks, so evenly ordered was their whole manner of life that it was as if arranged by a learned physician rather than by a law-giver.

Two world-wide modes of practice found their earliest illustration in ancient Egypt. Magic represented the attitude of primitive man to nature, and really was his religion. He had no idea of immutable laws, but regarded the world about him as changeable and fickle as himself, and "to make life go as he wished, he must be able to please and propitiate, or coerce those forces outside himself."[8](i)

The point of interest to us is that in the pyramidal texts - "the oldest chapter in human thinking preserved to us, the remotest reach in the history of man which we are now able to discern"[9](ii) one of their six-fold contents relates to the practice of magic. A deep belief existed as to its efficacy, particularly in guiding the dead, which were said to be glorious by reason of mouths equipped with the charms, prayers and ritual of the Pyramid texts, armed with which alone could the soul escape the innumerable dangers and ordeals of the passage through another world. And man has never yet lost his belief in the efficacy of magic, in the widest sense of the term. Only a very few of the most intellectual nations have escaped from its shackles. Nobody has so clearly expressed the origins and relations of magic as Pliny in his Natural History.[10](iii) "Now if a man consider the thing

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(i) [8] Thorndyke, "The Place of Magic in the Intellectual History of Europe". New York, 1905.

(ii) [9] Breasted, "Development of Religion & Thought in Ancient Egypt". 1912.

(iii) [10] History of the World, commonly called the Natural History of C.Plinius Secundus, translated into English by Philemon Holland Doctor of Physicke, London 1601. TomeII. Pg.371.

"no marvaile it is that it hath continued thus in so great re-
"quest and authoritie; for it is the onely Science which seemeth
"to comprise in it self three possessions besides, which have the
"command and rule of man's mind above any other whatsoever. For,
"to begin withall, no man doubteth but that Magicke tooke root
"first, and proceeded from Physicke, under the pretence of main-
"taining health, curing and preventing diseases: things plausible
"to the world , crept and insinuated further into the heart of man
", with a deep conceite of some high and divine matter therein
"more than ordinarie, and in comparison whereof, all other Physicke
"was byt basely accounted. Anf having thus made way and entrance,
"the better to fortifie it selfe, and to give a goodly colour and
"lustre to those fair and flattering promises of things, which our
"nature is most given to hearken after, on goeth the habite also
"and cloake of religion; a point, I may tell you, that even in
"these daies holdeth captivate the spirit of man, and draweth away
"with it a greater part of the world, and nothing so much. But
"not content with this successe and good prodeeding, to gather
"more strength and win a greater name, shee intermingled with d
"medicinable receipts and religious ceremonies, the skill of As-
"trologie and arts mathematicall; presuming upon this, That all
"~~all~~ men by nature are very curious and desirous to know their
"future fortunes, and what shall betide them hereafter, persuad-
"ing themselves, that all such fore-knowledge dependeth upon the
"course and influence of the starres, which give the truest and
"most certain light of things to come. Being thus wholly poss-
"essed of men, and having their senses and understanding by this
"meanes fast ynough bound with three sure chains, no marvell if

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"this art grew in prodesse of time to such an head, that it was
"and is at this day reputed by most nations of the earth for
"the paragon and cheefe of all sciences: insomuch as the mightie
" kings and monarchs of the Levant are altogether rules and gov-
" erned thereby".

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The second world-wide practice which finds its earliest record among the Egyptians is the use of the secretions and parts of the animal body as medicine. The practice is one of great antiquity among primitive man, but the papyri already mentioned contain the earliest known records. Saliva, urine, bile, faeces, various parts of the body, dried and powdered, worms, insects, snakes were important ingredients in the pharmacopoeia. The practice became very widespread throughout the ancient world, and its extent and importance may be best gathered from chapters VII and VIII in the 28th book of Pliny's Natural History. Several remedies are mentioned as derived from man; others from the elephant, lion, camel, crocodile and some 79 are prepared from the Hyaena. The practice was widely prevalent throughout the Middle Ages, and the pharmacopoeia of the 17th and even of the 18th century contains many extraordinary ingredients. ~~From~~ The Royal Pharmacopoeia of Moses Charras (Lond Ed. 1678) the most scientific work of the day is full of organotherapy & directions for the preparation of medicines from the most loathsome excretions

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A curious thing is that with the discoveries of the mummies a belief arose as to the great efficacy of pawdered mummy in various maladies, and Sir Thomas Browne remarks in his "Urn Burial" "Mummy has become merchandize. Mizraim cures wounds, and Pharaoh is sold for balsam".

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One formula in everyday use has come to us in a curious way from the Egyptians. In the Osiris myth the youthful Horus loses an eye in his battle with Set, and this eye, the symbol of sacrifice, became, next to the sacred beetle, the most common talisman of the country, and all Museums are rich in models of the Horus eye in glass or stone. (i)

" When Alchemy, or chemistry, which had its cradle in Egypt, "and derived its name from Khami, an old title for this country, " passed to the hands of the Greeks, and later of the Arabs, this "sign passed with it. It was also adopted to some extent by "the Gnostics of the early Christian Church in Egypt. In a "cursive form it is found in the mediæval translations of the "works of Ptolemy the astrologer (i) as the sign of the planet "Jupiter. As such it was placed upon horoscopes and upon for- "mulae containing drugs made for administration to the body, so "that the harmful properties of these drugs might be removed "under the influence of the lucky planet. At present, in a "slightly modified form, it still figures at the top of pre- "scriptions written daily in Great Britain (R). "

" (i) Ptolemæi de Praedictio Astronomi Tetrabiblos, 1645. "

(i) John D. Comrie, "Medicine among the Assyrians and Egyptians in 1500 B.C." Pg.21. Edin. Med. Jour. Feb. 1909.

~~EGYPTIAN MEDICINE.~~

For centuries Egyptian physicians had a great reputation, and in the Odyssey (Bk.IV, 229) Polydamna, the wife of Thonis, gives medicinal plants to Helen in Egypt - " a country producing an infinite number of drugs . . . where each physician possesses knowledge above all other men." (quote from Chapman) Jeremiah refers to the virgin daughter of Egypt, who should in vain use many medicines. Herodotus tells that Darius had at his court certain Egyptians, whom he reckoned the best skilled physicians in all the world, and he makes the interesting statement that "Medicine is practised among them on a plan of "separation; each physician treats a single disorder, and no more: "thus the country swarms with medical practitioners, some under- "taking to cure diseases of the eye, others of the head, others "again of the teeth, others of the intestines, and some those which "are not local."[13] ~~(i)~~

A remarkable statement is made by Pliny, inthe discussion upon the use of radishes, which are said to cure a'phthysik', or ulcer of the lungs - "a proofe whereof was found and seen in Egypt by occasion that the KK. there, caused dead bodies to be cut up, and anatomies to be made, for to search out the maladies whereby men died".[13] ~~(ii)~~

~~(i)~~ The Hist. of Herodotus, Bk.II. parag.84. Blakeney's Ed.

~~(ii)~~[13] Nat. Hist. of Pliny, Bk.XIX, ~~xx~~.Chap.V.

EGYPT.

The study of the anatomy of mummies has thrown a very interesting light upon the diseases of the ancient Egyptians, one of the most prevalent of which appears to have been osteo-arthritis. This has been studied by Elliot-Smith, Wood Jones, and Ruffer & Rietti. The majority of the lesions appear to have been the common osteo-arthritis, which involved not only the men, but many of the pet animals kept in the temples. In a much higher proportion apparently than in modern days the spinal column was involved. It is interesting to note that the "determinative" of old age in hyeroglyphic writing is the picture of a man afflicted with arthritis deformans. Evidences of tuberculosis, rickets and syphilis, according to these authors, have not been found.

A study of the internal organs has been made by Ruffer, who has shown that arterio-sclerosis with calcification was a common disease 3,500 years ago; and he holds that it could not have been associated with hard work or alcohol, for the ancient Egyptians did not drink spirits, and they had practically the same hours of work as modern Egyptians, with every seventh day free.

ASSYRIA + Babylonian Medicine

Of even greater importance in the evolution of medicine was the practically comtemporary civilization in Mesapotamia. Science here reached a much higher pitch than in the valley of the Nile. An elaborate scheme of the universe was devised, a system growing out of the Divine Will, and a recognition for the first time of a law guiding and controlling heaven and earth alike. Here too we find Medicine ancillary to Religion. Disease was due to evil spirits or demons. "~~These "demons"~~ - (1)

(2) invisible to the naked eye - were the precursors of the modern "germs" and "microbes", while the incantations recited by the priests are the early equivalents of the physician's prescriptions. There were different incantations for different diseases; and they were as mysterious to the masses as are the mystic formulas of the modern physician to the bewildered, yet trusting patient. Indeed, their mysterious character added to the power supposed to reside in the incantations for driving the demons away. Medicinal remedies accompanied the recital of the incantations, but despite the considerable progress made by such nations of hoary antiquity as the Egyptians and Babylonians in the diagnosis and treatment of common diseases, leading in time to the development of an extensive pharmacology, so long as the cure of disease rested with the priests, the recital of sacred formalus, together with rites that may be conveniently grouped under the head of sympathetic magic, was regarded as equally essential with the taking of the prescribed remedies." (i)

(i) Morris Jastrow - "The Liver in Anticuity and the Beginningsof Anatomy". An Address before the Coll.of Phys. Philadelphia; Nov. 6th, 1907.

ASSYRIA + Babylonian Medicine

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(3) Three points of interest may be referred to in connection with ~~Chaldean~~ Babylonian Medicine. Our first recorded observations on anatomy are in connection with the art of divination - the study of the future by the interpretation of certain signs. The student recognised two ~~particular~~ divisions of divination - the involuntary, dealing with the interpretation of signs forced upon our attention, such as the phenomena of the heavens, dreams etc., and ~~xxx~~ voluntary divination, the seeking of signs, more particularly through the inspection of sacrificial animals. This method reached an extraordinary development among the Babylonians, and the cult spread to the Etruscans, Hebrews, and later to the Greeks and Romans.

The 2nd was the supposed influence of the heavenly bodies upon mans welfare. A belief that the stars in their course fought for or against him arose early in their investigation and directly out of their studies in ~~Sumerian~~ astrology & mathematics

The 3rd important feature in Babylonian medicine is the evidence afforded by the Hammurabi code about B.C. 2000 of a highly organized profession in which practice was regulated with great detail

e x a m i n a t i

Of all the organs inspected in a sacrificial animal the liver, from its size, position and richness in blood, impressed the early observers as the most important of the body. Probably on account of its richness in blood it came to be regarded as the seat of life - indeed the seat of the soul. From this important position the liver was not dislodged for many centuries, and in the Galenic physiology it shared with the heart and the brain in the triple control of the natural animal and vital spirits. Many expressions in the literature indicate how persistent was this belief. Among the Babylonians the word 'liver' was used in hymns and other compositions precisely as we use the word "heart', and Jastrow gives a number of illustrations from Hebrew, Greek and Latin sources illustrating this usage.

The belief arose that through the inspection of this important organ in the sacrificial animal the course of future

"mirror in which the god's mind is reflected, or, to use another "figure, a watch regulated to be in sympathetic and perfect "accord with another watch. If, therefore, one can read the "liver of the sacrificial animal, one enters, as it were, into "the workshop of the divine will."(15 i)

Hepatoscopy thus became among the Babylonians of extraordinary complexity, and the liver of the sheep was studied and figured as early as 3000 B.C. In the divination rites the lobes, the gall-bladder, the appendages of the upper lobe and the markings were all inspected with extraordinary care. The earliest known anatomical model, of which I show you a picture, is the clay model of a sheep's liver with the divination text dating from about 2000 B.C., and Jastrow has worked out the modern anatomical

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(i) 15 Morris Jastrow - "The Liver in Anticuity and the Beginnings of Anatomy". date

events could be predicted. "The life or soul, as the seat of "life, in the sacrificial animal is, therefore, the divine ele- "ment in the animal, and the god in accepting the animal, which "is involved in the act of bringing it as an offering to a god, "identifies himself with the animal - becomes, as it were, one "with it. The life in the animal is a reflection of his own "life, and since the fate of men rests with the gods, if one "can succeed in entering into the mind of a god, and thus ascer- "tain what he purposes to do, the key for the solution of the "problem as to what the future has in store will have been found. "The liver being the centre of vitality - the seat of the mind, "therefore, as well as of the emotions - it becomes in the case "of the sacrificial animal, either directly identical with the "mind of the god who accepts the animal, or, at all events, a "mirror in which the god's mind is reflected, or, to use another "figure, a watch regulated to be in sympathetic and perfect "accord with another watch. If, therefore, one can read the "liver of the sacrificial animal, one enters, as it were, into "the workshop of the divine will."(15 ~~i~~)

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(~~i~~) 15 Morris Jastrow - "The Liver in Anticuity and the Beginnings of Anatomy". date

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viii

equivalents of the Babylonian terms. To reach a decision on any point the phenomena of the inspection of the liver were carefully recorded, and the interpretations rested on a more or less natural and original association of ideas. Thus, if the gall-bladder were swollen on the right side it pointed to an increase in the strength of the King's army, and was favourable; if on the left side, it indicated rather success of the enemy, and was unfavourable. If the bile duct was long, it pointed to a long life. Gallstones are not infrequently mentioned in the divination texts and might be favourable, or unfavourable. Various interpretations were gathered by the scribes in the reference note-books which serve as guides for the interpretation of the omens and for text-books of instructions in the temple schools. (Jastrow).

The art of divination spread widely among the neighbouring nations. There are many references in the Bible to the prac- The Princes of Moab came to Balaam "with the rewards of divination in their hands". Joseph's cup of divination was found in Benjamin's sack; and in Ezekiel (xxi, 21) the King of Babylon stood in the parting of the way and looked on the liver Hepatoscopy was practiced extensively by the Etruscans, and from them it passed to the Greeks and the Romans, among whom it degenerated into a more or less meaningless superstition. But Jastrow states that in Babylonia and Assyria, where for several thousand years the liver was consistently employed as the sole organ of divination, there are no traces of the rite's having fallen into decay, or having been abused by the priests.

In Roman times Philostratus gives an account of the trial of Appolonius of Tyana[16](1) accused of human hepatoscopy by sacrificing a boy in the practice of magic arts against the Emperor. "The liver, which the experts say is the very "tripod of their art, does not consist of pure blood; for the "heart contains all the uncontaminated blood, and irrigates "the whole body with it by the conduits of the arteries; "whereas the gall, which is situated next the liver, is stim-"ulated by anger and depressed by fear into the hollows of the "liver."

The Goddess of Fever was much invoked, and there is extant a touching tablet to fever

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(1)[16] Phillimore's edition, Oxford, (Vol.II. pg. 233) 1912.

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We have seen how early and how widespread was the belief in amulets and charms against the occult powers of darkness. One that has persisted with extraordinary tenacity is the belief in the Evil Eye, the power of certain individuals to injure with a look. Of general belief in the older civilisations, and referred to in several places in the Bible, it passed to Greece and Rome, and today is still held fervently in many parts of ~~southern Italy~~ Europe. The sign of 'le corna' , the first and fourth fingers extended, the others turned down and the thumb closed over them, ~~is~~ still used against the Evil Eye in Italy, ~~and~~ was a mystic sign used by the Romans in the festival of Lemuralia. And we meet with the belief also in this country. ~~I remember~~ A child with haemiplegia, ~~whose parents were intelligent people~~ at the Infirmary for Nervous Diseases Philadelphia was believed by its parents to have from the central part of Pennsylvania, ~~and who were firmly convinced that the whole mischief had arisen from~~ had the Evil Eye cast upon it

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~~BABYLONIAN MEDICINE.~~ 32

ASTROLOGY. The second contribution of Babylonia and Assyria to Medicine,- one that affected mankind profoundly,- relates to the supposed influence of the heavenly bodies upon man's welfare. A belief that the stars in their courses fought for or against him arose early in their civilisation, and directly out of their studies on astrology and mathematics. The Macrocosm, the heavens that declare the Glory of God reflect, as in a mirror the Microcosm, the daily life of man on earth. The first step was the identification of the sun, moon and stars with the gods of the pantheon. The records of their astronomical observations show an extraordinary development of practical knowledge. The movements of the sun and moon and of the planets were studied; they knew the procession of the equinoxes and many of the fundamental laws of astronomy, and the modern nomenclature dates from their work. The twelve constellations traced in the heavens correspond practically with the signs of the zodiac - each division represented by the symbol of some god, as the Scorpion, the ram, the twins, etc. "Changes in the heavens... portended changes on earth." The Biblical expression "hosts of heaven" for the starry universe admirably reflects the conception held by the Babylonian astrologers. Moon, planets and stars constituted an army in constant activity, executing military manoeuvres which were the result of deliberation and which had in view a fixed purpose. It was the function of the priest - the bârû, or "inspector", as the astrologer as well as the "inspector" of the liver was called - to discover this purpose. In order to do so, a systen of interpretation was evolved,

less logical and less elaborate than the system of hepatoscopy, which was analysed in the preceding chapter, but nevertheless meriting attention both as an example of the pathetic yearning of men to peer into the minds of the gods, and of the influence that Babylonian-Assyrian astrology exerted throughout the ancient world." (Jastrow.)

With the rationalising influence of the Persians the hold of astrology weakened, and according to Jastrow it was this, in combination with Hebrew and Greek modes of thought, that led the priests in the three centuries following the Persian occupation, to exchange their profession of diviners for that of astronomers; and this, he says, marks the beginning of the conflict between religion and science. At first an expression of the science of the day, astrology, became a superstition, from which the human mind has not yet escaped. In contrast to divination, astrology does not seem to have made much impression on the Hebrews and definite references in the Bible are scanty. From Babylonia it passed to Greece (without, however, - and this is a curious fact - influencing Greek Medicine), and our language is rich in words of astral significance derived from the Greek, e.g. disaster.

The introduction of astrology into Europe has a special interest, but this must not detain us long. Apparently the Greeks had made important advances in astronomy before coming in contact with the Babylonians, - who, in all probability received from the former a scientific conception of the universe. † "In Babylonia and Assyria we have astrology first, and astronomy afterwards, in Greece we have the sequence reversed -

† M. Jastrow. "Religious Belief in Babylonia & Assyria" Pg.210

"astronomy first and astrology afterwards." (Jastrow (i) 18)

It is surprising to learn that previous to their contact with the Greeks astrology as relating to the individual - that is to say, the reading of the stars to determine the conditions under which the individual was born - had no place in the cult of Babylonia and Assyria. The individualistic spirit led the Greek to make his gods take note of every action in his life, and his pre-ordained fate might be read in the stars. - "A connecting link between the individual and the movements in the heavens was found in an element which they shared in common. Both man and stars moved in obedience to forces from which there was no escape. An inexorable law controlling the planets corresponded to an equally inexorable fate ordained for every individual from his birth. Man was a part of nature and subject to its laws. The thought could therefore arise that, if the conditions in the heavens were studied under which a man was born, that man's future could be determined in accord with the beliefs associated with the positions of the planets rising or visible at the time of birth or, according to other views, at the time of conception. These views take us back directly to the system of astrology developed by Babylonian bârû priests. The basis on which the modified Greek system rests is likewise the same that we have observed in Babylonia - a correspondence between heaven and earth, but with this important difference, that instead of the caprice of the gods we have the unalterable fate controlling the entire universe - the movements of the heavens and the life of the individual alike." (ii) (Jastrow) 19

(i) 18 M.Jastrow. "Religious Belief in Babylonia & Assyria" Pg. 256.

(ii) 19 M.Jastrow " " " " Pg.267-8

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From this time on, like a shadow, astrology follows astronomy until the Renaissance. Regarded as two aspects of the same subject, the one, natural astrology, corresponding to astronomy, was concerned with the study of the heavens, the other, judicial astrology, was concerned in the casting of horoscopes, and reading in the stars the fate of the individual.

As I mentioned, Greek science in its palmy days seems to have been very free from the bad features of astrology. Aristotle

(i)

In the conquest of the Roman mind astrology took a prominent share. It came to Rome as part of the great Helenising movement after the Punic Wars. The strength of its growth may be gaged from the edicts issued against astrologers as early as the middle of the second century B.C. In his introduction to the recently issued Book 2 of the Astronomicon of Manilius Garrod traces the growth of the cult, which under the Empire had an extraordinary vogue. Oracles were sought on all occasions in life, and the doctrine of the stars influences deeply the popular thought and religion. The professional astrologers, as Pliny says, were Chaldeans, Egyptians

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(ii) Pliny "Natural History", 18th Book.

and Greeks, and The Etruscans, who were the professional diviners of Rome, seem also to have cultivated the science. Many of these Isiaci Conjectores and "Astrologi de Circo" were worthless charlatans, but on the whole the science seems to have attracted the attention of thoughtful men of the period. Garrod quotes the following remarkable passage from Tacitus: "My judgement wavers," he says: " I dare not say whether it be fate and necessity immutable which governs the changing course of human affairs - or just chance. Among the wisest of the ancients, as well as among their apes, you will find a conflict of opinion. Many hold fixedly the idea that our beginning and our end - that man himself - is nothing to the Gods at all "The wicked are in prosperity and the good meet tribulation. Others "believe that Fate and the facts of this world work together. But "this connection they trace not to planetary influences but to a "concatenation of natural causes. We choose our life, -that is free: "but the choice once made, what awaits us is fixed and ordered. "Good and evil are different from the vulgar opinion of them. Often "those who seem to battle with adversity are to be accounted blessed; "but the many even in their prosperity are miserable. It needly only "to bear misfortune bravely, while the fool perishes in his wealth. "Outside these rival schools stands the man in the street. No one "will take from him his conviction that at our birth are fixed for "us the things that shall be. If some things fall out differently "from what was foretold, that is due to the deceit of men that speak "what they know not: 'calling into contempt a science to which past "and present alike bear glorious testimony." (Ann. VI. 22.) "

Manili Astronomicon Liber II. Introduction III. Pg.lxix. H.W.Garrod edidit.

The third important feature in Babylonian medicine is the evidence afforded by the famous Hammurapi Code (ca. 2000 B.C.) - a body of laws civil and religious, many of which relate to the medical profession. This extraordinary document (Fig.) is a black diorite block 8 ft. high once containing 21 columns on the obverse, 16 & 28 columns on the reverse with 2540 lines of writing of which now remain, and 1114 lines of writing,/surmounted by the figure of the king receiving the law from the Sun-god. Copies of this were set up in Babylon "that anyone oppressed or injured, who had a tale of woe to tell, might come and stand before his image, that of a king of righteousness, and there read the priceless orders of the King, and from the written monument solve his problem". (Pl.34; Jastrow) From the enactments of the code we gather that the medical profession must have been in a highly organised state, for not only was practise regulated in detail, but a scale of fees was laid down, and penalties exacted for malpraxis. Operations were performed, and the veterinary art was recognised. An interesting feature, from which it is lucky that we have in these days escaped, is the application of the 'lex talionis' - an eye for an eye, bone for a bone and tooth for a tooth, which is a striking feature of the code.

Some of the laws of the code may be quoted:-

"If a physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver.

"If it be a freed man, he shall have five shekels.

The third point of interest in Babylonian Medicine is the evidence

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Paragr.215. If a doctor has treated a gentleman for a severe wound with a bronze lancet and has cured the man, or has opened an abscess of the eye for a gentleman with the bronze lancet and has cured the eye of the gentleman, he shall take ten shekels of silver.

218. If the doctor has treated a gentleman for a severe wound with a lancet of bronze and has caused the gentleman to die, or has opened an abscess of the eye for a gentleman and has caused the loss of the gentleman's eye, one shall cut off his hands.

219. If a doctor has treated the severe wound of a slave of a poor man with a bronze lancet and has caused his death, he shall render slave for slave.

220. If he has opened his abscess with a bronze lancet and has made him lose his eye, he shall pay money, half his price.

221. If a doctor has cured the shattered limb of a gentleman, or has cured the diseased bowel, the patient shall give five shekels of silver to the doctor.

224. If a cow doctor or a sheep doctor has treated a cow or a sheep for a severe wound and cured it, the owner of a cow or a sheep shall give one sixth of a shekel of silver to the doctor as his fee.

(i) "The Oldest Code of Laws in the World"; translated by C.H.W.Johns, Edinburgh, 1903.

¶ HEBREW MEDICINE. The medicine of the ~~Bible~~ Old Testament is largely of Egyptian and Babylonian origin; the social hygiene is a reflex of regulations, the origin of which may be traced in the Pyramid texts and in the Papyri. ~~While the~~ There are ~~some~~ doubts if Pentateuch codes ~~may not~~ really go back to the days of Moses, ~~it was~~ but certainly some one 'learned in the wisdom of the Egyptians' ~~who~~ drew ~~them~~ it up. As Neuburger briefly summarises :-

"The commands concern prophylaxis and suppression of epidemics, suppression of venereal disease and prostitution, care of the skin, baths, food, housing and clothing, regulation of labour. sexual life, discipline of the people, etc. Many of these commands, such as Sabbath rest, circumcision, laws concerning food (interdiction of blood and pork), measures concerning menstruating and lying-in women and those suffering from gonorrhoea, isolation of lepers, and hygiene of the camp, are, in view of the conditions of the climate, surprisingly rational." 23 ~~(i)~~

Divination ~~which was~~ not very ~~was~~ widely practiced, was borrowed, no doubt, from Babylonia; ~~the famous~~ Joseph's Cup was used for the purpose, and in ~~the~~ Exodus the ~~nobles~~ Princes of Balak went to Balaam with the rewards of divination in their hands. The belief in enchantments and witchcraft was universal, and the strong enactments against witches in the Old Testament made a belief in them almost imperative until more rational beliefs came into vogue in the 18th & 19th centuries

23 History of Medicine. Vol I Oxford Univ. Press

In Roman times Philostratus gives an account of the trial of Apolloneus of Tyana[(i)] accused of human hepatoscopy by sacrificing a boy in the practice of magic arts against the Emperor. "The liver, which the experts say is the very tripod of their art, does not consist of pure blood; for the heart retains all the uncontaminated blood, and irrigates the whole body with it by the conduits of the arteries; whereas the gall, which is situated next the liver, is stimulated by anger and depressed by fear into the hollows of the liver."

Whatever view we may take of it, the medicine of the New Testament is full of interest. Divination has disappeared, though in the Acts there is mention of a damsel possessed of a spirit of divination. There is only one mention of astrology (Acts VII, 43) ; there are no witches, neither are there charms or incantations. The diseases mentioned are numerous: demoniac possession, convulsions, paralysis, skin diseases-as leprosy, dropsy, haemorrhages, fever, fluxes, blindness and deafness. And the cure is simple - usually a fiat of the Lord, rarely with a prayer, or with the use of means such as spittle. They are all miraculous, and the same power was granted to the apostles - 'power against unclean spirits, to cast them out, to heal all manner of sickness, and all manner of disease'. And more than this ; not only did the blind receive their sight, the lame walked, the lepers were cleansed, the deaf heard, but the dead were raised up No question of the mandate. He who went about doing good was as well as of the Soul a physician of the body, and could the rich promises of the Gospel have been fulfilled there would have been no need of a new dispensation of science. It may be because the children of this world have never

(i) Phillimore's edition, Oxford, (Vol ii .pg.233) 1912.

Only a few weeks ago the Bishop of London followed with great success, it is said, the practice of St James - without I believe calling to aid the Elders of the Church.

have never been able to accept ~~the~~ its hard sayings ~~of Christ~~ - the insistance upon poverty, upon humility, upon peace, that Christianity has lost touch no less with the practice than with the principles of its Founder. Yet all through the centuries the Church has never wholly abandoned the ~~powers of~~ the claim to apostolic healing; nor is there any reason why she should. To the miraculous there should be no time limit - only conditions have changed and nowadays to have ~~the~~ a mountain-moving faith is not easy. Still the possession is cherished, and it adds enormously to the spice and variety of life to know that men of great intelligence, for example, my good friend Dr. James J. Walsh of New York, believe in the miracles of Lourdes.[24] It does not really concern us much, -as Oritental views of disease and its cure have had very little influence on the evolution of scientific medicine - except in illustration of the persistende of an ~~mental~~ attitude towards disease always widely prevalent, and indeed increasing; Nor can we say that the medicine of our great colleague, St Luke, the Beloved Physician, whose praise as in the Gospels, differs so fundamentally from that of the other writings of the New Testament that we can claim for it, ~~as does Harnack~~ a scientific quality. The stories of the miracles ~~and the~~ have technical terms and are in a language coloured by medical phraseology, but the mental attitude towards disease is ~~tell of a Greek trained in the Aesclepiads~~, certainly not that of a follower of Hippocrates, or of a scientifically trained contemporary of Dioscorides[25] ~~a man who had been brought up in the tradition of Alexandria~~

(i) [24] Psychotherapy. New York. 1912 p 79. "I am convinced that miracles happen there. There is more than natural power manifest"

(ii) [25] See Luke the Physician by Harnack. Eng. Edition 1907 and Hobart The medical Language of St Luke. 1882

L. I

Last p. 97 before Clemens M.

Divination and astrology sore let & hindred the spiritual progress of the early Xians. Many of the fathers denounce the practice with great bitterness. St Augustine calls divination 'a formication to the soul.' The astrologer & the sorcerer shared the practice of the & with the physician, who was himself not at all unlikely to consult the stars

CHINESE MEDICINE.

Chinese medicine illustrates the condition at which a highly intellectual people may arrive, among whom thought and speculation were restricted by religious prohibitions. Perhaps the chief interest in its study lies in the fact that we may seetoday the persistence of views about disease similar to those which prevailed in ancient Egypt and Babylonia. The Chinese believe in a universal animism - all parts being animated by gods and spectres - and devils swarm everywhere in numbers incalculable. The Universe was spontaneously created by the operation of its Tao,"and composed of two sould, the Yang and the Yin; the Yang represents light, warmth life, as also the celestial sphere from which all those blessings emanate; the Yin is darkness, cold, death, and the earth, which, unless animated by the Yang, or heaven, is dark, cold, dead. The Yang and the Yin are divided into an infinite number of spirits respectively good and bad, called shen and kwei; for man and every living being contains a shen and a kwei, infused at birth, and departing at death, to return to the Yang and the Yin. Thus man and his dualistic soul is a microcosmos, born from the Macrocosmos spontaneously. Even every object is animated as well as the Universe of which it is a part."[26] (i)

In the animistic religion of China the Wu represented a group of persons of both sexes, who wielded, with respect to the world of spirits, capacities and powers not possessed by the rest of men. Many practitioners of Wu were physicians who, in addition to charms and enchantments, used death-banishing medicinal herbs. Of great antiquity, Wu-ism has changed in some ways its outward

(i) [26] Groot; Relig. System of China. Vol.IV.

aspect, but has not altered its fundamental characters.
The Wu, as exorcising physicians and practitioners of the medical art, may be traced in classical literature to the time of Confucius. In addition to charms and spells, there were certain famous poems which were repeated, one of which, by Han Yü of the T'ang epoch, had an extraordinary vogue. Groot says that the 'Ling', or magical power of this poem must have been enormous, seeing that its author was a powerful Mandarin, and also one of the loftiest intellects China has produced. This poetic febrifuge is translated in full by Groot (Pg.1054-6), and the demon of fever, potent chiefly in the autumn, is admonished to begone to the clear and limpid waters of the deep river.

In the High Medical College at Court in the T'ang Dynasty there were four classes of Masters; attached to each were two High Medical Chiefs, Masters of Medicine, of Acupuncture, or of Manipulation; and two masters for frustration by means of spells.

Soothsaying and exorcism may be traced far back to the 5th and 6th centuries B.C. ~~In times of epidemic the specialists of~~ In times of epidemic the specialists of Wu-ism, who act as seers, soothsayers and exorcists, engage in processions stripped to the waist, dancing in a frantic delirious state, covering themselves with blood by means of prick-balls, or with needles thrust through their tongues, or by sitting, or stretching themselves on nail points or rows of sword edges. In this way they frighten the spectres of disease. They are nearly all young, and are spoken of as 'divining youths', and they use an exorcising magic based on the principle that legions of spectres prone to evil live in the machine of the world.

130 ~~43~~ ~~44~~

The Chinese believe that it is the Tao, or 'Order of the Universe', which affords immunity from evil, and according to whether the birth occurred in a beneficent year, dominated by four double cyclical characters or not, the horoscope is "heavy" or "light". Those with light horoscopes are specially prone to incurable complaints, but much harm can be averted if such an individual be surrounded with exorcising objects, if he be given proper amulets to wear and proper medicines to swallow, and by selecting for him auspicious days and hours.

Two or three special points ~~in Chinese medicine~~ may be referred to. The doctrine of the pulse reached such extraordinary development that the whole practice of the art centred round its different characters. There were some scores of varieties, which in complication and detail put to confusion the complicated system of some of the old Greeco-Roman writers, ~~such as~~ The basic idea seems to have been that each part and organ had its own proper pulse, and just as in a stringed instrument each cord has its own tone, so in the human body, if the pulses were in harmony it meant health; if there was discord, it meant disease Those Chinese views reached Europe in the 17th & 18th centuries, and you will find a very elaborate description of them in Floyer's well-known book~~(i)~~ [27]. And the idea of ~~idea that~~ harmony ~~of~~ the pulse is

is met with into the 18th century

8pt – ~~(i)~~ [27] Floyer; "The Physician's Pulse Watch . etc". 1707.

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#4

Organotherapy was as extensively practised in China as in Egypt. Parts of organs, various secretions and excretions are very commonly used. One useful method of practise meached a remarkable development, viz. the art of Acupuncture, the thrusting more or less deeply into the affected part of fine needles. There are some 388 spots on the body in which acupuncture could be performed (get figure) , and so well had long experience taught them as to the points of danger that the course of the arteries may be traced by the tracts that are avoided.
They practised inoculation for smallpox as early as the eleventh century.

Even the briefest sketch of the condition of Chinese medicine leaves the impression of the appalling stagnation and sterility that may afflict a really intelligent people for thousands of years. It is doubtful if they are today in a very much more advanced condition than were the Egyptians at the time when the Ebers Papyrus was written. From one point of view it is an interesting experiment, as illustrating the state in which a people may remain who have no knowledge of anatomy, physiology or pathology.

Leave space for 1/2 page art of Acupuncture.

Early Japanese medicine has not much to distinguish it from the Chinese. ~~It was~~ at first purely theurgic; ~~and was greatly influenced by the Chinese~~ later ~~and~~ acupuncture and a refined study of the pulse characterized the practice. It has en extensive literature, largely based upon the Chinese, and extending as far back as the beginning of the Christian era. European medicine was introduced by the Portuguese and the Dutch, the physicians to whose factories were not without influence upon practice. An extraordinary stimulus was given to the belief in European medicine by a dissection made by Mayeno in 1771 demonstrating ~~that~~ the position of the organs as shown in the European anatomical tables, and proving the Chinese figures to be incorrect. The next day a translation into Japanese of the anatomical work of Kulmus was begun, and from its appearance in 1773 may be dated the commencement of reforms in medicine. In 1793 the work on Internal Medicine of De Gorter was translated, and it is interesting to know that before the so-called 'opening of Japan' many European works on medicine had been ~~translated~~ published. In 1857 a Dutch Medical School was started in Yedo. Since the political upheaval in 1868 Japan has made rapid progress in scientific medicine, and its institutions and teachers are now among the best known in the world.[28] ~~(i)~~

~~(i)~~ [28] See Geschichte der Medizin in Japan von Dr.Med. Y. Fujikawa, Tokyo, 1911.

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Lecture II.

Montreal

Chamberlain Chapter II - capes 135 47

GREEKS.

O Gracae gentis decus! let us sing with Lucretius, one of the great interpreters of Greek thought. How grand and how true is his paean, which appeals to us -

"Out of the night, out of the blinding night,
Thy beacon flashes; - hail, beloved light
Of Greece and Grecian; hail, for in the mirk
Thou dost reveal each valley and each height.
Thou art my leader, and the footprints thine
Wherein I plant my own. . . . . .

. . . . . .

The world was thine to read, and having read,
Before thy children's eyes thou didst outspread
The fruitful page of knowledge, all the wealth
Of Wisdom, all her plenty for their bread!" (it)

Let us come out of the murky night of the East, heavy with phantoms, into the bright daylight of the West, into the company of men whose thoughts made our thoughts, and whose ways made our ways, the men who first dared to look on nature with the clear eyes of the mind. Browning's famous poem "Childe Roland to the Dark Tower Came" is an allegory of the pilgrimage of man through the dark places of the earth, on a dismal path beset with demons, and strewn with the wreckage of generations of failures. In his ear tolled the knell of all the lost adventurers, his peers, all lost, lost, within sight of the dark Tower itself -

"The round squat turret, blind as the fool's heart
Built of brown stone, without a counterpart
In the whole world -"

lost in despair at the all-encircling mystery. Not so, the Greek Childe Roland, who set the stag-horn to his lips and blew a challenge. Neither Shakespeare nor Browning tells us what happened, and the old legend

Childe Roland is the incarnation of the Greek spirit, the young light-hearted master of the modern world, at whose trumpet blast the dark towers of ignorance, superstition and deceit have vanished into thin air, as the base fabric of a dream. Not that the jeering phantoms have ~~forever~~ flown! They still beset, in varied form, the path of each generation, but The Achaian Childe Roland ~~gave~~ to ~~taught the race~~ man self-confidence, and taught him the lesson that nature's mysteries, to be solved, must be challenged. ~~Over the~~ On a portal of one of the temples of Isis in Egypt ~~is the legend~~ was carved: "I am whatever hath been is or ever will be and my veil no man has yet lifted"

The Greek ~~has read~~ lifted it and herein lies his value to us. What of this Genius? How did it arise among the peoples of the Aegean Seas? ~~Read~~ may read the story, those ~~of you~~ who wish to know the rock whence ~~you were~~ Hellas was hewn, ~~as~~ told in vivid language by Professor Gomperz in his "Greek Thinkers", the fourth volume of which has recently been published (~~McMillan & Co.~~ Macmillan & Co), and last year there was published ~~by the Clarendon Press~~ a book by one of the younger Oxford teachers, ~~R.W.Livingstone~~, "The Greek Genius and its Meaning to Us" (i) from which those ~~of you~~ who shrink from the serious study of Gomperz's four volumes may learn something of the spirit of Greece. Let me quote a few lines from his introduction:-

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(i) R.W.Livingstone, Clarendon Press, Oxford, 1912.

"Europe has nearly four million square miles; Lancashire has 1,700; Attica has 700. Yet this tiny country has given us an art which we, with it and all that the world has done since it for our models, have equalled perhaps, but not surpassed. It has given us the staple of our vocabulary in every domain of thought and knowledge. Politics, tyranny, democracy, anarchism, philosophy, physiology, geology, history - these are all Greek words. It has seized and up to the present day kept hold of our higher education. It has exercised an unfailing fascination, even on minds alien or hostile. Rome took her culture thence. Young Romans completed their education in the Greek schools. . . . . And so it was with natures less akin to Greece than the Roman. S.Paul, a Hebrew of the Hebrews, who called the wisdom of the Greeks foolishness, was drawn to their Areopagus, and found himself accomodating his gospel to the style, and quoting verses from the poets, of this alien race. After him, the Church, which was born to protest against Hellenism, translated its dogmas into the language of Greek thought and finally crystallized them in the philosophy of Aristotle."

Whether a plaything of the Gods, or a cog in the wheels of the Universe- this was the problem which life offered to the thinking Greek; and in undertaking its solution he set in motion the forces that have made our modern civilization. That the problem remains unsolved is nothing in comparison with the supreme fact that in wrestling with it, and in studying the laws of ~~the~~ machine action man is learning to control the small section of ~~the machine~~ it with which he is specially concerned. The veil of ~~mythology~~ thaumaturgy

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which shrouded the Orient, while not removed, waa rent in twain and for the first time in history man had a clear vision of the world about him -"had gazed on Nature's naked loveliness" unabashed and unfrighted by the supernatural powers about him. ~~For~~ That the Greek ~~did not get~~ got rid of his gods - far from it! but he made them so like himself, and lived on terms of such familiarity with them that they inspired no terror.[2] ~~(i)~~

Livingstone discusses the Greek Genius as displayed to us in certain 'notes' - the Note of Beauty - the Desire for Freedom, the Note of Directness- the Note of Humanism, ~~and their~~ the Note of Sanity and of Many-sidedness, ~~and~~ Upon some ~~certain~~ of ~~these~~ which there characteristics we shall have occasion to dwell in the brief sketch of the rise of scientific medicine among this wonderful people.

We have seen that in the primitive man and in the great civilizations of Egypt and Babylonia the physician evolved from the priest - in Greece he had a dual origin, ~~from~~ philosophy and ~~from~~ religion, ~~and it is interesting to remark that~~ ~~though~~ in spite of a ~~in close union with the latter it seems to have had very little influence upon him~~. Let us first trace the Origins ~~may be traced to~~ in the philosophers, particularly ~~to~~ in the group known as the Ionian Physiologists, whether at home ~~in Ionia~~ or as colonists in the south of Italy, in whose work the beginnings of scientific medicine, may be found. ~~as we know it, may be traced in their work~~.

Let me quote a statement from Gomperz:- ~~(i)~~

~~(i)~~ [2] "They made deities in their own image, in the likeness of an image of corruptible man. Sua cuique deus fit dira cupido. 'Each man's fearful passion becomes his god.' Yes, and not passions only, but every impulse, every aspiration, every humour, every virtue, every whim. In each of his activities the Greek found something wonderful, and called it God: the hearth at which he warmed himself and cooked his food, the street in which his house stood, the horse he rode, the cattle he pastured, the wife he married, the child that was born to him, the plague of which he died or from which he recovered, each suggested a deity, and he made one to preside over each. So too with qualities and powers more abstract."
R.W.Livingstone, "The Gk.Genius & its Meaning to Us" Pg.51-2.

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"We can trace the springs of Greek success achieved and maintained by the great men of Hellas on the field of scientific enquiry to a remarkable conjunction of natural gifts and conditions. There was the teeming wealth of reconstructive imagination united with the sleepless critical spirit which shrank from no test of audacity; there was the most powerful impulse to generalization coupled with the sharpest faculty for descrying and distinguishing the finest shades of phenomenal peculiarity; there was the religion of Hellas, which afforded complete satisfaction to the requirements of sentiment, and yet left the intelligence free to perform its destructive work; there were the political conditions of a number of rival centres of intellect, of a friction of forces, excluding the possibility of stagnation, and, finally, of an order of state and society strict enough to curb the excesses of "childre crying for the moon", and elastic enough not to hamper the soaring flight of superior minds. . . . . We have already made acquaintance with two of the sources from which the spirit of criticism derived its nourishment - the metaphysical and dialectical discussions practised by the Eleatic philosophers, and the semi-historical method which was applied to the myths by Hecataeus and Herodotus. A third source is to be traced to the schools of the physicians. These aimed at eliminating the arbitrary element from the view and knowledge of nature, the beginnings of which were bound up with it in a greater or less degree, though practically without exception and by the force of an inner necessity. A knowledge of medicine was destined to correct that defect, and we shall mark the growth of its most precious fruits

in the increased power of observation and the counterpoise it offered to hasty generalizations, as well as in the confidence which learned to reject untenable fictions, whether produced by luxuriant imagination or by a priori speculations, on the similar ground of self-reliant sense-perception." (3)

~~While~~ The nature philosophers of the Ionian days did not contribute much to medicine proper, but their spirit and their outlook upon nature ~~must have~~ infulenced its students profoundly. Their bold generalizations on the nature of matter and of the elements are still the wonder of chemists. We may trace to one of them, Anaximenes, who regarded air as the primary principle, the doctrine of the 'pneuma', or the breath of life - the psychic force which animates the body and leaves it at death. Another, the famous Heracleitus, was possibly a physician. The existing fragments do not relate specially to medicine; but to the philosopher of fire may be traced the doctrine of heat and moisture, and their antithesis, which influenced practice for many centuries, and there is evidence in the Hippocratic writings of the attempt to apply this doctrine to the human body. The famous expression 'panta rei" - all things are flowing, ~~as attributed to him~~, expresses the insistent flux in which he believed all matter ~~to~~ exists. No one has said a ruder thing of the profession, for ~~one~~ of the fragments reads:- ... "physicians, who cut, burn, stab and rack the sick, then complain that they do not get any adequate recompense fot it". (4)

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(3) Gomperz; "Greek Thinkers" Vol.1. p.276

(4) Burnet; "Early Greek Philosophy", 1892, p.137.

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The south Italian nature philosophers contributed much more to the science of medicine, and in certain of the Colonial towns there were medical schools as early as the fifth century B.C. The most famous of these physician philosophers was Pythagoras, whose life and work had an extraordinary influence upon medicine, particularly in connection with his theoty of numbers, and the ~~influence~~ importance of critical days. His discovery of the dependance of the pitch of sound on the length of the vibrating chord is one of the most fundamental in acoustics. Among the members of the school which he founded at Crotona were many physicians, who carried his views far and wide throughout Magna Graeca. Nothing in his teaching dominated medicine so much as the doctrine of numbers, the sacredness of which seems to have had an enduring fascination for the medical mind. ~~Doubtless~~ Many of the~~ir~~ common diseases, such as malaria, or typhus, terminating abruptly on special days, favoured this belief. How dominant it became and how persistent you may judge from the literature upon Critical Days which ~~in the Index Catalogue of the Surgeon General's Library, where you will find references to monographs and articles on the subject as late as~~ is rich to the middle of the 18th century.

One member of the Crotan school, Alcmaeon, achieved great distinction in both anatomy and physiology. He first recognised the brain as the organ of the mind, and made careful dissections of the nerves, which he traced to the brain. He described the optic nerves and the Eustachian tubes, made correct observations upon vision, and refuted the common view that the sperma came from the spinal cord. He suggested the definition of health as the maintainance of equilibrium, or an 'isonomy' in the material

qualities of the body.

Of all the South Italian physicians of this period, the personality of none stands out in stronger outlines than that of Empedocles of Agrigentum, ~~It is not easy in his case, to separate the physician from the~~ a wonder-worker, also, and magician, ~~who boasted that~~ he was acclaimed in the cities as an immortal god by countless thousands desiring oracles or begging ~~from him~~ the word of healing. That he was a keen student of nature is witnessed by many recorded observations in anatomy and physiology; but our attention must be confined to his introduction of the theory of the four elements - fire, air, earth and water - of which, in varying quantities, all bodies were made up. Health depended upon the due equilibrium of these primitive substances; disease was their disturbance. Corresponding to those were the four essential qualities of heat and cold, moisture and dryness, and upon this four-fold division was engrafted by the later physicians the doctrine of the humours which, from the days of Hippocrates almost to our own dominated ~~the theory of~~ medicine. All sorts of magical powers were attributed to Empedocles, and the story of Pantheia whom he called back to life after a thirty days' trance has long clung in the imagination. Matthew Arnold ~~gives a good picture of him in the~~ describes him in the well-known poem "Empedocles on Etna -

"... ..... but his power
Swells with the swelling evil of this time,
And holds men mute to see where it will rise.
He could stay swift diseases in old days,
Chain madmen by the music of his lyre,
Cleanse to sweet airs the breath of poisonous streams
And in the mountain-chinks inter the winds.
This he could do of old."

Poetical Works of Matt. Arnold; MacMillan & Co. 1898. p.440.

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a quotation which will give you an idea of some of the powers attributed to this wonder-working physician.

But of no one of the men of this remarkable circle have we such definite information as of the Crotan physician physician Demokedes, whose story is given at length by Herodotus; and his story has also the great importance of showing that even at this early period a well devised scheme of of public medical service existed inthe Greek cities. It dates from the second half of the sixth century B.C. - fully two generations before Hippocrates.

GREEK MEDICINE.

~~STATE PHYSICIANS. A well devised scheme of public medical service existed among the Grecian cities. One of the most charming of the stories in Herodotus is that of Democêdes the~~ A Crotonian, Democedes, name ~~who~~ was found among the slaves of Oroetes, ~~and~~ Of ~~whose~~ his fame as a physician some one had heard and he was called in to treat the dislocated ankle of King Darius. The wily Greek, longing for his home, feared that if he confessed to a knowledge of medicine there would be no chance of escape, but under threat of torture he undertook a treatment which proved successful. Then Herodotus ~~goes on with the~~ tells his story-how, ill-treated at home in Crotona, ~~he~~ Democedes went to Egina, where he set up as a physician, and in the second year the State of Egina hired his services at the price of a talent. In the third year the Athenians engaged him at 100 minae; and in the fourth Polycrates of Samos at two talents. Democêdes shared the misfortunes of Polycrates and was taken prisoner by Oroetes. Then Herodotus tells how ~~Democêdes~~ he cured Atossa the daughter of Cyrus, and wife of Darius of a severe abscess of the breast, but on condition that she helped him to escape, and she induced her husband to send an expedition of exploration to Greece under the guidance of Democêdes, but with the instructions ~~were~~ at all costs to bring back the much prized physician. From Tarentum Democêdes escaped to his native city, but the Persians followed him, and it was with the greatest difficulty that he escaped from their hands. Deprived of their guide, the Persians gave up the expedition and sailed for Asia. In palliation of his flight Democêdes sent a message to Darius that he was engaged to the daughter of Milo the wrestler, who was in high repute with the King.(1)

(1) Foot note next page

GREEK MEDICINE.

NOTE.

DEMOCEDES.

The well-known editor of Herodotus, R.W.Macan, Master of University College, Oxford, in his Sheaf of Sonnets, "Hellenikon" (Oxford, 1893) has included a poem which may be quoted in connection with this incident:-

NOSTALGY.

Atossa, child of Cyrus king of kings
healed by Greek science of a morbid breast,
gave lord Dareios neither love nor rest
till he fulfilled her vain imaginings.

"Sir, show our Persian folk your sceptre's wings'.
"Enlarge my sire's and brother's large bequest.
"This learned Greek shall guide your galleys west,
"and Dorian slave-girls grace our banquettings."

So said she, taught of that o'er-artful man,
the Italiote captive, Kroton's Demokede,
who recked not what of maladies began,

nor who in Asia and in Greece might bleed,
if he - so writes the guileless Thurian -
regained his home, and freedom of the Mede.

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Plato has several references to the state physicians, who were evidently elected by a public assembly :-
"when the assembly meets to elect a physician" (1) and the office was yearly, for in "The Statesman" we find the following: "When the year of office is expired, the pilate, or physician has to go before a court of review" to answer any charges. The physician must have been in practice for some time and attained eminence, before he was deemed worthy of the post of state physician.

"If you and I were physicians, and were advising one another that we were competent to practise as State Physicians, should I not ask you, and would you not ask me, Well, but how about Socrates himself, has he good health? and was anyone else ever known to be cured by him whether slave or freeman?" (2)

All that is known of these state physicians has been collected by Pohl[2] who has traced their evolution into Roman times. That they were secular, independent of the Asculapian temples, that they were well paid, that there was keen competition to get the most distinguished men, that they were much esteemed - are facts to be gleaned from Herodotus and the inscriptions. The lapidary records, extending over 1000 years have been collected by Professor Oehler of Reims and they throw an important light on the state of medicine in Greece & Rome. The vases are representations of these State Doctors at work. Dr Poltier has published one which has been reproduced showing the treatment of a patient - probably bleeding

(1) Plato's Dialogues by Jowett's Ed. II. p.407.
[2] de Graecorum Medicis Publicis . Bertolini . Reimer. MCMV
see also James. Bd XV

That dissections were practised by this group of nature philosophers is shown not only by the studies of Alcmaeon, but we have evidence that one of the latest of them, Diogenes of Apollonia must have made elaborate dissections. In the "Historia Animalium" of Aristotle occurs his account of the blood-vessels, which is by far the most elaborate met with in the literature until the writings of Galen. It has too the great merit of accuracy, (if we bear in mind the fact that it was not until after Aristotle that arteries and veins were differentiated) and indications are given from which vessels blood may be drawn.

9/ The Works of Aristotle - translated into English.. Oxford. At the Clarendon Press. Vol iv. BK III. 512

ASCLEPIOS. No God made with hands, to use the Scriptural phrase, had a more successful 'run' than Asklepios - for more than a thousand years the consoler and healer of the sons of men. Shorn of his divine attributes he remains our patron saint, our emblematic God of Healing whose figure with the serpents appears in our seals and charters. He was originally a Thessalian chieftain, and fought in the Trojan War, and his sons, Machaon and Podalirius, became famous physicians. Nestor, you may remember, carried off the former, declaring, in the oft-quoted phrase, that a doctor was better worth saving than many warriors unskilled in the treatment of wounds.

Later genealogies trace his origin to Apollo, as whose son he is usually regarded. "In the wake of the northern tribes, this good Asklepios - a more majestic figure than the blameless leech of Homer's song - came by land to Epidaurus, and was carried by sea to the eastward island of Cos, ...Asklepios grew in importance with the growth of Greece, but may not have attained his greatest power till Greece and Rome were one."

(i) R.W.Chapman,

(ii) Louis Dyer; "The Gods in Greece", 1891, pg.221.

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A word on the idea of the serpent as an emblem of the healing art which goes far back into antiquity. The mystical character of the snake, and the natural dread and awe inspired by it, early made it a symbol of supernatural power. There is a libation vase of Gudia found at Lagash (probably the earliest representation of the symbol) with two serpents entwined round a staff (Pl.IV. Jastrow) From the earliest times it has been associated with mystic and magic power, and enew today among native races the snake plays a part in the initiation of medicine men.

In Greece the serpent became a symbol of Apollo, and prophetic serpents were kept and fed at his shrine, as well as at that of his son Asclepias. There was an idea too that snakes had a knowledge of herbs, and this is referred to in the famous poem of Nikander on Theriaka.[12](i) ~~Some of~~ You may remember that when Alexander, the famous quack and oracle monger, depicted by Lucian, started out 'for revenue', the first thing he did was to provide himself with two of the large, harmless, yellow snakes of Asia Minor.

The exact date of the introduction of the cult into Greece is not known, but by the year ——— it was in full swing, and by the ——— century its great centres were at Epidaurus, Cos, Pergamos and -. It throve with wonderful rapidity.

(i) 12 31 Foll. Scholia pg.87; Greek Divination.

Greek med

Askelia I I

No God made with hands, ~~as~~ To use the Scriptural ~~cafts than~~ phrase had a more successful run than Asclepias & for more than a thousand years the consoler & healer of the sons of men. ~~And he remains~~ Shorn of his attributes he remains our patron saint our Emblematic God of Healing whose figure with the serpents appears on our seals & charters

Asklepios became one of the most popular of the gods, and by the time of Alexander it is estimated that there were between three and four hundred temples dedicated to him

His worship
~~It~~ was introduced into Rome ~~in the year~~ at the time of the Great Plague at the beginning of the third century B.C. (as told by Livy in Book XI.) and the Temple on the Island of Tiber became a famous resort. If you can transfer in ~~your~~ imagination ~~to~~ the Hot Springs of Virginia ~~to~~ the neighbourhood of Washington, and put there a group of buildings such as are represented in these outlines of Caton's, add a sumptuous theatre with seating capacity for 20,000, a Stadium 600ft. long with a seating capacity of 12,000, and all possible accessories of art and science, you will have an idea of what the temple at Epidaurus, ~~was~~ a few miles from Athens. "The cult flourished mostly in places which, "through climatic or hygienic advantages, were natural health "resorts. Those favoured spots on Hill or mountain, in the shel- "ter of forests, by rivers or springs of pure flowing water, were "conductive to health. The vivifying air, the well cultivated "gardens surrounding the shrine, the magnificent view, all tended "to cheer the heart with new hope of cure. Many of these temples "owed their fame to mineral or merely hot springs. To the home- "ly alters, erected originally by sacred fountains in the neigh- "bourhood of health-giving mineral springs, were later added mag- "nifieent temples, pleasure-grounds for festivals, gymnasia in "which bodily ailments were treated by physical exercises, baths "and inunctions, also, as it proved by excavations, living rooms "for the patients. Access to the shrine was forbidden to the un- "clean and the impure; pregnant women and themortally afflicted

~~It~~ In the Tiber.

were kept away; no dead body could find a resting-place within the holy precincts, the shelter and the cure of the sick being undertaken by the keepers of inns and boarding-houses in the neighbourhood. The suppliants for aid had to submit to careful purification, to bathe in the sea, river, or spring, to fast for a prescribed time, to abjure wine and certain articles of diet, and they were only permitted to enter the temple when they were adequately prepared by cleansing, inunction and fumigation. This lengthy and exhausting preparation, partly dietetic, partly suggestive, was accompanied by a solemn service of prayer and sacrifice, whose symbolism tended highly to excite the imagination."[14] ~~(i)~~

The temples were in charge of members of the guild or fraternity, the head one of which was oftem, though not necessarily, a physician. The Chief was appointed annually. From Caton's excellent sketch[15] ~~(ii)~~ you can get a good idea of the ritual, but still better is the delightful description given in the "Plutus" of Aristophanes. After offering on the altar honey-cakes and baked meats the suppliants arranged themselves on the pallets.

> "Soon the Temple servitor
> Put out the lights and bade us fall asleep,
> Nor stir, nor speak, whatever noise we heard.
> So down we lay in orderly repose.
> And I could catch no slumber, not one wink,
> Struck by a nice tureen of broth which stood
> A little distance from an old wife's head,
> whereto I marvellously longed to creep.
> Then, glancing upwards, I behold the priest
> Whipping the cheese-cakes and figs from off
> The holy table; thence he coasted round to every
> To every altar spying what was left.
> And everything he found he consecrated
> Into a sort of sack".[16] (?)

(~~i~~) Neuburger English

(~~ii~~) Caton "Temples & Ritual of Asklepios" 2nd ed. Lond. 1900.

(~~iii~~) B.B.Roger's trans. Vol VI Bell & Sons, Lond. 1907

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a procedure which reminds one of the story of "Bell and the Dragon". Then the god came, in the person of the priest, and scanned each ~~disease~~ patient. He did not neglect physical measures, as he brayed in a mortar cloves, Tenian garlic, verjuice, squills and Sphettian vinegar, with which he made application to the eyes of the patient.

11/st

"Then the God clucked,
And out there issued from the holy shring
Two great enormous serpents.
And underneath the scarlet cloth they crept,
And licked his eyelids, as it seemed to me;
And, mistress dear, before you could have drunk
Of wine ten goblets, Wealth arose and saw." ~~(i)~~ 17

The incubation sleep, in which in which indications of cure were divinely sent, formed ~~the~~ an most important part of the ritual

The Asklepieion, or Health Temple of Cos, recently excavated, is of special interest, as being very probably the scene of the labours of Hippocrates, who was always stated to be an Asklepiad. It is known that Cos was a great medical school and the investigations of Professor Rudolf Hertzog have shown that it was very nearly the counterpart of the temple at Epidaurus.

Hygieia was the daughter of Asclepius and often represented with him

Fragment of Hygeia

Hygeia

Heroic from Cos.

~~(i)~~ 17 Aristophanes; B.B.Rogers' Translation, Vol.VI. Bell & Sons, London, 1907.

~~ASKLEPIOS.~~ Aesculapian temples must have furnished a rich field for clinical research, like our modern hospitals, and the larger one had rich libraries full of valuable manuscripts and records of cases. That there should have been secular Asklepiads connected with the temple, who were freed entirely from its superstitious practices and theurgic rites is very extraordinary; yet perhaps not so much so as one might think. ~~We have~~ How have our physicians often to bow ourselves in the House of Rimmon!! It is very much the same today at Lourdes, where lay physicians have to look after scores of patients, whose faith is too weak, or whose maladies are too strong to be relieved by Our Lady of this famous shrine. Even in the Christian era there is evidence of the association of distinguished physicians with Aesculapian temples, and I notice in one of ~~the~~ his anatomical treatises Galen speaks with affection of a citizen of Pergamos who has been a great benefactor of the Aesculapian temple of that city. In "Marius, the Epicurean" Pater gives a delightful sketch of one of those temple health resorts, and brings in Galen stating that he had himself undergone the temple sleep; but to this I can find no reference in the general index of Galen's works.

From the votive tablets found at Epidaurus we get a very good idea of the nature of the cases and of the cures. A large number of them have now been deciphred. There are evidences of various forms of diseases of the joints, ~~pulse(?)~~ affections of women, wounds, baldness, gout; but we are again in the world of miracles, as you may judge from the following:-

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"Heraicus of Mytilene is bald and entreats the God to make his hair grow. An ointment is applied over-night and the next morning he has a thick crop of hair."

There are indications that operations were performed and abscesses opened. From one we gather that dropsy was treated in a novel way: Asklepios cuts off the patient's head, holds him up by the heels, lets the water run out, claps on the patient's head again. Here is one of the invocations:-

"Oh, blessed Asklepios, God of Healing, it is thanks to thy skill that Diophantes hopes to be relieved from his incurable and horrible gout, no longer to move like a crab, no longer to walk upon thorns, but to have sound feet as thou hast decreed."

The priests did not neglect the natural means of healing, and the ~~incantations~~ inscriptions show that great attention was paid to diet, exercise, massage and bathing, and when necessary drugs were used. Birth and death were believed to defile the sacred precincts, and it was not until the time of the Antonines that provision was made at Epidaurus for these cases.

One practice of the temple was of special interest, viz. the incubation sleep, in which dreams were suggested to the patients. ~~We have already seen~~ In the religion of Babylonia ~~how~~ an important ~~was the~~ part was played by the mystery of sleep, and the interpretation of dreams; and no doubt from the East the Greeks took over the practice of divination in sleep, for in the Aesculapian cult also the incubation sleep played a most important rôle. (A very full study of the subject has been made by Miss Hamilton (now Mrs. Dickens). (i)) as the inscriptions at Epidaurus show, ~~and~~

(i) Incubation, or cure of Disease in Pagan Temples and Christian Churches. London, 1906.

The oracle of Amphiaraus in Attica sent dreams into the hearts of his consultants. The priests led the sacrificer and kept him fasting from food for one day, and from wine for three days to give him perfect spiritual -?- lucidity to absorb the divine communication" (Philostrates Apollonius of Tyana. Vol 1. p 92.

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That it continued in later times is well indicated in the orations of Aristides, the arch-neruasthenic of ancient history, who was a great ~~dreamer~~ dreamer of dreams. How incubation sleep was carried into the Christian church, its association with St. Cosmas and St. Damian and other saints, its practice throughout the Middle Ages, and its continuation to our own time may be read in the careful study of the subject made by Miss Hamilton (now Mrs. Dickens).[18] There are still in parts of Greece & in Asia Minor shrines at which incubation is practised regularly, and if one may judge from the reports, with as great success as in Epidaurus. At one place in Britain, Christchurch in Monmouthshire, incubation was carried on till the early part of the 19th century. Now the profession has come back to the study of dreams,[19] and there are professors as ready to give suggestive interpretations to them, as in the days of Aristides. As usual, Aristotle seems to have said the last word on the subject:- "Even scientific physicians tell us that one should pay diligent attention to dreams, and to hold this view is reasonable for those who are not practitioners but speculative philosophers,"[20] for ~~he has too much regard for~~ * is asking too much to think that the Deity ~~to think that he~~ would trouble to send dreams to very simple people and to animals, if they were ~~not~~ designed in any way to reveal the future.

In its struggle with Christianity, Paganism made its last stand in the temples of Asklepios. The miraculous healing of the saints superceded the cures of the heathen god, and it was wise

[18] Miss Hamilton; Incubation, or Cure of Disease in Pagan Temples and Christian Churches. London, 1906.
[20] Aristotle; Parva Naturalia. Part I. 462.b. Oxford Edition.
[19] Freud - On Dreams. 2nd Edition 1913

Inscriptions at Epidaurus show

to adopt the useful practice of his temple. There are indeed churches in Rome, e.g. St. Theodora and in which there has been a direct continuity of the heathen and Christian practice of temple healing. Even today at a certain period

There is no essential difference between the types of miracles

Votive offerings —

GREEK MEDICINE.

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HIPPOCRATES AND THE HIPPOCRATIC WRITINGS.:- Deservedly the foundation of Greek Medicine is associated with the name of Hippocrates a native of the island of Cos; and yet, ~~when we look into it~~, he is a ~~very~~ shadowy personality, about whom ~~there is but~~ we have little accurate first-hand information. ~~a fact which places him~~ This is in strong contrast ~~with~~ to some of his distinguished contemporaries and successors, for example Plato and Aristotle, about whom we have such full and accurate knowledge. You will perhaps be surprised to hear that the only contemporary mention of Hippocrates is made by Plato. In the "Protagoras",(i) The young Hippocrates, son of Apollodorus has come to Protagoras, "that mighty wise man", to learn the science and knowledge of human life. Socrates asked him:- "If you were going to Hippocrates of Cos, the Asclepiad, and were about to give him your money, and some one had said to you, 'You are paying money to your namesake, Hippocrates, O Hippocrates; tell me, what is he that you give him money?' how would you have answered?" "I should say", he replied, "that I gave money to him as a physician." "And what will he make of you?" "A physician," he said. And in the Phaedrus, in reply to a question of Socrates whether the nature of the sould could be knwon intelligently without knowing the nature of the whole, Phaedrus replies:- "Hippocrates, the Asclepiad, says that the nature, even of the body, can only be understood as a whole."

Several lives of Hippocrates have been written. The one most frequently quoted is that of Soranus (probably of Ephesus) a physician at the time of Trojan, and the statements which he gives are usually accepted, viz: that he was born in the island of

Cos in the year 460 B.C.; that he belonged to an Asclepiad family of distinction, ~~and there were several physicians of the same name~~; that he travelled extensively, visiting Thrace, Thessaly, and various other parts of Greece; that he returned to Cos, where he became the most renowned physician of his period, and died in about 375 B.C. Aristotle mentions him but once, calling him "the great Hippocrates". Busts of him are common; the earliest of which is and a representation of it is here given. (Figure)

Of the numerous writings attributed to Hippocrates it cannot easily be determined which ~~and how many~~ are really the work of the Father of Medicine himself. They were collected at the time of the Alexandrian School, and it became customary to write commentaries upon them, ~~and~~ much of the most important information we have about them, we derive from Galen. The earliest manuscript is the 'Codex Laurentianus' of Florence, dating from the 9th century, a representation of which is annexed. Those of you who are interested, and wish to have full references to the various works attributed to Hippocrates, will find them in "Die Handschriften der antiken Ärzte" of the Prussian Academy, edited by Diels, Berlin 1905. The ~~report of the~~ Prussian Academy, ~~which~~ has undertaken the editorship of the 'Corpus ~~Graecorum~~ Scriptorum Graecorum', ~~will no doubt discuss the sources and the authenticity of the Hippocratic Writings~~. There is no complete edition of them in English. In 1849 the Deeside physician, Adams, published (in the old Sydenham Society) a translation of the most important works, ~~This is an~~ edition easily obtained. Littré's ten-volume edition ("Oeuvres

complètes d'Hippocrate, Paris, 1839) is the most important for reference. Those of you who want a brief, but very satisfactory account of the Hippocratic Writings, with numerous extracts, will find the volume of Theodor Beck very useful. (Theodor Beck (?)

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~~We~~ I can only indicate in ~~the~~ a very brief ~~est possible~~ way ~~certain~~ the special features ~~of~~ in the Hippocratic writings that have influenced the evolution of the science and art of medicine.

The first is undoubtedly the note of humanity. In his introduction to "The Rise of the Greek Epic"[i] Gilbert Murray emphasises the idea of service to the community as more deeply rooted in the Greeks than in us. The question they asked about each writer was, "Does he help to make better men?" or " Does he make life a better thing?" Their aim was to be useful, to be helpful, to make better men in the cities, to ~~create~~ correct life, "to make gentle the life of the world," in which brief phrase was summed up the praise of the Athenians. ~~All those~~ aspirations ~~are~~ illuminated ~~by~~ in the remarkable saying of Prodicus ~~in the~~ (fifth century B.C.). "That which benfits human life is God". The Greek view of man ~~as an animal~~ was the very antithesis of that which St. Paul enforced upon the Christian world. One idea pervades ~~Greek~~ thought from Homer to Lucian like an aroma - pride in the body as a whole.[ii] ~~[illegible]~~

[i] Oxford, Clarendon Press, 2nd Ed. 1911.

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(1) Oxford, Clarendon Press, 2nd Ed. 1911.

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In the strong conviction that 'our soul in its rose mesh' is quite as much helped by flesh as flesh by the soul the Greek sang his song "For pleasant is this flesh". Just so far as we appreciate the value of the fair mind in the fair body so far do we apprehend ideals expressed ~~today~~ by the Greek in every department of life. The beautiful soul harmonising with the beautiful body was as much the glorious ideal of Plato as it was the end of the education of Aristotle. What a splendid picture in Book III of the "Republic", of the day when " . . our youth will dwell in a land of health, amid fair sights and sounds and receive the good in everything; and beauty, the effluence of fair works, shall flow into the eye and ear like a health giving breeze from a purer region, and insensibly draw the soul from earliest years into likeness and sympathy with the beauty of reason". The glory of this zeal for the enrichment of this present life was revealed to the Greeks as to no other people, but in respect to care for the body of the common man, we have only seen its fulfillment in our own day, as a direct result of the methods of research initiated by them. Everywhere throughout the Hippocratic writings we find this attitude towards life, which has never been better expressed than in the fine phrase, "Where there is love of humanity there will be love of the profession". This is well brought out in the qualifications laid down by Hippocrates for the study of medicine. "Whoever is to acquire a competent knowledge of medicine ought to be possessed of the following advantages: a natural disposition; instruction; a favourable position for the study; early tuition; love of labour; leisure. First of all, a

natural talent is required, for when nature opposes everything else is vain; but when nature leads the way to what is most excellent, instruction in the art takes place, which the student must try to appropriate to himself by reflection, becoming an early pupil in a place well adapted for instruction. He must also bring to the task a love of labour and perseverance, so that the instruction taking root may bring forth proper and abundant fruits. ".....

And the directions given for the conduct of life and for the relations which the phsycian should have with the public are those of our code of ethics today. Consultations in doubtful cases are advised, touting for fees is discouraged. "If two or more ways of medical treatment were possible, the physician was recommended to choose the least imposing or sensational; it was an act of 'deceit' to dazzle the patient's eye by brilliant exhibitions of skill which might very well be dispensed with. The practice of holding public lectures in order to increase his reputation was discouraged in the physician, and he was especially warned against lectures tricked out with quotations from the poets. Physicians who pretended to infallibility in detedting even the minutest departure from their prescriptions were laughed at; and finally, there were precise bye-laws to regulate the personal behaviour of the physician

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He was enjoined to observe the most scrupulous cleanliness, and was advised to cultivate an elegance removed from all signs of luxury, even down to the detail that he might use perfumes, but not in an immoderate degree."(1) But the High water-mark of professional morality is reached in the famous Hippocratic oath, which Gomperz calls "a monument of the highest rank in the history of civilization". It is of small matter whether this is of Hippocratic date or not, nor whether it has in it egyptian or Indian elements: its importance lies in the accuracy with which it represents the Greek spirit. For twenty five centuries it has been the 'credo' of the profession, and in many universities it is still the formula with which men are admitted to the doctorate.

"I swear by Apollo the physician and Aesculapius ahd Health (Hygeia) and All-Heal (Panacea) and all the gods and goddesses, that according to my ability and judgement, I will keep this oath and this stipulation -- to reckon him who taught me this art equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring on the same footing as my own brothers, and to teach them this art, if they shall wish to learn it, without fee or stipulation; and t that by precept, lecture, and every other mode of instruction, I will impart a knowledge of my art to my own sons, and those of my teachers, and to disciples bound by a stipulation and oath according to the law of medicine, but to none others. I will follow that system of regimen which, according to my ability and judgement I consider for the benefit of my patients, and abstain from whatever

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(1) Gomperz Greek Thinkers Vol. I

is deleterious and mischievous.

"I will give no deadly medicine to anyone if asked, nor suggest any such counsel; and in like manner I will not give to a woman a pessary to produce abortion.

"With purity and with holiness I will pass my life and practise my art.

"I will not cut persons labouring under the stone, but will leave this to be done by men who are practitioners of this work.

"Into whatsoever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption, and, further, from the abduction of females or males, of freemen or slaves. Whatever, in connection with my professional practice, or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret.

"While I continue to keep this oath unviolated, may it be g granted to me to enjoy life and the practice of the art, respected by all men, in all times'. But should I trespass and violate this oath, may the reverse be my lot! "

In his ~~ideal~~ Republic Plato put the physician low enough, in the last stratum, indeed, but he has never been more honorably placed than in the picture of Athenian society given by this author in the 'Symposium'. Here the physician is shown as a cultivated gentleman, mixing in the best, if not always the most sober, society Eryximachus, the son of Acumenus, himself a physician, plays in this famous scene a typical Greek part - A strong advocate of temporance and mind and body, deprecating, as a physician, excess in

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drink, he urged that conversation should be the order of the day and he had the honour of naming the subject - 'Praise of the God of Love. Incidentally Eryximachus gives his view of the nature of disease, and shows how deeply he was influenced by the views of Empedocles. ". . . . so too in the body the good and healthy elements "are to be indulged, and the bad elements and the elements of disease "are not to be indulged, but discouraged. And this is what the "physician has to do, and in this the art of medicine consists: for "medicine may be regarded generally as the knowledge of the loves "and desires and desires of the body and how to satisfy them or not; "and the best physician is he who is able to separate fair love from "foul, or to convert one into the other; and he who knows how to "eradicate and how to implant love, whichever is required, and can "reconcile the most hostile elements in the constitution and make "them loving friends, is a skilful practitioner."

The second great note in Greek medicine illustrates the directness with which they went to the very heart of the matter. Out of mysticiem, superstition and religious ritual the Greek went directly to nature and was the first to grasp the conception of medicine as an art based on accurate observation, and an integral part of the science of man. What could be more striking than the phrase, in "The Law", "Il y a en effet deux choses, savoir et croire savoir; savoir, d'est la science, croire savoir, c'est l'ignorance."[23/11] Translation . . .

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[11] Littré Oeuvres d'Hippocrate, T.IV. p.641-2

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But no single phrase in the writings can compare for directness with the famous aphorism which has gone into the literature of all lands; "Life is short and Art is long; the Occasion fleeting, Experience fallacious, and Judgement difficult."

Everywhere one finds a strong, clear common sense, which refuses to be entangled either in theological or philosophical speculations. What Socrates did for philosophy Hippocrates may be said to have done for medicine. As Socrates devoted himself to ethics, and the application of right thinking to good conduct, so Hippocrates insisted upon the practical nature of the art, and in placing its highest good in the benefit of the patient. Empiricism, experience, the collection of facts, the evidence of the senses, the avoidance of philosophical speculations, ~~these~~ were the distinguishing features of Hippocratic medicine.
One of the most striking contributions of Hippocrates is the recognition that diseases are only part of the processes of nature that there is nothing divine or sacred about them. With reference to epilepsy, which was regarded as a sacred disease, he says, "It appears to me to be no wise more divine nor more sacred than other diseases, but has a natural cause from which it originates like other affections; men regard its nature and cause as divine from ignorance." And in another place he remarks that each disease has its own nature, and that no one arises without a natural cause. He seems to have been the first to grasp the conception of great healing powers of nature. In his long experience with

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the cures in the temples he must have seen scores of instances in which the god had worked the miracle through the 'vis medicatrix naturae';. and to the shrewd wisdom of his practical suggestions in treatment may be attributed in large part the extraordinary vogue which the great Coan has enjoyed for 25 centuries. One may appreciate the veneration with which the Father of Medicine was regarded by the attribute "divine" which was usually attached to his name. ~~Then~~ Listen to this for direct ~~statement, which comes home to all of us~~ press and honestly speak. ~~It is~~ taken from the work on the joints ~~which is~~ characterized by Littré as "the great surgical monument of antiquity":- "I have written this down deliberately believing it is valuable to learn of unsuccessful experiments, and to know the causes of their non-success."

The note of freedom is not less remarkable throughout the Hippocratic writings, and it is not easy to understand how a man brought up and practising within the precincts of ~~so~~ a famous an Aesculapian temple could have divorced himslef so wholly from the superstitions and vagaries of the cult. There is no reference in the Hippocratic writings to divination; incubation sleep is not often mentioned, nor are charms, incantations or the practice of astrology. ~~While~~ Here and there we find practices which jar upon modern feeling, but on the whole ~~one~~ we feels in ~~xxxxxx~~ reading the Hippocratic writings nearer to their spirit than to that of the Arabians or of the many writiers of the 15th and 16th centuries A.D. And it was not only against the powers ~~of them that sit in high places~~ that the Hippocratic writings protested, but they express

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an equally active reaction against the excesses and defects of the new philosophy, ~~This is~~ a point ~~which Gomperz (i) has~~ brought out very clearly by Gomperz[24] He regards it as an undyeing glory of the School of Cos that after years of vague, restless speculation it introduces steady sedentary habits into the intellectual life of mankind. "Fiction to the right, reality to the left, was the battle cry of this school in the war they were the first to wage against the excesses and defects of the new philosophy." Though the protest was effective in certain directions, we shall see that the authors of the Hippocratic writings could not entirely escape from the hypotheses of the older philosophers.

There are probably grounds for Pliny's suggestion that he benefited by the receipts written in the temple, registered by the sick cured of any disease. "Afterwards", Pliny goes on to remark in his characteristic way, "he professed that Course of Physicke which is called Clinice whereby physicians found such sweetness that afterwards there was no measure nor end of fees" (Nat. History Book 29. 9)

~~(i)~~ 24 Greek Thinkers, Vol.1. pg.296.

As ~~Good~~ the famous Regimen Sanitatis of Salernum, the popular ~~book~~ family hand-book of the Middle ages says

"Foure Humours raigne within our bodies wholly,
And them compared to foure Elements"

I can do no more than indicate in the briefest possible way some of the more important views ascribed to Hippocrates. ~~They come into~~ We cannot touch upon the disputes between the Coan and the Cnidian schools. ~~We must remember~~ We must keep in mind that the Greeks at this time had no human anatomy Dissections were impossible; their physiology was of the crudest character, strongly dominated by the philosophies. Empedocles regarded the four elements, fire, air, earth and water, as 'the roots of all things', and this became the corner stone in the humoral pathology of Hippocrates. As in the macrocosm - the world at large - there were four elements, fire, air, earth, and water, so in the microcosm -the world of man's body- there were four elements, or humours, blood, phlegm, yellow bile (or choler) and black bile (or melancholy), and they corresponded to the four qualities of matter, heat, cold, dryness, and moisture. For two thousand years, or more, these views prevailed. In his "Regiment of Life" (1546) Thomas Phaer says: ". . which humours are called ye sones of the Elements because they be complexioned like the foure Elements, for like as the Ayre is hot and moyst: so is the blooud, hote and moyste. And as Fyer is hote and dry: so is Cholere hote and dry And as water is colde and moyst: so is fleume colde and moyste. And as the Earth is colde and dry: so Melancholy is colde and dry."

According to Littré there is nowhere so strong a statement of these views in the genuine works of Hippocrates, but they are found at large in the Hippocratic writings, and nothing can be clearer than the following statement from the work "The Nature of Man".

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i) The student who wishes a fuller account is referred to the histories of (a) Neuburger, Vol.1.Oxford,1910; (b) Withington 1894.

Thos.Phaer."Regiment of Life"

"The body of man contains in itself blood and phlegm and yellow bile and black bile, which things are in the natural constitution of his body, and the cause of sickness and of health. He is healthy when they are in proper proportion between one another as regards mixture and force and quantity, and when they are well mingled together; he becomes sick when one of these is diminished or increased in amount, or is separated in the body from its proper mixture, and not properly mingled with all the others."

No words could more clearly express the views of disease which, as I mentioned, prevailed until quite recent years. The black bile, melancholy, has given us a great word in the language, and that we have not yet escaped from the humoral pathology of Hippocrates is witnessed by the common expression of biliousness- 'too much bile'- or 'he has a touch of the liver'. The humours imperfectly mingled prove irritant in the body. They are kept in due proportion by the innate heat which, by a sort of internal coction, gradually changes the humours to their proper proportion. Whatever may be the primary cause of the change in the humours manifesting itself in disease, the innate heat, or as Hippocrates terms it, the nature of the body itself, tends to restore conditions to the norm; and this change occurring suddenly, or abruptly, he calls the "crisis", which is accomplished on some special day of the disease, and is often accompanied by a critical discharge, or by a drop in the body temperature. The evil, or superabundant humours were discharged, and this view of a special 'materies morbi' to be got rid of by a natural process, or a crisis, dominated ~~the views of disease~~ pathology until quite recently. Hippocrates had a great belief in the

power of nature 'Vis medicatrix naturae' to restore the normal state. A keen observer and an active practitioner, his views of disease, thus hastily sketched, dominated the profession for twenty-five centuries; indeed, echoes of his theories are still heard in the schools, and his very words are daily on our lips. If asked what was the great contribution to medicine of Hippocrates and his school we could answer - the art of careful observation.

Phthisis

In the Hippocratic writings is summed up the experience of Greece to the Golden Age of Pericles. Out of philosophy, out of abstract speculation, had come a way of looking at nature for which the physicians were mainly responsible, and which has changed for ever men's views on disease. Medicine broke its leading strings to Religion and Philosophy - a tottering, though lusty child whose fortunes we are to follow in these lectures. I have a feeling that, could we know more of the medical history of the older races of which I spoke in the first lecture, we might find that this was not the first-born of Aesculapius, that there had been many premature births, many still-born offspring, even live-births - the products of the fertilization of nature by the human mind; but the record is dark, and the infant was cast out like Israel in the chapter of Isaiah

But the high-water mark of mental achievement had not been reached by the great generation in which Hippocrates had laboured. He had been dead years, and Socrates years, and Plato was a man of when far away in the north in the little town of Stagira (now) in Macedonia was born a "man of men" the one above all others to whom the phrase of Milton may be applied. The child of an Asclepiad, Nicomachus, physician to the father of Philip, there must have been a rare conjunction of the planets at this birth, of the great Stagirite. In the first circle of the "Inferno" Virgil leads Dante into a wonderful company, 'star-seated' on the verdure (he says!) - the philosophic family looking with reverence on "the Master of those who know" - "Il Maestro

And with justice has Aristotle been so regarded for these twenty-five centuries.(i) No man has ever swayed such an intellectual empire - in Logic, Metaphysics, Rhetoric, Psychology, Ethics, Poetry, Politics and Natural History, in all a creator, and still a master. The history of the human mind offers no parallel to his career. As the creator of the sciences of comparative anatomy, systematic zoology, Embryology, Teratology, Botany & Physiology, his writings have an eternal interest. They present an extraordinary accumulation of facts relating to the structure and functions of various parts of the body. It is an unceasing wonder how one man, even with a school of devoted students, could have done so much.

Dissection - already practised by Alcmaeon, Democritus, Diogenes, and others, was conducted on a large scale, but the adult human body was still taboo. Aristotle confesses that the "inward parts of man are known least of all" and he had never seen the human kidneys or uterus. In his physiology I can refer to but one point - the pivotal question of the heart and blood vessels. To Aristotle the heart was the central organ controlling the circulation, the seat of vitality, the source of the blood, the place in which it received its final elaboration and impregnation with animal heat. The blood was contained in the heart and vessels as in a vase - hence the use of the term 'vessel'. "From the heart the blood-vessels extend throughout the body, as in the anatomical diagrams which are represented on the walls, for the parts lie round there because they are

(i) The "Good collector of qualities" Dioscorides, Hippocrates, Avicenna and Galen were the medical members of the group.

formed out of them."[28] The nutriment oozes through the blood-vessels and the passages in each of the parts "like water in unbaked pottery". He did not recognize any distinction between arteries and veins, calling both , ~~though~~ the vena cava is the great vessel, and the aorta ~~is~~ the smaller, but both contained blood. He did not use the word 'arteria' ( ) for either of them. There was no movement from the heart to the vessels but the blood was incessantly drawn upon by the substance of the body and as unceasingly renewed by absorption of the products of digestion, the mesenteric vessels taking up nutriment very much as the plants take theirs by the roots from the soil. From the lungs was absorbed the pneuma, or spiritus, which was conveyed to the heart by the pulmonary vessels - one to the right, and one to the left side. These vessels in the lungs, "through mutual contact" with the branches of the trachea, took in the pneuma. A point of interest is that the wind-pipe, trachea, is called 'arteria', both by Aristotle and by Hippocrates. (Epidemics, Littré, VII, 9.) It was the air-tube disseminating the breath through the lungs. We shall see in a few minutes how the term came to be applied to the arteries, as we know them. The pulsation of the heart and arteries was regarded by Aristotle as a sort of ebullition in which the liquids were inflated by the vital, or innate heat, the fires of which were cooled by the pneuma taken in by the lungs and carried to the heart by the pulmonary vessels

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~~(i)~~ [28] De Generatione Animalium, Bk. II. 743a.

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In Vol.IV of Gomperz "Greek Thinkers" you will find an admirable discussion on Aristotle as an investigator of Nature, and those of you who wish to study his Natural History works more closely may do so-easily- in the new translation which is in process of publication by the Clarendon Press, Oxford.
At the end of the chapter "de Respiratione" in the "Parva Naturalia" (Oxford Edition,1908.) we have Aristotle's attitude towards medicine expressed in a way worthy of a son of the profession:-

"But health and disease also claim the attention of the scientist, and not merely of the physician,in so far as an account of their causes is concerned. The extent to which these two differ and investigate diverse provinces must not escape us, since facts show that their inquiries are, at least to a certain extent, conterminous. For physicians of culture and refinement make some mention of natural science, and claim to derive their principles from it, while the most accomplished investigators into nature generally push their studies so far as to conclude with an account of medical principles".

Theophrastus, a student of Aristotle and his successor, created the science of Botany; and made possible the pharmacologists of a few centuries later. Some of you doubtless know him in another guise - as the author of the golden booklet on "Characters",- in which "the most eminent botanist of antiquity observes the doings of men with the keen and unerring vision of a natural historian" (Gomperz) . In the Hippocratic writings there are mentioned 236 plants, in the botany of Theophrastus 455 .

To one trait of master and pupil I must refer - the human feeling, not alone of man for man, but a sumpathy that even claims kinship with the animal world. "The spirit with which he (Theophrastus) regarded the animal world found no second expression till the present age". (Gomperz) ~~I see~~ (Halliday), however, makes that statement that Porphyry[29] goes as far as any modern humanitarian in preaching our duty towards animals".

[29] Greek Divination by W R Halliday Macmillan & Co 1913. p.

GREEK MEDICINE.

II ALEXANDRIAN SCHOOL. From the death of Hippocrates in the year till the founding of the Alexandrian School in ——— a period of ——— years, the physicians were engrossed largely in speculative views, and not much real progress was made, except in the matter of elaborating the humoral pathology. Only three or four men of the first rank stand out in this period: Diocles the Carystian "both in time and reputation next and second to Hippocrates" (Pliny), a keen anatomist and an encyclopaedic writer; but only scanty fragments of his work remain. In some ways the most important member of this group was Praxagoras, a native of Cos, about 340 B.C. Aristotle, you remember, made no essential distinction between arteries and veins, both of which he held to contained blood: Praxagoras recognized that the pulsation was only in the arteries, and maintained that only the veins contained blood, and the arteries air. As a rule, ~~as you know,~~ the arteries are empty after death, and Praxagoras believed that they were filled with an aeroform fluid, a sort of pneuma, which was responsible for their pulsation. The word 'arteria', which had already been applied to the trachea, as an air-containing tube, was then attached to the arteries, and on account of the rough and uneven character of its resonance it was called the 'arteria tracheia', or the 'rough air tube'. We call it simply the 'trachea' but in French the word 'trachée-artère' is still used.

Praxagoras was one of the first to make an exhaustive study of the pulse, and it must have been a man of considerable clinical

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acumen, as well as boldness, to recommend in obstruction of the bowels the opening of the abdomen, removal of the obstructed portion and uniting the ends of the intestine by sutures.

After the death of Alexander Egypt fell into the hands of his famous general Ptolemy, under whose care the city became one of the most important on the Mediterranean. He founded and maintained a Museum, an establishment that corresponded very much to a modern university, for the study of Literature, Science and the Arts. Under his successors, particularly the third Ptolemy, the museum developed, more especially the library, which contained more than half a million volumes. The teachers were drawn from all centres, and the names of the great Alexandrians are among the most famous in the history of human knowledge, including such men as Archimedes, Euclid, Strabo and Ptolemy.

In mechanics and physics, astronomy, mathematics and optics the work of the Alexandrians forms the ground-work of a large part of our modern knowledge. The school-boy of today - or at any rate of my day - studies the identical problems that were set by Euclid 300 years B.C., and the student of physics still turns to Archimedes, and Heron, and the astronomer to Eratosthenes and Hipparchus. To those of you who wish to get a brief review of the state of science in the Alexandrian School I would recommend the chapter in Vol.I of Dannemann's history.

Of special interest to us in Alexandria is the growth of the first great medical school on antiquity. Could we have visited the famous Museum about 300 B.C. we should have found a medical school in full operation, with extensive laboratories, libraries and cliniques. Here for the first time the study of the structure of the human body reached its full development,

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Till ~~then~~ now ~~time~~ barred everywhere by religious prejudice ~~had barred effectively the study of the structure of the human body~~; but full permission was given by the Ptomemies to perform human dissection, and, even if we may credit some authors, even ~~to the~~ vivisection, ~~of criminals~~. The original writings of the chief men of this school have not been preserved, but there is a possibility that any day a papyrus may be found which will supplement the scrappy and imperfect knowledge afforded us by Pliny, Celsus and Galen. The two most distinguished names are Herophilus - who, Pliny says, has the honour of being the first physician "who searched into the causes of ~~morals~~ disease" - and Erasistratus.

Herophilus, ille anatomicorum coryphaeus, as Vesalius calls him, was a pupil of Praxagoras, and his name is still in everyday use by medical students attached to the 'torcular Herophili'. Modern anatomy practically dates from the ~~ose~~ Alexandrine ~~observers~~, ~~also~~ who described ~~and our knowledge of~~ the valves of the heart ~~and such structures as~~ the duodenum, & many of the important parts of the brain, ~~xxx~~ they recognized the true significance of the nerves (which before their day had been confounded with the tendons) ~~the~~ distinguished ~~recognition of the~~ between motor and sensory nerves, ~~of~~ and regarded the brain as the seat of the perceptive faculties and voluntary action. Herophilus counted the pulse, using the water-clock for the purpose, and made many subtle analyses of its rate and rhythm; and, influenced by the musical theories of the period, he built up a rhythmical pulse lore which continued in medicine until recent times. ~~(i)~~ He was a skilful practitioner and to him

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(i)

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is ascribed the statement that drugs are the hands of the Gods. There is a very modern flavour to his oft-quoted expression that the best physician was the man who was able to distinguish between the possible and the impossible.

Erasistratus elaborated the view of the pneuma, one form of which he believed came from the inspired air, and passed to the left side of the heart and to the arteries of the body. It was the cause of the heart-beat and the source of the innate heat of the body, and it maintained the processes of digestion and nutrition. This was the vital spirit; the animal spirit was elaborated in the brain, chiefly in the ventricles, and sent by the nerves to all parts of the body, endowing the individual with life and perception and motion. In this way a great division was made between the two functions of the body, and two sets of organs: in the vascular system, the heart and arteries & abdominal organs, life was controlled by the vital spirits; on the other hand, in the nervous system were elaborated the animal spirits ~~that~~ controlled motion, sensation and the various special senses. These views on the vital and animal spirits held unquestioned sway until well into the eighteenth century, and we still, in a measure, express the views of the great Alexandrian when we speak of 'high' or 'low' spirits.

Rosenthal

~~GREEK MEDICINE~~.

¶ GALEN. Pergamos had ~~now~~ become little more than a name associated in our memory with the fulminations of St. John against the seven Churches of Asia, and on hearing the chapter read we wondered what was "Satan's seat" and who were the "Nicolaitanes" whose doctrine he so hated. Renewed interest has been aroused in the story of its growth ~~in~~ and of its intellectual rivalry with Alexandria ~~is familiar to all students of Greek history~~, since ~~and now~~ the wonderful discoveries by ~~of~~ German archeologists which have enabled us actually to see this great Ionian capital, and even the 'seat of Satan'. ~~has been exposed~~. The illustration here shown (Fig.) is of the famous city, in which you can see the Temple of on the rock, and the amphitheatre. Its interest for us is connected with the greatest ~~most famous~~ name, after Hippocrates, in Greek medicine, Claudius Galen, born at Pergamos A.D.130, in whom were united as never before, - and indeed one may say, never since - the treble combination of observer, experimenter and philosopher. His father, Nikon, ~~was~~ a prosperous architect, ~~who~~ was urged in a dream to devote his son to the profession ~~study~~ of medicine, ~~and~~ upon which ~~this~~ study the lad ~~student~~ entered in his seventeenth year under Satyrus. In his ~~From the~~ writings ~~of~~ Galen ~~we know a great~~ gives many details of his life, ~~and he~~ mentioning the names of his teachers, and many incidents in his Wanderjahre, during which he studied ~~worked~~ at the best medical schools, including Alexandria. Returning to his native city he was put in charge of the gladiators, whose wounds he said he treated with wine. In the year 162 he paid his first visit to Rome the science ~~seat~~ of his greatest labors ~~successes~~. Here he gave public lectures on anatomy, and became 'the fashion'. He mentions many of his

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subcesses; one of them is the well worn story told also of Erasistratus and Stratonice, but Galen's story is worth telling, ~~as~~ and it is figured in the frontispiece of some of the editions of his works x (Fig.). ~~He~~ Called to see a lady ~~and~~ he found her suffering from general malaise without any fever or increased action of the pulse. He saw at once that her trouble was mental and, like a wise physician, engaged her in general conversation. Quite possibly he knew her story, for the name of a certain actor, Pylades, was mentioned, and he noticed that her pulse at once increased in rapidity and became irregular. On the next day he arranged that the name of another actor, Morphus, should be mentioned, and on the third day the experiment was repeatedm but without effect. Then on the fourth evening it was again mentioned that Pylades was danving, and the pulse quickened and became irregular, so he concluded that she was in love with Pylades. He tells how he was first called to treat the Emperor Marcus Aurelius, who had a stomach ache after eating too much cheese. He treated the case so successfully that the Emperor remarked, "I have but one physician, and he is a gentleman". He seems to have had good fees, as he received 400 aurei (about 2000 dollars) for a fortnight's attendance upon the wife of Boettus.

He left Rome for a time in 168 A.D. and returned to Pergamos, but was recalled to Rome by the Emperor, whom he accompanied on an expedition to Germany. There are records in his writings of many journeys, and busy with his practice in dissections and experiments he passed a long and energetic life, dying, according to most authorities, in the year 200 A.D.

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A sketch of the state of medicine in Rome is given by Celsus in the first of his eight books, and he mentions the names of many of the leading practitioners, particularly Asclepiades, the Bythinian a man of great ability, and a follower of the Alexandrians, who regarded all disease as due to a disturbed movement of the atoms. Diet, exercise, massage and bathing were his great remedies, and his motto - tuto, cito et jucunde - has been the emulation of all physicians. How important a rôle he and his successors played until the time of Galen may be gathered from the learned lectures of Sir Slifford Allbutt [31] on 'Greek Medicine in Rome' (Lancet 1909-1910), and from Meyers Theodorus Priscianus und die Römische Medizin [32]. But for a first-hand sketch of the condition of the profession we must go to the great master Pliny, whose account in the 29th book of the 'Natural History' is one of the most interesting and amusing chapters in that delightful work.

From certain lay writers we learn that it was the custom for popular speakers to be followed on their rounds by crowds of students. Martials (V. ix) epigram is often referred to —

Languebam: sed tu comitatus prolixus ad me
Venisti centum, Symmache, discipulis
Centum me tegigere manus agnilone gelatae
Non habui febrem, Symmache nunc habeo.

and in the Apollonius of Tyana by Philostratus, when Apollonius wishes to prove an alibi he calls the physicians of his sick friend, Telencus and Stratocles to witness who were accompanied by their clinical class to the number of about thirty students. [33]

31/ Lancet. 1909 & 1910
32/ Fischer. Jena. 1909
33/ Philostratus Edition. Oxford University Press Vol II p 231

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ROMAN MEDICINE.

The sketch ~~given~~ by Pliny, in the 29th book of his 'Natural History,' of the growth of medicine in Rome is one of the most interesting and amusing chapters in that delightful book. He quotes Cato's tirade against Greek physicians - corrupters of the race, whom he would have banished from the city. then he sketches the career of some of the more famous of the physicians under the Empire, some of whom must have had incomes never approached at any other period in the history of medicine. ~~It is~~ The a chapter which gives a good picture of the stage on which Galen (practically a contemporary of Pliny) was to play so important a rôle. He seems himself to have been rather disgusted with the devious paths of the doctors of ~~that~~ his day, and there is no one who has touched with stronger language upon the weak points of the art of physic. In one place he says that it alone has this peculiar art and privilege, "That whosoever professeth himself a Physician, is straightwaies beleeved, say what he will: and yet to speake a truth, there are no lies dearer sold or more dangerous than those which proceed out of a Physician's mouth. Howbeit, we never once regard or look to that, so blind we are in our deepe persuasion of them, and feed our selves each one in a sweet hope and plausible conceit of our health by them. Moreover, this mischeef there is besides, That there is no law or statute to punish the ignorance of blind Physicians, though a man lost his life by them: neither was there ever any man known, who had revenge of recompense for the evill intreating or misusage under their hands. They learn their skill

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"by endaungering our lives: and tomake proof and experiment of
"their medicines, they care not to kill us."
He says it is hard that, while the judges are carefully chosen and selected, physicians are practically their own judges, and that of the men who may give us a quick despatch and send us to Heaven or Hell, no enquiry or examination is made of their quality and worthiness. It is interesting to read so early a bitter criticism of the famous'Theriaca', a great conpound medicine invented by - which had a vogue for fifteen hundred years.

But we must return to Galen and his works, which comprise the most voluminous body of writings left by any of the ancients. The great edition is that in twenty volumes by Kuhn (1820). The most useful editions are the 'Junta' of Venice,which were issued in _____ , and in connection with the fourth a very useful index was published by Brassiavolus. A critical study of the writings is at present being made by German scholars for the Prussian Academy, which will issue a definitive edition of his works.

Galen had an eclectic mind and could not identify himself with any of the prevailing schools, but regarded himself as a disciple of Hippocrates. For our purpose both his philosophy and his practice are of minor interest in comparison with his great labours in anatomy and physiology.

In anatomy he was a pupil of the Alexandrians, to whom he constantly refers. Times must have changed since the days of Herophilus, as Galen does not seem ever to have had an opportunity of dissecting the human body, and he laments the prejudice which

(i) Pliny's Natural History, Vol.II. p.347, Philemon Holland, London, 1601.

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prevents it. In the study of osteology he urges the student to be on the look-out for an occasional human bone exposed in a graveyard, and on one occasion he tells of finding the carcase of a robber with the bones picked bare by birds and beasts. Failing this source he advises the student to go to Alexandria, where there were still two skeletons. He himself dissected chiefly apes and pigs. His osteology was admirable, and his little tractate "De Ossibus" with very few changes could be used today by a hygiene class as a manual. His description of the muscles and of the organs is very full, containing, of course, many sins of omission and of commission, but it was the culmination of the study of the subject by Greek physicians.

His work as a physiologist was even more important, for, so far as we know, he was the first to carry out experiments on a large scale. In the first place, he was within an ace of discovering the circulation of the blood. You may remember that through the errors of Praxagoras and Erasistratus the arteries were believed to contain air and got their name on that account: Galen showed by experiment that the arteries contained blood and not air. He studied particularly the movements of the heart and the action of the valves, and the pulsatile forces in the arteries. The x figure before you (Fig.) illustrates better than any I know the Galenic views on the circulation. Of the ~~There were~~ two kinds of blood, the one, contained in the venous system, was dark and thick, ~~was~~ and rich in grosser elements, and served for the general nutrition of the body. This system took its origin, as is well shown in the figure, in the liver, ~~which was~~ the central organ of nutrition and of sanguification. From the portal system were obsorbed through

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the stomach and intestines the products of digestion. From the ~~xxx~~ liver extend the venae cavae, one to supply the head and arms, the other the lower extremities: extending from the right heart was a branch, corresponding to the pulmonary artery, the arterial vein which distributed blood to the lungs. This was the closed venous system. The arterial system, shown, as you see, quite separate~~ly~~ in the figure, was full of a thinner, brighter, warmer blood characterized by the presence of an abundance of the vital spirits. Warmed in the ventricle it distributed vital heat to all parts of the body. The two systems were closed and communicted with each other only through certain pores or perforations in the septum separating the ventricles. At the periphery, however, Galen recognized (as had been done already by the Alexandrians) that the arteries anastomose with the veins, "...and they mutually receive from each other blood and spirits through certain invisible and extremely small vessels."

It is difficult to understand how Galen missed the circulation of the blood. He knew that the valves of the heart determined the direction of the blood that entered and left the organ, but he did not appreciate that it was a pump for distributing the blood, regarding it rather as a fire-place from which the innate heat of the body was derived. He knew that the pulsatile force was resident in the walls of the heart and in the arteries, and he knew that the expansion, or diastole, drew blood into its cavities, and that the systole forced blood out. Apparently his view was that there was a sort of ebb and flow in both systems - and yet, he uses language just such as we would, speaking of the venous system as

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". . a conduit full of blood with a multitude of canals large and small running out from it and distributing blood to all parts of the body". He compares the mode of nutrition to irrigating canals and gardens with a wonderful dispensation by nature that they should "neither lack a sufficient quantity of blood for absorption nor be overloaded at any time with excessive supply." The function of respiration was the introduction of the pneuma, the spirits which passed from the lungs to the heart through the pulmonary vessels. He went a good deal beyond the idea of Aristotle, reaching our modern conception that the function is to maintain the animal heat, and that the smokey matters derived from combustion of the blood are discharged by expiration.

I have dwelt on those points in Galen's physiology, as they are fundamental in the history of ~~our present views~~ the circulation ; and they are sufficient to illustrate his position. Among his other brillian experiments were the demonstration of the function of the laryngeal nerves, of the motor and sensory functions of the spinal nerve roots, of the effect of transverse incision of the spinal cord, and of the effect of hemisection. Altogether there is no ancient physician in whose writings are contained so many indications of modern methods of research.

Galen's views of disease in general are those of Hippocrates but he introduces many refinements and subdivisions according to the predominance of the four humours, the harmonious combination of which means health, or eucrasia, while their perversion or improper combination leads to dyscrasia, or ill-health. In treatment he had not the simplicity of Hippocrates: he had great faith in drugs

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and collected plants from all parts of the known world, for the sale of which he is said to have had a shop in the neighbourhood of the Forum. As I mentioned, he was an eclectic, held himself aloof from the various schools of the day, calling no man master save Hippocrates. He might be called a rational empiricist. He made war on the theoretical practitioners of the day, particularly the Methodists who, like some of their modern followers, held that their business was with the disease and not with the conditions out of which it arose.

No physician has ever occupied the commanding position of Claudius Galen. For fifteen centuries he dominated medical thought as powerfully as did Aristotle in the Schools. Not until the Renaissance did daring spirits begin to question the infallibility of this medical Pope. But here we must part with the last, and in many ways the greatest of the Greeks - a man very much of our own type who, could he visit this country today, might teach us many lessons. He would smile in scorn at the water-supply of many of our cities, thinking of the magnificent aqueducts of Rome and of many of the Colonial towns- some still in use- which in lightness of structure and in durability testify to the astonishing skill of their engineers. There are ~~many~~ country districts in which he would find imperfect drainage and could tell of the wonderful system by which Rome was kept sweet and clean. Nothing would delight him more than a visit to Panama to see what the organixation of knowledge has been able to accomplish. Everywhere he could tour the country as a sanitary expert, preaching the gospel of good water-supply and good drainage, two of the great elements in civilization, in which in many places we have not yet reached the Roman standard.

Lecture III

Section III

Chapter ~~LECTURE~~ III. Jeeps 29 188 163

There are waste places of the earth which fill one with terror - not simply because they are waste; one has not such feelings in the dessert nor in the vast solitudes of the ocean. Very different is it when the ruin ~~desolation~~ has overtaken a brilliant and flourishing product of man's head and hand. To know that

11 pt "..the Lion and the Lizard keep
The Courts where Jamshyd gloried and drank deep "

~~is to~~ sends a chill to the heart, and one trembles with a sense of human instability. ~~With this feeling we enter the Middle Ages.~~ Following the glory that was Greece and the grandeur that was Rome a desolation came upon the civilized world, in which the light of learning burned low, flickering almost to extinction. How came it ~~to be~~ possible that ~~such~~ the gifts ~~as~~ of Athens and of Alexandria ~~had offered~~ were deliberately thrown away.? ~~There were~~ For two ~~main~~ causes. The barbarians shattered the Roman Empire to its foundations. When Alaric entered Rome in 410 A.D. ghastly was the impression made on the contemporaries; as has been said the Roman world shuddered in a titanic spasm (Lindner) The land was a garden of Eden before them, behind a howling wilderness, ~~as is so graphically told in Gibbon's great History.~~ Many of the most important centres of learning were destroyed, and for centuries Minerva and Apollo forsook the haunts of men. The other equally important cause was the change wrought by Christianity. The brotherhood of man, the care of the body, the gospel of practical virtues formed the essence of the teaching of the Founder - in these the Kingdom of Heaven was to be sought; in these lay salvation. But the world was very evil, all thought that the times were waxing late, and into men's minds entered as never

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before a conviction of the importance of the four last things - death, judgement, heaven and hell. One obstacle alone stood between man and his redemption, the vile body - "the muddy vesture of decay", that so grossly wrapped his soul. To find methods of bringing it into subjection was the task of the Christian Church for centuries. In the Vatican Gallery of Inscriptions is a stone slab ~~bearing~~ with the single word 'Stercoriae,' and below it the Christian symbol It might serve as a motto for the Middle Ages, during which, to quote St. Paul, all things were "counted (but dung) to win Christ." In this attitude of mind the wisdom of the Greeks was not simply foolishness, but a stumbling block in the path. Knowledge other than that which ~~makes~~ made a man 'wise unto salvation' was useless. All that was necessary was contained in the Bible or taught by the Church. This simple creed brought consolation to thousands and illumined the lives of some of the noblest of men. But, "In seeking a heavenly home man lost his bearings upon earth." ~~Let me commend for your reading Taylor's "Mediaeval Mind".~~(1) I cannot judge of its scholarship, which I am told by scholars is ripe and good, but I can judge of its usefulness for anyone who wishes to know the story of the mind of man in Europe at this period. Into the content of mediaeval thought only a mystic can enter with full sympathy. It was ~~one of the~~ a needful change in the evolution of the race. Christianity brought new ideals and new motives into the life of men. The world's desire was changed - a desire for the Kingdom of Heaven, in the search for which the lust of the flesh, the lust of the eye and the pride of life

(1) Macmillan & Co. New York, 1911.

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were as dross. A master-motive swayed the minds of sinful men and a zeal to save other sould occupied the moments not devot ed to the perfection of their own. The new dispensation made any other superfluous. As Tertulian said :- Investigation since the Gospel no longer necessary. (Quoted by Dannemann Bd. I p 214). The attitude of the Early fathers towards the body is well expressed by Jerome "Does your skin roughen without baths? Who is once washed in the blood of Christ needs not wash again"

In this unfavourable medium for its growth science was simply disregarded, not in any hostile spirit, but as unnecessary. (2)

~~and a third cause must be considered. The plague of the (see Howorths St Gregory) leave 6 lines)~~

Note to Printer | Leave 6 lines

Galen died ~~in~~ about 200 A.D.; ~~and~~ the high-water mark of the Renaissance, so far as medicine is concerned, was reached in the year 1542. Greek science reached as thro. three channels - 1) South Ital. 2) Byzantine 3 Arabians ~~In order that we may~~ traverse this long interval intelligently to ~~I will sketch certain great movements in connection with and great men.~~ ~~To~~ tracing the currents of Greek thought, ~~to~~ setting forth in their works the lives of certain great leaders, until we ~~to see the birth of the Universities, and to~~ greet the dawn of our own day

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(2) Taylor; "Mediaeval Mind", Vol.I. p.13:-

"Under their action (the Christian Fathers) the peoples of Western Europe, from the eighth to the thirteenth century, passed through a homogeneous growth, and evolved a spirit different from that of any other period of history - a spirit which stood in awe before its monitors divine and human, and deemed that knowledge was to be drawn from the storehouse of thepast; which seemed to rely on everything except its sin-crushed self, and trusted everything except its senses; which in the actual looked for the ideal, in the concrete saw the symbol, in the earthly Church beheld the heavenly, and in fleshly joys discerned the devil's lures; which lived in the unreconciled opposition between the lust and vain-glory of earth and the attainment of salvation; which felt life's terror and its pitifulness, and its eternal hope; around which waved concrete infinitudes, and over which flamed the terror of darkness and the Judgment Day."

1 Howard C St Augustine

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LECTURE III. MIDDLE AGES.

After flowing for more than a thousand years through the broad plain of Greek civilization, the stream of scientific medicine which we have been following is apparently lost in the morass of the Middle Ages; but, checked and blocked like the White Nile in the Sud, three channels may be followed through the weeds of theological and philosophical speculation.

A wide stream is in Italy, where the "antique education never stopped, antique reminiscences and traditions never passed away, and the literary matter of the pagan past never faded from the consciousness of the more educated among the laity and clergy"(3) Greek was the language of south Italy and was spoken in some of the eastern towns until the century. The cathedral and monastic schools served to keep alive the ancient learning. Monte Casino stands pre-eminent as a great hive of students, and to thefamous Regula of St. Benedict (4) we are indebted for the preservation of many precious manuscripts.

The Norman Kingdom of south Italy and Sicily was a meeting ground of Saracens, Greeks and Lombards. Greek, Arabic and Latin were in constant use among the people of the capital, and Sicilian scholars of the twelfth century translated directly from the Greek. The famous Almagest of Ptolemy, the most important work of ancient Astronomy, was translated from a Greek manuscript as early as 1175 by a medical student of Salerno.(5)

(3) H.O.Taylor; "The Mediaeval Mind", Vol.I. Pg.251. Macmillan & Co. New York, 1911.

(4)

(5) Haskins & Lockwood "Harvard Studies in Classical Philology". 1910.

About 30 miles south-east of Naples, ~~and~~ ~~, miles from Monte Casino~~ lay Salernum, which for centuries kept alight the lamp of the old learning, and became the centre of medical studies in the Middle Ages; well deserving its name of 'Civitas Hippocratica'. The date of foundation is uncertain, but Salernian physicians are mentioned as early as the middle of the ninth century, and from this date until the rise of the Universities it was not only a great medical school, but a popular resort for the sick and wounded. As the Scholar says in Longfellows ~~says in the~~ Golden Legend

Then at every season of the year
There are crowds of guests & travellers here;
Pilgrims and mendicant friars & traders
From the Levant, with figs and wine,
And bands of wounded & sick Crusaders,
Coming back from Palestine

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and particularly a halting place for the returning crusaders, among whom may be mentioned Robert of Normandy, son of the Conqueror. There were medical and surgical clinics, foundling hospitals, Sisters of Charity, men and women professors - among the latter the famous Trotula - & apothecaries, and Dissections were carried out, chiefly upon animals, though human dissections were undoubtedly made also. In the 11th and 12th centuries the school reached its height, and that remarkable genius, Frederick II., laid down regulations for the preliminary study which extended over three years, and the course in Medicine for 5 years, including surgery. permission was also given to dissect human bodies. Fee tables and strict regulations as to practice were made; in one of which it is specifically stated that the masters were to teach in the schools, theoretically and practically, under the authority of Hippocrates and Galen. The literature from the school had a far reaching influence. One book on the anatomy of the pig illustrates the popular subject for dissection at that time.(6) The writings, which are numerous, have been collected by Dr Renzi.(7)

The Antidotarium of Nicholaus Praepositus, about 1100, became the popular pharmacopoeia of the Middle Ages, and many modern preparations may be traced to it.

The most prominent man of the school The man who stands out most prominently is Constantinus Africanus, a native of Carthage who, after numerous journeys, reached Salernum about the middle of the 11th century. He was

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(7) De Renzi: "Storia Documentata della Schola Medica di Salerno." Naples, 1857.

(6) and dissections of the bodies of swine
As liveliest the human form divine. Golden Legend

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familiar with the works both of the Greeks and of the Arabs, and it was largely through his translations that the works of Rhazes and Avicenna became known in the West.

~~But~~ One work above all others spread the fame of the School ~~of Salernum~~ - the Regimen Sanitatis, or Floss Medicinae as it is sometimes called, a ~~work~~ poem on popular medicine ~~and in verse~~. It is dedicated to Robert of Normandy who had been bredied at Salernum and the lines begin :- "Anglorum regi scripsit schola tota Salerni" ... It is a hand-book of diet and house-hold medicine with many shrewd and taking sayings, which have passed into popular use, such as " Joy, temperance and repose slam the door on the doctor's nose." A full account of the work and the various editions of it is given by Sir Alexander Croke (8) and the Finlayson lecture (Glasgow 1898) by Dr. Norman Moore gives an account of its introduction into the British Isles.

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(8) Regimen Sanitatis Salernitani; a Poem on the Preservation of Health in Rhyming Latin Verse. Oxford; D.A.Talboys, 1830.

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The second great stream which carried Greek medicine to modern days runs through the Eastern Empire. Between the third century and the fall of Constantinople there was a continuous series of Byzantine physicians whose inspiration was largely derived from the old Greek sources. The most distinguished of these was Oribasius, a voluminous compiler, a native of Pergamos and so close a follower of his great townsman that he has been called 'Galen's ape'. He left many works, and ~~there~~ is an edition of which available in the Old Sydenham Society collections edited by . Many facts relating to the older writers are recorded in his works. He was a contemporary, ~~and the~~ friend as well as the physician of the Emperor Julian, a letter from whom

Other important Byzantine writers were Aëtius, Alexander of Tralles ~~and Paul of Aegina~~, both of whom were strongly under the influence of Galen and Hippocrates. Their Materia Medica was based largely upon Dioscorides.

From Byzantium we have the earliest known complete medical manuscript dating from the 6th century - a work of Dioscorides - one of the most beautiful in existence. It was prepared in the year for Julia, daughter of the Emperor and is now one of the great treasures of the Imperial library at Vienna. (9)

(9) It has been reproduced by

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From those early centuries till the fall of Constantinople there is ~~precious~~ very little of interest medically. A few names stand out prominently, but it is a blank period in our records. Perhaps one mane may be mentioned, as he had a great influence on later ages - Actuarius, who lived about 1300, and whose book on the urine laid the foundation of much of the popular uroscopy and water-casting that had such a vogue in the sixteenth and seventeenth centurkes. His work on the subject.....

~~One has the impression that~~ The Byzantine stream of Greek medicine had dwindled to a very tiny rill when ~~before~~ the fall of Constantinople ~~and the distribu~~ dispersed to the West of many Greek scholars and many precious Manuscripts

The third and by far the strongest branch of the Greek river reached the West after a remarkable and meandering course. x The map before you (Fig.) shows the distribution of the Graeco-Roman Christian world at the beginning of the 7th century. You will notice that Christianity had extended far eastwards, almost to China. Most of those eastern Christians were Nestorians and one of their important centres was Edessa whose school of learning became so celebrated. Here in the 5th century was built one of the most ~~famous~~ celebrated hospitals of antiquity

Now look at another map (Fig.) showing the same countries about ~~the middle of the 7th~~ a century later. No such phenomenal change ever was made within ~~a century~~ the short space of time as that which thus altered ~~the face of~~ the map of Asia and Europe at this period. ~~In that short space of time~~ within a century the Crescent had swept from Arabia through the Eastern Empire, over Egypt, North Africa and over Spain in the West, and the fate of Western Europe ~~hung~~ in the balance ~~until it was settled~~ before the gates of Tours in 732. ~~in 1738.~~ ~~It was largely through this Arabian civilization that Greek~~ ~~science filtered into modern Europe.~~ Medicine ~~was~~ cultivation of medicine

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was encouraged by the Arabs in a very special way. Anyone wishing to follow the history of the medical profession among this remarkable people will find it admirably presented in Lucian Leclerc's "Histoire de la Médecine Arabe" (Paris, 1876). An excellent account is also given in Friend's well-known "History of Medicine" ( ). Here I can only indicate very briefly the course of the stream and its freightage.

With the rise of Christianity Alexandria became a centre of bitter theological and political factions, the story of which haunts the memory of anyone who was so fortunate as to read in his youth Kingsley's "Hypatia". These centuries with their potent influence of Neoplatonism on Christianity appear to have been sterile enough in medicine. I have already referred to the late Greeks, Aëtius and Alexander of Tralles, and the last of the Alexandrians was a remarkable man, Paul of Aegina, a great name in Medicine and in surgery, who lived in the early part of the seventh century. He also, like Oribasius, was a great compiler. In the year the Arabs took Alexandria, and for the third time a great library was destroyed in the "first city of the West." Leclerc brings out a point not referred to particularly in the histories, viz. that shortly after the conquest of Egypt Greek works were translated into Arabic, particularly certain of Galen's books on medicine, and chemical writings which appear to have laid the foundation of Arabian knowledge on this subject.

Through Alexandria then was one source: but the ~~most extra-~~ Itecial ordinary development of the Greek science and of medicine took place in the ninth century under the Eastern Caliphates. Let me quote here a couple of sentences from Leclerc: (Tome I p.)

"The world has but once witnessed so marvellous a spectacle as that presented by the Arabs in the ninth century. This pastoral people, whose fanaticism had suddenly made them masters of half of the world, having once founded their empire, immediately set themselves to acquire that knowledge of the sciences which alone was lacking to their greatness. Of all the invaders who competed for the last remains of the Roman Empire they alone pursued such studies; ~~and~~ while the Germanic bands, glorying in their brutality and ignorance, took a thousand years to re-unite the broken chain of tradition, the Arabs accomplished this in less than a century. They provoked the competition of the conquered Christians - a healthy competition which secured the harmony of the races.

"At the end of the eighth century their whole scientific possessions consisted of ~~xx~~ a translation of one medical treatise and some books on alchemy. Before the ninth century had run to its close, the Arabs were in possession of all the science of the Greeks, they had produced from their own ranks students of the first order, and had raised among their initiators men who, without them, would have been groping in the dark; and they showed from this time an aptitude for the exact sciences, which was lacking in their instructors, whom they henceforward surpassed."

It was chiefly through the Nestorians that the Arabs became acquainted with Greek medicine, and there were two famous families of translators, the Bakhtishuas and the Messuas, both Syrians, and probably not very thoroughly versed in either Greek or Arabic. But the prince of translators, ~~and~~ one of the finest figures of the century was Honein, a Christian Arab, born in 809, whose name was Latinized as Joannitius. "The marvellous extent of his works, "their excellence, their importance, the trials he bore nobly at "the ~~xxxxx~~ beginning of his career, everything about him arouses "our interest and sympathy. "If he did not actually create the Orien-"tal renaissance movement, certainly no one played in it a more act-"ive, decided and fruitful part." (10) His industry was colossal. and he translated most of the works of Hippocrates and Galen, Aristotle and many others. His famous 'Introduction' or 'Isagoge' a very popular book in the Middle Ages, is a translation of the 'Microtegni' of Galen, a small hand-book, of which a translation is appended to Cholmondley's "John of Gaddesden" (11). The first printed edition of it appeared in

The Messuas also did ~~a~~ great work ~~as translators~~, and their ~~works~~ translations, particularly those of the younger Messua, were widely distributed in manuscript and were early printed (1471) The Canones were frequently reprinted, even as late as the 17th century.

Leclerc gives the names of more than 100 known translators, ~~and~~ who ~~and they~~ not only dealt with the physicians but with the Greek

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(10) Leclerc; "Hist. de la Medecine Arabe," T.I. pg.139.

(11) Oxford, Clarendon Press, 1912.

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philosophers, mathematicians and astronomers. The writings of the physicians of India and of Persia were also translated into Arabic.

But close upon the crowd of translators who introduced the ~~xxxx~~ learning of Greece to the Arabians came original observers of the first rank; To a few only of which time will only allow me to refer. ~~to a few of~~ them. Rhazes, socalled from the name of the town in which he was born, was educated at the great hospital at Baghdad in the second half of the ninth century. With a true Hippocratic spirit he made careful many observations on disease, and to him we owe the first accurate account of smallpox, which he differentiated from measles. This work was translated in the Old Sydenham Society by and the description given of the disease is well worth reading. He was a man of strong powers of observation, good sense, and excellent judgement. His works were very popular, particularly the gigantic "Continens ", one of the bulkiest of incunabula. The Brescia edition, a magnificent volume, extends over pages and it must weigh more than pounds. It is an Encyclopoedia filled with extracts from the Greek and other writers interspersed with memoranda of his own experiences. His'Almansor' was a very popular text-book, and one of the first ~~things~~ to be printed. Book IX of 'Almansor' (~~which, by the way, was~~ the name of the Prince to whom it was addressed) with the title "De Aegritudinibus a capite usque ad pedes" was a very favourite mediaeval text-book, ~~of which~~ x ~~I show you here an illustration.~~ (Fig). On account of his zeal for his studies Rhazes was known as the 'Experimentator'.

The ~~greatest~~ first of the Arabians, known throughout the Middle Ages as the Prince, the rival, indeed, of Galen, was the Persian Ibn Sina, better known as Avicenna, one of the greatest names in the history of medicine. ~~He was~~ Born about 1000 A.D. in the province of Bokhara, ~~and~~ he has left a brief autobiography from which we learn something of his early years ~~from a brief autobiography in which he states that~~ He could repeat the Koran by heart when ten years old, and ~~that~~ at twelve he had disputed in Law and in Logic. To which he turned Medicine was an easy subject, not hard and thorny like mathematics and metaphysics! He worked night and day, and could solve problems in his dreams. "When I found a difficulty", he says, " I referred to my notes and prayed to the Creator. At night, when weak, or sleepy, I strengthened myself with a glass of wine." (12) He was a voluminous writer to whom scores of books are attributed, and he is the author of the most famous text-book ever written. It is safe to say that the 'Canon' was a medical bible for ~~read through~~ a longer period than any other medical work. It "stands for the epitome of all precedent development, the final codification of all Graeco-Arabic Medicine. It is a hierarchy of laws liberally illustrated by facts which so ingeniously rule and are subject to one another, stay and uphold one another, that admiration is compelled for the sagacity of the great organiser who, with unparelleled power of systematisation, collecting his material from all sources, constructed so imposing an edifice of fallacy. Avicenna, according to his lights, imparted to contemporary medical science the appearance of almost mathematical accuracy, whilst the art of therapeutics, although empiricism did not lack recognition, was deduced as a logical sequence from theoretical (Galenic and Aristotelian) premises. Is it not, therefore, matter for surprise

(12)

" that the majority of investigators and practitioners should have "fallen under the spell of this consummation of formalism, and "should have regarded the "Canon" as an infallible oracle, the more "so in that the logical construction was impeccable and the premises, "in the light of contemporary conceptions, passed for incontrovert-"ible axioms?" (13)

Innumerable manuscripts of it existed: of one of the most beautiful, which ~~of which~~ I ~~will~~ show you an illustration (Fig.) is in the Bologna ~~Bodleian~~ Library. The work was first printed in 14 and there are numberless editions, the last in 1663. Avicenna was not only a successful writer, but the prototype of the successful physician, who was at the same time statesman, teacher, philosopher, and literary man. Rumour has it that he became dissipated, and a contemporary saying was that all his philosophy could not make him moral, nor all his physic teach him to preserve his health. He enjoyed a great reputation as a poet. I show you here (Fig.) a representation of a manuscript of one of his poems, which we have in the Bodleian. Professor A.V.W.Jackson says that some of his verse is ~~they are~~ peculiarly Khayyamesque, though he antedated Omar by a century. That "large Infidel" might well have written such a ~~verse~~ stanza as

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From Earth's dark centre unto Saturn's Gate
I've solved all problems of this world's Estate
From every snare of Plot and Guile set free
Each bond resolved - saving alone Death's Fate

(13) Neuburger, "History of Medicine, Vol.I. pg.368-369.

His hymn to the Deity might have been written by Plato and rivals the famous one of Cleahthes.(14) A casual reader gets a very favourable impression of Avicenna, and the story of his dominion over the schools in the Middle Ages is one of the most striking in our history. Perhpas we feel that Leclerc exaggerate when he says, "Avicenne est un phenomene intellectuel. Jamais peut-etre on ne vit une intelligence precoce, facile et etendue se prolonger et se soutenir avec une aussi etrange et aussi infatigable activite ". (Avicenna is an intellectual phenomenon. Never perhaps has an example been seen of so precocious, quick and wide an intellect extending and asserting itself with so strange and indefatigable an activity) . The touch of the man never reached me until I read some of his mystical and philosophical writings translated by Mehren.(15) It is Plato over again The beautiful allegory in which men are likened to birds snared and caged until set free by the Angel of Death might be met with anywhere in the immortal Dialogues. The tractate on Love is a commentary on the Symposium; and the essay on Destiny is Greek in spirit without a trace of Oriental fatalism, as you may judge from the concluding sentence, which I leave you as his special message:- "Observe les limites de ta capacite , et alors tu arriveras a la connaissance du vrai. Combien est vrai l'adage "Travaillez toujours, et chacun sera favorise du succes de tout - pour lequel il a ete cree par la nature."; ".

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(14) L'Elegie du Tograi par P.Valtier, Paris MDCLX.

(15) Traites Mystiques d'Abou Ali al-Hosain b.Abdallah b.Sina ou d'Avicenne par M.A.F.Mehren, Leyde. A.J.Brill Facs. 1-1V 1889-1899.

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Avicenna died in his 58th year. When he saw that physic was of no avail, resigning himself to the inevitable, he sold his goods, distributed the money to the poor, read the Koran through once every three days, and died in the holy month of Ramdan. His tomb of which I show you Jackson's illustration (Fig.) at Hamadan/(the ancient Ecbatana) still exists, and is described by Jackson as a simple brick-work building, rectangular in shape, and surrounded by an unpretentious court. Having fallen into ruins it was restored in 1877. ~~It~~ is ~~still~~ much visited by pilgrims, and cures among them are said to be not uncommon. ~~and as D'Arcy Power remarks in his description of it, "though dead", the great Persian "has still a large practice."~~

Though dead the great Persian has still a large practice at his tomb

The Western Caliphate produced physicians and philosophers almost as brilliant as those of the East. Remarkable schools of medicine were founded at Seville, Toledo and Cordova. The most famous of the professors were Averroes, Albucasis and Avenzoar. Albusacis was 'the Arabian restorer of surgery', Averroes called in the Middle Ages 'the soul of Aristotle', or 'the Commentator', is better known today among philosophers than physicians. On the revival of Moslem orthodoxy he fell upon evil days, and was persecuted as a free-thinker, and the saying is attributed to him - "Sit anima mea cum philosophis".

Arabian medicine had certain very definite characteristics: the basis was Greek, derived from translations of the works of Hippocrates and Galen. No contributions were made to anatomy, as dissections were prohibited, nor to physiology, and the pathology was practically that of Galen. Certain new and important diseases were described; a number of new and active remedies were

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introduced, chiefly from the vegetable kingdom. The Arabian hospitals were well oragnised and were deservedly famous. No such hospital exists today in Cairo as that which was built by al-Mansur Gilafun in 1283. The description of it by Makriza quoted by Neuburger, reads like that of a 20th century institution with hospital units. (16)

It was in the domain of chemistry that the Arabs made the greatest advances. You may remember that in Egypt chemistry had already made considerable strides, and I alluded to Professor Elliot Smith's view that one of the great leaps in civilization was the discovery in the Nile valley of the metallurgy of copper. In the brilliant period of the Ptolemies both chemistry and pharmacology were studied, and it seems not improbable that, when the Arabs took Alexandria in the year .there were still many

(16) "I have founded this institution for my equals and for those beneath me, it is intended for rulers and subjects, for soldiers and for the Emir, for great and small, freemen and slaves, men and women' He ordered medicaments, physicians and everything else that could be required by anyone in any form of sichmess; placed male and female attendants at the disposal of the patients, determined their pay, provided beds for patients and supplied them with every kind of covering that could be required in any complaint. Every class of patient was accorded separate accomodation: the four halls of the hospital were set apart for these with fever and similar complaints; one part of the building was reserved for eye-patients, one for the wounded, one for those suffering from diarrhoea, one for women; a room for convalescents was divided into two parts, one for men, and one for women. Water was laid on to all these departments. One room was set apart for cooking food, preparing medicine and cooking syrups, another for the compounding of confections, balsams, eye-salves, etc. The head-physician had an apartment to himself wherein he delivered medical lectures. The number of patients was unlimited, every sick or poor person who came found admittance, nor was the duration of his stay restricted, and even those who were sick at home were supplied with every necessity."
- Makrizi

"In later times this hospital was much extended and improved. The nursing was admirable and no stint was made of drugs and appliances; each patient was provided with means upon leaving so that he should not require immediately to undertake heavy work." Neuburger; "History of Medicine, Vol.I. P.378

workers in these subjects.

The most famous of those early Arabic writers is the somewhat mythical Geber, who lived in the first half of the eighth century, and whose writings had an extraordinary influence throughout the Middle Ages. The whole story of Geber is discussed by Berthelot in his "Etudes de la Chimie".

The transmission of Arabian science to the Occident began with the Crusades, though earlier ~~than that~~ a filtering of important knowledge in mathematics and astronomy had reached southern and middle Europe through Spain. Among the translators several names stand out prominently, ~~like~~ Gerbert, who became later Pope Sylvester II. ~~and who~~ is said to have given us our present Arabic figures. You may read the story of his remarkable life ~~in~~ by Taylor (17), who says he was "the first man of his time, its greatest teacher, most eager learner, and most universal scholar." But he does not seem to have done much directly for medicine.

The Greeco-Arabic learning passed into Europe through two sources. As I have already mentioned, Constantinus Africanus, a North African Christian monk, widely travelled and learned in languages, came to Salerno and translated many works from Arabic into Latin, particularly those of Hippocrates and Galen. The 'Pantegni' of the latter became one of the most popular text-books of the Middle Ages. A long list of other works which he translated is given by Leclerc It is not unlikely that Arabic medicine had already found its way to Salernum before the time of Constantine, but the influence of his translations was very great.

The second was a more important source - through the Latin translators in Spain, where from the middle of the 12th till the middle of the 13th century ~~there was~~, ~~more~~ particularly in Toledo, an extraordinary number of Arabic works in philosophy, mathematics and astronomy were translated ~~into Latin~~. Among the translators Gerhard of Cremona is prominent, and has been called the 'Father

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(17) The Mediaeval Mind", Vol.I. pg.280.

of Translators'. He was one of the brightest intelligences of the Middle Ages, and did a work of the first importance to science, in the extraordinary variety of material he put in circulation. (Leclerc). Translations not only of the medical writers, but of an indescriminate crowd of authors in philosophy and general literature came from his pen. He furnished the first translation of the famous 'Almagest' of Ptolemy, which opened the eyes of his contemporaries to the value of the Alexandrian astronomy.(16)
Leclerc gives a list of 71 works from his hand.

Many of the translators of the period were Jews, and many of the works were translated from Hebrew into Latin. For years Arabic had been the the learned language of the Jews, and in a large measure it was through them that the Arabic knowledge and the translations passed into South and Central Europe.

The Arab writer whose influence on Mediaeval thought was the most profound was Averroes, the great Commentator on Aristotle.

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(18) For an account of that remarkable work see

The rise of the Universities

The most striking intellectual phenomenon of the thirteenth century is the rise of the university. The story of their foundation is fully stated in Rashdall's great work. Monastic and collegiate schools, seats of learning like Salernum, student guilds as at Bologna, ~~now failed~~ had tried to meet the educational needs of the age. The word university literally means an association, and ~~it~~ was not ~~necessarily~~ at first restricted to learned bodies. The origin appears to have been in certain guilds of students formed for mutual protection associated at some place specially favourable for study - the attraction generally being a famous teacher. The University of Bologna ~~appears to have~~ grew up about guilds formed by students of law, and at Paris ~~quite~~ early in the 12th century there ~~was a~~ were communities of teachers, chiefly in ~~physiology~~ philosophy and theology. In this way arose ~~the~~ two different types of mediaeval university. The ~~prosperous~~ universities of northern Italy were largely controlled by ~~the~~ students, ~~and were in the hands of~~ who were grouped in different 'nations' ~~alities~~. They ~~appointed a lecturer~~ arranged the lectures and had control of the appointment of teachers. On the other hand, inthe universities founded on the Paris model the Masters had control of the studies, though the students, also in ~~who were arranged according to~~ Nations~~ality~~, ~~more or less controlled~~ managed their own affairs. ~~The masters were organised in faculties, and elected their Chancellor, or Head.~~

~~The~~ Two universities ~~that~~ have a special interest at this period in connection with the development of medical studies, ~~are those of~~ Bologna and Montpellier. At the former ~~is of special note in connection with the regival of~~ the study of anatomy was revived. In the knowledge of the structure of the human body no advance had been made/

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1216

made for more than a thousand years - ~~in fact~~, since Galen's day. In the process of translation from Greek to Syriac, from Syriac to Arabic, from Arabic to Hebrew, and from Hebrew or Arabic to Latin, both the form and thought of the old Greek writers were not infrequently confused, and often even perverted and Galens anatomy suffered severely in the transmission. ~~There do exist some very plain and direct translations of Galens works~~ on ~~anatomy into Arabic; and From a unique Arabic manuscript in the Bodleian library xxxxxxxxxxxx the seven last books of Galen's anatomy have been translated by Simon (i)~~. Our earliest knowledge of the teaching of medicine at Bologna is connected with a contemporary of Dante, Taddeo, for whom is claimed the combination of Arabian erudition with the Greek spirit. He occupied a position of extraordinary prominence, was regarded as the first citizen of Bologna and a public benefactor exampt from the payment of taxes. That he should have acquired welath is not surprising if his usual fees were at the rate at which he charged Pope Honorius IV. i.e. 200 florins a day, besides a 'gratification' of 6000 florins

The man of the most powerful infulence on Medicine in Bologna was Mundinus, the first modern student of anatmoy. We have seen that at the school of Salernum it was decreed that the human body should be dissected at least once every five years, but it was with the greatest difficulty that permission was obtained for this purpose. It seems probable that under the strong influence of Taddeo there was an occasional dissection at Bologna, but it was not until Mundinus (Professor from 1306 to 1326) took the chair that the study of anatomy became popular. The bodies were usually those of condemned criminals, but in the year 1319 there is a

~~(i) Simon;~~

record of a legal procedure against four medical students for body-snatching - the first record, as far as I know, of this gruesome practice. In 1316 Mundinus issued his work on anatomy which served as a text-book for more than 200 years. He quotes from Galen the amusing reasons why a man should write a book:- "Firstly to satisfy his own friends; secondly, to exercise his best mental powers; and thirdly, to be saved from the oblivion incident to old age." Scores of manuscripts of his work must have existed, but they are now excessively rare in Italy. The book was first printed at Pavia in 1478 in a small folio without figures. It was very often reprintedin the fifteenth and sixteenth centuries, and the quaint illustrations show us the mediaeval method of teaching anatomy: the lecturer sitting on a chair reading from Galen, while a barber surgeon, or a butcher open the cavities of the body. (Fig.)

I have already referred to the study of medicine by women at Salernum. Their names are also early met with in the school of Bologna. Mundinus had a valuable assistant, a young girl Alesandria Giliani, an enthusiastic dissector, who is said to have been the first to practice the injection of the blood-vessels with coloured liquids. She died, consumed by her labours, at the early age of nineteen, and her monument is to be seen

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Bologna honoured its distinguished professors with magnificent tombs, sixteen or seventeen of which, in a wonderful state of preservation, may still be seen in the Civic Museum. That of Mundinus also exists - a sepulchral bas-relief on the wall of the church of San Vitale. (19)

(19) For these figures and for points relating to the old school at Bologna see Cavazza's work, "Le Scuole dell' Antico Studio Bolognese," Milano, 1896.

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You will be interested to know just what sort of anatomy Mundinus taught, and how far it differed from that of Galen.

The other early mediaeval university of special interest in medicine is that of Montpellier. With it are connected three teachers who have left great names in our story - Arnold de Villanova, Henri de Mondeville and Guy de Chauliac. The city was very favourable situated not far from the Spanish border, and the receding tide of the Arab invasion in the ~~eighth~~ century had left a strong Arabic influence in that province. The date of the origin of the university is doubtful, but there were teachers of medicine there in the twelfth century, though it was not uhtil 1289 that it was formally founded by a ~~Papal bull~~.

Arnold de Villanova ~~was~~ the most prolific writer of the early Middle Ages. He had travelled much, was deeply read in Arabic medicine and was also a student of law and of philosophy. He was an early editor of the Regimen Sanitatis, and a strong advocate ~~for~~ of diet and hygiene. His views on disease were largely those of the Arabic physicians, and we cannot see that he himself made any very important contribution to our knowledge; but he was a man of strong individuality and left an enduring mark on mediaeval medicine, as one may judge from the fact that among the first hundred medical books printed there were associated with his name. He was an early heretic and constantly in trouble with the Church, though ~~he was~~ befirended by the Popes on account of his medical knowledge. There is a Bull of Clement V. asking the bishops to search for a medical book by Arnold dedicated to himself, but not many years later his writings were condemned as heretical.

(Fig. -)
Arnoldus

In Henri de Mondeville we have the typical mediaeval surgeon, and we know his work now very thoroughly from the editions of his Anatomy and Surgery edited edited by Pagel (Berlin 1889-1902), and the fine French edition by Nicaise, (Paris, 1893). The dominant Arabic influence is seen in that he quotes so large a proportion of these quthors, but he was an independant observer and a practical surgeon of the first rank. He had a sharp wit and employed a bitter tongue against the medical abuses of his day. How the Hippocratic humours dominated practice at this time you may see at a glance from the tables prepared by Nicaise from the works of de Mondeville (Fig. Pg XL. Nicaise) We have here the whole pathology of the period.

A still greater name in the history of this school is Guy de Chauliac, whose works have also been edited by Nicaise (Paris 1890). His important Surgery was one of the most important text-books of the late Middle Ages. There are many manuscripts of it, some fourteen editions in the 15th century and thirty-eight in the 16th, and it continued to be reprinted far into the 17th century. He too was dominated by the surgery of the Arabs, and on nearly every page one reads of the sages Avicenna, Albucasis, or Rhazes. He lays down four conditions necessary for the making of a surgeon - the first is that he must be learned, the second, expert, the third that he should be ~~"bien morigere"~~ well disciplined.

You will find a very discerning sketch of the relation ~~history~~ of these two men to the history of surgery in the opening address

given at the St. Louis Congress in 1904 by Sir Clifford Allbutt.[20] They were strong men with practical minds and good hands, whose experience taught them wisdom. In both there was a blunt honesty that so often characterizes a good surgeon, and I commend to modern surgeons de Mondeveile's saying:- "If you have operated conscientiously on the rich for a proper fee, and on the poor for charity, you need not play the monk, nor make pilgrimages for your soul".

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[20] Allbutt; "Historical Relations of Medicine and Surgery," MacMillan ' Co., 1905.

l.c.

One other great mediaeval physician may be mentioned, Peter of Abano (a small town near Padua famous for its baths). He is the first in a long line of distinguished physicians connected with the great school of Padua. Known as the 'Conciliator' from his attempt to reconcile the diverse views on philosophy and medicine, he had an extraordinary reputation as a practitioner and author, the persistence of which is well illustrated by the fact that of the printed books before 1480 were from his pen. He appears to have taught medicine in Paris, Bologna and Padua. He was a devoted astrologer, had a reputation among the people as a magician and, like his contemporary, Arnold of Villanova, came into conflict with the Church and appears to have been several times before the Inquisition, indeed it is said that he escaped the stake only by a timely death. ~~Accused and condemned for the practice of magic~~ in his ~~80th year he fortunately died before sentence was passed~~. He was a ~~great~~ prolific commentator on Aristotle, and his exposition of the Problems had a great vogue. His early editions are among the most superb works ever printed. ~~I show here a page of the Mantua edition of the Problems, 1475. (Fig.)~~ He outlived his reputation as a magician, for more than a century after his death Frederick, Duke of Urbin caused his effigies tobe set up over the gate of the palace at Padua with this inscription:-

"~~Petrus Aponus Patavinus Philosophiae Medicinaeque Scientissimus, ob idque Conciliatoris nomen adeptus~~

"PETRUS APONUS PATAVINUS PHILOSOPHIAE MEDICINAEQUE SCIENTISSIMUS, OB IDQUE CONCILIATORIS NOMEN ADEPTUS, ASTROLOGIAE VERO ADEO PERITUS, UT IN MAGIAE SUSPICIONEM INCIDERIT, FALSOQUE DE HAERESI POSTULATUS, ABSOLUTUS FUERIT." ~~(1)~~ 21 ~~Tooker~~ ~~(1)~~ 21 Naudé's Magick. London 1657. pg. 182.

It is said that Abano ~~he~~ caused to be painted the astronomical figures in the great hall of the Palace ~~at~~ Padua.

One characteristic of mediaeval medicine in ~~the re~~ its union with theology, ~~and this is~~ which is not remarkable, ~~because~~ as the learning of the time was ~~really~~ chiefly in the hands of the clergy. One of the most popular works ~~in medicine~~, the 'Theaaurus Pauperum', was written by Petrus Hispanus, afterwards Pope John XXI. We may judge of the pontifical practice from the page here reproduced (Fig. 21 x) , which probably includes, under the term 'iliac passion' all the varieties of mediaeval appendicitis.

For our purpose two beacons ~~reflect~~ illuminate the spirit of the 13th century in its outlook on man and nature. Better than Abelard or St. Thomas Aquinas, and much better than any physicians, Albertus Magnus and Roger Bacon represent the men who were awake to greet the rising of the sun of science. What a contrast in their lives and in their works! The great Dominican's long life was an uninterrupted triumph of fruitful accomplishment - the titanic task he set himself was not only completed but was appreciated to the full by his own generation - a life not only of study and teaching, but of practical piety, ~~and~~, as Head of the Order in Germany ~~of his Order~~ and Bishop of Regensburg, he had ~~of~~ wide ecclesiastical influence ; and in death he left ~~remained~~ a memory equalled only by one or two of his century, and excelled only by his great pupil Thomas Aquinas. There are many Alberts in history - the Good, the Just, the Faithful - but there is only one we call 'Magnus' and who richly deserved the name. What is his record? Why do we hold his name in reverence today?

Albertus Magnus was an encyclopoedic student and author, who took all knowledge for his province. His great work and his great ambition was to interpret Aristotle to his generation. Before his day the Stagirite was only known in part, but he put within the reach of his contemporaries the whole science of Aristotle, and imbibed no small part of his spirit. He recognized the importance of the study of nature, even of testing it by way of experiment, and in the long years thathad elapsed since Theophrastus no one else, except Dioscorides, had made a thorough study of botany. His paraphrases of the natural history boo ks of Aristotle were immensely popular, and served as a basis for

all subsequent studies. Some of his medical works had an extraordinary vogue, particularly the "De Secretis Mulierum" and the "De Virtutibus Herbarum", though there is some doubt as to the authorship of the first named; (but Jammy and Borgnet include it in the collected editions of his works). So fabulous was his learning that he was suspected of magic and comes in Naudé's list of the wise men who have unjustly been reputed magicians. Ferguson tells (22 i) that "there is in actual circulation at the present time a chap-book containing charms, receipts, sympathetic/al and magical cures for men and animals, which passes under the name of Albertus." But perhaps the greatest claim of Albertus to immortality is that he was the teacher and inspirer of Thomas Aquinas, the man who undertook the colossal task of fusing Aristotelian philosophy with Christian theology, and with such success that the 'angelic doctor' remains today the supreme human authority of the Roman Catholic Church.

But a man of much greater interest to us from the medical point of view is Roger Bacon, and for two reasons. More than any other mediaeval mind he saw the need of the study of nature by a new method. The man who could write such a sentence as this:- "Experimental science has three great prerogatives over other "sciences; it verifies conclusions by direct experiment; it discovers truth which they never otherwise would reach; it investigates the course of nature and opens to us a knowledge of the past and of the future". is mentally of our day and generation.

(22 i) Bibliotheca Chemica, Vol.I. pg.15. 1906.

Bibliotheca Chemica Vol.1

Bacon was born out of due time, and his contemporaries had little sympathy with his philosophy, and still less with his mechanical schemes and inventions. From the days of the Greeks no one had had so keen an appreciation of what experiment meant in the development of human knowledge, and he was obcessed with the idea, so commonplace to us, that knowledge should have its utility and its practical bearing. "His chief merit is that he was one of the first to point the way to original research - as opposed to the acceptance of an authority - though he himself still lacked the means of pursuing this path consistently. His inability to satisfy this impulse led to a sort of longing, which is expereessed in the numerous passgaes in his works where he anticipates man's greatery mastery over nature."(23 ~~i~~)

Bacon wrote a number of medical treatises, most of which remained in manuscript. His treatise on the Cure of Old Age And the Preservation of Youth was printed in English 18 1683(24 ~~ii~~). His authorities were largely Arabian. One of his manuscripts is "On the Bad Practices of Physicians.".

23
(~~i~~) Dannemann: "Die Naturwissenschaften in ihrer Entwickelung und in ihrem Zusammenhange". Vol.I. pg.278-9. Leipzig.1910.

24
(~~ii~~) It may be interesting to note the three causes to which he attributes old age:- "As the World waxeth old, Men grow old with it: not by reason of the Age of the World, but because of the great Increase of living Creatures, which infect the very Air, that every way encompasseth us, and Through our Negligence in ordering our Lives, and That great Ignorance of the Properties which are in things conducing to Health, which might help a disordered way of Living, and might supply the defect of due Government."

Next year the septencentenary of the birth of Roger Bacon will be celebrated by Oxford, the University of which he is the most distinguished ornament. Among the works that will be issued at that time it is hoped that his unpublished medical writings will be included.

What would have been its fate, if the mind of Europe had been ready for Roger Bacon's ferment, and if men had turned to the profitable studies of physics, astronomy and chemistry, instead of wasting centuries over the scholastic philosophy and the subtleties of Duns Scotus, Abelard and Thomas Aquinas? who can say? But ~~let us~~ make no mistake about the quality of these men - giants in intellect, who have had their place in the evolution of the race; but from the standpoint of man struggling for the mastery of this world they are like the members of Swift's famous college 'busy distilling sunshine from cucumbers.' I speak, of course from the position of the natural man, who sees for his fellows more hope from the experiments of Roger Bacon than from the disputations of philosophy on the 'Instants, Familiarities, Quiddities and Relations", which so roused the scorn of Erasmus.

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Mediaeval medical Studies.

It will be of interest to know what studies were followed at a mediaeval university. At Oxford, as at most of the Continental Universities, there were three degrees, that of Bachelor, Licenciate and Doctor. The books read were the 'Tegni' of Galen, the Aphorisms of Hippocrates, the 'Liber Febri' of Isaac and the 'Antidotarium' of Nicolaus Praepositus: if a graduate in Arts six years study in all were required, if not eight. One gets very full information on such matters from a most interesting book, "Une Chaire de Médecine au XVe. Siècle by Dr.Ferrari, (Paris 1899). The university of Pavia was founded in 1361, and like most of those in Italy was largely frequented by foreigners, who were arranged, as usual, according to their nationalities; but the students do not appear to have controlled the university quite so much as at Bologna. The documents of the Ferrari family, on which the work is based, tell the story of one of its members, who was a Professor at Pavia from 1432 to 1472. One is surprised at the range of studies in certain directions, and still more at the absence of other subjects. A list is given of the teachers in medicine for the year 1433, 20 in all, and there were special lectures for the morning, afternoon and evening. The subjects are Medicine, Practical Medicine, Physics, Metaphysics, Logic, Astrology, Surgery and Rhetoric: very striking is the omission of Anatomy, which does not appear in the list even in 1367. The salaries paid were not large, so that most of the teachers must have been in practice: 400 and 500 florins were the maxima.

? 1467

The dominance of the Arabians is striking. In 1467 special lectures were given on the 'Almansor' of Rhazes, and in the catalogue of the Ferrari's library more than one half of the books are Arabian commentaries on Greek medicine. Still more striking evidence of their influence is found in the text-book of Ferrari which was printed in 1471 and had been circulated earlier in MS. Im it Avicenna is quoted more than 3000 times, Rhazes and Galen 1000, Hippocrates only 140 times.

Professor Ferrari was a man who played an important rôle in the university, and had a large consultation practice. You will be interested to know what sort of advice he gave in special cases, and I have ~~here~~ the record of an elaborate consultation written in his own hand, from which ~~you~~ one may gather what a formidable thing it was to fall into the hands of a mediaeval physician. Sir John de Calabria had a digestive weakness of the stomach, and rheumatic cerebral disease, combined with superfluous heat and dryness of the liver and multiplication of choler. There is firs an elaborate discussion on diet and general mode of life; then he proceeds to draw up certain light medicines as a supplement, but it must have taken an extensive apothecary's shop to turn out the 22 prescriptions designed to meet every possible contingency.

225 8 140

One of the difficulties in the early days of the universities was to procure good MSS. In the Paris faculty, the records of which are the most complete in Europe, there is an inventory for the year 1395 which gives a list of twelve volumes, nearly all by Arabian authors. (25) Franklin gives an interesting incident illustrating the ratity of medical MSS. at this period. Louis XI., always worried about his health, was anxious to have in his library the works of Rhazes. The only copy available was in the library of the medical school. The Manuscript was lent, but on excellent decurity, and it ss nice to know that it was returned.

It is said that one of the special advantages that Montpellier had over Paris was its possession of so many important MSS, particularly those of the Arabian writiers. Many 'Compendia' were writtenn containing extracts from various writers, and no doubt those were extensively copied and lent or sold to students. At Bologna and Padua there were regulations as to the price of these MSS. The university controlled the production of them, and stationers were liable to fines for inaccurate copies. The trade must have been extensive in those early days, as Rashdall mentions that in 1323 there were 28 sworn booksellers in Paris, besides keepers of bookstalls in the open air. I have here what appears to be a student's compendium written at the University of Montpellier in 1372.

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(25) Recherches de la Bibliothèque de la Faculté de Médecine de Paris, Franklin. 1864.

[illegible] practice. The Greek doctrine of the four humours coloured all the conceptions of disease; upon their harmony alone it was thought that health depended. The four temperaments, sanguine, phlegmatic, bilious and melancholic, corresponded with the prevalence of these humours. The body was composed of certain natural things, seven in number - the elements, the temperaments, the humours, the members or parts, the virtues or faculties, the operations or functions, and the spirits. Certain non.natural things preserved the health of the body, six in number - air, food and drink, movement and repose, sleeping and waking, excretion and retention, and the passions. Disease was due usually to alteration in the composition ofthe humours, and the indications for treatment were in accordance with these doctrines. They were to be evacuated, tenuated, cooled, heated, purged,or strengthened. This humoural doctrine prevailed throughout the Middle Ages, and reached far into modern times - indeed echoes of it are still to be heard in popular conversations on the nature of disease.

The Arabians were famous for their vigour and resource in matters of treatment. Bleeding was the first resort in a large majority of all diseases. In the "Practica" of Ferrari there is scarcely a malady for which it is not recommended. All remedies were directed to the regulation of the six non-naturals, and they either preserved health, cured the disease - or did the opposite. The most popular medicines were derived from the vegetable kingdom, and as they were chiefly those recommended by Galen, they were, and still are, called by his name.
Many important mineral medicines were introduced by the Arabians, particularly mercury, antimony, iron, etc. There were in addition scores of substances, the parts or products of animals, some harmless, others salutary, others again useless and disgusting.

Surgery was in the hands of the berbers, who performed all the minor operations, such as bleeding; the more important operations, few in number, wer performed by surgeons.

At this period astrology, which included astronomy, was everywhere taught. In the "Goueruaunce of Princes, or Pryvete of Pryveties", translated by James Young, 1422 (26) there occurs the statement:- "As Galian the full wies leche Saith and Isoder the Gode clerk, hit witnessith that a man may not perfitely can the sciens and craft of Medissin but if he be an astronomoure."

We have seen how the practice of astrology spread from Babylonia and Greece throughout the Roman Empire. It was carried on into the Middle Ages as an Active and aggressive cult, looked upon askance at times by the Church, but countenanced by the courts, encouraged at the universities, and always by the public. In the curriculum of the mediaeval university astronomy made up with music, arithmetic and geometry the Quadrivium. In the early faculties astronomy and astrology were not separate, and at Bologna in the early fourteenth century we meet with professors of astrology. (27) One of his duties, as a salaried professor, was to supply 'judgements' gratis for the benefit of enquiring students. A treacherous and delicate professorship, as that most distinguished occupant of the Chair at Bologna found, Cecco d'Ascoli, who was burned at the stake in 1357, a victim of the Florentine Inquisition! (28)

Roger Bacon was a warm believer in judicial astrology and in the influence of the planets, stars & comets on generation, disease and death.

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26 (i) Early Engl. Text Soc. 1898; Rawl.MS. B.490.)

27 (ii) Rashdall, "Universities of Europe in the Middle Ages", Vol.I.p.240.

28 (iii) Rashdall, l.c.Vol.I. p.244. - Rashdall also mentions that in the 16th century at Oxford there is an instance of a scholar admitted to practice astrology. l.c. Vol.II. p.458.

Many of the stronger minds of the Renaissance broke away from the follies of the subject. Thus Cornelius Agrippa in reply to the request of a friar to consult the stars on his behalf says: (1) "Judicial astrology is nothing more than the fallacious guess of "superstitious men, who have founded a science on uncertain things "and are deceived by it: so think nearly all the wise; as such it "is ridiculed by some most noble philosophers; Christian theolo- "gians reject it, and it is condemned by sacred councils of the "Church. Yet you, whose office it is to dissuade others from these "vanities, oppressed, or rather blinded by I know not what distress "of mind, flee to this as to a sacred augur, and as if there were "no God in Israel, that you send to inquire of the god of Ekron".

But in spite of the opposition of the Church it was tolerated, and many of the universities at the end of the 15th century published almanacks, which were known as 'Prognosticons', and the practice was continued far into the 16th century. I show you here some illustrations (Figs.

Rabelais, you may remember, when physician to the Hotel Dieu in Lyons, published almanacks for the years
In the title-page he called himself 'Doctor of Medicine and Professor of Astrology", and they continued to be printed under his name until 1550. In the preparation of these he must have had his tongue in his cheek, as in his famous Pantagrueline Prognostication, in which, to satisfy the curiosity of all good companions, he had turned over all the archives of the heavens,

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(1) Cornelius Agrippa (H.Morley) Vol.II., p.138.

39 229 144

calculated the quadratives of the moon, hooked out all that has ever been thought by all the Astrophils, Hypernephilists, Anemophylakes, Uranopets and Ombrophori, and felt on every point with Empedocles.(30 ~~i~~)

Even physicians of the most distinguished reputation practised judicial astrology. Jerome Cardan was not above earning money by casting horoscopes, and on this subject he wrote one of his most popular books, (*De Supplementō Almanach &c. 1643*) in which astronomy and astrology are mixed in the truly mediaevall fashion. He ~~studied~~ gives in it some 67 nativities remarkable for the events they foretell, with an exposition. One of the accusations brought against him was that he had "attempted to subject to the Stars the Lord of the Stars and cast our Saviour's horoscope".(31 ~~ii~~) Cardan ~~seems to~~ professed to have abandoned ~~the~~ a practice, ~~which was~~ looked upon with disfavour both by the Church and by the universities, but he returned to it again again. I show here his own horoscope (Frs) That remarkable character, Michael Servetus, the discoverer of the lesser circulation, when a fellow student with Vesalius at Paris, gave lectures upon judicial astrology, which brought him into conflict with the faculty; and the rarest of the Servetus works, rarer even than the 'Restitutio Christianismi' is the "Apologetica disceptatio pro astrologia" a manuscript copy of which is in the Bibliotheque Nationale Nor could the new astronomy and the acceptance of the heliocentric views dislocate the popular belief. The literature of the 17th centruy is rich in astrological treatises dealing with medicine.

(30 ~~i~~) Rabelais, W.F.Smith's edition, Vol.II. p.460.)

(31 ~~ii~~) Thuanus, quoted by Morley in "Life of Jerome Cardan" Vol.II.p.294.

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(ii) Thuanus, quoted by Morley in "Life of Jerome Cardan" Vol.II.p.294.

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40 145

DIVINATION. No ~~body~~ one has ever poured such satire upon the mantic arts as did Rabelais in chapter 25 of the second volume of Pantagruel. Panurge goes to consult Her Trippa- (the famous Cornelius Agrippa,) whose opinion of astrology has already been quoted, but who nevertheless, as Court Astrologer to Louise of Savoy, had a great contemporary reputation. After looking ~~him~~ Panurge in the face and making conclusions by metoposcopy and physiognomy he cast his horoscope secundum artem then, (then) taking ~~up~~ a branch of a tamarisk, a favourite tree from which to get (the) a divining rod, ~~by~~ he names some 29 or 30 mantic arts from pyromancy to necromancy (by which) he offered to predict his future. While full of rare humour this chapter throws an interesting light on the extraordinary number of modes of divination that have been employed. Small wonder that Panurge repented of his visit'.

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I show you here the title-page of a popular book by one of the most famous of the English astrological physicians, Nicholas Culpeper. (Fig - ~~Frontispiece and title-page to be photographed~~)

Never was the opinion of sensible men on this subject better expressed than by Sir Thomas Browne (32 ~~1~~):- "Nor do we hereby reject or condemn a sober and regulated Astrology; we hold there is more truth therein than in Astrologers; in some more than many allow, yet in none so much as some pretend. We deny not the influence of the Starres, but often suspect the due application thereof; for though we should affirm that all things were in all things; that heaven were but earth celestified, and earth but heaven terrestrified, or that each part above had an influence on its divided affinity below; yet how to single out these relations, and duly to apply their actions, is a work oft times tobe effected by some revelation, and Cabala from above, rather than any Philosophy, or speculation here below."

late as 1699 a thesis was discussed at the Paris Faculty. "Whether comets were harbingers disease" and in 1707 the Faculty negatived the ~~thesis~~ question propounded in a thesis "whether the n had any sway to human ody"

The 18th and 19th centuries saw, among intelligent men, a progressive weakening of the belief in the subject; but not even the satire of Swift whose practical joke in predicting and announcing the death of the famous almanac maker, nor contemptuous neglect of the subject of late years ~~have~~ sufficed to dispel the belief from the minds of the public. The almanacks of More and Zadkiel are still published, and still popular, and in London sandwich men are met with carrying advertisements of Chaldeans and Egyptians who offer to tell your fortune by the stars.

(32 ~~1~~) Sir Thomas Browne "

Garth in the Dispensary (1699) satirises the astrological practitioner of his day -

"The sage in Velvet ~~sub~~ Chair, here lolls at ease
To promise future Health for present fees
Then as from ~~solomon~~ Tripod solomon shams reveals
and what the stars know nothing of, forbes" Canto ii

Even in this country astrology is still practised to a surprising ~~degree that is surprising~~ extent, if one may judge from ~~until one's attention is called to the~~ advertisements in certain papers, and from ~~to astrological~~ publications, which must have a considerable sale. Many years ago I had as a patient, an estimable astrologer, whose lucrative income was derived from giving people astral information as to the rise and fall of stocks. It is a chapter in the vagaries of the human mind that is worth careful study.[33] Let me commend to some of you the sympathetic story in the "Rewards and Fairies" of Kipling called "A Doctor of Medicine". The hero ~~of which~~ is Nicolas Culpeper, Gent., whose picture I have just shown you. One stanza of the poem at the end of the story "Our Fathers of Old" may be quoted:-

11/28

"Wonderful tales had our fathers of old-
  Wonderful tales of the herbs and the stars-
The Sun was Lord of the Marigold,
  Basil and Rocket belonged to Mars.
Pat as a sum in division it goes -
  "Every plant had a star bespoke)-
Who byt Venus should govern the Rose?
  Who but Jupiter own the Oak?
    Simply and gravely the facts are told
    In the wonderful books of our fathers of old."

33) It is not generally known that Stonewall Jackson practised astrology. Col. J. W. Revere in Keel & Saddle tells of meeting Jackson in 1852 on a Mississippi steamer & talking with him on the subject. Some months later Revere received a letter from Jackson enclosing his (Reveres) Horoscope. There was a "culmination of malign ~~influence~~ aspect at or during the first days of May 1863 - both will be exposed to a common daughter at the time indicated." At the battle of Chancellorsville, 1863 Revere saw Jacksons death!

James J. Walsh of New York has written a book of extraordinary interest called "The Thirteenth, Greatest of Centuries." I have not the necessary knowledge to say whether he has made out his case or not for art and for literature. There was certainly a great awakening, and inspired by high ideals men turned with a true instinct to the belief that there was more in life than could be got out of barren scholastic studies. With many of the strong men of the period one feels the keenest mental sympathy. Grosseteste, the great Clerk of Lincoln, as a scholar, a teacher and a reformer, represents a type of mind that could only grow in fruitful soil. Roger Bacon may be called the first of the moderns - certainly the first to appreciate the extraordinary possibilities which lay in a free and untrammelled study of nature. A century which could produce men capable of building the Gothic Cathedrals may well be called one of the great epochs in history, and the age that produced Dante is a golden one in literature. Humanity has been the richer for St. Francis, and and Abelard, Albertus and Aquinas form a trio not easy to match, in their special departments, either before or after. But so far as science ~~is concerned~~, and particularly medicine, ~~so~~ and ~~far as~~ in the advance of man's outlook upon nature ~~goes~~, the thirteenth century did not help ~~us~~ man very much. Roger Bacon was a voice crying in the wilderness', and not one of the men I have picked out as specially typical of the period instituted any new departure either in practice or in science. They were servile followers, when not of the Greeks, of the Arabians. This is attested

by the barrenness of the century and a half that followed. One would have thought that the stimulas given by Mundinus to the study of anatomy would have borne fruit, but little ~~or nothing~~ was done in science during the two and a half centuries that followed the delivery of his ~~famous~~ lectures. and still less in the art

Fig 26

The truth is, from the modern standpoint the thirteenth was not the true dawn brightening more and more into the perfect day, but a glorious aurora which flickered down again into the arctic night of mediaevalism.

While William of Wyckham was building Winchester Cathedral and Chaucer was writing the Canterbury Tales, John of Gaddesden in practice was blindly following blind leaders whose authority no one dared question

To sum up - In medicine the middle ages represent a restatement from century to century of the facts and theories of the Greeks, modified here & there by Arabian practice. There was, in Bacon's phrase, much iteration, small addition. The schools bowed in humble slavish submission to Galen ~~or~~ Hippocrates, taking everything from them but their spirit and there was no advance in our knowledge of the structure or function of the body. The Arabians lit a brilliant torch from ~~the~~ Grecian lamps ~~lamps of Aristotle & Galen~~ and from the 8th to the 11th centuries the profession reached among them a position of dignity & importance to which it is hard to find a parallel in history

2342

Lecture IV

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1570

LECTURE IV. 9 caps

The "reconquest of the classic world of thought was by far the most important achievement of the fifteenth and sixteenth centuries. It absorbed nearly the whole mental energies of the Italians ..... The revelation of what men were, and what they wrought under the influence of other faiths and other impulses in distant ages with a different ideal form their aim not only widened the narrow horizon of the Middle Ages, but it also restored self confidence and the reason of humanity." (1)

Everywhere throughout the Middle Ages learning was the handmaid of theology. Even Roger Bacon with his strong appeal for a new methods accepted the dominant mediaeval conviction - that all the sciences did but minister to their Queen, theology. A new spirit entered man's heart as he came to look upon learning as a guide to the conduct of life. A revolution was slowly effected in the intellectual world. It is a mistake to think of the Renaissance as a brief period of sudden fruitfulness in the north Italian cities. So far as science is concerned, the thirteenth century was an aurora followed by a long period of darkness. ~~of the fourteenth and early fifteenth centuries,~~ but the dawn when it came in ~~of~~ the fifteenth brightened more and more into a perfect day. Always a reflex ~~or an index~~ of its period medicine joined heartily though slowly in the revolt against mediaevalism. How slowly I did not

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(1) J.A.Symonds; The Renaissance in Italy; the Revival of Learning. 1877, pg.52.

appreciate until recently . ~~I have been~~ Studying the earliest printed medical works to catch the point of view of the men who were in the thick of the movement up to 1480 - which may be taken ~~as about~~ to include the first quarter of a century of printing — one gets ~~It is~~ a startling record. The mediaeval mind still dominates :- of the works were by men of the thirteenth and fourteenth centuries, were editions of Arabian works, and were from the School of Salernum, only were Greek - Hippocrates, Galen or

The medical profession gradually caught the new spirit. It has been well said that Greece arose from the dead with the New Testament in the one hand and Aristotle in the other. There was awakened a perfect passion for the old Greek writers, and with it a study of the original sources which had become now available in many manuscripts. Gradually Hippocrates and Galen came to their own again. Almost every pfofessor of medicine besame a student of the MSS. of Aristotle and of the Greek physicians, and before 1530 the presses had poured out a stream of editions. A wave of enthusiasm swept over the profession, and the best energies of its best minds were devoted to a study of the Fathers. Galen became the idol of the schools. A strong revulsion of feeling arose against the Arabians, and Avicenna, the ~~Arabian~~ Prince, who had been clothed with an authority only a little less than divine, became anathema. The Arabians made a strong fight under the leadership of the Montpellier School but it was a losing battle all along the line. This group of

medical humanists - men who were devoted to the study of the old humanities, as Latin and Greek were called,- has had a great and beneficial influence upon the profession. They were for the most part cultivated gentlemen with a triple interest - literature, medicine and natural history. How important is the part they played may be gathered from a glance at the "Lives" given by Bayle in his Biographie Médicale (Paris) between the years and . More than one half of them had translated or edited works of Hippocrates or Galen; many of them had made important contirbutions to general literature, and a large proportion of them were naturalists: Leonicenus, Linacre, Champier, Fernel, Fracastorius, Gonthier, Caius, J. Sylvius, Brasavola, Fuchsius, Matthiolus, Conrad Gesner, to mention only those I know best, form a great group. Linacre edited Greek works for Aldus, translated works of Galen, taught Greek at Oxford, wrote ~~a Greek~~ Latin grammars and founded the Royal College of Physicians. Caius was a keen Greek scholar, an ardent student of natural history, and his name is enshrined as co-founder of one of the most important of the Cambridge colleges. Gonthier, Fernel, Fuchsius and Matthiolus were great scholars and greater physicians. Champier, one of the most remarkable of the group, was the founder of the Hotel Dieu at Lyons, and author of ~~a series~~ of books of a characteristic ~~remarks~~ renaissance type and of singular bibliographical interest. In many ways greatest of all was Congad Gesner, whose 'mors inopinata' at 49, bravely fighting the plague is so touchingly and tenderly mourned by his friend Caius.(2) Physician, botanist, mineralogist, geologist, chemist, the first great modern bibliographer, he is the very embodiment of the spirit of the age. In the fly-leaf of my copy of the

(2) Joannis Caii Britanni ~~De Canibus Britannicis~~ de libris suis &c. 1570

'Bibliotheca Universalis', 1545, is ~~pasted~~ written a fine tribute to his memory. I do not know by whom it is, but I do know from my reading that it is true:-

"Conrad Gesner, who kept open house there for all learned men who came into his neighborhood. Gesner was not only the best naturalist among the scholars of his day, but of all men of that century he was the pattern man of letters. He was faultless in private life, assiduous in study, diligent in maintaining correspondence and good-will with learned men in all countries, hospitable - though his means were small - to every scholar that came into Zurich. Prompt to serve all, he was an editor of other men's volumes, a writer of prefaces for friends, a suggestor to young writers of books on which they might engage themselves, and a great helper to them in the progress of their work. But still, while finding time for services to other men, he could produce as much out of his own study as though he had no part in the life beyond its walls."

~~Almost every one~~ A large majority of these early ~~sixteenth and seventeenth century~~ naturalists and botanists were physicians.(3) The Greek art of Observation was revived in a study of the scientific writing of Aristotle, Theophrastus and Dioscorides and in the original mss of Hippocrates & of Galen. That progress was at first slow due in part to the fact that the leaders were too busy scraping the Arabian Laurinist from the pure gold of Greek medicine and correcting the anatomical mistakes of Galen to bother much about his physiology or pathology. ~~Copy p 3~~ ~~Histor. Dev. pamphlet~~

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(3) See "The Early Naturalists, Their Lives and Work", Miall, London, 1912.

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Here and there among the great anatomists of the period we read of an experiment, but it was the art of observation, the art of Hippocrates, not the science of Galen, not the carefully devised experiment to determine function, that characterized their work. There was indeed every reason why men should have been content with the physiology and pathology of that day, as, from a theoretical standpoint, it was excellent. The doctrine of the four humours and of the natural, animal and vital spirit afforded a ready explanation for the symptoms of all diseases, and the practice of the day was admirably adapted to the theories. There was no thought of, no desire for change. But the revival of learning awakened in men at first a suspicion and at last a conviction that the ancients had left something which could be reached by independent research, and gradually the paralytic-like torpor passed away.

¶ PARACELSUS. The ~~Renaissance~~ sixteenth and seventeenth centuries did three things in Medicine - shattered authority. laid the foundation of an accurate knowledge of the structure of the human ~~machine~~ body and demonstrated how its functions should be studied intelligently - with which advances as illustrating this period, may be associated the names of Paracelsus, Vesal and Harvey.

Paracelsus is "der Geist der stets verneint", ~~and in~~ He roused men against the dogmatism of the schools, ~~this lay the chief value of his work, though~~ and he ~~also~~ stimulated enormously ~~the~~ practical study of chemistry. These are his great merits, against which must be placed a flood of hermetical and transcendental medicine, some his own, some foisted in his name, the influence of which is still ~~with~~ us.

"With what judgement ye judge it shall be judged to you again" is the verdict of three centuries on Paracelsus. In return for unmeasured abuse of his predecessors and contemporaries he has been held up to obloquy as the arch-charlatan of history. We have taken a cheap ~~our~~ estimate of him from Fuller and Bacon, and from a host of scurrilous scribblers, who debased or perverted his writings. Fuller (4) ~~appears to have~~ picked him out as exemplifying the drunken quack, whose body was a sea wherein the tide of drunkenness was ever ebbing and flowing - "He boasted that shortly he would order Luther and the Pope, as well as he had done Galen and Hippocrates. He was never seen to pray, and seldome came to Church. He was not onely skilled in naturall Magick (the utmost bounds whereof border on the suburbs of hell) but is charged to converse constantly with familiars. Guilty he was of all vices but wantonnesse: .."

(4) "The Holy & Profane State, (1642, Cambridge) pg.56.)

Bacon too says many hard things of him.(5 ~~1~~)

On the other hand, to the mystics he is Paracelsus the Great, the Divine, the most supreme of the Christian Magi, whose writings are too precious for science, ~~a man~~ the Monarch of Secrets who has discovered the Universal Medicine. In Professor Lounsbury's lectures on the early writings of Robert Browning he speaks

This is ~~well~~ illustrated in Browning's well-known poem "Paracelsus" (18 published when he was ~~a young man of~~ only twenty-one; and there is no more pleasant picture ~~given~~ in literature of the man and of his aspirations. His was a "searching and impetuous soul" that sought to win from nature some startling secret - ".. a tincture of force to flush old age with youth, or breed gold, or imprison moonbeams till they change to opal shafts!" 6 ~~(i)~~ ~~and~~ At the same time ~~had~~ with that capacity for self-deception which characterises the true mystic, he sought to cast

> "Light on a darkling race; save for that doubt,
> I stood at first where all aspire at last
> To stand: the secret of the world was mine.
> I knew, I felt, (perception unexpressed,
> Uncomprehended by our narrow thought,
> But somehow felt and known in every shift
> And change in the spirit,- nay, in every pore
> Of the body, even,) - what God is, what we are,
> What life is - .. ."

(i)

(~~1~~ 6) Robert Browning, "Paracelsus".
(5 1)

Much has been done of late to clear up his story and his character. Professor Sudhoff of Leipzig has made a bibliographical study of his writings(7), and there have been recent monographs by Julius Hartmann, Professor Franz and Karl Strunz.(8) and a sympathetic summary of his life and writings has been published by the Late Miss Stoddard(9). There is at present a cult of Paracelsus which The hermetic and alchemical writings are available in English in the edition of A.E.Waite, London 1894 The main facts of his life you can find in all the biographies. Suffice it here to say that he was born at Einsiedeln, near Zürich in 1493, the son of a physician, from whom he appears to have had his early training both in medicine and in chemistry. Under the famous Abbot and alchemist, Trithemius of Wurzburg, he studied chemistry and occultism. After working in the mines at Schwatz he began his wanderings, during which he professes to have visited nearly all the countries in Europe and to have reached India and China. Returning to Germany, he began a triumphal tour of practice through the German cities, always in opposition to the medical faculty, and constantly in trouble. He undoubtedly performed many important cures, and was thought to have found the supreme secret of alchemistry. In the pummel of his sword he was believed to carry a familiar spirit. So dominant was his reputation that in 1526 he was called to the Chair of Physic in the University of Basel, but embroiled in quarrels with Oporin he was forced to leave secretly, and again began his wanderings, working through German cities

(7) Prof. Sudhoff:

(8)

(9) Miss Stoddard, "The Life of Paracelsus", London, Jho.Murray, 1911.

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quarrelling, curing ~~in various German cities~~, and ~~he~~ died prematurely at Salzburg in 1541 - one of the most tragic figures in ~~our~~ the history of medicine

Paracelsus is the Luther of Medicine, the very incarnation of the spirit of revolt. At a period when authority was paramount, and men blindly followed old leaders, when to stray from the beaten track in any field of knowledge was a damnable heresy, he stood out boldly for independant study and the right of private judgement. After ~~being~~ elected to the Chair at Basel he at once introduced a startling innovation by lecturing in German. He had caught the new spirit and was ready to burst all bonds both in medicine and in theology. He must have startled the old teachers and practitioners by his novel methods. "On June 5th, 1527, he attached a programme of "his lectures to the black-board of the University inviting all to "come to them. It began by greeting all students of the art of "healing. He proclaimed its lofty and serious nature, a gift of "God fo man, and the need of developing it to new importance and "to new renown. This he undertook to do, not retrogressing to the "teaching of the ancients, byt progressing whither nature pointed, "through research into nature, where he himself had discovered and "had verified by prolonged experiment and experience. He was ready "to oppose obedience to old lights as if they were oracles from "which one did not dare to differ. Illustrious doctors might be "graduated from books, but books made not a single physician. ~~&~~ 10 "Neither graduation, nor fluency, nor the knowledge of old langu-"ages, nor the reading of many books made a physician, but the

~~4~~ 10 And men have oft grown old among their books
To die case hardened in their ignorance
Paracelsus. Browning

"knowledge of things themselves and their properties. The business "of a doctor was to know the different kinds of sicknesses, their "causes, their symptoms and their right remedies. This he would "teach, for he had won this knowledge through experience, the great- "est teacher, and with much toil. He would teach it as he had "learned it, and his lectures would be founded on works which he had "composed concerning inward and external treatment, physic and surgery" (~~i~~) 11 Sortly afterwards, at the Feast of St. John, the students had a bon-fire in front of the University. Paracelsus came out holding in his hands the 'bible of medicine', Avicenna's Canon, which he flung into the flames saying - "Into St. John's fire so that all misfortune may go into the air with the smoke". It was, as he explained afterwards, a symbolic act; "What has perished must go to the fire; it is no longer fit for use: what is true and living that the fire cannot burn." With abundant confidence in his own capacity he proclaimed himself the legitimate monarch, the very Christ of medicine. "You shall follow me", cried he, "you, Avicenna Galen, Rhasis, Montagnana, Mesues, you, gentelman of Paris, Mont- pellier, Germany, Cologne and Vienna, and whomsoever the Rhine and Danube nourish; you who inhabit the isles of the sea; you, likewise, Dalmatians, Athenians; thou, Arab; thou, Greek; thou, Jew: all s shall follow me, and the monarchy shall be mine." 12 (~~ii~~)

~~It was the~~ This first great revolt against the slavish authority of the schools, ~~but~~ had little immediate effect, largely on account of the personal vagaries of the reformer — but it made men think and Paracelsus stirred the pool as it had not been done for 15 centuries

(11/~~i~~) Miss Stoddart. Life of Paracelsus, 1911. pg.95-96

(12/~~ii~~) ~~Strafford's edition of~~ Brownings Poetical works, MacMillan ' Co. 1888. pg.180.

Much more important ~~really~~ is the relation of Paracelsus to the new chemical studies, and their relation to practical madicine. Alchemy, he held, "Is to make neither gold nor silver: its use is to make the supreme sciences and to direct them against disease." He recognized three basic substances, sulphur, mercury and salt, which were the necessary ingredients of all bodies organic or inorganic. They were the basis of the three principles out of which the Archeus, the spirit of nature formed ~~made~~ all bodies. He made important discoveries in chemistry; zinc, the various compounds of mercury, calomel, flowers of sulphur, among others, and he was a strong advocate of the use of preparations of iron and antimony. In practical pharmacy he has perhaps had a greater reputation for the introduction of a tincture of opium - labdanum, or laudanum - with which he effected miraculous cures, and the use of which he had probably learned in the East.

~~There is no doubt that~~ Through Paracelsus a great stimulus was given to the study of chemistry and pharmacy, and he ~~may be regarded as~~ is the first of the modern iatro-chemists. In contra-distinction to Galenic medicines, which were largely derived from the vegetable kingdon, from this time on we find in the literature references to spagyric medicines and a 'spagyrist' was a Paracelsian who regarded chemistry as the basis of all medical knowledge.

One cannot speak very warmly of the practical medical writings of Paracelsus. Gout, which may taken as the disease upon which he had the greatest reputation, is very badly described, and yet he has one or two singularly mixed with mediaeval astrology; but he has here and there very happy insights, as where he remarks "nec praeter synoviam locum alium allum podagra occupat."(13) In the tract on phlebotomy I see nothing modern, and here again he is everywhere dominated by astrological ideas, -"sapiens dominator astris".

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(13) Geneva Edition, MDcliix, Vol.1. pg.613.

As a protagonist of occult philosophy Paracelsus has had a more enduring reputation than as a physician. In estimating his position there is the great difficulty referred to by Sudhoff in determining which of his extant treatises are genuine. In the two volumes issued in English by Waite in 1894 there is much that is difficult to read and to appreciate from our modern standpoint. In his book 'Concerning Long Life' he confesses that his method and practice will not be intelligible to common persons and that he writes only for those whose intelligence is above the average. To those who are fond of such transcendental studies they will appear and are perhaps intelligible. find much to interest them. Everywhere one comes across shrewd remarks which xxxxxxxxxx prove that Paracelsus had a keen belief in the all-controlling powers of nature and of man's capacity to make those powers operate for his own good: "the wise man rules Nature, not Nature the wise man." "The difference between the Saint and the Magus is that the one operates by means of God, and the other by means of Nature." He had great faith in nature and the light of nature, holding that man obtains from nature as much as he believes. His theoty of the three principles appears to have controlled his conception of everything relating to man, spiritually, mentally and bodily. and his three-fold genera of disease correspond to the same mysterious way with the three primary substances, salt, sulphur and mercury.

How far he was a believer in astrology, charms and divination it is not easy to say. From many of the writings in his collected works one would gather, as I have already quoted, that he was a strong believer, in astrology: on the other hand, in the "Paramirum' he says:- "Stars control nothing in us, suggest nothing,

incline to nothing, know nothing; they are free from us and we are free from them." (Stoddart, pg.185) The Archeus, not the stars controls man's destiny. "Good fortune comes from ability, and ~~a~~ ability from the spirit" (Archeus).

No one has held more firmly the dualistic conception of the healing art. There ware two kinds of doctors; those who heal miraculously, and those who heal through medicine. Only he who believes can work miracles. The physician has to accomplish that which God would have done miraculously, had there been faith enough in the sick man. (Stoddart ; pg.194). He had the Hippocratic conception of the 'vis medicatrix naturae' - no one keener since the days of the Greeks. Man is his own doctor and carries his herbal anatomy in his own body: the physician is in ourselves, in our own nature are all things that we need: and speaking of wounds, with singular prescience he says that the treatment should be defensive so that no contingency from without could hinder nature in her work. (Stoddart, pg.213.)

Paracelsus expresses those healing powers of nature by the word "Mumia" which he regarded as a sort of magnetic influence or force, and he believed that anyone possessing this could arrest or heal disease in others. As the lily breaks forth in invisible perfume, so healing influences may pass from an invisible body. Upon these views of Paracelsus was based the theory of the sympathetic cure of disease which had an extraordinary vogue in the late sixteenth and seventeenth centuries, and which is not without its modern counterpart.

In the next century in van Helmont we meet with the Archeus everywhere presiding, controlling and regulating the animate and inanimate bodies, working this time through ~~an~~ agents, ~~the~~ oral ferments. The Rosicrucians had their direct inspiration from his writings, and such mystics as the English Rosicrucian Fludd, were strong Paracelsians[14](~~i~~).

The doctrine of contraries drawn from the old Greek philosophy, upon which a good deal of the treatment of Hippocrates and Galen was based - dryness expelled by moisture, cold by heat, etc. - was opposed by Paracelsus in favour of a theory of similars, upon which the practice of homeopathy is based. This really arose from the primitive beliefs, to which I have already referred as leading to the use of eyebright in diseases of the eye, and cyclamen in diseases of the ear because of its resemblance to that part; and the Egyptian organotherapy had the same basis, - spleen would cure spleen, heart, heart, etc. In the sixteenth and seventeenth centuries these doctrines of sympathies and antipathies were ~~greatly discussed~~ much in vogue. ~~That interesting~~ A Scotchman, Sylvester Rattray, ~~wrote~~ collected in the "Theatrum Sympatheticum"[15](~~ii~~) all the working dealing with the ~~special~~ sympathies and antipathies of man with ~~all the~~ animal, vegetable and mineral substances, and on ~~which~~ the whole ~~practice~~ art of physic on this principle was based. ~~He collected also in this volume the various essays that had been written on the subject.~~

~~It was~~ Upon this theory of "munia", or magnetic force ~~that~~ the sympathetic cure of disease was based. The weapon-salve, the sympathetic ointment, and the famous powder of sympathy were the

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(14 ~~i~~)

(15 ~~ii~~) Theatrum Sympatheticum; Norimbergae, MDCLXll.

instruments through which it acted. The magnetical cure of wounds became the vogue. Van Helmont adopted these views in his famous treatise "De Mag. Vulnerum Curatione"(16 i), in which he asserted that cures were wrought through magnetic influence. How close they came to modern views of wound infection may be judged from the following:- "Upon the solution of Unity in any part of the ambient air.....repleted with various evaporations or aporrhoeas of mixt bodies, especially such as are then suffering the act of putrefaction, violently invadeth the part and thereupon impresseth an exotic miasm or noxious diathesis, which disposeth the blood successively arriving at the wound, to putrefaction, by the intervention of fermentation."(i) With his magnetic sympathy Van Helmont expressed clearly the doctrine of immunity and the cure of disease by immune sera "For he who has once recovered from that disease hath not only obtained a pure balsaamical blood, whereby for the future he is rendered free from any recideration of the same evil, but also infallibly cures the same affection in his neighbour.....and by the mysterious power of Magnetism transplants that balsaam and conserving quality into the blood of another." He was rash enough to go further and say that the cures effected by the relics of the saints were also due to the same cause - a statement which led to a great discussion with the theologians and to Van Helmont's arrest for heresy, and small wonder, when he makes such bold statements as - "Let the Divine

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(16 i) An English translation by Walter Charleton appeared in 1650 - entitled ~~A Ternary of Paradoxes~~. A Ternary of Paradoxes. Prolegmena

(ii) French edition, 1658, English translation, same year. For a discussion on the author of the salve see Van Helmont who gives the various formulas.

enquire only concerning God, the Naturalist concerning Nature", and "God in the production of miracles does for the most part walk hand in hand with Nature."

That wandering genius, Sir Kenelm Digby, did much to popularize this method of treatment by his lecture on the Powder of Sympathy(17 ±). His powder was composed of copperas alone or mixed with gum tragaganth. He regarded the cure as effected through the subtle influence of the sympathetic spirits, or as Highmore says by "atomicall energy wrought at a distance" and the remedy could be applied to the wound itself, or to a cloth soaked in the blood or secretions, or to the weapon that caused the wound. One factor leading to success may have been that in the directions which Digby gave for treating the wound (in the celebrated case of James Howell, for instance)- it was to be let alone and kept clean. The practice is alluded to very frequently by the poets. In the "Lay of the Last Minstrel" we find the following:-

"But she has ta'en the broken lance,
And washed it from the clotted gore,
And salved the splinter o'er and o'er.
William of Deloraine, in trance,
Whene'er she turns it round and round,
Twisted as if she gall'd his wound,
Then to her maidens she did say,
That he should be whole man and sound."

and in Dryden's "Enchanted Island" Ariel says:-

"Anoint the sword which pierced him with this
Weapon salve, and wrap it close from air
Till I have time to visit it again."

(17 ±) French edition, 1658, English translation, same year. For a discussion on the author of the weapon salve see Van Helmont, who gives the various formulas. Highmore (1651) says the "powder is a Zaphyrian salt calcined by a celestial fire operating in Leo and Cancer into a Lunar complexion"

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From Van Helmont comes the famous story of the new nose that dropped off in sympathy with the dead arm from which it was taken, and the source of the famous lines of Hudibras. As I have not seen the original story quoted of late years it may be worht while to give it:- "A certain inhabitant of Bruxels, in a combat had his nose mowed off, addressed himself to Tagliacozzus, a famous Chirurgeon, living at Bononia, that he might procure a new one; and when he feared the incision of his own arm, he hired a Porter to admit it, out of whose arm, having first given the reward agreed upon, at length he dig'd a new nose. About thirteen moneths after his return to his own Countrey, on a sudden the ingrafted nose grew cold, putrified, and with in few days dropt off. To those of his friends who were curious in the exploration of the cause of this unexpected misfortune, it was discovered, that the Porter expired, neer about the same punctilio of time, wherein the nose grew frigid and cadaverous. There are at Bruxels yet surviving, some of good repute, that were eye-witnesses of these occurrences." (18)

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(18) Charleton; Of the Magnetic Cure of Wounds. London. 1650. pg.13.

Equally in the history of science and of medicine ~~is~~ 1542 is a starred year, marked by a revolution in our knowledge alike of macrocosm and microcosm. In Frauenberg the town physician and a Canon, now nearing the Psalmist limit and his end, had sent to the press the studies of a life-time - "De revolutionibus orbium celestium (1)". It was no new thought, no new demonstration that Copernicus thus gave to his generation. Centuries before men of the keenest scientific minds from ~~Aristotle~~ Pythagoras on had worked out a heliocentric theory fully promulgated by Aristarchus, and generally accepted by the brilliant investigators of the Alexandrian school; but in the long interval ~~man~~, lapped in ~~an~~ oriental lethargy, man had been content to acknowledge that the heavens declared the Glory of God and that the firmament sheweth his handiwork. There had been great astronomers before Copernicus, and in the fifteenth ~~and sixteenth~~ centuries ~~there were~~ (suggested both the heliocentric theory) Cusa & Regiomontanus; but 1542 marks an epoch in the history of ~~intellec~~ scientific tual development, since for all time Copernicus, ~~in the words of Lucretius~~ put the problem in a way that compelled acquiescence

~~It was to a thankless generation that the "de revolutionibus"~~ appeared.

Nor did Copernicus announce a truth perfect and complete, not to be modified, but there were many contradictions and lacunae which the work of subsequent observers had to reconcile and fill up.

(1)

For long years Copernicus had brooded over the great thoughts which his careful observation had compelled. We can imagine the touching scene in the little town when his friend Osiander brought the first copy of the precious volume hot from the press, a well enough printed book, and

Already on his death-bed, stricken with a long illness, the old man knew the thankless generation - the swine before whom he had thrown his pearl. Fortunately death saved him from the 'rending' which is the portion of so many innovators and discoverers.

The other great reformer of his day, Luther, expressed the view - the fool will turn topsy-turvy the whole art of astronomy; but the Bible says that Jesus commanded the Sun to stand still, not the Earth; and the scholarly Melanchthon, himself an astronomer, thought the book so Godless that he recommended its suppression (Dannemann).

The same year, 1542 saw a very different picture in the far-famed city of Padua, "nursery of the arts". The central figure was a man not yet in the prime of life, and justly full of its pride, as you may see from his portrait. (Fig. x)

Like Aristotle and Hippocrates cradled and nurtured in an Aesculapian family, Vesal was from his childhood a student of nature, and was now a wandering scholar far from his Belgian home; But in Italy he had found what neither Louvain nor Paris could give, freedom in his studies and opportunities for research and teaching. What an impression he must have made on the student

bodies at Padua we may be judged from the fact that shortly after his graduation, at the age of 24 he was elected to the Chair of Anatomy and Surgery. Two things favoured him - an insatiate desire to see and handle for himself the ~~known~~ parts of the human frame, and an opportunity, such as had never before been offered to the teacher, to obtain material for the study of human anatomy. Learned with all the learning of the Grecians, - and of the Arabians, Vesal grasped, as no modern before him had done, the cardinal fact that to know the human machine and its working, it is necessary first to know its parts - its fabric.

To appreciate the work of this great ~~Belgian~~ man we must go back and review briefly in a brief the growth of the study of anatomy, ~~and also give a short sketch of his career.~~

Among the Greeks only the Alexandrians knew ~~anything of~~ human anatomy. What their knowledge was we know ~~only~~ at second hand, but ~~even from that~~ the evidence ~~it~~ is plain that they knew a ~~good~~ great deal. Galen's anatomy was first class and was based on ~~that of~~ the Alexandrians and on his studies of the ape and the pig. We have already ~~seen~~ noted how much superior was his osteology to that of Mundinus. Between the Alexandrians and the early days of the school of Salernum we have no record of systematic dissections of the human body. It is even doubtful if these were permitted at Salernum: ~~I see~~ Neuburger states that the ~~injunctions~~ instructions of Frederick II., as to dissection, were merely nominal ~~an "Ausschmückung"~~.

~~(? more for show than use - nominal)~~

How atrocious was the anatomy of the early Middle Ages may be gathered from the cuts in the works of Henri de Mondeville.

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and ~~we have~~ in the Bodleian Library is a remarkable English anatomical treatise of the 14th century, one illustration from which will x suffice to show the ignorance of the author. (Fig.)
Mundinus of Bologna, (of whom I have already spoken) ~~was~~ unquestionably the first man in the Middle Ages to study anatomy from the subject, ~~but he~~ was under the strong domination of the Arabians, from whom he appears to have received a very imperfect ~~account of~~ the Galenic anatomy. From this date ~~on~~ we meet with occasional dissections at ~~the~~ various schools, but we have seen that in the elaborate curriculum of the University of ~~Ferrara~~ Pisa in the middle of the fifteenth century there was no provision for the study of the subject. Even well into the sixteenth century dissections were not common, and the old practice was followed of holding a professorial discourse, while the butcher, or barber surgeon opened the cavities of the body

A member of the famous Basel family of physicians, Felix Plater, has left us in his autobiography (19) details of the dissections he witnessed at Montpellier between November 14th 1552 and January 10th, 1557, ~~and they were~~ only eleven in number. How difficult it was at that time to get subjects is shown by the risks they ran in ~~making~~ 'body-snatching' expeditions, of which he records three.

And now came the real master of modern anatomy:

Andreas Vesalius had a good start in life. ~~He came~~ Of a family long associated with the profession, ~~and~~ his father occupied the position of apothecary to Charles V. whom he accompanied on his journeys and campeigns. ~~The boy had a good~~ Training at Louvain, ~~and~~ he had from his earliest youth had an ardent desire to dissect, and ~~as a boy~~ cut up mice and rats, and even cats and dogs. To Paris

(11) However there is no work from which we can get a better idea of the life of the 16th century medical student and the style of education & of the degree ceremonies &c. Cumston has given an excellent summary of it (Johns Hopkins Hospital Bulletin April 1912)

the strong school of the period, he went in 1533, and studied under two men of great renown, Jacob Sylvius and Guinterius. Both were strong Galenists and regarded the Master as an infallible authority. He had as a fellow prosector, under the latter, the unfortunate Servetus. The story of his troubles and trials in getting bones and subjects you may read in Roth's Life.(2°i) Many interesting biographical details are also to be found in his own writings. He returned for a time to Louvain, and here he published his first book the 'Almansor' of Rhazes, in 1537.

Finding it difficult either in Paris or Louvain to pursue his anatomical studies he decided to go to Italy where, at Venice and Padua the opportunities were greater. At Venice he attended the practice of a Hospital (now a barracks) which was in charge of the Theatiner Order. I show you a photograph of the building taken last year. (Fig. 8) And here a strange destiny brought two men together. In 1537 another pilgrim was working in Venice, waiting to be joined by his six disciples. After long years of probation Ignatius Loyola was ready to start on the conquest of a very different world. Devoted to the sick and to the poor he had attached himself to the Theatiner Order, and in the wards of the Hospital and the quadrangle the fiery dark-eyed little Basque must frequently have come into contact with the sturdy young Belgian, busy with his clinical studies and his anatomy. Both were to achieve phenomenal success - the one in a few years to revolutionize anatomy, the othe within twenty years to be the controller of universities, the counsellor of Kings, and the founder of the most famous order in the Roman Catholic Church. It was in this hospital that Vesal made observations on the Chyna root, on which he published a monograph in 1546. The Padua School was close to Venice and associated with

(2°i) Andreas Vesalius Bruxellensis, M.Roth, Berlin, 1892.
An excellent account of Vesal & his contemporaries is given

it, so that the young student had probably many opportunities of going to and fro. On the 6th December, 1537, before he had reached his 24th year and shortly after taking his degree, he was elected to the Chair of ~~xxxxxxxxxxxxxxxxxxxx~~ Surgery and Anatomy at Padua.

(ii)

by James Moores Ball in his superbly printed Andreas Vesalius, the Reformer of Anatomy ; St. Louis. MDCCCCX

The task Vesalius set himself to accomplish was to give an accurate description of all the parts of the human body, with proper illustrations. He must have had abundant material, more, probably, than any teacher before him had ever had at his disposal. We do not know where he conducted his dissections, as the old amphitheatre has disappeared, but it must have been very different from the tiny one put up by his successor Fabricius in 1594. Possibly it was only a temporary building, for he says in the second edition of the "Fabrica" that he had a splendid ~~wooden~~ lecture theatre which accomodated more than 500 spectators. (Pg.681.)

With Vesal disappeared the old didactic method of teaching anatomy. He did his own dissections and made his own preparations, and when human subjects were scarce employed dogs, pigs, or cats, and occasionally a monkey. For five years he taught and worked at Padua. Twice he is known to have given public demonstrations in Bologna. The first fruits of his work is of great importance in connection with the evolution of his knowledge. In 1538 he published six anatomical tables issued apparently in single leaves. Of those famous "Tabulae Sex" only two copies are known, one in the San Marco Library, Venice and the other in the possession of Sir John Stirling Maxwell, whose father reproduced an impression of thirty copies privately in 1874. Some of the figures were drawn by Vesalius himself, and some are from the pencil of his friend and countryman Stephan van Calcar. Those plates were extensively pirated. ~~He had also~~ About this time he also edited for Junta some of the anatomical works of Galen (+)

(+) 21



Ketham 1493
Carpi 1521
Dryander 1537

175 260

~~Unfortunately~~ We know very little of his private life at Padua ~~this period~~. His most important colleague in the faculty was the famous Montanus, ~~the~~ Professor of Medicine. Among his students and associates was the Englishman Caius, who lived in the same house with him. ~~During those five years at Padua he cannot have had much time to spare~~, When ~~if we consider~~ the output is considered he cannot have had much spare time at Padua.

He did not create Human Anatomy - that had been done by the Alexandrians - but he ~~had~~ studied it in so orderly and thorough a manner that for the first time in history it could ~~was ready to~~ be presented in a way that explained the entire structure of the human body. Early in 1542 the MS. was ready; the drawings had been made with infinite care, ~~and~~ the blocks for the figures had been cut and in September he wrote to Operimus urging that the greatest pains should be taken with the book, that the paper should be strong and of equal thickness, the workmen chosen for their skill, and that every detail of the pictures must be distinctly visible. He writes with the confidence of a man who realized the significance of the work he had done. It is difficult to speak in terms of moderation of the "Fabrica". To appreciate its relative typographical value one must compare it with the other anatomical works of the period, and for this purpose I put before you a few of figures from the textbooks on the subject that were available for students during the first half of the sixteenth century. ~~Both~~ In figures and texts we have anatomy ~~such~~ as we know it; and let us be honest and say, too, largely ~~such~~ as Galen knew it. Time will not allow me to go into the question of the relations of these two great anatomists, but we must remember that at this period Galen ruled supreme, and was regarded in the schools as infallible. ~~When someone showed~~

And now, after five years of incessant labour Vesal ~~he~~ was prepared to leave his much loved Padua, ~~the V~~ and his devoted students. He had accomplished an extraordinary work - the manuscript was ready, the drawings had been made with infinite care, trouble, the blocks of the wood-cuts were ready. He knew, I feel sure, what he had done. He knew that ~~his~~ the MSS. contained something that the world had not seen since the great Pergamite sent the rolls of his among his friends. Too precious to entrust to any printer but the best - and the best in the middle of the sixteenth century was Cis-Alpine - he was preparing to go north with ~~his~~ the precious burden. We can picture the youthful teacher - he was but 28! - among ~~his~~ students in ~~the~~ a University which they themselves controlled - some of them perhaps the very men who five years before had elected him - at the last meeting with his class, perhaps giving a final demonstration of the wood-cuts which were of an accuracy and beauty ~~not~~ never seen before by students' eyes, and reading his introduction. There would be sad hearts at the parting, for never had anyone taught anatomy as he had taught it - no one had ever known anatomy as he knew it. But the strong, confident look was on his face, and with the courage of youth and sure of the future, he would picture a happy return to ~~help them with~~ attack new and untried problems. Little did he dream that his happy days as student and teacher were finished, that his work as an anatomist was over, that the most brilliant and epoch making career of a professor was a thing of the past. A year or more was spent at Basel with his friend Oporinus supervising the

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printing of ~~His~~ great work, which appeared in 1543 with the title "De humani corporis fabrica". The worth of a book, as of a man, must be judged by ~~its~~ results, and so judged the 'De Fabrica' is one of the great books of the world, and would come in any century of volumes which embraced the richest harvest of the human mind. In medicine it represents the full flower of the Renaissance. ~~And~~ As a book it is a sumptuous tome - a worthy setting of his jewel - ~~paper~~, type, ~~ink~~, illustration to match, as you may see for yourselves in this folio - the chef d'oeuvre of any medical library.

In every section Vesalius enlarged and corrected the work of Galen. Into the details we need not enter: they are all given in Roth's monograph, and it is a chapter of ancient history not specially illuminating. Never did a great piece of literary work have a better setting. Vesal must have had a keen appreciation of the artistic side of the art of printing, and he must also have realized the fact thatthe masters of the art had by this time moved north of the Alps.

Operinus

A note
22 (+) The next ~~was~~ in 1559 is recorded by Platter in his Autobiography, who gave a public dissection during three days in the Church of St Elizabeth

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I~~n order to~~ While superintending the printing of ~~his~~ the precious work ~~Vesal spent the~~ in winter of 1542-1543 in Basel, ~~and while there~~ Vesal prepared for the medical school a skeleton from the body of an executed man, which is probably the earliest preparation of the kind in Europe. ~~Fig.~~ How little anatomy had been studied at the period may be judged from the fact there had been no dissection at Basel since 1531.[22] (+) The specimen is now in the Vesalium, Basel of which I show you a picture taken by Dr. Harvey Cushing. (Fig 12

Fig 12

From the typographical standpoint no more superb volume on anatomy has been issued from any press, except indeed the second edition ~~of the work~~ issued in 1555. The paper is, as Vesalius directed, strong and good, but it is not, as he asked, always of equal thickness ~~throughout;~~ as a rule it is thick and heavy but there are copies on a good paper of a much lighter quality. The illustrations drawn by his friend and fellow-countryman van Calcar are very much in advance of anything previously seen, except those of Leonardo. The title-page, one of the most celebrated pictures in the history of medicine, shows Vesalius in a large amphitheatre (an imaginary one of the artist, I am afraid) dissecting a female subject. He is demonstrating the abdomen to a group of students about the table, but standing in the auditorium are elderly citizens and even women. One student is reading from an open book. There is a monkey on one side of the picture and a dog on the other. Above the picture on a shield are the three weasels, the arms of Vesal. The reproduction which I show you here (Fig. ~~13~~) is from the Epitome - a smaller work issued before the 'Fabrica' with rather larger plates, two of which represent nude human bodies and are not reproduced in the great work. The freshest and most

beautiful copy ~~I know~~ is the one on vellum which formerly belonged to Dr. Mead, ~~and is~~ now in the British Museum, a nd from ~~which~~ it this picture was taken. One of the most interesting features of the book are the full-page illustrationsof the anatomy of the arteries, veins and herves. They had not in those days the art of making corrosion preparations, but they could in some way dissect ~~out~~ to their finest ramifications the arteries, veins and nerves, which were then spread on boards and dried. Several such preparations are now at the College of Physicians in London, brought from Padua by Harvey. ~~Fig.~~) The plates of the muscles are remarkably good - more correct, though not better perhaps on the whole than some of Leonardo's.

Vesal had no idea of a general circulation. Though he had escaped from the domination of the great Pergamite in anatomy, he was still his follower in Physiology. The two figures annexed (Figs.) taken from one of the two existing copies of the Tabulae Sex, are ~~I think~~ unique in anatomical illustration, and are of special value as illustrating the doctrine of the circulation that prevailed until Harvey's day. I have already called your attention to Galen's view of the two separate systems, one ~~comprising~~ containing the course, ~~of~~ venous blood for the general nutrition of the body, the other the arterial, full of a thinner, warmer blood with which were distributed the vital spirits and the vital heat. The veins had their origin in the liver; the superior vena cava communicated with the right heart, and as Galen ~~states~~ taught some blood was distributed to the lungs.; but the two sys

tems/

Apparently No no 15

were closed, though ~~you will remember that~~ Galen believed there was was a communication at the periphery between the arteries and veins. Vesal accepts Galen's view that there is some communication between the venous and arterial systems through ~~the~~ pores in the septum of the ventricles, though he had his doubts, and in the second edition of his book (1555) says that in spite of the authority of the Prince of Physicians he cannot see how the smallest quantity of blood could be transmitted through so ~~small~~ dense a muscular septum. Two years before this (1553) his old fellow student Michael Servetus had in his "Restitutio Christianismi" ~~demonstrated~~ announced the lesser circulation.- Evidently they had not kept in anatomical touch with one another!

The publication of the "Fabrica" shook the medical world to its foundations. Galen ruled supreme in the schools: to doubt him in the least particular roused the same ~~sort~~ kind of feeling as ~~to~~ did doubts on the verbal inspiration of the scriptures ~~about 40 of~~ 50 years ago! His old teachers in Paris were up in arms: Sylvius, nostrae tis medicorum decus, as Vesal calls him, wrote furious letters, and later spoke of him as. ~~spoke of him as~~

The younger men were with him and he had many friends, but he had aroused a roaring tide of detraction against which he protested a few years later in his work on the "Chyna Root" ~~(1546)~~ which is full of details about ~~his work~~ the Fabrica. In a fit of temper he threw notes on Galen and other mss in the fire [23]. No sadder page exists in medical writings than the ~~Why he did not return to Padua we do not know,~~ and His life for a couple of years is not easy to follow, but we know that in 1546 ~~In 1546~~ he took service with Charles V as his body physician, and the greatest anatomist

[23] Epistola - Chyna root, 1546, p 196. ~~copy & translate~~. No sadder page has ever been printed in a medical work. It may be quoted in explanation - in palliation

one in which Vesalius tells of the burning of his books & mss. It is here reproduced and translated. 24

Fort. note on p 34 (Vesalius, p. 195.) ~~34a~~ 182 1.

chapt. in 24 All these impediments I made light of; for I was too young to seek gain by my art, and I was sustained by my eager desire to learn and to promote the studies in which I shared. I say nothing of my diligence in anatomizing — those who attended my lectures in Italy know how I spent three whole weeks over a single public dissection. But consider that in one year I once taught in three different universities. If I had put off the task of writing till ~~now~~, this time; if I were now just beginning to digest my materials; ~~then~~ students would not have had the use of my anatomical labours, which posterity may or may not judge superior to the réchauffé's formerly in use, whether of Mesua, of Gatinaria, of some Stephanus or other on the differences, causes, and symptoms of diseases, ~~of~~ or, lastly, of a part of Servitor's pharmacopoeia.

X As to my Notes, which had grown into a huge volume, they ~~all perished~~ were all destroyed by me; and on the same day there similarly perished the whole ~~ten books~~ of my paraphrase on the ten books of Rhazes to King Almansor, which had been composed by me with far more care than the one which is prefaced to the ninth book. With these also went the books of ~~it~~

~~certain author~~ some author or other ~~on~~ on the formulae and preparation of medicines, to which I had added much matter of my own which I judged ~~not~~ to be not without utility; and the same fate overtook all the books of Galen which I had used in learning anatomy, and which I had liberally disfigured in the usual fashion. I was on the point of leaving Italy and going to Court; those physicians you know of had ~~given~~ made to the Emperor and to the nobles a most unfavourable report of my books and of all that is published nowadays for the promotion of study; I therefore burnt all those works that I ~~have~~ have mentioned, thinking at the same time that it would be an easy matter to abstain from writing for the future. I must allow that I have since repented more than once of my impatience, and regretted that I did not take ~~off~~ the advice of the friends who were then with me.

of his age was lost in the wanderings of Court and campaigns. He became an active practitioner, a distinguished surgeon, much consulted by his colleagues, and there are references to many of his cases, the most important of which are to the internal aneurysms, which he was one of the first to recognize. In 1555 he brought out the second edition of the "Fabrica", an even mors sumptuous volume than the first.

There is no such pathetic tradgedy in the history of ~~the~~ profession ~~as that which relates to André~~ Vesal. Before the age of thirty ~~he~~ Vesal had effected a revolution in anatomy; he ~~was~~ became the valued physician of the greatest court of Europe; but call no man happy till he is dead! A mystery surrounds his last days. The story is that he had obtained permission to perform a post mortem examination on the body of a young Spanish nobleman, whom he had attended. When the body was opened, the spectators to thei horror saw the heart beating, and there were signs of life! Accused by the Inquisition of murder and also of general impiety he only escaped ~~execution~~ through the intervention of the King, ~~and on~~ with the condition that he made a pilgrimage to the Holy Land. In carrying this out in 1564 he was wrecked on the island of Zante where he died of a fever or of exhaustion, in the fiftieth year of his age.

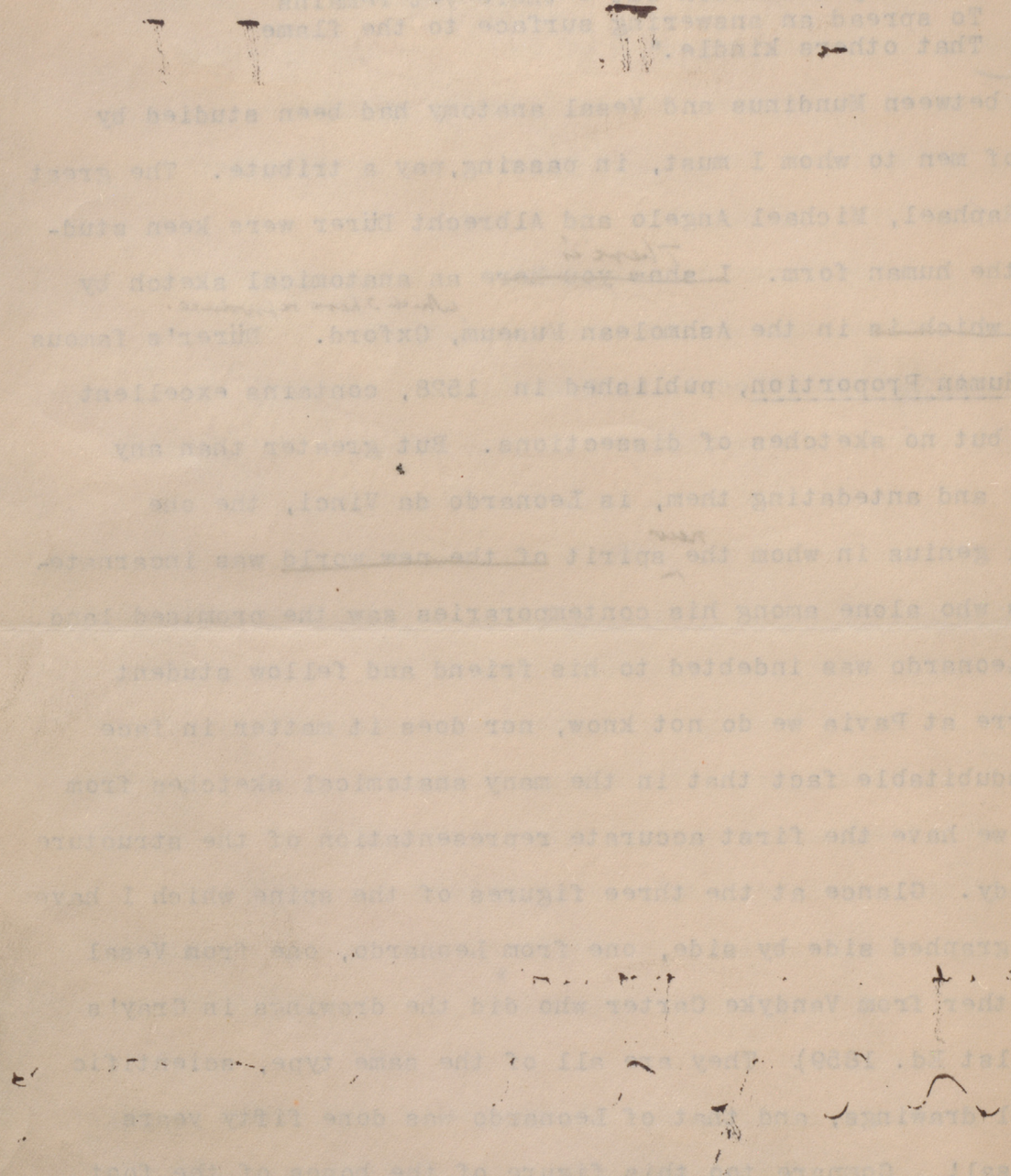
To the North American Review, November 1902 Edith Wharton contributed a poem on "Vesalius in Zante", in which she pictures hi his life so full of accomplishment, so full of regrets - regrets

accentuated by the receipt of an anatomical treatise by Fallopius, the successor to the chair in Padua! She makes him say:-

"There are two ways of spreading light; to be
The candle or the mirror that reflects it.
I let my wick burn out - there yet remains
To spread an answering surface to the flame
That others kindle."

But between Mundinus and Vesal anatomy had been studied by a group of men to whom I must, in passing, pay a tribute. The great artists Raphael, Michael Angelo and Albrecht Dürer were keen students of the human form. ~~I show you here~~ There is an anatomical sketch by ~~Raphael~~ Michael Angelo, ~~which is~~ which I here reproduce. in the Ashmolean Museum, Oxford. Dürer's famous work on Human Proportion, published in 1528, contains excellent figures, but no sketches of dissections. But greater than any of these, and antedating them, is Leonardo da Vinci, the one universal genius in whom the new spirit ~~of the new world~~ was incarnate- the Moses who alone among his contemporaries saw the promised land. How far Leonardo was indebted to his friend and fellow student della Torre at Pavia we do not know, nor does it matter in face of the indubitable fact that in the many anatomical sketches from his hand we have the first accurate representation of the structure of the body. Glance at the three figures of the spine which I have had photographed side by side, one from Leonardo, one from Vesal and the other from Vandyke Carter who did the drawings in Gray's Anatomy (1st Ed. 1859). They are all of the same type, scientific anatomical drawings, and that of Leonardo was done fifty years before Vesal! Compare too this figure of the bones of the foot with a similar one from Vesal[25] (Fig.). Insatiate in experiment intellectually as greedy as Aristotle, painter, poet, sculptor, engineer, architect, mathematician, chemist, botanist, aeronaut,

[25] He was the first to make and represent anatomical sections. See Études Anatomiques (Recueil B.) - Paris. Edouard Rouveyre MDCCCI



musician, and withal a dreamer and mystic, full accomplishment in any one department was not for him! A passionate desire for a mastery of nature's secrets made him a fierce thing, replete with too much rage! But ~~the~~ for us a record remains - ~~he~~ Leonardo was the first of modern anatomists, and ~~Vesal~~ fifty years later ~~entered~~ into the breach he made, ~~(i)~~ Vesal entered ~~(i)~~ (26)

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(26) See Knox; "Great Artists and Great Anatomists". London 1852. and Mathias Duval in Fasciculus A. of the reprints of the Anatomical Fragments - Édouard Rouveyre. Paris
For a good account of Leonardo da Vinci see the novel, "The Forerunner".
~~The Anatomical Fragments have been published in Fasciculi by Edouard Rouveyre. Paris~~

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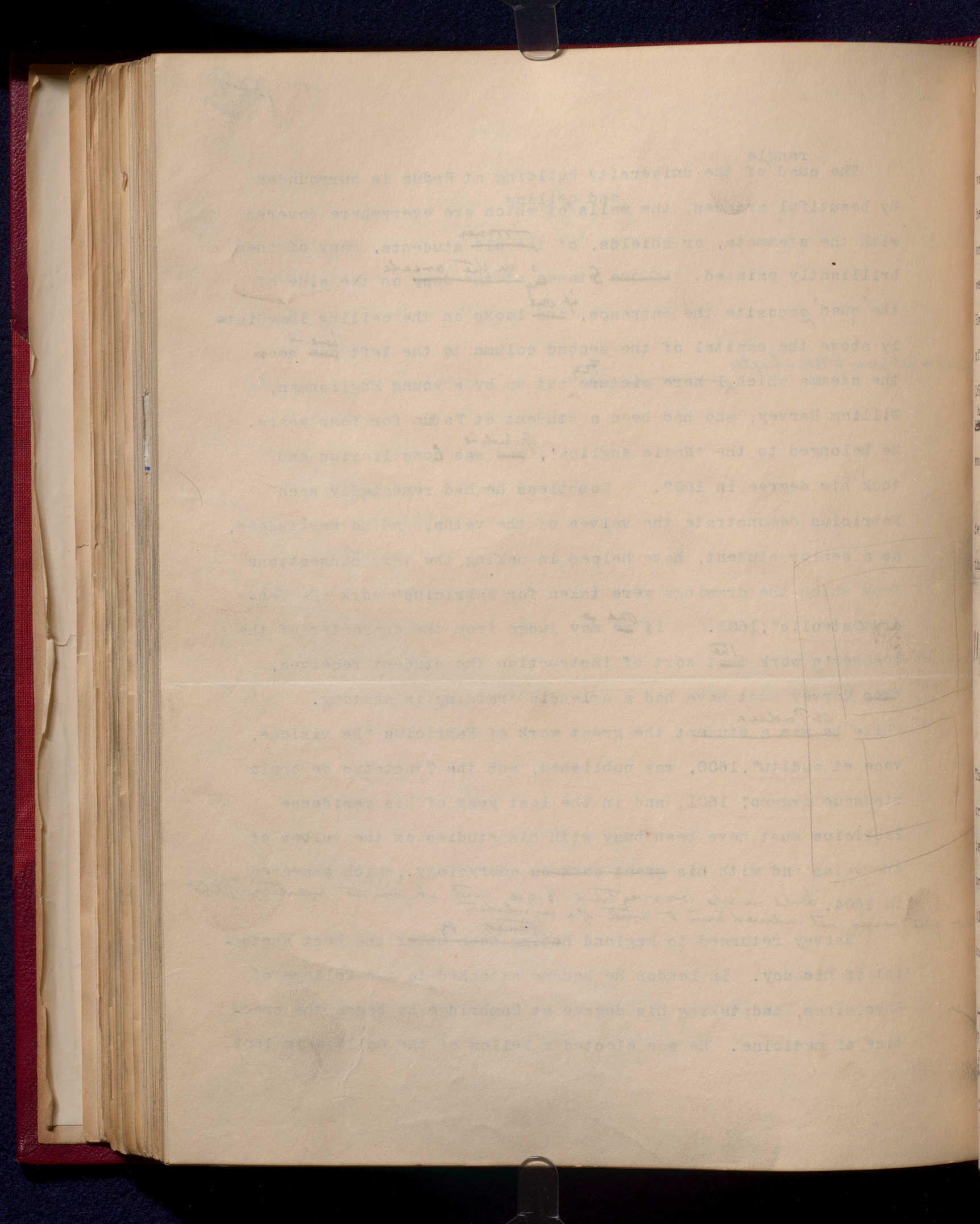
HARVEY. ~~We come now to a very different scene.~~ Let us ~~come~~ return ~~back~~ to Padua about the year 1600. Vesalius, who had made the school the most famous anatomical centre in Europe ~~He~~ was succeeded ~~in the Chair by~~ by Fallopius, one of the best known names in anatomy, at whose death an unsuccessful attempt was made to get Vesalius back. He was succeeded in 1562 by a remarkable man, Fabricius, (who usually bears the added name of Aquapendente, from the town of his birth) a worthy ~~successor~~ follower to Vesalius. In 1593, in the thirtieth year of his professoriate, he built at his own expense a new anatomical amphitheatre, which still exists in the university buildings. It is a ~~very~~ small, ~~very~~ high-pitched room with six standing-rows for auditors ~~standing~~ rising quickly one above the other. The arena is not much more than large enough for the dissecting table which, by a lift, could be brought up from a preparing room below. The study of anatomy at Padua must have declined since the days of Vesaliusif this tiny amphitheatre held all its students; ~~but~~ all the same it is probably the oldest existing anatomical lecture room amphitheatre, and for us it has a very special significance.

Early in ~~the 17th century, during~~ his anatomical studies ~~course~~ Fabricius had demonstrated the valves in the veins. I show you here two figures (Figs. 20-21) the first, so far as I know, in which these structures are depicted. It does not concern us who first discovered them ~~valves of the veins~~; they had doubtless been seen before, but Fabricius first recognized them as general structures in the venous system, and he called them 'little doors-"Ostiola".

The quadrangle of the university building at Padua is surrounded by beautiful arcades, the walls and ceiling of which are everywhere covered with the stemmata, or shields, of the former students, many of them brilliantly painted. Standing in the arcade on the side of the quad opposite the entrance, if one looks on the ceiling immediately above the capital of the second column to the left here is seen the stemma which Fig 7 put up by a young Englishman, William Harvey, who had been a student at Padua for four years. He belonged to the 'Natio Anglica', of which he was Conciliarius and took his degree in 1602. Doubtless he had repeatedly seen Fabricius demonstrate the valves of the veins, and he may indeed, as a senior student, have helped in making the very dissections from which the drawings were taken for Fabricius' work "De Venarum Osteolis", 1603. If one may judge from the character of the teacher's work the sort of instruction the student receives, Harvey must have had a splendid training in anatomy. While at Padua the great work of Fabricius "De visione, voce et auditu", 1600, was published, and the Tractatus de oculo visuscue organo", 1601, and in the last year of his residence Fabricius must have been busy with his studies on the valves of the veins and with his embryology., which appeared in 1604. Late in life Harvey told Boyle that it was the position of the valves of the veins that induced him to think of the circulation

Harvey returned to England having been framed by the best anatomist of his day. In London he became attached to the College of Physicians, and taking his degree at Cambridge he began the practice of medicine. He was elected a Fellow of the College in 1607.

appear as tail piece to this chapter



and physician to St. Bartholomew's hospital in 1609. In 1615 he was appointed Lumleian Lecturer to the College of Physicians, and his duties were to hold certain 'public anatomies' as they were called, or lectures. We know little or nothing of what Harvey had been doing other than his routine work in the care of the patients at St. Bartholomew's. It was not until April, 1616, that his lectures began. Chance has preserved to us the ~~notes~~ of this first course; the MS. is now in the British Museum and was published by the College in 1886.(27) ~~The~~

The second day lecture, April 17th, was concerned with a description of the organs of the thorax, and after a discussion on the structure and action of the heart come the lines:-

" W. H . constat per fabricam cordis sanguinem
per pulmones in Aortam perpetuo
transferri, as by two clacks of a
water bellows to rayse water
constat per ligaturam transitum sanguinis
ab arteriis ad venas
unde perpetuum sanguinis motum
in circulo fieri pulsu cordis. "

x The illustration (Fig. 24) will give you an idea of the extraordinarily crabbed hand in which these notes are written, but it is worth while to see the original, for here is the first occasion upon which is laid down in clear and unequivocal words that the blood circulates.. The lecture gave evidence of a skilled anatomist, well versed in the literature from Aristotle to Fabricius.

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(27) "Prelectiones anatomiae universalis" by William Harvey. J. & A. Churchill. 1886.

Note to Author

There is apparently no figure 25- Should we not have a portrait of William Harvey

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In the MS. of the thorax-, or as he calls it the 'parlour-lecture' there are about a hundred references to some twenty authors. The remarkable thing is that although those lectures were repeated year by year, we have no evidence that they made any impression upon Harvey's contemporaries, so far, at least, as to excite discussions that led to publication. It was not until twelve years later, 1628, that Harvey published in Frankfurt a small quatto volume of 74 pages[28], "De Motu Cordis". In comparison with the sumptuous "Fabrica" of Vesalius this is a trifling ~~volume~~ booklet; but if not its equal in bulk, or typographical beauty (it is in fact very poorly printed ~~work~~) it is its counterpart in physiology, and did for that science what Vesalius had done for anatomy, though not in the same way. The experimental spirit was abroad in the land, and as a student at Padua Harvey must have had many opportunities of learning the technique of vivisection, but no one before his day had attempted an elaborate piece of experimental work deliberately planned to solve a problem relating to the most important single function of the body. Herein dies the special merit of his work; ~~and~~ from every page of which there breathes the modern spirit. ~~With it the age~~ To him, as to Vesalius before him, the current views of the ~~Sept, the age of Observation began~~ movements of the blood were unsatisfactory, more particularly the movements of the heart and arteries, which were regarded as an active expansion by which they were filled with blood, like bellows with air. The question of the transmission of blood through the thick septum, and the transferance of air and blood from the lungs to the heart were secrets which he was desirous of

[28] ~~(i) (De Motu Cordis~~ Exercitatio Anatomica de Motu Cordis et Sanguinis in animalibus. Francofurti MDCXXVIII

searching out be means of experiment.

One or two special points in the work may be referred to as illustrating his method. He undertook first the movements of the heart, a task so truly arduous and so full of difficulties that he was almost tempted to think with Fracastorius that "the movement of the heart was only to be comprehended by God". But after many difficulties he made the following statements: first that the heart is erected and raises itself up into an apex, and at this time strikes against the breast and the pulse is felt externally: second, that is it contracted everyway, but more so at the sides; and thirdly, that grasped in the hand it was felt to become harder at the time of its motion: from all of which actions Harvey drew the very natural conclusion that the activity of the heart consisted in a contraction of its fibres by which it expelled the blood from the ventricles. These were the first four fundamental facts which really opened the way for the discovery of the circulation, as it did away with the belief that the heart in its motion attracts blood into the ventricles, stating on the contrary that by its contraction it expelled the blood and only received it during its period of repose or relaxation. Then he proceeded to study the action of the arteries and showed that their period of diastole, or expansion, corresponded with the systole, or contraction of the heart, and that the arterial pulse follows the force, frequency and rythm of the ventricle and is, in fact, dependant upon it. Here was another new fact; that the pulsation in the arteries was nothing else

than the impulse of the blood within them. Chapter IV. in which he describes the movements of the auricles and ventricles, is a model of accurate description, to which little has since been added. It is interesting to note that he mentions what is probably auricular fibrillation, He says:- "After the heart had ceased pulsating an undulation, or palpitation remained in the blood itself which was contained in the right auricle, this being observed so long as it was imbued with heat and spirit".
He recognized too the importance of the auricles as the first to move and the last to die. The accuracy and vividness of Harvey's description of the motion of the heart have been appreciated by generations of physiologists. Having grasped this first essential fact, that the heart was an organ for the propulsion of blood, he takes up in chapters VI & VII. the question of the conveyance of the blood from the right side of the heart to the left. Galen had already insisted that some blood passed from the right ventricle to the lungs - enough for their nutrition, but Harvey points out with Colombo, that from the arrangement of the valves there could be no other view than that with each impulse of the heart blood passes from the right ventricle to the lungs and so to the left side of the heart. How it passed through ~~it passed through~~ the lungs was a problem: ~~he thought that~~ probably by a continuous transudation ~~must be considered~~..

In Chapters VIII. and IX. he deals with the amount of blood passing through the heart from the veins to the arteries. Let me quote here what he says, as it is of cardinal import:-

"But what remains to be said upon the quantity and source of the blood which thus passes, is of a character so novel and unheard-of that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom become a second nature. Doctrine once sown strikes deeply its root, and respect for antiquity influences all men. Still the die is cast, and my trust is in my love of truth, and the candour of cultivated minds." (29 ~~i~~)

Then he goes on to say:-

"I began to think whether there might not be A MOVEMENT, AS IT WERE, IN A CIRCLE. Now this I afterwards found to be true; and I finally saw that the blood, forced by the action of the left ventricle into the arteries, was distributed to the body at large, and its several parts, in the same manner as it is sent through the lungs, impelled by the right ventricle into the pulmonary artery, and that it then passed through the veins and along the vena cava, and so round to the left ventricle in the manner already indicated." (30 ~~ii~~)

(29 ~~i~~) Exercitatio Anatomica De Motu Cordis et Sanguinis in Animalibus, by William Harvey. Francofurti, M.DC,XXVIII. Guil.Fitzeri. pg.48

(30 ~~ii~~) The same; pg.49.

The experiments dealing with the transmission of blood in the veins are very accurate, and he uses the old experiment, that Fabricius had employed to show the valves, to demonstrate that the blood in the veins flows towards the heart, ~~and~~ for the first time ~~he gave~~ a proper explanation of the action of these valves is given. Harvey had no appreciation of how the arteries and veins communicated with each other. Galen, you may remember, recognized that there were anastonoses, but Harvey preferred the idea of filtration.

The 'De Motu Cordis' donstitutes a unique piece of work in the history of medicine. Nothing of the same type had appeared before. It is a thoroughly sensible, scientific study of a definite problem, the solution of which was arrived at through the combination of accurate observation and ingenious experiment. Much misunderstanding has arisen in connection with Harvey's discovery of the circulation of the blood. He did not discover that the blood moved - that was known to Aristotle and to Galen, from both of whom I have given quotations which indicate clearly that they knew of its movements - but ~~up to~~ at the time of Harvey not a single anatomist had escaped from the domination of Galen's views. Both Servetus and Colombo knew the pulmonary circulation which was described by the former in very accurate terms. Caesalpinus, ~~one of the~~ a great names in anatomy and botany, for whom is claimed the discovery of the circulation, only expressed the accepted doctrines in the following oft-quoted phrase:-

"We will now consider how the attraction of aliment and the process of nutrition takes place in plants; for in animals we see the aliment brought through the veins tp the heart, as to a laboratory of innate heat, and, after receiving there its final perfection, distributed through the arteries to the body at large, by the agency of the spirits produced from this same aliment in the heart."(31) There is nothing in this but Galen's view, and Caesalpinus believed, as did all his contemporaries, that the blood was distributed through the body by the vena cava and its branches for the nourishment of all its parts. To those who have any doubts as to Harvey's position in this matter I would recommend the reading of the "De Motu Cordis" itself, then the various passages relating to the circulation from Aristotle to Vesalius. Many of these can be found in the admirable works of Dalton, Flourens and Richet(32). In my Harveian Oration for 1906(33) I have dealt specially with the reception of the new views, and have shown how long it was before the reverence for Galen allowed of their acceptance. The University of Paris opposed the circulation of the blood ~~declined to accept Harvey's views~~ for more than half a century after the appearance of the 'De Motu Cordis'.

To summarize- until the seventeenth century there were believed to be two closed systems in the circulation, i) the natural, containing venous blood, ~~xxxxx~~ had its origin in the liver from which ~~as~~ from a fountain the blood continually ebbed and

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(31) "De Plantis". Lib.I. Cap.2.

(32) Dalton; "Doctrines of the Circulation", Philadelphia, 1884
Flourens; Hist. de la decouverte de la circulation du sang" 2-me edition, Paris, 1837.

(33) Paul Richet;
Wm.Osler; The Alabama Student & Other Essays; pg.295.

flowed for the nourishment of the body; ii) the vital, containing another blood and the spirits, ebbed and flowed from the heart distributing heat and life to all parts. Like a bellows the lungs fanned and cooled this vital blood. Here and there we find glimmering conceptions of a communication between these systems, but practically all teachers believed that the only one of importance was through small pores in the wall separating the two sides of the heart. Observation - merely looking at and thinking about things - had done all that was possible, and further progress had to await the introduction of a new method, viz:- experiment. Galen, it is true, had used this means to show that the arteries of the body contained blood and not air. The day had come when men were no longer content with accurate description and with finely spun theories and dreams. It was reserved for the immortal Harvey to put into practice the experimental method by which he demonstrated conclusively that the blood moved in a circle. The ~~little book~~ "De Motu Cordis" marks the final break of the modern spirit with the old traditions. It took long for men to realise the value of this 'inventum mirabile', ~~sought for so earnestly and~~ used so effectively by ~~Descartes~~ the Alexandrians - Galen - its full value ~~only done so~~ has only been appreciated within the past century. ~~but - To the dawning Age was now added the devising hand as an instrument in solving the problems of the mind~~

Let me quote a paragraph from my Harveian Oration[34] "To the Age of the Heaven in which men had heard & heard only, had succeeded the age of the Eye in which men had seen & had only been content to see. But - at last came the age of the hand - the thinking, devising, planning hand, the hand as an instrument of the mind, now reintroduced into the world in a modern attire - monograph from which we may date the beginning of Experimental medicine."

[34] Alabama Student &c p 325

IV

Harvey caught the experimental spirit in Italy, ~~where Galileo had already laid the foundation of modern mechanics and of astronomical investigation~~. Brain, eye and hand were his only ~~instruments~~ aids, but now a ~~new~~ era opened in which medicine was to derive an enormous impetus from the discovery of instruments of precision. "The new period in the development of the natural sciences, which reached its height in the work of such men as Galileo, Gilbert and Kepler, is chiefly characterized by the invention of very important instruments for aiding and intensifying the perceptions of the senses, by means of which was gained a much deeper insight into the phenomena than had hitherto been possible. Such instruments as the earlier ages possessed were little more than primitive hand-made tools. Now we find a considerable number of scientifically made instruments deliberately planned for purposes of special research, and as it were, on the threshold of the period stand two of the most important, the compound microscope and the telescope." The former was invented in 1590 and the latter in 1608."[35] (~~1~~)

It was a fellow Professor of the great genius Galileo, who attempted to put into practice the experimental science of his friend. With Sanctorius began the studies of ~~the~~ temperature, respiration and the physics of the circulation. The memory of this great investigator has not been helped by the English edition of his "De Medicina Statica", not his best work, with a frontispiece showing the author in his dietetic balance. (Fig. 27a) Full justice has been done to him by Dr. Wier Mitchell in an address as President of the Congress of

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35 Dahnemann; "Die Naturwissenschaften in Ihrer Entwickelung..." Vol.II. pg.7.

Physicians and Surgeons, 18-- (36) Sanctorius worked with a pulsilogue devised for him by Galileo, with which he made observations on the pulse, and he is said to have been the first to put in use the clinical thermometer, and his experiments on insensible perspiration mark him as one of the first of modern physiologists.

But neither Sanctorius nor Harvey had the immediate influence upon their contemporaries which the novel and stimulating character of their work justified. Harvey's great contryman, Bacon, although he lost his life in making a cold storage experiment, did not really appreciate the enormous importance of experimental science. He looked very coldly upon Harvey's work. It was a philosopher of another kidney, René Descartes, who did more than anyone to help men to realize the value of the better way which Harvey had pointed out. That the beginning of wisdom was in doubt, not in authority, was a novel doctrine in the world, but Descartes was no armchair philosopher, and his strong advocacy and practice of experimentation had a profound influence in directing men to 'la nouvelle méthode.' He brought the human body, the earthly machine, as he calls it, into the sphere of mechanics and physics, and he wrote the first text-book of physiology, "De l'homme". Locke, too, became the spokesman of the new questioning spirit, and before the close of the 17th century experimental research became all the mode. Lower, Hooke and Hales were probably more influenced by Descartes than by Harvey, and they made note contributions to experimental physiology in England. Borelli

(36) See Transactions Vol. -

author of the famous work on "The Motion of Animals" ( ) brought to the study of the action of muscles a profound knowledge of physics and mathematics and really founded the mechanical, or iatro-mechanical school. The literature and the language of medicine became that of physics and mechanics; Wheels and pulleys, wedges, levers, screws, cords, canals, cisterns, seives and strainers with angles, cylinders, celerity, percussion, & resistance were among the words that now came into use in medical literature, and Withington quotes a good example in a description by Pitcairne, the Scot who was Professor of Medicine at Leyden at the end of the 17th century. "Life is the circulation of the blood. Health is free and painless circulation. Disease is an abnormal motion of the blood, either general or local. Like the English school generally he is far more exclusively mechanical than are the Italians, and will hear nothing of ferments or acids even in digestion. This, he declares is a purely mechanical process due to heat and pressure, the wonderful effects of which may be seen in Papin's invented "digester". That the stomach is fully able to comminute the food may be proved by the following calculation. Borelli estimates the power of the flexors of the thumb at 3720 lb., their average weight being 122grains. Now, the average weight of the stomach is 8 oz., therefore it can develop a force of 117,088 lb., and this may be further assisted by the diaphragm and abdominal muscles, the power of which, estimated in the same way, equals 461,219 lb.! Well may Pitcairne add that this force is not inferior to that of any millstone." (37 ~~i~~)

(37 ~~i~~) Withington; "Medical History from the Earliest Times". London, 1894, (Scientific Press) Pg.317.

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Paracelsus gave an extraordinary stimulus to the study of chemistry and more than any one he put the old alchemy on modern lines. I have already quoted his sane remark that its chief service is in seeking remedies. But there is anothe side to this question. If, as seems not improbable, that Basil Valentine whose writings were supposed to have inspired Paracelsus, was a hoax and his works made up in great part from the writings of Paracelsus, then to our medical Luther, and not to the mythical Benedictine monk, must be attributed a great revival in the search for the Philosopher's Stone for the Elixir of Life, for a universal medicine, for the perpetuum mobile and for an autum potabile. (38) (~~i~~) I reproduce, almost at random, 28a two a pages from the fifth and last part of the last testament of Basil Valentine (London MDCLVI) from by which you may judge ~~will see what~~ the x chemical spirit of the time ~~was after~~. (Fig. 28a)

~~I am afraid too that~~ Out of the mystic doctrines of Paracelsus arose the famous 'Brothers of the Rosy Cross'. "The brotherhood was possessed of the deepest knowledge of science, the transmutation of metals, the perpetuum mobile and the universal medicine were among their secrets; they were free from sickness and suffering during their lifetime, though subject finally to death." (39) (~~ii~~)

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A school of a more rational kind followed directly upon the work of Paracelsus, in which the first man of any importance was Van Helmont. The Paracelsian Archaus was the presiding spirit in living creatures, and worked through special local ferments, by which the functions of the organs are controlled. Disease of any part

38 (~~i~~) See Professor Stillman on the Basil Valentine Hoax. Pop.Science Monthly, 1912.

39 (~~ii~~) Ferguson; Bibliotheca Chemica. Vol.II. pg.290.
For an account of Fludd and the English Rosicrucians see Craven's Life of Fludd. Kirkwall, 1902.

represents a strike on the part of the local Archaeus, who refuses to work. Though full of fanciful ideas Van Helmont had the experimental spirit and was the first chemist to discover the diversity of gases. Like his teacher, he was in revolt against the Faculty, and he has bitter things to say of physicians. He got into trouble with the Church about the magnetic cure of words, as no fewer than twenty-seven propositions incompatible with the Catholic faith were found in his pamphlet. (Ferguson) The Philosophus per ignem, Toparcha in Royenborgh, as he is styled in certain of his writings, is not an easy man to tackle. I show you the title page of the 'Ortus Medicinae' the collection of his works by his son. As in the pages of Paracelsus, there are many gems to be dug out. The counterblast against bleeding was a useful protest, and to deny in toto its utility in fever required courage - a quality never lacking in the Father of Modern Chemistry, as he has been called.

A man of a very different type, a learned academic, a professor of European renown, was Daniel Sennertus of Wittemberg, the first to introduce the systematic teaching of chemistry into the curriculum, and he tried to harmonize the Galenists and Paracelsians

Francescus Sylvius, a disciple of Van Helmont established the first chemical laboratory in Europe at Leyden, and to him is due the introduction of modern clinical teaching. In 1664 he writes "I have led my pupils by the hand to medical practice, using a method uhknown at Leyden, or perhaps elsewhere, i.e., taking them daily to visit the sick at the public hospital. There I have put the symptoms of disease before their eyes; have let them hear the complaints of /

~~of~~ the patients, and have asked them their opinions as to the causes and rational treatment of each case, and the reasons for those opinions. Then I have given my own judgment on every point. Together with me they have seen the happy results of treatment when God has granted to our cares a restoration of health; or they have assisted in examining the body when the patient has paid the inevitable tribute to death." (~~1~~ 40)

Glauber, Willis, Mayow, Lemery, Agricola and Stahl led up to Robert Boyle with whom modern chemistry may be said to begin.

Even as late as 1716 Lady Mary Wortley Montagu in Vienna found that all had transferred their superstition from Astrology to Chemistry. "Scarcely a man of opulence or fashion that has not an alchemist in his service"

(~~1~~ 40) Withington; Med. Hist. from the Earliest Times. pg.312-313.

To one scientific man of the period I must refer ad the quthor of the first scientific book published in England. Dryden sings:-

"Gilbert shall live till load-stones cease to draw
Or British fleets the boundless ocean awe."

and the verse is true, for by the publication in 1600 of the "De Magnete" the science of electricity was founded.

William Gilbert was a fine type of the 16th century physician, a Colchester man, educated at St. John's College, Cambridge . Silvanus Thompson says:- "He is beyond question rightfully regarded as the Father of Electric Science. He founded the entire subject of Terrestrial Magnetism. He also made notable contributions to Astronomy, being the earliest English expounder of Copernicus. In an age given over to metaphysical obscurities and dogmatic sophistry,he cultivated the method of experiment and of reasoning from observation, with an insight and success which entitles him to be regarded as the father of the inductive method. That method, so aften accredited to Bacon,Gilbert was practising years before him."(41)

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(41) Gilbert of Colchester ..... by Silvanus Thompson,F.R.S. London 1903. (Chiswick Press).

Note to Author

Should we not have a portrait of William Gilbert and of Franciscus Sylvius as well as of Pitcairn

Lecture V.

Section V

Chapter ~~LECTURE~~ V. Caps

~~After two thousand years~~ The middle of the seventeenth century saw ~~sees~~ the profession thus ~~not very~~ far on its way. Certain objective features of disease were known, ~~and~~ the art of careful observation had been cultivated, many empirical remedies had been discovered, the coarser structure of man's body had been well worked out, and a good beginning had been made in the knowledge of how the machinery worked, nothing more ~~but this was all~~. What disease really was, where it was, how it was caused, ~~were questions which~~ had not even begun to be discussed intelligently. over p. 1a

~~The next~~ A great step in advance followed ~~was~~ the objective study of the changes wrought in the body ~~organs~~ by disease. To a few of these the anatomists had already called attention. Vesalius ~~was~~ always keen in his description of aberrations from the normal~~, and, as I have already mentioned, he~~ was one of the first to describe internal aneurysm. The truth is, even the best of men had little or no appreciation of the importance of the study of these changes. ~~Even~~ Sydenham, ~~of whom we shall soon speak~~, scoffs ~~ingly remarks:~~ at the value of post-mortems

Again we have to go back to Italy for the beginning of these studies, this time to Florence, in the glorious days of Lorenzo the Magnificent. ~~This time~~ The pioneer now ~~it~~ is not a professor, but a general practitioner, Antonio Benevenini, of whom ~~we~~ know very little ~~of his life~~, save that ~~but~~ he was a friend of Marsilio Ficini and of Angelo Poliziano,

~~The great~~ an empirical discovery of the first importance marks the middle of the century

The story of ~~the introduction of~~ ~~this famous medicine~~ Chinchona is of special interest as it was the first great specific in disease to be discovered. In 1638 the wife of the Viceroy of Peru, the Countess of Chinchona, lay sick of an intermittent fever in the Palace of Lima. A friend of her hunband's, who had become acquainted with the virtues, in fever, of the bark of a certain tree, sent a parcel of it to the Viceroy, and the remedy administered by her physician, Don Juan de Vega, rapidly effected a ~~complete~~ cure. In 1640 the Countess returned to Spain, bringing with her a supply of quina bark, which thus became ~~gradually~~ known in Europe as "the Countess's Powder" (pulvis Comitissae) A little later her doctor followed bringing additional quantities. Later in the century the Jesuit Fathers sent parcels of the bark to Rome, whence it was distributed to the priests of the community and used for the cure of ague; hence the name of "Jesuit's bark". ~~The use of~~ Its value was early ~~advocated~~ recognized by Sydenham and by Locke. At first there was a great deal of opposition, and the Protestants did not like it because of its introduction by the Jesuits. The famous Quack, Robert Talbor, sold to Louis XIV in 1679 the secret of preparing quinquina for two thousand louis d'or, a pension and a title. That the profession was divided in opinion on the subject was probably due to sophistication, or to the importation of other and inert barks. It was well into the 18th century before its virtues were universally acknowledged. The tree itself was not described until 1738, and Linnaeus established the genus 'Chinchona' in honour of the Countess. (1)

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(1) ~~Sp~~ (1) "Peruvian Bark." by Clements R. Markham, C.B., F.R.S. London, John Murray, 1880.

& Memoir of the Lady Anna di Osoria, Countess of Chinchona and Vice-Queen of Peru, 1874.

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and he practised in Florence during the last third of the fifteenth century, and died in 1502. Through associations with the scholars of the day, he had become a student of Greek medicine, and he was not only a shrewd and accurate observer of nature, but a bold and successful practitioner. He had formed the good habit of making brief notes of his more important cases, and after his death these were found by his brother Jerome and published in 1506.[2] The book has a rare value as a record of the work of an unusually intelligent practitioner of that period. There are in all 111 observations, most of them commendably brief. The only one of any length deals with the new 'Morbus Gallicus', of which in the short period between its appearance and Benevenius's death he had seen enough to leave a very accurate description; and it is interesting to note that even in those early days mercury was employed for its cure. The surgical cases are of exceptional interest, and No.38 refers to a case of angina for which he performed a successful operation. This is supposed to have been a tracheotomy, and if so, it is the first in the fourteen centuries that had elapsed since the days of Antyllos.[3] There are other important cases which show that he was a dexterous and fearless surgeon. But the special interest of the work for us is that for the first time in modern literature we have reports of post mortem examinations made specifically with a view to finding out

2 De abditis nonnullus ac mirandis morborum et sanationum causis. Florence, 4°. 1507.

3 As I have never seen the case quoted and as it illustrates the man's style, I think it is worth while to give it in full. Possibly it was only a case of angina Ludivici, or retro-pharyngeal abscess.

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the exact cause of death. Among the 111 cases there are records of ~~post mortems~~ post-mortem; cases of gall-stones, abscess of the messentery, thrombosis of the messenteric veins, several cases of heart disease, senile gangrene, and one of cor villosum. ~~I know of~~ From no other book ~~from which one~~ do we get ~~a better~~ To good an idea of a practitioner's experience at this period; the notes are ~~so~~ plain and straightforward, and ~~so~~ singularly free from all theoretical and therapeutic vagaries. He gives several remarkable instances of faith healing, and case No.26, a man with the point of an arrow sticking in his left scapula

To know accurately the anatomical changes that take place in disease is of importance both for diagnosis and for treatment. The man who created the science, who taught us to think anatomically of disease, was the ~~great~~ Morgagni, whose "De Sedibus et causis morborum per anatomen indagatis"[4] is one of the great books in our literature. During the ~~sixteenth~~ 17th century the practice of making post mortem examinations had extended greatly, and in the "Sepulchretum anatomicum" of Bonetus (~~1700~~ 1679) these scattered fragments are collected.[5] But the work of Morgagni is of a different type, for in it are the clinical and anatomical observations of an able physician during a long and active ~~practice~~ life.

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4 (~~i~~) Venice 1761.

5 Boerhaave remarked that if a man wished to ~~get~~ deserve a get a medical degree from one medical author ~~alone~~ let it be this Catkinson Med. Bibliography 268

Insert Morgagni

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The work had an interesting origin, A young friend interested in science and in medicine was fond of discoursing with Morgagni about his preceptors, particularly Valsalva and Albertini, and sometimes the young man inquired about Morgagni's own observations and thoughts. ~~Then Morgagni~~ yileded to ~~his friend's~~ a strong wish that he would write ~~him~~ his young friend ~~in as~~ familiar ~~a manner as possible~~ letters describing his experiences. (Morgagni consented to) I am sorry that Morgagni does not mention the name of the young man, to whom we are so much indebted, and who, he states, was so pleased with the letters, that he continually solicited him to send more and more "till he drew me on so far as the seventieth; .the..sowhen I begged them of him in order to revise their contents, he did not return them, till he had made me solemnly promise, that I would not abridge any part thereof."(1) (Preface)

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(1) Morgagni: "The Seats and Causes of Diseases ..." London, 1769. Preface, pg.21.

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Born in 1682, Morgagni ~~he~~ studied at Bologna under Valsalva and Albertini. In 1711 he was elected Professor of Medicine at Padua. He published numerous anatomical observations and several smaller works of less importance. The great work, which has made his ~~im~~ name immortal in the profession ~~he published~~ appeared in his 80th year, and ~~it~~ represents the collected experience of a long ~~and busy~~ life. Though written in the form of letters, the work is arranged systematically, and has an index of exceptional value. From no section does one get a better idea of the character and scope of the work than from that relating to the heart and arteries - affections of the pericardium, diseases of the valves, ulceration, rupture, dilatation and hypertrophy, and affections of the aorta are very fully described. The section on aneurysm of the aorta remains one of the best ever written. It is not ~~only~~ the anatomical observations alone that make the work of unusual value, but the combination of clinical with and anatomical records. What could be more correct that this account of angina pectoris - probably the first in the literature? - "A lady forty-two years of age, who for a long time, had been a valetudinarian, and within the same period, on using pretty quick exercise of body, she was subject to attacks of violent anguish in the upper part of the chest on the left side, accompanied with a difficulty of breathing, and numbness of the left arm; but these paroxysms soon subsided when she ceased from exertion. In these circumstances, but with cheerfulness of mind, she undertook a journey from Venice, purposing to travel along the continent, when she was seized with a paroxysm and dies on the spot. I examined the body on the following day."

Fig 3 to be used as headpiece to this Chapter.

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"..... ....The aorta was considerably dilated at its curvature; and, in places, through its whole tract, the inner surface was unequal and ossified. These appearances were propagated into the arteria innominata. The aortic valves were indurated" ....."

He remarks, "The delay of the blood in the aorta, in the heart, in the pulmonary vessels, and in the vena cava, would occasion the symptoms of which the woman complained during life; namely, the violent uneasiness, the difficulty of breathing, and the numbness of the arm."[6(±)]

Morgagni's life had as much influence as his work. In close correspondence with the leading men of the day, with the young and rising teachers and workers, his methods must have been a great inspiration; and he came just at the right time. The profession was literally ravaged by theories, schools and systems - iatro-mechanics, iatro-chemistry, humorists, the animism of Stahl, the vitalistic doctrines of Van Helmont and his followers - and into this metaphysical confusion Morgagni came like an old Greek with his clear observation, sensible thinking and ripe scholarship. Sprengel well remarks that"it is hard to say whether one should admire most his rare dexterity and quickness in dissection „ his unimpeachable love of truth and justice

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6(±) Cooke's Morgagni, Vol.1. Pg.417-418.

(±±) I cannot too warmly commend to young clinicians the reading of Morgagni. English editions are available - Alexander's (3) volume translation of 1769 and Cooke's Abridgement, and there was an American edition published in Boston in 1824.

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in his estimation of the work of others, his extensive scholarship and rich classical style, or his downright commonsense and manly speech."

Upon this solid foundation the morbid anatomy of modern clinical medicine was built. Many of Morgagni's contemporaries did not fully appreciate the change that was ~~xxixxxxxxxxxxxx~~ in progress, and the value of the new method of correlating the clinical symptoms and the morbid appearances. After all, it was only the extension of the Hippocratic method of careful observation - the study of facts from which reasonable conclusions could be drawn. In every generation there had been men of this type - I dare say many more than we realize - men of the Benevenini character, thoroughly practical, clear-headed physicians. A model of this sort arose in England in the middle of the seventeenth century, Thomas Sydenham (1624-1689), who took men back to Hippocrates, just as Harvey had led them back to Galen. Sydenham broke with authority and went to nature. It is an extraordinary ~~fact that~~ law he could have been so emancipated from dogmas and theories of all sorts. He laid down the fundamental proposition, and acted upon it, that "all disease could be described as natural history". To do him justice we must remember, as Dr. John Brown says, "in the midst of what a mass of errors and prejudices, of theories actively mischievous, he was placed, at a time when the mania of hypothesis was at its height, and when the practical part of his art was overrun and stultified by vile and silly nostrums." Listen to what he says upon the method of the study of medicine:- "In writing therefore, such

a natural history of diseases, every merely philosophical hypothesis should be set aside, and the manifest and natural phenomena, however minute, should be noted with the utmost exactness. The usefulness of this procedure cannot be easily overrated, as compared with the subtle inquities and trifling notions of modern writers, for can there be a shorter, or indeed any other way of coming at the morbific causes, or discovering the curative indications than by a certain perception of the peculiar symptoms? By these steps and helps it was that the father of physic, the great Hippocrates, came to excel, his theory being no more than an exact description or view of Nature. He found that Nature alone aften terminates diseases, and works a cure with a few simple medicines, and often enough with no medicines at all."

Towards the end of the century many ~~Many of his contemporaries became~~ great clinical teachers arose of whom perhaps the most famous was ~~intimate friend~~ Boerhaave, often spoken of as the Dutch Hippocrates, and who inspired ~~about whom arose~~ a group of distinguished students. I have already referred to the fact that Franciscus Sylvius at Leyden was the first among the moderns to organise systematic clinical teaching. Under Boerhaave this was so developed that to this Dutch University ~~Leyden~~ flocked students from all parts of Europe. After teaching botany and chemistry, Boerhaave succeeded to the chair of physic in 1714. With an unusually wide general training, a profound knowledge of the chemistry of the day, and an accurate acquaintance with all aspects of the history of the profession, he had a strongly objective attitude of mind towards disease, following closely the methods of Hippocrates and Sydenham.

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He adopted no special system, but studied disease as one of the phenomena of nature. His clinical lectures, held bi-weekly, became exceedingly popular and were made attractive not less by the accuracy and care with which the cases were studied than by the freedom from fanciful doctrines and the frank honesty of the man. He was much greater than his published work would indicate, and, as is the case with many teachers of the first rank, his greatest contributions were his pupils. No teacher of modern times has had such a following. Among his favourite pupils may be mentioned Haller, the physiologist, and van Swieten, and de Haen the founders of the Vienna school.

In Italy too there were men who caught the new spirit, and appreciated the value of combining morbid anatomy with clinical medicine. Lancisi, one of the early students of disease of the heart, left an excellent monograph on the subject, and was ~~probably~~ the first to call special attention to the association of syphilis with cardio-vascular disease. A younger contemporary of his at Rome, Baglivi, was unceasing in his call to the profession to return to Hippocratic methods, to stop reading philosophical theories, and give up what he calls the "fatal itch" to make systems.

The Leyden methods of instruction were carried far and wide trhoughout Europe; into Edinburgh by John Rutherford, who began to teach at the Royal Infirmary in 1747, and was followed by Whytt and by Cullen; into England by William Saunders of Guy's Hospital. Unfortunately the great majority of clinicians could

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not get away from the theoretical conceptions of disease, and Cullen's theory of and the atony exercised a profound influence on practice particularly in this country, where it had the warm advocacy of Benjamin Rush. Even more wide-spread became the theories of a pupil of Cullen's, John Brown, who regarded excitability as the fundamental property of all living creatures: too much of this excitability produced what were known as sthenic maladies, too little, asthenic; on which principles practice was plain enough. Few systems of medicine have ever stirred such bitter controversy, particularly on the Continent, and in Charles Creighton's account of Brown[7 (i)] we read that as late as 1802 the University of Göttingen was so convulsed by controversies as to the merits of the Brunonian system that contending factions of s students in enormous numbers, not unaided by the professors, met in combat in the streets on two consecutive days and had to be dispersed by a troop of Hanoverian horse.

But the man who combined the ~~characters~~ qualities of Vesalius, Harvey and Morgagni in an extraordinary personality was John Hunter. He was in the first place a naturalist to whom pathological processes were only a small part of a stupendous whole, governed by law, which, however, could never be understood until the facts had been accumulated, tabulated and systematized. By his example, by his prodigious industry, and by his suggestive experiments he led men again into the old paths of Aristotle, Galen and Harvey. He made all thinking physicians naturalists, and he lent a dignity to the study of organic life, and re-established a close union between

7 (i) Dictionary of National Biography.

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medicine and the natural sciences. Both in Britain and Greater Britain he laid the foundation of the great collections and museums, particularly those connected with the medical schools. The Wistar-Horner and the Warren museums in this country originated with men who had been greatly influenced by Hunter. He was, moreover, the intellectual father of that interesting group of men on this side of the Atlantic who, while practising as physicians, devoted much time and labour to the study of natural history; such men as Benjamin Smith Barton, David Hossack, Jacob Bigelow, Richard Harlan, John D. Godman, Samuel George Morton, John Collins Warren, Samuel L. Mitchill and J. Aiken Meigs. He gave an immense impetus in Great Britain to the study of morbid anatomy, and his nephew, Matthew Baillie, published the first important book on the subject in the English language.

The beginning of the nineteenth century saw the profession in possession of i) a good general knowledge of the structure of the human body; ii) an increasing knowledge of its functions - though in no single department had any such progress been made as that which characterized the work of Harvey; but in the hands of John Hunter and others experimental pathology and physiology had made rapid strides.

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Before the eighteenth century closed practical medicine had made ~~one more~~ great advance. Smallpox, though not one of the great scourges like plague or cholera, was a ~~very~~ prevalent and much dreaded disease, and in civilizes countries few reached adult life without an attack. Edward Jenner, a practitioner in Gloucestershire, and the pupil to whom John Hunter gave the famous advice:- "Don't think, try!" had noticed that milkmaids who had been infected with cow-pox from the udder of the cow were insusceptible to smallpox. I show you here (Fig.) the hand of Sarah Nelmes with cow-pox, 1796. A vague notion had ~~been~~ prevailed among the dairies from time immemorial that this disease was a preventative of the smallpox. Jenner put the matter to the test of experiment. Let me quote here Jenner's own words:- "The first experiment was made upon a lad of the name of Phipps, in whose arm a little vaccine virus was inserted, taken from the hand of a young woman who had been accidentally infected by a cow. Notwithstanding the resemblance which the pustule, thus excited on the boy's arm, bore to variolous inoculation, yet as the indisposition attending it was barely perceptible, I could scarcely persuade myself the patient was secure from the Small Pox. However, on his being inoculated some months afterwards, it proved that he was secure." (8 ~~i~~)
The results of his experiments were published in a famous small quarto volume in 1798. (Fig.) From this date smallpox

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8 (~~i~~) Edward Jenner: "The Origin of the Vaccine Inoculation." London, 1801. 4°.

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has been under control. Thanks to Jenner not a single person in this audience is pock-marked! A hundred and twenty-five years ago the faces of more than half of you would have been scarred. We now know the principle upon which protection is secured: an active acquired immunity follows upon an attack of a disease of a similar nature. Smallpox and cow-pox are closely allied and the substances formed in the blood by the one are resistant to the virus of ~~smallpox~~ the other. I do not see how any reasonable person can oppose vaccination or decry its benefits. I show you the figures of the Prussian army and of the German Empire. A comparison of the statistics of the armies of other European countries in which revaccination is not so thoroughly carried out is most convincing as to its efficacy

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9≠ Pocken und Vaccinationslehre. Jochmann. 1913

The early years of the ~~nineteenth~~ the century saw the ~~origin~~ rise ~~and growth~~ of modern clinical medicine in Paris. In the art of observation men had come to a standstill. I doubt very much whether Corvisart in 1800 was any more skillful in recognizing a case of pneumonia than was Aeteus in the second century A.D. But disease had begun to be more systematically studied; special cliniques were organized, and teaching became much more thorough. ~~If~~ Anyone who wishes to ~~see~~ have a picture of ~~the state of~~ the medical schools in Europe in the first few years of the century, ~~let him~~ should read ~~read~~ the account of the travels of ~~which~~ Joseph Frank ~~gave to his father~~, ~~the famous~~ of Vienna[10] ~~physician.~~ ~~(i)~~ The ~~picture~~ description of Corvisart is of a pioneer in clinical teaching whose ~~remarkable~~, ~~and his~~ method, ~~as described~~, remains in vogue today in France ~~with the French physicians teachers~~ - the ward visit, followed by a systematic lecture in the amphitheatre. There were still lectures on Hippocrates three times a week, and bleeding was the principal plan of treatment: one morning ~~he~~ Frank saw 30 patients out of 112 bled! Corvisart was the strong clinician of ~~the day~~ his generation, and his accurate studies on the heart were among the first that had concentrated attention upon ~~one~~ a special organ. To him too is due the re-introduction of the art of percussion in internal disease discovered by Auenbrugger in 1761.

~~But~~ The man who gave ~~a~~ the greatest impetus to the study of scientific medicine at this time was Bichat, who pointed out that the pathological changes in disease were not so much in organs as in tissues. His studies laid the foundation of

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[10] ~~(i)~~ Reise nach Paris und London; Wien, 1805.

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modern histology. He separated the chief constituent elements of the body into various tissues possessing definite physical and vital qualities. "Sensibility and contractability are the fundamental qualities of living matter and of the life in our tissues. Thus Bichat substituted for vital forces 'vital properties', that is to say a series of vital forces occupying the different tissues."[1] His "Anatomie Générale" , published in gave an extraordinary stimulus to the study of the finer processes of disease, and his famous "Recherches sur la Vie et sur la Mort" ( ) dealt a death blow to the old iatro-mechanical and iatro-chemical views. His celebrated definition may be quoted :- "La vie est l'ensemble des propriétés vitales qui résistent aux propriétés physiques ou bien la vie est l'ensemble des fonctions qui résistent à la mort." (Life is the sum of the vital properties that withstand the physical properties, or, life is the sum of the functions that withstand death.) Bichat is another pathetic figures in medical history. His meteoric career ended in his thirty-first year: he died a victim of a post-mortem wound infection.

It was a pupil of Corvisart, René Théophile Laennec, who laid the foundation of modern clinical medicine. The story of his life is well known. A Breton by birth he had a hard up-hill struggle as a young man - a struggle of which we have only recently been made aware by the publication of a charming book by Professor Rouxeau of Nantes , "Laennec avant 1806" .

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[1] E.Boinet; Les Doctrines medicales, leur Evolution. Paris. Pg.85-86.

at his death Corvisart wrote Napoleon "Bichat has just died at the age of thirty. That battlefield on which he fell is one which demands courage and claims many victims. He has advanced the science of medicine. No one has done so much so well"

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Influenced by Corvisart he began to combine the accurate study of cases in the wards with anatomical investigations in the dead-house. Before Laennec the examination of a patient had been largely by sense of sight, supplemented by that of touch, as in estimating the degree of fever, or the character of the pulse Auenbrugger's 'Inventum novum' of percussion, recognized by Corvisart, extended the field ~~a little~~; but the discovery of auscultation by Laennec, and the publication of his work - "L'auscultation médiate", 1819, ~~introduced a method which gave an extraordinaty impetus to~~ marked an era in the study of ~~clinical~~ medicine. The clinical recognition of individual diseases had made really very little progress. With the stethoscope begins ~~a new era~~ the day of physical diagnosis . The clinical pathology of the heart, lungs and abdomen was revolutionized. Laennec's book is in the category of the eight or ten greatest contributions to the science of medicine (Fig. 20) His description of tuberculosis is perhaps the most masterly chapter in clinical medicine. This revolution was effected by a simple extension of the Hippocratic method from the bed to the dead-house, and by correlating the signs and symptoms of a disease with its anatomical appearances.

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The pupils and successors of Corvisart, - Bayle, Andral, Bouillaud, Chomel, Piorry, Bretonneau, Rayer, Cruveilhier and Trousseau, brought a new spirit into the profession. Everywhere the investigation of disease by clinical-pathological methods widened enormously the diagnostic powers of the physician.

~~It was~~ By this method ~~that~~ Richard Bright opened a new chapter on the relation of disease of the kidney to dropsy, and to albuminous urine. It had already been shown by Blackwell and by Wells, the celebrated Charleston (S.C.) physician, that the urine contained albumin in many cases of dropsy, but it was not until R Bright began a careful investigation of the bodies of patients who had presented these symptoms, that he discovered the association of ~~XXXXXXX~~ various forms of disease of the kidney with anasarca and albuminous urine. In no direction was the harvest of this combined study more abundant than in the complicated and confused subject of fever. The work of Louis and of his pupils, W.W.Gerhard and others, revealed the distinction between typhus and typhoid fever, and so cleared up one of the most obscure problems in pathology. By Morgagni's method of 'anatomical thinking' Skoda in Vienna, Schönlein in Berlin, Graves and Stokes in Dublin, Marshall Hall, C.J.B.Williams, and many others introduced the new and exact methods of the French and created a new clinical medicine. A very strong impetus was given by the researches of Virchow on cellular pathology, which removed the seat of disease from the tissues, as taught by Bichat, to the individual elements, the cells. The introduction of the use of the microscope in clinical work widened greatly our powers of diagnosis, and we obtained thereby a very much clearer conception of the actual processes of disease. In another way, too, medicine was greatly helped by the rise of experimental pathology, which had been introduced by John Hunter,

was carried along by Magendie and others, and reached its culmination in the epock-making researches of Claude Bernard. Not only were valuable studies made on the action of drugs, but also out knowledge of cardiac pathology was revolutionized by the work of Traube, Cohnheim and others. In no direction did the experimental method effect such a revolution as in our knowledge of the functions of the brain. Clinical neurology, which had received a great impetus by the studies of Todd, Romberg, Lockhart, Clarke, Duchenne and Weir Mitchell, was completely revolutionized by the experimental work of Hitzig, Fritsch and Ferrier. Under Charcot the school of French neruologists gave great accuracy to the diagnosis of obscure affections of the brain and spinal cord, and the combined results of the new anatomical, physiological and experimental work have rendered clear and definite what was formerly the most obscure and complicated section of internal medicine.

The end of the 5th decade of the century is marked by a discovery of supreme importance. Humphry Davy had noted the effects of nitrous oxide and the exhilarating influence of sulphuric ether had been casually studied, & Long of Georgia ~~in the~~ had made patients inhale the vapor until anesthetic and had performed operations upon them when in this state; but it was not until 1847 - Oct 16th, in ~~the operating room of~~ the Massachusetts General Hospital that Morton, in a public operating room ~~put~~ rendered a patient ~~under~~ insensible with Ether and demonstrated the utility of surgical anesthesia. The rival claims of priority no longer interest us, but the occasion is one of the most memorable in the history of the race. It is well that our colleagues celebrate Ether Day in Boston - no more precious boon has ever been granted to suffering humanity -

Fig.

Mass Gen

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In 1857 a young man, Louis Pasteur, sent a paper to the Lille Scientific Society on "Lactic Acid Fermentation" (Fig.) and in December of the same year presented to the Academy of Sciences in Paris a paper on "Alcoholic Fermentation" in which he concluded that "the deduplication of sugar into alcohol and carbonic acid is correlative to a phenonemon of life." A new era in medicine dates from those two publications. The story of Pasteur's life should be read by every student. It is one of the glories of human literature, and, as a record of achievement and of nobility of character, is almost without an equal. Figs. 2. Pasteur, Home at Dôle)

get reproduction

fig. 21

At the middle of the last century we did not know much more of the actual causes of the great scourges of the race, the plagues, the fevers and the pestilences, than did the Greeks. Here comes in Pasteur's great work. Before him Egyptian darkness; with his advent a light that brightens more and more as the years give us ever fuller knowledge. The facts that fevers were catching, that epidemics spread, that infection could remain attached to articles of clothing, etc., all gave support to the view that the actual cause was something alive, a contagium vivum. It was really a very old view, the germs of which may be found in the Fathers, but which was first clearly expressed - so far as I know - by Fracastorius, the Veronese physician, in the 16th century, who spoke of the seeds of contagion passing from one person to another;[12] and he first drew a parallel between the processes of contagion and the fermentation of wine.

fig

fig

[12] Varro De re Rustica RK I. 12. speaks of minute organisms which the eye cannot see & which enter the body & cause disease

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This was more than one hundred years before Kircher, Leeuwenhoek, and others, began to use the microscope and to see animalculae, etc.in water, and so give a basis for the "infinitely little" view of the nature of disease germs. And it was a study of the processes of fermentation that led Pasteur to the sure ground on which we now stand.

Out of these researches arose a famous battle which kept Pasteur hard at work for four or five years - the struggle over spontaneous generation. It was an old warfare, but the microscope had revealed a new world, and the experiments on fermentation had lent great weight to the omne vivum ex ovo doctrine. The famous Italians, Redi and Spallanzani, had led the way in their experiments, and the latter had reached the conclusion that there is no vegetable ad no animal that has not its own germ. But heterogenesis became the burning question, and Pouchet in France, and Bastian in England, led the opposition to Pasteur. The many famous experiments carried conviction to the minds of scientific men, and destroyed for ever the old belief in spontaneous generation. All along the analogy between disease and fermentation must have been in Pasteur's mind; and then came the suggestion. "What would be most desirable would be to push those studies far enough to prepare the road for a serious research into the origin of various diseases." If the changes in lactic, alcohol and butyric fermentations are due to minute living organisms, why should not the same tiny creatures make the changes which occur in the body

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in the putrid and suppurative diseases? With an accurate training as a chemist, having been diverted in his studies upon fermentation into the realm of biology, and nourishing a strong conviction of the identity between putrefactive changes of the body and fermentation, Pasteur was well prepared to undertake investigations, which had hitherto been confined to physicians alone.

He was early impressed with the analogies between fermentation and putrefaction and the infectious diseases, and in 1863 he assured the French Emperor that his ambition was "to arrive at the knowledge of the causes of putrid and contagious diseases." After a study upon the diseases of wines, which has had most important practical bearings, an opportunity came of the very first importance, which not only changed the whole course of his career, but had great influence in the development of medical science. A disease of the silkworm had, for some years, ruined one of the most important industries in France, and in 1865 the Government asked Pasteur to give up the laboratory work and teaching, and to devote his whole energies to the task of investigating it. The story of the brilliant success which followed years of application to the problem will be read with deep interest by every student of science. It was the first of his victories in the application of the experimental methods of a trained chemist to the problems of biology, and it placed his name high in the group of the most illustrious benefactors of practical industries.

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In a series of studies on the diseases of beer, and on the mode of production of vinegar, he became more and more convinced that these studies on fermentation had given him the key to the nature of the infectious diseases. It is a remarkable fact that the distinguished English philosopher of the seventeenth century, the man who more than anyone else of his century appreciated the importance of the experimental method, Robert Boyle, had said that he who could discover the nature of ferments and fermentation, would be more capable than anyone else of explaining the nature of certain diseases.

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22 7

In 1876 there appeared in the _____

a paper on the Etiology of Anthrax by a German district physician

x in Wollstein, Robert Koch (Fig.) .I show you here a picture

x of the first page of this article (Fig.) which is memorable

22 in our ~~history~~ literature as ~~it was~~ the starting point of ~~modern~~ a new method of research into the causation of infectious diseases. Koch demonstrated the constant presence of germs in the blood of animals dying from the disease. Years before those organisms had been seen by Pollender and Devaine, but the epoch-making advance of Koch was to grow those organisms in a pure culture outside the body, and to produce the disease artificially by inoculating animals with the cultures. Koch is really our medical Galileo who, by means ~~of~~ pure cultures and ~~skillful~~ isolation ~~by~~ staining,—introduced us to a new world. ~~Then~~ In 1878 followed his study on the Etiology of Wound Infections in which ~~with his improved methods~~ he was able to demonstrate con-

x clusively the association of micro-organisms with the disease. (Fig)

23 Upon those two memorable researches made by a country doctor rests the modern science of bacteriology.

The next great advance was the discovery by Pasteur of the possibility of so attenuating, or weakening, the poison that an animal ~~could be~~ inoculated ~~and have~~ had a slight attack, recovered and ~~be~~ was then protected against the disease. More than eighty years had passed since on May 14th 1796 Jenner had vaccinated a child with cow-pox and proved that a slight attack of one disease ~~would~~ protected the body from a disease of an allied nature. An occasion Equally famous in the history of medicine was the day in 1881 when Pasteur determined that a flock of sheep vaccinated with the attenuated

virus of anthrax remained well when every one of the unvaccinated infected from the same material had died. & Meanwhile from Pasteur's researches on fermentation and spontaneous generation a transformation had been initiated in the practice of surgery, which it is not too much to say has proved one of the greatest boons ever conferred upon humanity. It had long been recognized that now and again a wound healed without the formation of pus, that is, without suppuration, but both spontaneous and operative wounds were almost invariably associated with that change; and, moreover, they frequently became putrid, as it was then called - infected, as we should say; the general system became involved, and the patient died of blood poisoning. So common was this, particularly in old, ill-equipped hospitals, that many surgeons feared to operate, and the general mortality in all surgical cases was very high. Believing that from outside the germs came which caused the decomposition of wounds, just as from the atmosphere the sugar solution got the germs which caused the fermentation, a young surgeon in Glasgow, Joseph Lister, applied the principles of Pasteur's experiments to their treatment. I show you here Lister's original paper, from which I quote the following:- (Fig.)

"Turning now to the question how the atmosphere produces decomposition of organic substances, we find that a flood of light has been thrown upon this important subject by the philosophic researches of M.Pasteur, who has demonstrated by thoroughly convincing evidence that it is not to the oxygen or to any of its gaseous constituents that the air owes this property, but to minute particles suspended in it, which are the germs of various low

forms of life, long since revealed by the microscope, and regarded as merely accidental concomitants of putrescence, but now shown by Pasteur to be its essential cause, resolving the complex organic compounds into substances of simpler chemical constitution, just as the yeast plant converts sugar into alcohol and carbonic acid". From these beginnings modern surgery took its rise, and the whole subject of wound infection, not only in relation to surgical diseases, but to child-bed fever, forms now one of the most brilliant chapters in the history of Preventive Medicine.

With the new technique and experimental methods the discovery of the specific germs of many of the more important acute infections followed each other with bewildering rapidity: typhoid fever, diphtheria, cholera, tetanus, plague, pneumonia, gonorrhoea and, most important of all, tuberculosis. It is not too much to say that the demonstration by Koch of the 'bacillus tuberculosis' is, in its far reaching results, one of the most momentous discoveries ever made.

Of almost equal valus have been the researches upon the protozoa, minute forms of animal life, as causes of disease. As early as 1873 ~~the~~ spirilla were demonstrated in relapsing fever. Laveran proved the association of Haematazoa with malaria in 1880. In the same year Griffith Evans discovered trypanozomes in ~~the~~ a disease of horses and cattle in India, and the same type of parasite was found in the sleeping sickness. Amoeb~~a~~ were demonstrated in one form of dyssentry, and in other tropical diseases protozoa were discovered, so that we were really prepared for the announcement in 1905 by Schaudinn of the discovery of a protozoan parasite in syphilis. Just fifty years had passed since Pasteur

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had sent in his paper on lactic acid fermentation to the Lille scientific Society - half a century in which more had been done to determine the true nature of disease than in all the time that had passed since Hippocrates. Celsus makes the oft-quoted remark:-

and it is the possibility of removing the cause that gives such importance to the new researches on disease.

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INTERNAL SECRETIONS.

One of the greatest contribution, of the 19th century to scientific medicine was the discovery of the internal secretions of organs. The basic work on the subject was done by Claude Bernard a pupil of the great Magendie, whose saying it is well to remember - " when entering a laboratory one should leave theories in the cloakroom." More than any other man of his generation Claude Bernard appreciated the importance of experimant in practical medicine. For him the experimental physician was the physician of the future - a view well borne out by the influence of his epoch-making work has had on the treatment of disease. His studies on the glycogenic functions of the liver opened the way for the modern fruitful researches on the internal secretions of the various glands. About the same time that ~~this work was developing in~~ was developing the side of the problem Bernard's laboratory, Addison, a physician of Guy's Hospital, pointed out the relation of a remarkable group of symptoms to disease of the suprarenal glands, small bodies situated above the kidneys, the importance of which had not been previously recognized. With the loss of the function of these glands by disease the body was deprived of something formed by them which was essential to its proper working. Then in the last third of the century came in rapid succession the demonstrations of the relations of the pancreas to diabetes, of the vital importance of the thyroid gland and of the pituitary body. Perhaps no more striking illustration of the value of experimental medicine has ever been given than that afforded by the studies upon those glands.

The thyroid body, situated in the neck, and the enlargement of which is called goitre, secretes ~~a~~ substances which pass into the blood, and which are necessary for the growth of the body in childhood, for the development of the mind and for the nutrition of the tissues of the skin. If following an infectious disease a child has wasting of this gland, or if, living in a certain district, it has a large goitre, normal development does not take place, and the child does not grow in mind or body and becomes ~~feeble-minded, or~~, ~~as it~~ what is called a cretin. More than this - if in adult life the gland is completely removed, or if it wastes, a somewhat similar condition is produced, and the patient in time loses his mental powers and becomes fat & flabby - myxoedematous. It has been shown experimentally in various ways that the necessary elements of the secretion ~~could~~ can be furnished by feeding with the gland or its extracts, and that the cretinoid or mixoedematous conditions could thus be cured, or prevented. The accompanying photographs illustrate ~~a~~ cretins aged 15 and show the phenomenal change in a cretin following eleven months' treatment ~~in another case.~~ with thyroid extract; the photographs taken at intervals of two months.

Figs 25, 26, 27, 28

Experimental work has also demonstrated the functions of the suprarenal glands and explained the symptoms of Addison's disease, and chemists have even succeeded in making synthetically the adrenalin.

There is perhaps no more fascinating story in the history of science than that of the discovery of those so-called ductless glands. Part of its special interest is due to the fact that clinicians, surgeons, experimental physiologists, pathologists and chemists have all combined in splendid team work to win the victory. No such miracles have ever before been wrought by

physicians as those which we see in connection with the internal secretions of the thyroid gland. The myth of bringing the dead back to life has been associated with the names of many great healers since the incident of Empedocles and Panthea but now-a-days the dead in mind & the deformed in body may be restored by the touch of the magic wand of science.

The study of the interaction of these internal secretions, their influence upon development upon mental processes & upon disorders ~~and on various diseases~~, of metabolism is likely to prove in the future of a benefit scarcely less remarkable than that which we have traced in the infectious diseases.

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CHEMISTRY.

Chemistry. — It is not making too strong a statement to say that the chemistry and chemical physics of the 19th century have revolutionized the world. It is difficult to realize that Liebig's famous Giessen laboratory, the first to be opened to students for practical study, was founded in the year Boyle, Cavendish, Priestley, Levoisier, Black, Dalton and others had laid a broad foundation, and Young, Frauenhofer, Rumford, Davy, Joule, Faraday, Clark-Maxwell, Helmholtz and others built upon that and gave us the new physics and made possible our age of electricity. New technique and new methods have given a powerful stimulus to the study of the chemical changes that take place in the body, ~~When I was a student those~~ which only a few years ago in the words of Professor Lee were matters largely of speculation. "Now" we recognize that, with its living and its non-living substances inextricably intermingled, the body constitutes an intensive chemical laboratory in which there is ever occurring a vast congeries of chemical reactions; both constructive and destructive processes go on; new protoplasm t takes the place of old. We can analyze the income of the body, and we can analyze its output, and from these data we can learn much concerning the body's chemistry. A great improvement in the method of such work has recently been secured by the device of inclosing the person who is the subject of the experiment in a respiration calorimeter. This is an air-tight chamber, artificially supplied with a constant stream of pure air, and from which the expired air, laden with the products of respiration,

is withdrawn for purposes of analysis. The subject may remain in the chamber for days, the composition of all food and all excreta being determined, and all heat that is given off being measured. Favorable conditions are thus established for an exact study of many problems of nutrition. The difficulties increase when we attempt to trace the successive steps in the corporeal pathway of molecule and atom. Yet these secrets of the vital process are also gradually being revealed. When we remember that it is in this very field of nutrition that there exist great popular ignorance and a special proneness to fad and prejudice, we realize how practically helpful are such exact studies of metabolism."[13] (1)

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[13] (1) Scientific Features of Modern Medicine, by Frederic S.Lee, Ph.D New York, 1911.

I would like to call attention to this work of Professor Lee's as presenting the whole scientific features of modern medicine in a way admirably adapted for anyone, lay or medical, who wishes to get a clear sketch of them.

Lecture VI.

[showing the use made of a former address on "The Nation and the Tropics" and of the close of "Man's Redemption of Man"]

Lecture VI.

[Showing the use made of a Form called
or "The Nation and the Tribes" and of
the Idea of "Man's Redemption of Man"]

1853

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Chapter

~~LECTURE~~ VI.

Like Karshish, a picker up of learnings crumbs'

~~I have so far told you a~~ The story so far has been of men and of movements - of men who have, consciously or unconsciously, initiated great movements, and of movements by which, nolens volens, the men of the time were moulded and controlled. Hippocrates in the tractate on Ancient Medicine has a splendid paragraph on the attitude of mind towards the men of the past. My attention was called to it one day in the Roman Forum by Commendatore Boni, who quoted it as one of the great sayings of antiquity. Here it is:- " But on that account, I say, we ought not to reject the ancient Art, as if it were not, and had not been properly founded, because it did not attain accuracy in all things, but rather, since it is capable of reaching to the greatest exactitide by reasoning, to receive it and admire its discoveries, made from a state of great ignorance, and as having been well and properly made, and not from chance."(1)

I have tried to tell you what the best of these men in successive ages knew, to show you their point of outlook on the things that interest us. To understand the old writers one must see as they saw, feel as they felt, believe as they believed - and this hard, indeed impossible! We may get near them by asking the Spirit of the Age in which they lived to enter in and dwell with us but it does not always come! Literary criticism is not literary history - we have no use here for the former, ~~we have had enough of it of late~~, but to analyse ~~the literary history~~ his writings is to get as far as we can behind the doors of a man's mind, to know & appraise his knowledge.

(1) The Works of Hippocrates, Adams, Vol. 1. pg.168. London, 1849. (Sydenham Society).

not ~~appraised~~ from our standpoint, ~~mark you~~, but from that of his contemporaries, his predecessors, and his immediate successors. Each generation has its own problems to face, ~~and~~, looking at truth from ~~its own standpoint~~ a special focus and does not see ~~it with~~ quite the same outlines as any other. For example, men of the present generation ~~have~~ grown up under influences very different from those which surrounded ~~us~~ my generation in the seventies of the last century, when Virchow and his great contemporaries laid the sure and deep foundations of modern pathology. Which of you now knows the Cellular Pathology as we did? To many of you it is a closed book, - to many more ~~of you~~ Virchow may be thought a spent force. But no, he has only taken his place in the great galaxy. We do not forget the magnitude of his labours, but a new generation has new problems - his message was not for you - but that medicine today runs in larger moulds and turns out finer castings is due to ~~the technique which he made possible~~ his labours and work. It is one of the values of lectures on the history ofmedicine to keep alive the good influences of a great man even after ~~his~~ their positive teaching is antiquated. Let no man be so foolish as to think that he has exhausted any subject for his generation. Virchow was not happy when he saw the young men pour the new wine of bacteriology into the old bottle of cellular pathology. Lister could never understand how aseptic surgery arose out of his work; Ehrlich will not recognise his epoch-making views on immunity when the rising generation has finished with them. I do not remember which philosopher ~~it was who~~ said that ~~all~~ progress ~~was~~ is a series of negations - the denial today ~~of~~ of what ~~we had~~ was accepted yesterday, the contradiction of each generation of some part at

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least of the philosophy of the last: but all is not lost, ~~but~~ the germ plasm remains, a nucleus of truth to be fertilized by men often ignorant even of the body from which it has come. Knowledge evolves, but in such a way that its possessors are never in sure possession. "It is because science is sure of nothing that it is always advancing." (Duclaux.)

History is the biography of the mind of man, and its educational value is in direct proportion to the completeness of our study of the individuals through whom this mind has been manifested. I have tried to take you back to the beginnings of science, and to trace its gradual development which is conditioned by three laws. In the first place, like a living organism, Truth grows, and its gradual evolution may be traced from the tiny germ to the mature product. Never springing Minerva-like, to full stature at once, Truth may suffer all the hazards incident to generation and gestation. Much of history is a record of the mishaps of truths which have struggled to the birth, only to die or else to wither in premature decay. Or the germ may be dormant for centuries, awaiting the fullness of time.

Secondly, all scientific truth is conditioned by the state of knowledge at the time of its announcement. Thus, at the beginning of the seventeenth century, the science of optics and mechanical appliances had not made possible (so far as the human mind was concerned) the existence of blood capillaries and blood corpuscles. Jenner could not have added to his inquiry a ~~course~~ study on immunity; Sir William Perkin and the chemists made Koch's technique possible; Pasteur gave the conditions that produced Lister; Davy and others furnished the preliminaries necessary for anaesthesia. Everywhere we find this ~~invariable~~ filiation, one event following the other in orderly sequence - 'Mind begets mind', as Harvey says; "opinion is the source of opinion". Democritus with his atoms, and Eudoxus with his chief good, which he placed in pleasure,

impregnated Epicurus; the four elements of Empedocles, Aristotle; the doctrine of the ancient Thebans, Pythagoras and Plato; geometry, Euclid" (De Generatione).

And, thirdly, to scientific truth alone may the homo mensura principle be applied, since of all mental treasures of the race it alone compels general acquiescence. That this general acquiescence, this aspect of certainty, is not reached per saltum but is of slow, often of difficult growth - marked by failures and frailties, but crowned at last with an acceptance accorded to no other product of mental activity - is illustrated by every important discovery from Copernicus to Darwin.

The difficulty is to get men to the thinking level which compels ~~acquiescence in~~ the application of scientific truths. Protagoras, that 'mighty wise man' as Socrates called him, who was responsible for the aphorism that man is the measure of all things, would have been the first to recognise the folly of this standard ~~that~~ for the people at large. ~~This is no true standard. Even today the commonplaces of science are folly to many people.~~ But we have gradually reached a stage in which knowledge is translated into action, made helpful for suffering humanity, just as the great discoveres in physics & chemistry have been made use of in the advance of civilization. ~~Take a concrete example: a new disease broke out two or three years ago in the lodging houses near the docks in Philadelphia - a very curious disease characterised by a painful eruption over the whole body with moderate fever. While not dangerous to life, it was very troublesome and often disabling. Now what are the possible attitudes towards so novel a manifestation? Either to take it meekly as a chastisement from God (which is still the attitude adopted by many people, and in periods of epidemics the whole intercessory power of the Church is brought to bear), or the~~ We have traced the progress of medicine through a series of upward steps - a primitive stage in which medicine emerged from magic and religion into an empirical art as seen in the Egyptians & Babylonians; a stage in which the natural character of disease was recognized and the importance of its study as a phenomenon of nature was determined; a stage in which the structure of the human body was worked out; a stage in which the clinical and anatomical features of disease were determined; a stage in which the causes of these disorders were hospitably studied; and a final stage, to which we have just entered, the application of this knowledge for their prevention. Science has completely changed man's attitude towards disease -

Take an recent concrete illustration ~~of the modern attitude~~. A couple of ago ~~Last~~ year in Philadelphia and ~~the vicinity, and indeed~~ in some other parts of the United States, a very peculiar disease appeared, characteris-ed by a rash upon the skin and moderate fever, and a constitution-al disturbance proportionate to the extent and severity of the eruption. The ~~disease~~ malady first ~~appeared~~ broke out in the members of a crew of a private yacht; then ~~it was noted~~ in the crews of other boats, and ~~the~~ among persons living in the boarding-houses along the docks. It was the cause of a great deal of suffering and disability.

There ~~are~~ were ~~the usual~~ three courses open : --

~~For the individuals~~ To accept the visitation disease a. a visitation of God ~~in a meek and prop-er spirit, regarding it as~~ a chastening affliction sent from above, and call to aid the spiritual arm of the church.. to pray

Except the 'Peculiar People' few now take this view, or adopt this practice ~~I do not quite know what the attitude of~~ The Christian Scientist ~~would be towards such an outbreak, but if consistent~~ he would probably deny its existence, ~~and~~ refuse to recognize the itching the What rash of the fever and get himself in harmony with the Infinite

Thereby the method of Experimental medicine ~~What was done was first~~, ~~to determine~~ First the conditions were studied under which the individual cases occured. The only common factor seemed to be certain straw mattresses manufactured by four different firms, all of which obtained the straw from the same source.

The second point was to determine the relation of the straw to the rash. One of the investigators exposed a bare arm and shoulder for an hour between two mattresses. Three people volunt-arily slept on the mattresses for one night. Siftings from the straw were applied to the arm, under all which circumstances the rash quickly developed, showing conclusively the relation of the straw to the disease.

Thirdly

Thirdly, siftings from the straw and mattresses, which had been thoroughly disinfected failed to produce the rash.

And fifthly, careful inspection of the siftings of the straw disclosed a living parasyte, small mites, which when applied to the skin quickly produced the characteristic eruption.

SANITATION.

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When the thoughtful historian gets far enough away from the 19th century to see it as a whole, ~~perhaps~~ no single feature will stand out with greater distinctness than the fulfilment of the prophesy of Descartes that we could be freed from an infinity of maladies both of body and mind, if we had sufficient knowledge of their causes, and of all the remedies with which nature has provided us. ~~Modern~~ Sanitation takes its place among the great political, social and intellectual modern revolutions. Great Britain deserves the credit for the first practical recognition of the ~~great~~ maxim salus populi suprema lex. In the middle and latter part of the century a remarkable group of men, Southwood Smith, Chadwick, Budd, Murchison, Simon, Acland, Buchanan J.W.Russell and Benjamin Ward Richardson, put practical sanitation on a scientific basis. Even before the full demonstration of the germ theory they had grasped the conception that the battle had to be fought against a living contagion, which found in poverty, filth and wretched homes the conditions for its existence. One terrible disease was practically wiped out in 25 years of hard work. It is difficult to realize that within the memory of men now living typhus fever was one of the great scourges of our large cities, and broke out in terrible epidemics - the most fatal of all to the medical profession. In the severe epidemic in Ireland in the forties of the last century one fifth of all the doctors in the island died of typhus ~~in~~ ~~But you will get a~~ better idea of the new crusade, made possible by new knowledge, is to be had from a consideration of ~~if I deal briefly with~~ certain ~~three~~ diseases against which the fight is in active progress.

Nothing illustrates more clearly the interdependance of the sciences than the reciprocal impulse given to new researches in pathology and entomology by the discovery of the part played by insects in the transmission of disease. The flea, the louse, the bed-bug, the house-fly, the mosquito, the tick, have all within a few years taken their places as important transmitters of disease. The fly population may be taken as the sanitary index of a place. The discovery, too, that insects are porters of disease has led to a great extension of our knowledge of their life history. Early in the nineties, when Dr. Thayer and I were busy with the study of malaria in Baltimore, we began experiments on the possible transmission of the parasites, and a tramp, who had been a medical student, offered himself as a subject. Before we began Dr. Thayer sought information as to the varieties of mosquities known in America, but sought in vain: there had at that time been no systematic study. The fundamental study, which ~~gave us the clue~~ put us on the track, was ~~that~~ The demonstration by Patrick Manson (1) in 1879, of the association of filarian disease with the mosquito. Many observations had already been made, and were made subsequently, on the importance of insects as intermediary hosts in the animal parasites, but the first really great scientific demonstration of a wide-spread infection through insects was by Theobald Smith of Harvard University in 1889 (2) in a study of Texas fever of cattle. I well remember his original communication ~~on the subject~~, which remains one of the most brilliant pieces of experimental work ever undertaken. The deep impression made upon me by In completeness, in accuracy of detail, in Harveian precision, and in practical results ~~this work of Smith's and, later, of his collaborator, Kilborne, has rarely been equalled.~~

(1) Linnaean Society, London 1879, Vol.XIV.

(2) Medical News, Philadelphia, Vol.LV. And monograph with Kilborne Washington 1893

It is difficult to draw comparisons in pathology; but I think, if a census were taken among the world'd workers on ~~the subject~~ disease, the judgement do be based on the damage to health and direct mortality, the votes would be given to malaria as the greatest single destroyer of the human race. Cholera kills its thousands, plague, in its bad years, its hundred thousands, yellow fever, hook-worm disease, pneumonia, tuberculosis, are all terribly destructive, some only in the tropics, others in more temperate regions: but malaria is today, as it ever was, a disease to which the word pandemic is specially applicable. In this country and in Europe its ravages have lessened enormously during the past century, but in the Tropics it is everywhere and always present, thegreatest single foe of the white man, and at times and places it assumes the proportions of a terrible epidemic. In one district of India alone during the last four months of 1908 one quarter of the total population suffered from the disease and there were 400,000 deaths - practically all from malaria. Today the control of this terrible scourge is in our hands, and, as I shall tell you in a few minutes, largely because of this control the Panama Canal is being built.

No disease illustrates better the progressive evolution of scientific medicine. It is one of the oldest of known diseases. The Greeks and Greeco-Romans knew it well. It seems highly probable, as ~~is so well~~ brought out by W.H.S.Jones of Cambridge, the statistics of that in part at least the physical degeneration in Greece and Rome may have been due to the ~~side spread~~ great increase of this disease. Its clinical manifestations were well known and admirably described by the older writers. In the seventeenth century, as

I have already told you, the remarkable discovery was made that the bark of the Chinchona tree was a specific. Between the date of the Countess's recovery in Lima and the year 1880 a colossal literature on the disease had accumulated. Literally thousands of workers had studied the various aspects of its many problems; the literature of this country, particularly of the Southern States in the first half of last century may be said to be predominantly malarial. Ordinary observation carried on for long centuries had done as much as was possible. In 1880 a young French army surgeon, Laveran by name, working in Algiers, found in the microscopic examination of the blood that there were little bodies in the red blood corpuscles, amoeboid in character, which he ~~declared~~ believed to be the ~~parasites~~ germs of the disease. Very little attention was paid at first to his work, and it is not surprising. It was the old story of "Wolf, wolf"; there had been so many supposed 'germs' that the profession had become suspicious. Several years elapsed before Surgeon General Sternberg called the attention of the English-speaking world to Laveran's work: it was taken up actively in Italy and in America by Councilman, Abbott and others among us in Baltimore. The result of these wide-spread observations was the confirmation in every respect of Laveran's discovery of the association with malaria of a protozoan parasite. This was step No. three. Clinical observation, empirical discovery of the ~~cause~~ cure, determination of the presence of a parasite. Two other steps followed rapidly. Another army surgeon, Ronald Ross, working in India, influenced by the work of Manson, proved that the disease was

transmitted by certain varieties of mosquitoes. Experiments came in to support the studies in etiology; two of those may be quoted: Mosquitoes which had bitten malarial patients in Italy were sent to London and there allowed to bite Mr. Manson, son of Dr.Manson, ~~who really suggested the mosquito theory of malaria~~. This gentleman had not lived out of England, ~~and~~ where there is now no acute malaria ~~in London.~~ He had been a perfectly healthy, strong man. In a few days following the bites of the infected mosquitoes he had a typical attack of malarial fever.

The other experiment, though of a different character, is quite as convincing. In certain regions about Rome, in the Campania, malaria is so prevalent that in the autumn almost every one in the district is attacked, particularly if he is a new-comer. Dr. Sambron and a friend lived in this district from June 1. to September 1, 1900. The test was whether they could live in this exceedingly dangerous climate for the three months without catching malaria, if they used stringent precautions against the bites of mosquitoes. For this purpose the hut in which they lived was thoroughly wirdd, and they slept ~~with the greatest care~~ under netting. Both of these gentlemen at the end of the period had escaped the disease.

Then came the fifth and final triumph - the prevention of the disease. The anti-malarial crusade, which has been preached by Sir Ronald Ross, has been carried out successfully on a wholesale scale in Italy and parts of India and Africa has reduced enormously the incidence of the disease. ~~but of sanitary organization, as applied to malaria, I will speak shortly in connection with the Panama Canal.~~

Professor Celli of Rome in his lecture room has an interesting chart which shows the reduction in the mortality from malaria in Italy since the preventive measures have been adopted — the death rate has fallen from above 25000 in 1888 to below 2500 in 1910

There is needed a sweeping campaign against the disease throughout the Southern States of this country

The story of yellow fever illustrates one of the greatest practical triumphs of scientific medicine; indeed, in view of its far reaching commercial consequences, it may range as one of the first achievements of the race. Ever since the discovery of America ~~yellow fever~~ the disease has been one of ~~the~~ this great scourges ~~of the country~~, permanently endemic in the Spanish Main often extending to the Southern States, ~~and~~ occasionally into the North; and ~~sometimes taken to Europe~~ not infrequently it has crossed the Atlantic. The records of the British Army in the West Indies show an appalling death-rate, chiefly from this disease. At Jamaica for the twenty years ending in 1836 the average mortality was 101 per thousand, and in certain instances as high as 178. ~~It is~~ One of the most dreaded of all infections, ~~and in~~ the periods of epidemics in the Southern States ~~it is usually~~ have been the occasions of a wide-spread panic with complete paralysis of commerce. How appalling the mortality is may be judged from the outbreak in Philadelphia in 1793 when ten thousand people died in three months.(4) The epidemics in Spain in the early part of the nineteenth century was of great severity. A glance through La Roche's great book(5) on the subject soon gives one an idea of the enormous importance of ~~the part it played~~ the disease in the history of the Southern States ~~of America~~. Havanna, ~~too~~, ever since its ~~colonization~~ foundation, had been ~~one of the chief centres~~ a hot bed of yellow fever ~~of the disease~~. The best minds of the profession had been attracted to ~~the~~ a solution of the problem, but all in vain. Commission after commission had been appointed with negative results;

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(4) Matthew Carey; -

(5) Yellow fever. Phila. 18 -

various organisms had been described as the cause, and there were sad illustrations of the tragedy associated with investigations undertaken without proper training or proper technique. By the year 1900 not only had the ground been cleared, but the work on insect-borne disease, by Manson & by Ross had given observers an important clue. It had repeatedly been suggested that some relation existed between the bites of mosquitos and the tropical fevers, particularly by that remarkable student, Nott of Mobile, and the French physician Beauperthuy. But the first to ~~appreciate~~ announce clearly the mosquito theory of the disease was Finlay of Havanna. Early in the spring of 1900, during the occupation of Cuba by the United States, a ~~new~~ commission ~~was~~ appointed by Surgeon-General Sternberg, ~~who had~~ (himself been one of the most energetic students of the disease) ~~to make~~ undertook fresh investigations. Dr. Walter Reid, ~~the~~ Professor of Bacteriology in the Army Medical School, was ~~to be~~ placed in charge; Dr. Carroll of the United States Army, Dr. Agramonte of Havanna, and Dr. Jesse W. Lazear were the other members. At the Johns Hopkins Hospital we were deeply interested in the work ~~of the commission~~ as Dr. Walter Reid was a favourite pupil of Professor Welch, a warm friend of all of us, and a frequent visitor to ~~the~~ our laboratories. Dr. Jesse Lazear had been my House Physician, had worked with Dr. Thayer and myself at malaria, ~~and was in~~ gave up the charge of my clinical laboratory, ~~and it was with great regret on our part that he severed his connection with the hospital.~~ to join the Commission

Many scientific discoveries have afforded brilliant illustrations of method in research, but in the work of the ~~com-~~ men ~~mission~~ one is at a loss to know which to admire more - the

remarkable accuracy and precision of the experiments, or the heroism of the men - officers and rank and file of the United States army - ~~who~~ knew ~~xxx~~ all the time that they were playing with death, and some of them had to pay the penalty! The demonstration was beyond a peradventure - successful - that yellow fever could be transmitted by mosquitos, and equally ~~so~~ the negative proposition - that it could not be transmitted by fomites. An interval of twelve or more days ~~is~~ was found to be necessary after the mosquito has bitten a yellow-fever patient before it is capable of transmitting the infection. Lazear permitted himself to be bitten by a stray mosquito while conducting his experiments in the Yellow fever Hospital. Bitten on the 13th, he sickened on the 18th and died on the 25th September, but not until he had succeeded in showing in two instances that mosquitos could convey the infection. He added another to the long list of members of the profession who have laid down their lives in ~~xxx~~ search of the ~~cure for this deadly disease~~ causes of disease - Of such men as these and ~~Among others were~~ Myers of the Liverpool Yellow-Fever Commission, Dutton and young Manson. ~~Of them~~ may fitly be sung from the noblest of American poems the tribute which Lowell paid to ~~the~~ Harvard ~~men~~ Sons who fell in the War of Secession

"Many in sad faith sought for her,
Many with crossed hands sighed for her;
But these, our brothers, fought for her.
At life's dear peril wrought for her,
So loved her that they died for her."

Fortunately, the Commander-in-Chief at the time in Cuba was General Leonard Wood, who had been an army surgeon, and ~~he~~ was the first to appreciate the importance of the discovery. The sanitation of Havanna was placed in the hands of Dr. Gorgas, and within nine months the city was cleared of yellow fever, and, with

the exception of a slight outbreak after the withdrawal of the American troops, since has remained free from a disease which had been its scourge for centuries. As General Wood remarked, "Reed's discovery has resulted in the saving of more lives annually than were lost in the Cuban War, and saves the commercial i nterest of the world a greater financial loss each year than the cost of the Cuban war. He came to Cuba at a time when one third of the officers of my staff died of yellow fever, and we were discouraged at the failure of our efforts to control it." Following the example of Havanna other centres were attacked, at Vera Cruz and Brazil, with the same success, and it is safe to say that now, thanks to the researches of Reed and his colleagues, ~~if~~ with proper measures ~~be taken~~ no country need fear ~~the recurrence of~~ a paralysing outbreak of this once dreaded disease. (4 Figs.)

The scientific researches in the last two decades of the nineteenth century made possible the completion of the Panama Canal. The narrow Isthmus separating the two great oceans and joining the two great continents, has borne for four centuries an evil repute as the white man's grave. Silent upon ~~the~~ a peak of Darien stout Cortez with eagle eye gazed ~~at~~ on the Pacific. As early as 1520 S aavedra prpposed to cut a canal through the Isthmus. There the first city was founded ~~in~~ by the conquerors of the new world, which still bears the name of Panama. Spaniards, English and French fought along its coasts; to it the founder of the Bank of England took his ill-fated colony; Raleigh, Drake, Morgan the buccaneer, and scores of adventurers seeking gold, found in fever an enemy stronger than the Spaniard. For years the plague stricken Isthmus was abandoned to the negroes and the half-breeds, until in 1849, stimulated by the gold-fever of California, a railway was begun by the American engineers, Totten and Trautwine, and completed in 1855, a railway every tie of which cost the life of a man. The dream of navigators and practical engineers was taken in hand by Ferdinand de Lesseps in January 1881. The story of the French Canal Company is a tragedy unparallelled in the history of finance, and, one may add, in the ravages of tropical disease. Yellow fever, malaria, dysentery, typhus carried off in nine years nearly twentythousand employees. The mortality frequently rose above 100, sometimes to 130, 140 and in September 1885 it reached the appalling figure of 176 per thousand work people. I ~~show you~~ give here the mortality tables of that year taken from Colonel Gorgas' report issued in 1906. (Fig.)

with the exception of a small epidemic in 1897. During the French occupation 6283 of the employees died in hospital, thousands died along the course of the canal; many thousands were damaged permanently in health, or died after their return to their homes. In Philadelphia in 1888 I had a telegram from a contractor asking what accommodation could be given in the hospitals for two ship-loads of workmen returning from the canal, the great majority of them ill with malaria and dysentery. The mortality had been very high as yellow fever had been raging. One of the ships came to Philadelphia and I do not remember ever to have seen a more appalling sight when these victims of chronic dysentery and malaria were landed; many were anæmic, others worn to the bone, and not a man of them had escaped serious damage. Not 50 per cent. of those who had gone out returned, and a very large proportion of those who landed in New York and Philadelphia died subsequently.

When in 1904 the United States undertook to complete the canal everyone felt that the success or failure was largely a matter of sanitary control. The necessary knowledge existed, but under the circumstances could it be made effective? Many were doubtful. Fortunately, there was at the time in the United States army a man who had already served an apprenticeship in Cuba, and to whom more than to anyone else was due the disappearance of yellow fever from that island. ~~I know that~~ To a man the profession in the United States felt that could Dr. Gorgas be given full control of the sanitary affairs of the Panama zone the health problem, which meant the canal problem, could be solved. There was at first a serious difficulty relating to the necessary administrative control by a sanitary officer. In an interview

which Dr. Welch and I had with President Roosevelt he keenly felt this difficulty and promised to do his best to have it rectified. It is an open secret that at first, as was perhaps only natural, matters did not go very smoothly, and it took a year or more to get properly organised. Yellow fever recurred on the Isthmus in 1904 and in the early part of 1905. It was really a colossal task in itself to undertake the cleaning of the city of Panama, which had been for centuries a pest-house, and the mortality of which, even after the American occupation, reached one month as high as 71 per 1000 living. There have been a great many brilliant illustrations of the practical application of science in preserving the health of a community and in saving life, but it is safe to say, considering the circumstances, the past history, and the extraordinary difficulties to be overcome, the work accomplished by the Isthmian Canal Commission is unique. 1905 largely dealt with organisation ; yellow fever was got rid of, and at the end of the year the total mortality among the whites had fallen to 8 per 1000, but among the blacks it was still high, 44. For three years with a progressively increasing staff which had risen to above 40,000, of whom more than 12,000 were white, the death-rate progressively fell.

Of the six important tropical diseases, plague, which reached the Isthmus one year, was quickly held in check. Yellow fever, the most dreaded of them all, has not been present for three years. Beri-beri, which in 1906 caused 68 deaths, in 1908 caused only 38. The hook-worm disease, ankylostomiasis, has steadily decreased. From the very outset malaria has been taken as the measure of sanitary efficiency. Throughout the French occupation it was the chief enemy to be considered, not only because of its fatality, but on account of the prolonged

incapacity following infection. In 1906, out of every 1000 employees there were admitted to the hospital from malaria 821; in 1907, 424; and in 1908, 282. The mortality from the disease has fallen from 233 in 1906 to 154 in 1907 and 73 in 1908; that is to say, with a force more than a third larger in 1908 there were only a third the number of deaths that occurred in 1906. Dysentery, next to malaria the most serious of the tropical diseases in the zone, caused 69 deaths in 1906; 48 in 1907; and in 1908 with nearly 44,000 only 16 deaths. But it is when the general figures are taken that we see the extraordinary reduction that has taken place. Out of every 1000 engaged in 1908 only a third of the number died that died in 1906, and half the number that died in 1907.

The death-rate among white males has fallen to 3·84 per 1000. The rate among the 2674 American women and children connected with the Commission was only 9·72 per 1000. But by far the most gratifying reduction is among the blacks, the rate of which had fallen to the surprisingly low figure in 1908 of 12·76 per 1000; in 1906 it was 47 per 1000. A remarkable result is that in 1908 the combined tropical diseases—malaria, dysentery, and beri-beri—killed fewer than the two great killing diseases of the temperate zone, pneumonia and tuberculosis—127 in one group and 137 in the other. The whole story is expressed in two words, *effective organisation*, and the special value of this experiment in sanitation is that it has been made, and made successfully, in one of the great plague spots of the world.

In Italy, in India, in many parts of Africa, and in the United States the anti-malarial campaigns are being pushed with the same vigour and success, but time will not permit me to dwell upon any of these or upon the

brilliant success which has followed the work of Bruce and his colleagues in clearing Malta of Malta fever, but I must stop to refer briefly to certain dark shadows in the picture of tropical medicine. Within ten years the investigations in Africa have shown the wide prevalence of formidable diseases of animal and man, unknown or previously but imperfectly known. The knowledge of the group of diseases caused by the trypanosomes has added terror to tropical life. The dreaded sleeping sickness which now extends over some million of square miles is one of the serious problems of life in Africa. A vigorous plan of campaign has been instituted, and already in Uganda, as the Governor's report shows, there is a steady diminution, and no whites have been attacked since 1906. The public will find in Boyce's book the whole story of the relation of tropical diseases to flies and insects, and this most timely contribution should help to call attention to the medical problems of the tropics and the supreme interest to the nation of these new maladies. And there is another dark spot in our story.

The Recrudescence of Plague.

Certain epidemic diseases are very much like the fabled "Hydra," from which so soon as one head was cut off another sprang up to take its place, or, what is just as bad, grew again. Even the eternal watchfulness which safety demands is not of any avail against the workings of nature when we do not understand her laws, and when we are face to face with certain mysterious phenomena, the sweep of whose orbit we have not yet measured. Geologists tell us of epochs when there must have been a wholesale destruction of certain types, possibly by disease. More than once within historic days it must have seemed as if the very existence of

Month by month a little, grey-covered pamphlet is published by Colonel Gorgas "Report of the Department of Sanitation of the Isthmian Canal Commission. I have been one of the favoured to whom it has been sent year by year, and, keenly interested as I have always been in infectious diseases, and particularly in malaria, and dysentery, I doubt if anyone has read it more faithfully. I reproduce the upper part of the page which gives the vital statistics for a month, taking at random the month of February 1912. You see that in a population of more than 52 thousand the death-rate from disease had fallen to 7.31 per thousand; among the whites it was 2.80 and among the coloured people 8.77. To Colonel Gorgas and his staff not only is the profession indebted for this remarkable demonstration, but they have offered an example of thoroughness and efficiency, which has won the admiration of the whole world. As J.B.Bishop, Secretary of the Isthmian Canal Commission, has recently said,"America arrived on the Isthmus in the full light of those invaluable discoveries (the insect transmission of yellow fever and malaria) Scarcely had they begun active work when an outbreak of yellow fever occurred which caused such a panic throughout their force that nothing except the lack of steam ship accomodation prevented the flight of the entire body from the Isthmus. Prompt, intelligent and vigourous application of the remedies shown to be effective by the mosquito discoveries not only checked the progress of the pest, but banished it for ever from the Isthmus. In this way, and in this alone was the building of the canal made possible. The supreme credit for its construction therefore belongs to the brave men

surgeons of the United States army, who by their high devotion to duty and to humanity risked their lives in Havana in 1900-1 to demonstrate the truth of the mosquito theory."(1)

Read extract for Chairman

(1) Bishop;"The French at Panama". Scribner's Magazine, Jan.1913.

One disease has still a special claim upon the public in this country. Some fourteen or fifteen years ago, in an address on the problem of typhoid fever in the United States, I contended that the question was no longer in the hands of the profession. In season and out of season we had preached volumes which fill State reports, public health journals, and our medical periodicals. Though much has been done, typhoid fever remains a question of grave national concern. You lost in this State last year from typhoid fever 154 lives, every one sacrificed needlessly, every one a victim of neglect and incapacity. This is a nation of contradictions and paradoxes - a clean people, by whom personal hygiene is carefully cultivated, displays in matters of public sanitation a carelessness simply criminal: a sensible people, among whom education is more widely diffused than in any other country, supinely acquiesces in conditions shameful beyond expression. The solution of the problem is not very difficult. What has been done in Europe can be done here. It is not so much in the cities, though here too the death-rate is still high, but in the smaller towns and rural districts, in many of which the sanitary conditions are still those of the Middle Ages. How Galen would have turned up his nose with contempt at the water supply of the capital of the Dominion of Canada, scourged so disgracefully by typhoid fever of late! There is no question that the public is awakening, but many of the State boards of health need more efficient organization, and larger appropriations. Many of them on the other hand are models, and it is not for lack of example that others lag behind. The salaries of the health officers should

be ~~increased: they should~~ have special training in sanitary science and special courses should be given in the Medical Schools leading to diplomas in Public Health. Were the health of the people ~~xx~~ made a question of public and not of party policy, only a skilled expert could possibly be appointed as a public health officer, not as is now so often the case, the man with the political pull.

It is a long and tragic story in the annals of this country. That distinguished man ~~who was~~ the first Professor of Physic in this University in the early years of last century, Dr. Nathan Smith, in that ~~splendid~~ notable monograph article on "Typhous Fever" (1824) tells how the disease had followed him in his various migrations, from 1787, when he began to practise, all through his career, and could be return three another years, & in every hundred & forty or one hundred & fifty families of the State he would find the same miserable tragedy which he had witnessed so often — the same heedless sacrifice of the young on the altar of ignorance & incapacity

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Tuberculosis.

In ~~out of~~ a population of about 1 million 1700 persons died in this State of tuberculosis in the year 1911 a reduction in 30 years of nearly fifty per cent ~~1882 - a ratio of per thousand; last year persons died of the disease out of a population of - a ratio of per thousand.~~ A generation has changed completely our outlook on one of the most terrible scourges of the race. It is simply appalling to think of the ravages of this disease in civilized communities. Before the discovery by Robert Koch of the bacillus we were helpless and hopeless, with folded hands in an oriental fatalism we accepted a state of affairs which use and wont had made bearable. Today, look at the contrast! We are both helpful and hopeful. Knowing the cause of the disease, knowing how it is distributed, better able to recognise the early symptoms, better able to cure a very considerable portion of all early cases, we have gradually organised an enthusiastic campaign which is certain to lead to victory. The figures I have quoted indicate how progressively the ~~figxxxx~~ mortality is falling. Only, do not let us be disappointed if this comparatively rapid fall is not steadily maintained in the country at large. It is a long fight against a strong enemy, and at the lowest estimate it will take several generations before tuberculosis is placed at last, with leprosy and typhus, among the vanquished diseases. Education, organization, co-operation, - these are the weapons of our warfare. Into details I need not enter. ~~Thanks to the energy of one of your colleagues, Professor Fischer, and to your efficient State Board of Health, and to your early organization of sanataria, you have been in the fore-front of the battle.~~ The work ~~which has been~~ done by the National Association

Association under the strong guidance of its secretary, ~~Dr~~ Mr. Farrant, the pioneer studies of Trudeau and the optimism which he has brought into the campaign, the splendid demonstration by the New York Board of Health of what organization can do have ~~given~~ have helped immensely in this world-wide conflict.

omit for the present Y.W.P.H.

A visited yesterday to one of your Sanatoria - at Wallingford, under the care of my old friend Dr Lyman, was an inspiration and filled me with hope for the success of this campaign. Have you read his last annual report with the figures relating to the financial returns - the earnings - of those who have passed through the Sanatorium & have had the disease arrested or who have been put into a wage-earning condition? It is one of the most encouraging statement I have seen and should be widely circulated

Some years ago in an address at Edinburgh, I spoke of the triple gospel which man has published - of his soul, of his goods, of his body. This,

has been the

"~~And the~~ third gospel, the gospel of his body, which brings man into relation with Nature - a true *evangelion*, the glad tidings of ~~a conquest beside which all others sink into insignificance - is~~ of the final conquest of nature, ~~out of which has come man's redemption of man~~ . . ."

by which man has redeemed thousands of fellow man from sickness & ~~[illegible]~~ from death

"If in the memorable phrase of the Greek philosopher, Prodicus, 'That which benefits human life is God,' we may see in this new gospel a link betwixt us and the crowning race of those who eye to eye shall look on knowledge, and in whose hand nature shall be an open book - an approach to the glorious day of which Shelley sings so gloriously:

"Happiness
And Science dawn though late upon the earth;
Peace cheers the mind, health renovates the frame;
Disease and pleasure cease to mingle here,
Reason and passion cease to combat there,
Whilst mind unfettered o'er the earth extends
Its all-subduing energies, and wields
The sceptre of a vast dominion there."

I will add in Galley proof another section here.

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