12

~~Osler 14~~ WG.7.

Osleriana

[The following MSS., nos. 7639–68, have, with a few exceptions, been identified and arranged since Sir William Osler's death. Those not previously bound, and now in a uniform half-leather binding, were not necessarily intended for permanent preservation, nor the unpublished material for publication.]

OSLER (SIR WILLIAM) 1849–1919.

7639. [Answers to three examination papers: (i) 'Physiology, 1st year, W. Osler, 1/4/68', University of Toronto; (ii) another, endorsed in his later hand 'Phy. paper, Tor. Univ.', undated; and (iii) 'Final paper', in medicine, undated (? McGill, 1872).]

Inserted in 1940 as Add. 28a-c: Osler's THESIS, 1872, 3 leaves of draft of introd. c.

7639

Inserted in 1962.

iv. "Trinity College. First Year Examination, June 1868. Euclid." [2 sheets]
v. "Latin Prose (Pass) June 1868. Coll. S.S. Trin. Toronto" [1 sheet]
vi. "Trinity College. Examination 1868. Algebra" [1 sheet]
vii. "Trinity College. June 1868. 1st year. Homer. Horace. Hon. Classics" [1 sheet]
viii. "Trinity College. June 1868. 1st year. Terence. Pass Latin" [1 sheet]
ix. "Roman History June 1868. [1 sheet]
x. "Trinity College. June Examination - 1868 - Trigonometry" [i sheet]
xi. "Trinity College. June Examination. 1868. 1st year - Medea - Hippolytus" [i sheet]

Originals of William Osler's answers
to examination questions:—

[1] "Physiology — 1/4/68" [at Toronto University] foll. 1-12.

X endorsed "My paper at the 1st year examination
of the University of Toronto
W.O."

Osler's hand "Phy. paper foll. 13-19.
primary" ex, which he had
in 1871.

is is endorsed on the verso
ler / Very good / paper / JB"

. in med., probably 1872 foll. 21-28

[4] (added in 1940:)
Thesis, 1872. 3 leaves of draft of introd. foll. 28 a-c.

OSLER's answers in physiology examinations at the Toronto School of Medicine, 1868, and at McGill, 1871.

Originals of William Osler's answers
to examination questions:—

[1] "Physiology -- 1/4/68" [at Toronto University] foll. 1-12.

* endorsed "My paper at the 1st year examination
of Univ. of Toronto
W.O."

[2] also physiology foll. 13-19.

endorsed in Sir William Osler's hand "Phy. paper
Tor. Univ," but probably his "primary" ex, which he had
to pass over again at McGill in 1871.

* Noted in card cat, 1940, that this is endorsed on the verso
of leaf 4, probably by Bovell, " Osler / Very good / paper / JB"

[3] (see fol. 20:) "Final paper" in med., probably 1872 foll. 21-28

[4] (added in 1940:)
Thesis, 1872. 3 leaves of draft of introd. foll. 28 a-c.

Part of Osler's McGill graduation thesis based on 20 post mortems, judged to be "greatly distinguished for originality and research" for which he was awarded a special book prize. In addition he placed first in the final exam. Spring, 1872.

B.O. 7639, Osler Library

u chords and allow the
revent this the Chordee-

e tricuspid valves closes
part of the wall of the ventricle. The whole po
cle is then employed in forcing the blood into the pulmona
artery pressing back the semilunar valves. During the
ventricular systole the auriculo-ventricular valves are
prevented from flapping back into the auricles by the
chordæ tendineæ which are attached to their vent
surface. But as the ventricle contracts

(;) sides together it would shorten the chords and allow the valves to flap back ~~again~~ but to prevent this the Chordæ-

Physiology Osler

(1)

The Blood returned from the body by the Superior & inferior Vena cava enters the right auricle during its diastole. When the auricle contracts it has a tendency to drive the blood in two directions viz towards the great veins and towards the ventricle but towards the great veins it is resisted by the whole mass of blood in them while no resistance is offered towards the ventricle, the auriculo-ventricular valves being open, consequently the Blood rushes through them into the ventricle which is empty, and dilate to receive it. In certain diseased states there is a small amount of reflux into the great veins, as ~~and~~ it is seen sometimes in the venous pulse of the neck. When the ventricle contracts the blood getting behind the [illegible] and is poured into the system, and then they form, so as it were grafted onto the Systemic, & hence of the vitality in the circulation are seen in the Erectile tissues

(1) sides together it would shorten the chords and allow the valves to flap back ~~again~~ but to prevent this the Chordæ tendinæ are not attached to the sides of the heart ~~but~~ but to masses of muscle called columnæ carneæ which contract at the same time as the heart. The Blood sent through the Pulmonary artery to the lungs is there aerated and poured back into the left auricle by the four pulmonary veins. It contracts and drives the blood through the mitral valves into the Left Ventricle and it through the semilunar valves into the Aorta, and from thence it is distributed to the body at large. We see from this that the circulation is divided into two. Systemic & Pulmonary. There is a peculiarity in the Systemic circulation which perhaps is worth noticing viz the Portal circulation The Blood from the Stomach, Intestines, Spleen, & Pancreas instead of ~~returning~~ emptying at once into the vena cava forms a large trunk the Portal vein which ramifies through the liver and there probably some of its constituents are elaborated. It is returned from the liver by the hepatic vein and is poured into the Inf vena Cava. Thus the Portal is as it were grafted onto the Systemic. Other peculiarities in the circulation are seen in the Erectile tissues

(4)

(2)

~~The~~ Undoubtedly the ~~post~~ cause is the heart. It is the ~~a~~ transmissive power by which the blood is sent

(3)

(1)

The change produced by the circulation of the blood through the lungs is that the dark venous blood is converted into the bright arterial. In this change the venous blood gives up its carbonic acid and receives oxygen, becomes arterialized the change in the colour is probably due to the different way in which carbonic acid and oxygen act upon them. Carbonic acid inflates them and so makes them reflect the light more strongly whilst oxygen flattens them. The change is well seen when by shaking up venous blood in oxygen it immediately becomes red and by shaking up arterial in carbonic acid it become dark & venous

(2)

The Undoubtedly the great cause is the heart. It is the great propulsive power by which the blood is sent through the different parts. but the supply is greatly modified by local causes. The contraction of the muscular walls of the arteries causes a diminution in their calibre and consequently a much less quantity of blood flows through them. The nerves which are plentifully supplied to the muscular coat also exert considerable influence. this is well seen in the act of Blushing an Emotion - sometimes pleasurable sometimes painful takes possession of the mind. this acts upon the nerves and causes them not to act so much upon the blood vessels and consequently there is a larger supply of blood sent to the part which instantly flushes & becomes red. The force supplied by the heart has been proved to be sufficient to propel the blood through the capillaries and veins but some have supposed this to be supplemented by a "capillary power" which certainly manifests itself in some of the lower animals. Some have supposed also that in inspiration the venous blood is as it were sucked up into the auricle. In the veins no doubt the pressure

and paleness is the consequence

separates out as crystals, when viewed under the microscope in a short time they begin to run together into masses arranged like rolls of coin. It is very much altered by different fluids according to their density water making them swell out and become round while

Bovell's commendation:
"Very good paper
J B"

(6)

(3)

(5)

2)

of the muscles and considerably and also their valves
In diseased conditions the parts growing and multiplying
rapidly require a greater amount of Pabulum than in
a healthy condition and as this can be afforded by the
blood alone, there is consequently a greater supply
afforded to them

(3)

Some have regarded the red blood corpuscle
as a cell but it can hardly be looked upon in that light
but rather as a round mass of organized matter
consisting of Globulin and a peculiar colouring matter
termed hæmatin which under some circumstances
seperates out as crystals, When viewed under the
microscope in a short time they begin to run together
into masses arranged like rolls of coin. It is very much
altered by different fluids according to their density
water making them swell out and become round while

(3)

while fluid of a greater density than themselves
makes them flatter. They are bi-concave, thicker
at the edges than at the middle. The Red blood corpuscle
is undoubtedly the offspring of the white. but whether the white
corpuscle merges into the red or whether the red corp-
uscle is merely the free nucleus of the white is not yet
determined though it is probably the latter. The first Blood
corpuscles come from the primordial cells of the "Blasto-
dermic vesicle" of the heart. The Red corpuscle is the life
of the blood in it are contained most of the nutritive qualities
Its relation also to oxygen is remarkable. It has been shown
(1) That the blood contains a much greater quantity of
oxygen than water could at the same temperature
and pressure (2) that this in some way depends upon
the red blood corpuscle for serum is no better than water
in containing oxygen, and it has been proved that a solution
of haematin has a great affinity for oxygen (3). In the passage
of certain substances, readily oxydized, through the blood such
as pyro-gallic acid, and there not being added only the oxygen
it would seem as though it was not free but in a state of

are the ones that secrete the gastric juice while the one
closer the pyloric end secrete the mucous which lubri-
ates the stomach. Towards the pyloric end the mucous mem-
brane is prolonged into processes ~~recent~~ analogous to the
villi of the Intestines but differing from them in containing

(8)

(4) no tactcals. The Lymphatics from plexuses in the

(7)

(3) chemical solution

(4) When a piece of the mucous membrane of the stomach is examined with a watchglass numerous alveoli or depressions are seen & in these depressions the opening of four or five ducts. these ducts are prolonged downward into the membrane and some of them branch spread out into two or three branches, they are the peptic follicles. they consist of a delicate basement membrane lined by a layer of columnar epithelium. these epithelium are the parts which secrete the gastric juice. It has been proved that the follicles near the cardiac extremity which are simpler in their character and not nearly so branched are the ones that secrete the gastric juice while the one closest the pyloric end secrete the mucous which lubricates the stomach. Towards the pyloric end the mucous membrane is prolonged into processes ~~recent~~ analogous to the villi of the Intestines but differing from them in containing

(4) no lacteals. The lymphatics form plexuses in the submucous coat in the entire extent of the stomach

(5) The gastric juice is an acid fluid secreted by the peptic follicles and consists of 990 pts water & 10 pts solid matter. The chief characteristic of the gastric juice is its decided acidity which is due to the presence of hydrochloric & lactic acids. Brucke has shown that the gastric juice is stored up in the follicles in the neutral state and that it is only at the moment of its discharge that it becomes acid. His observations would lead to the conclusion that the acid is stored up seperately. During the intervals of digestion the secretion which mantles the walls of the stomach is neutral or even alkaline. That the quantity of gastric juice secreted is in direct relation to the wants of the system and not to the amount of food ingested is a principle of the highest importance.

only and exerts no solvent actions upon either the saccharine oleaginous or farinaceous constituents of the food, although the change in the farinaceous constituents (which commences in the mouth) is usually continued in the stomach &c.

(10)

5)

presence of

(3)

(4) Our knowledge of

The nature and process of gastric digestion has been much advanced of late and we are now in a position to state with considerable certainty what it is, what it is not the province of the gastric juice to effect. There can be no doubt that the process is one of chemical solution and that the vital attributes of the stomach are only exercised in the preparation of the solvent and in the performance of those movements necessary for the act. It is not true as was formerly supposed that the gastric juice acts upon all the constituents of the food the mistake probably arose from the solution in which they undergo, all being contained in a large bolus to which the name chyme has been given. All the more recent and accurate experiments of those who have studied the chemistry of digestion lead to the fact the gastric juice acts upon azotized substances only and exerts no solvent action upon either the saccharine oleaginous or farinaceous constituents of the food although the change in the farinaceous constituents which commences in the mouth is usually continued in the stomach &c.

5/

presence of
consumance is due to the saliva ~~present~~ for it is
completely precluded when by tying the oesophagus
the saliva is prevented from coming down. The saccha-
rine constituents being readily soluble in water do not
require the action of the gastric juice any more than for
the solution of their membrance whereby they are set
free, no change whatever occurs in the albuminous
constituents except perhaps a finer division, accom-
to manner two new substances are found namely
Peptone and Parapeptone whatever may have
been the albuminous food digested, but a mixture of
these new substances as precipitable by heat. It is
evident that a process of chemical transformati-
as well as of solution has taken place, but as
no peptones are found in the blood but only albumen
it is evident that it is only for the purpose of absorption
~~that~~ always more Peptone is found than Parapeptone
Certain accessary condition are necessary for this process
By a heat from 26° to 100° ~~being~~ the process being retarded

(12)

(6)

(11)

(5)

as there is a diminution of the thermometer below this standard and an entire stoppage at the ordinary temperature of the air. It is perceived however upon and increase of heat. A certain amount of motion is also necessary. thus does not act as was formerly supposed ~~by tortoise~~ by trituration for food placed in iron balls perforated with holes is well digested.

Food is also digested out of the body of the gastric juice is kept at ~~about~~ a temperature of 98°. The products of gastric digestion which pass through the pylorus have received the name of chyme. It contains much azotized matter which is still undigested. the solution of this is probably effected by the "Succus Entericus"

(12)

(6)

The mucous membrane lines the mouth. nose trachea pharynx œsophages, stomach & intestinal tubes. It is continuous upon the lips with the skin. It consist of a delicate basement membrane lined upon its surface with epithelial cells: the nature of which vary in different parts of the body. On the tongue. lips & cheeks it is of the squamous variety. In the trachea. part of the pharynx. vagina & some other parts it is situated. in the intestinal tube is cylindrical The office of the mucous membrane varies in different parts in some parts it secrets as the buccal mucous membrane it furnishes important constituents of fluid also in the intestinal tract. It both serves for the reception of the various gland structures embedded in it. but it likewise aids in secreting these fluids. In the small intestine more particularly, by its protrusion into villi it greatly and the reception in them of the capillary network and lacteals it materially aids in the process of absorption In the ciliated Epithelium we see a wonderful provision for the removal of mucous from place by the constant curling vibratile established by their peculiar movement, and thus a current is always towards the external orifice the tubes enter the central portion termed in the malpighian tufts = afferent vessel in it, it forms a capillary plexus through which the blood portions of the urine are secreted

Physiology
1st year
W. Osler

1/4/81

My paper at the
1st year examination
of June & Sept.
81.0

I

Secretions are made in ~~the~~ Salivary
and in mastication, speech, acts on starchy
element changes it to sugar, aids in deglutition.
Buccal secretion thick & tenacious aids deglut-
ition & envelopes the bolus of food
(b) Gastric secretion, acts on envelopes of
fat, converts all albuminous food into
albumoses which can be absorbed, has no
action on starchy or fatty matters only on
albuminous
(c) Succus Entericus, acts probably on the albumi-
ous & starchy; function not quite made out
(d) Pancreatic starchy matters acted on,
fatty & probably to a slight degree albuminous
(e) Biliary, Partially excrementitious, acts
on fatty matters principally promoting emul-
sion, acts a little on starchy, some on albumi-
Prevents putrefaction, ~~and~~ acts as natural
purgative & by having the epithelium cast enable
the fatty matter to be absorbed
(f) Lay intestinal tubular glands of it secrete a
fatid matter, which may have some secon-
day digestive power

Consists of (a) duodenum about 10 inches in
length, Jejunum 4-5 feet. Ileum 5-6 feet
terminates in the cæcum, dilated portion. Large bowel
colon, sigmoid flexure & rectum. in all about 5 feet in length
terminates in the anus

II Kidney two portions, vascular & secretory
vascular. Renal artery branches into & forms
the vasa recta these running up between
the tubes enter the cortical portion. terminate
in the Malpighian tufts = afferent vessel
in it, & forms a capillary plexus through wh.
the urinal portions of the urine are secreted

eaves the tuft as an efferent vessel when & close to where the afferent enters, then breaks up into a venous plexus about the tubes forming the "portal system" of the Kidney, & from this system by means of the Epithelium of the convoluted tubes the various salts of the urine are eliminated & pass down the convoluted & straight tube to enter the ~~to~~ pelvis of the organ

Specific gravity varies from 1015 in ~~winter~~ summer to 1020 in winter. but is both increased & diminished by disease.

Reaction is acid

50 Daily amount ℥LII (Parkes).

Urea 512 grs. Uric acid gr 8.12. Hippuric grs 10, Sulphuric acid 35; Phosphoric 51.

Extractives, i.e. Xanthin Mucous, Oxalic, creatin fatty matters, = grs 140

III Spinal cord consists of white and grey matter white external, grey internal in two crescentic masses joined by a commissure. There is an anterior & posterior fissure., & two lateral

Nerves. Anterior motor; posterior. with a ganglion on its root, sensitive

The nerves fibres entering the cord are variously distributed. some passing upwards. some transversely inwards. other downwards. appearing to connect the different segments of the cord

The Posterior are purely sensitive conveying impressions from the periphery to the centre

Anterior are motor & convey mandates of will to the various organs

Functions:- Impressions ~~Posterior fibres~~ on entering the cord through the posterior fibres & pass most of them to the grey matter

7

some to the anterior columns can thus transmitted to the brain.

(b) Those fibres passing up do not do so on the same side as that from which they proceeded in the body but in entering decussate throughout the whole length of the posterior columns

(c) The posterior columns have some influence in reflex action as shown in cases of disease of that portion

(d) Heat, cold, pain muscular sense all pass up to the cord & seperate fibres & are conducted from each other

(e) The mandates of the will pass down the anterior columns of the cord, A decussation occurs along the upper portion of the anterior tract but only those portions of the anterior column which are derived from the lateral tract participate in it

(f) The spinal cord is the great centre of reflex action this is seen in sleep when the mind is suspended the reflex irritability is still kept up, also in hemiplegia, the limbs still take movements, purposeless in mammalia purposive in amphibia. It maintains the sphincters in a tonic state also tubular up

50

(g). as already stated it is the great conducting medium between the brain and the organs of animal

Structure of spinal nerves. When put boiled (the elementary tubes) they appear homogeneous, like glass tubes filled with a pulped matter. soon it seperates into two portions an external or white substance of Schwann (b) internal or axis cylinder this gives the nerves a double contour intermingled with the spinal nerves are also the ganglionic or sympathetic ones

IV

Ovum in passing down the Fallopians tubes is nourished by its secretion & an albuminous layer is formed about, the villi of the chorion begin to grow & serve some purpose in abortion but have no vessels as yet.

Decidua. Three theories 1st Von Hunters that the ovum in entering the uterus pushes before it a fold of membrane which forms the decidua thus it has been deprived

II That the decidua is formed of the development of the mucous membrane of the uterus which forms part the Decidua vera. Then the ovum being lodged in a niche in crypts of this the membrane grew around over it as granulations do over a pea and so formed the decidua reflexa.

III That the D. vera is formed from the M. membrane of the uterus & the D. reflexa is a secretion from it. The

The ovum after arriving in the uterus develops at chorion. the villi increase. more at one point ~~of absorbed~~ when it becomes attached to the uterus & diminish at the other parts. Then the fœtal & maternal portion of the placenta grow together the villi dipping at the sinuses of the maternal placenta & are there bathed in the maternal blood but are not continuous with it. The movement & movement of the fœtal blood is a process of Osmosis. ~~The function of the placenta is to the placenta~~. The placenta is to the fœtus in utero what the lungs skin excretory & excretory organs are to the adult conveying nutriment to it & receiving from it waste the products of the fœtus

17

I First theory was that the CO_2 united in the lung with the oxygen of the air & by their union produced the heat which was carried by the blood to all parts of the body, but as the lungs are not hotter than any other part it is disproved;

II That the O of the air is conveyed by the blood to the capillaries & there in turn come in contact with the CO_2 & cause the heat also that on the O taken in is in excess of the CO_2 given off, the surplus unites with the S. Phosphor & other elements & so helps to raise the heat, III Muscular motion raises the heat of the body & probably all the organic function when being performed help in some degree

50 A temperature of 110° or one of 86° indicates life in the one hand such an excessive tissue combustion & on the other such a depressing as is quite incompatible with life, the former is seen sometimes in Rheumatic fever & Tetanus the latter in Cholera &c.

IV Modern pathology recognizes five changes through which inflammatory & tubercular exudations may undergo, viz (1) Caseous or withering, (2) Fatty (3) Calcareous (4) Pigmental (5) Suppurative

Caseous.

in this a sufficient amount of serum is not exuded from the vessels to liquify the products, they & up & cheesy, yellowish, crumbling cheese This is Niemeyer's view of ordinary Phthisis, i.e. that the Pneumonic products of inflammation undergo this caseous

caseous transformation wh = yellow tubercle of the older authors

Fatty. all tissues when growing dd tend to degenerate fatty. morbid products follow the same rule a diseased kidney gets fatty in time, The heart in a weakened system becomes fatty. Fat is found in tubercle in small amount

Calcareous. In this animal matter and also and calcareous matter deposited in their place, This is seen in the small chalky concretion met with in the lungs, seen in degenerating arteries from atheroma

Pigmental. This is seen more in the lower animals than in man, It consists in the deposition from the blood of its colouring matter in a somewhat altered state. It is seen in the lung in healthy & diseased specimens of chronic inflammations, Met in melanotic cancer

Suppurative

This only takes place when the products are weak & affect the elements of the tissues, wh in an inflammed part have proliferated, It reduced the elements to pus Epithelium may undergo this change. degenerating into pus, The white blood cells wh play such an important part in modern inflammation may proliferate & form pus also

Wm Osler

Phy. Labr

Tor. Univ

Originals of William Osler's answers
to examination questions (cont'd)

[3] Medicine

endorsed in Sir William Osler's hand
"Final paper"

[probably at McGill University in 1872]

If W.O.'s endorsement on the opposite page, in his later hand, "Tor. Univ." is correct, this would also appear to be a Toronto paper.
W.W.F.

FINAL EXAMINATION PAPER IN MEDICINE, 1872

T

Typhus	Typhoid
Initial symptoms more rapid. headache & rigor more severe	Slower, headache & rigor less marked
Countenance dull, lethargic Early stupid	~~Co~~ Countenance brighter cheeks flushed
Delirium early quiet taciturn	Delirium later 2 week. more active
Pulse quicker, sooner feeble & heart sounds resemble each other	
Gastro intestinal symptoms not so marked, tendency is toward the head	Vice versa
No abdominal tenderness gurgling, borborygmi &c. Stools dark, offensive & consistence of mud acid reaction. no flocculi	As in Typhoid stools, ochre yellow seperate into two portions have flocculi
Temperature rises suddenly to 104 then goes higher & continues high. not oscillation in third week defervescence rapid	Rises more gradually 1 1/10° per day, has a shape of stairs, oscillation in 3rd week of 4°, Decline slow
Epistaxis rare.	Common
" "	
Lasts from five weeks	Uncertain may be longer

1

Eruption out on 5-7 day mulberry coloured all come out in one crop run thro stages ↑ elevated ∨ diffused 2nd. deeper ∨ less elevated 3rd Pleuritic

On 7-12 day in many crops, lasting 2-3 days vesicle coloured. margin defined fade on pressure. Pleuritic rare. Not seen after death. In typhus are

Death from coma ∨ the brain

from congestion of lung. haemorrhage of bowel ∨ perforation

Epidemic

Endemic

No special lesion merely internal congestion

Papules glands. ∨ internal congestion

All ages attacked

Rare after 40 seldom death after 40

Recovery rapid

Slow tends to relapse

30

II Sensation motion ∨ intellectual faculties may be disturbed. as shown by the pronounced numbness, tingling, irregular motion, twitchings, drowsy irritable, impaired memory An aura may precede, from any part of the periphery as a creeping sensation, toward the brain ∨ the epileptic cry is heard. (1) He falls in to a fit, in which there is loss of volition convulsive ∨ irregular twitching of muscles of face ∨ arms first. then general spasms "tonic" in character. Face congested, blue. respiration impeded, pupils dilated. In 2nd. spasms cease ∨ a little respiration not so impeded face brightens, pupils contracted. Spasm clonic in character, irregular

dejections, He wakes up from this stand about & falls into a state of coma (3rd stage). In this breathing less impeded. face clearer, irregular movements continue, pupil dilated or contracted. After this he wakes up feeling sore & knowing nothing of what has happened

Epilepsy	Apoplexy
Occurs in Epilepsy	1 doesn't turn pale 2 no aura. 3 or cry. 4 not the stages of Epilepsy. 5 Preceded by signs of degeneration of blood vessel. 6 eg heart kidney disease &c.
None in it. has had previous fit, loss of consciousness profound	7 In the fit, consciousness may not be lost. Is 8 some reflex action

Hysterical convulsion.	Epilepsy
Globus, clonic spasms throughout, last a longer time never loses consciousness entirely, a loud threat will bring her to her senses. If fall in fit gets herself out fit	Stages. tonic. clonic spasm, aura, complete loss of consciousness. sleep after he falls. fit-cluster

Chief remedies are. Zinc oxide, 1/2 - 1 gr. Silver (oxide) 1/4 - 1/2. Arsenic. Fowler's solution v - x m. Salts of K or ammonia. Belladonna 1-11 grs &c. Valerian ʒss (tinct). Camphor. v gr. Succus Conii ʒii Strychnia 1/32 gr. Brucia 1/12. KI v - x gr. KBr x - xxx. Br NH_4 x - xx.

Brown-Séquard formula

KBr	---	ʒss
KI	---	ʒi
Br NH_4		ʒii
Pot Bicarb		℈ii
Aqu	-	℥vi

V

Obstructive, within the ducts; ~~Catarrh, catarrhal forms~~

II Emphysema. Inspection. [1] chest looks full [2] powerful elevation movement but [3] little expansion [4] may be barrel shaped, [5] intercostal spaces may be flat or [6] protruded. Auscultation, [7] feeble respiration sound [8]. Expiration 3–4 as long as inspiration. [9] may be a few bronchial rales. Percussion, [10] over resonant. [11] limits of lung increased & [12] cannot be diminished by expiration. [13] Cardiac dullness diminished. [14] Liver pushed down. [15] Clear note low behind

Gd —

Pleuritic Effusion

Slight. [1] Inspection. deficient ~~elevation~~ expansion on affected side. [2] Respiration weak. [3] may hear a friction rub. If effusion slight dullness in plastic pleurisy slight dullness from the effusion. Chest half full. Then. On inspection. side motionless & nearly so. Percussion dull note over the fluid, get clearer as you ascend. Vocal fremitus ~~increased~~ diminished. Bronchophony diminished. May have Ægophony ~~In full chest~~. Alteration of position alters the limit of dullness. In full chest. wooden dullness all over, perhaps a tubular note ~~inf~~ just below the clavicle when the lung is compressed against the side of the vertebra. ~~D~~ Side enlarged intercostal spaces bulge, viscera displaced downwards, Respiration nil, vocal fremitus & Bronchophony nil Egoph—

Hepatization 1st stage. may be slight dullness respiration weak, fine crepitant rale at end of inspiration; 2nd stage. wooden dullness blowing breathing. Bronchophony & vocal fremitus increased, Respiration ~~weak~~ interrupted when lung not

affected. side somewhat motionless &c. 3rd stage Resolution; dullness diminishes. redux crepit also heard, gradually the breathing gets normal May have in its course Bronchial râles

35

III Mild cases need but little, & the plaster & poultices the same. Ordinary cases of much pain in the side leech or cups, apply anodyne fomentations. Put on low diet and give arterial sedatives as Ant. 1/8–1/4 gr. Tinct aconite gtt every hour or Tinct Digital v–x m, with an alkaline carbonate and a little Ipecac, keeps bowels open.

If it goes on ~~to~~ fill the chest, then alteratives Calomel 1 gr bis in die, K I v grs, act on bowels with Jalap (Pul Co), Give Addison's Pill Squill 1 gr Digitalis 1 gr. Calomel 1 gr to act on Kidney. Continue diaphoretics. If these means fail, stop them for a while & try a tonic course, good food. Fe. &c. & then after health restored, return to alteratives & absorbefacient, In this stage travelling is often good. If it goes on to Empyaemia, the treatment must be supporting, good diet Fe. Ol. Morrhuae; Hypophosphites. Not over purge now. if tendency to tubercle may excite them in the bowels. If great dyspnoea comes on, or even if no dyspnoea & the patient getting weak, and after you have tried fairly the means given tap the chest, This may be done even in serous stage & to advantage – fair but not the latest information

Croup. Put into a warm bath at once 98°–100° & keep in till weak, or pack in wet sheet & blanket. Give emetic Ipecac (Vini) to child under 6 months 3ss every 20' till vomit over 6 months 1–2 years 3i – 3ii. If these fail, Squills, Cupri Sulph., Mustard, Ammon Carb. if weak

Cold compresses important & needful

III

Leech in early stage. If signs of asphyxia or coma come on put it in hot bath & pour cold water on the head. Locally swab out the throat, with Arg nit v–x gr to ℥ if mild XXX–XL gr if severe. Remove pellicle. Alum. good blow in, or as solution. Tinct ferri perchloridi. or Muriat acid & honey. If all these fail. Tracheotomy, & do not wait too long. give the child a chance

30

VI

Exocardial	Endocardial
1 Localized seldom or never transmitted up the arteries. Systolic. 2 Change site frequently; 3 Are ~~soft tone~~ grating produced 4 May be intensified by pressure	1 Transmitted up aorta. 2 Sound to scapula 3 Louder. less grating; 4 systolic and diastolic; 5 Not likely to change site. 6 Cannot intensify by pressure

Dangers are 1 dilatation and 2 hypertrophy of chambers; 3 Congestion of lungs; 4 ultimately venous obstruction; 5 serous Effusion, both anasarca & ascites; 6 Congestion of liver, resulting in fibroid disease or jaundice 7. Catarrh of Stomach & intestines, interferes with function of Kidney & its consequences

25

V Obstructive, Within ducts. 1 Catarrh, 2 Gallstones, 3 hydatid 4 cancer, 5 worms. Outside, Cirrhosed liver, Cancer of pancreas, liver, pylorus, all tumors nearly of the abdom hydatids, Cancerous or amyloid gland pressing on the duct.

Non obstructive, Fevers (Eruptive, Malarial) Poisons,

Symptoms, are those of an acute bilious attack Feeling of lassitude, indigestion, sense of fullness in liver and soon signs of Jaundice, stains blood first then serous & synovial fluids & lastly the skin

Skin is changed from a light colour to a yellowish black. May be nausea & vomiting. constipation or diarrhoea. Stools usually clay coloured, and not so much fat in them. Oftentimes, brain is affected gets lethargic drowsy, apathetic. Heart & pulse gets weak., ~~these~~ Kidneys interfered with, seems to stop the elimination of urea & this acts on the brain disorder, Convulsions may occur or coma result in

15

Wm Osler

1 30
2 35
3 30
4 45
5 15
6 15
170

Final [illegible]

Trinity College

First Year Examination. June 1868.

Euclid.

× 1. Define an isosceles triangle, and a right angled triangle. Prove that every right angled triangle may be divided into two isosceles triangles.

× 2. The greater side of every triangle is opposite to the greater angle (I. 18) The greatest side of a given quadrilateral is opposite to the least; prove that either of the angles adjacent to the least side is greater than the opposite angle.

× 3. If two triangles have two sides of the one equal to two sides of the other, each to each, but the angle contained by the two sides of one of them greater than the angle contained by the two sides equal to them of the other, the base of that which has the greater angle shall be greater than the base of the other. (I. 24)

That diagonal of a parallelogram which passes through the greater angle is ~~greater~~ less than the other diagonal.

4. If a straight line be divided into any two parts, the squares on the whole line, and on one of the parts, are equal to twice the rectangle contained by the whole and that part, together with the square on the other part. (II. 7)

5. If in a circle two straight lines cut one another, which do not both pass through the centre, they do not bisect each other (III. 4).

6. The angles in the same segment of a circle are equal to one another (III. 21).

The perpendiculars AD, BE, CF from the angles of a triangle on the opposite sides meet in a point P; if N be the middle point of CP, prove that the angle DNE is double the angle C.

7. The angle in a segment of a circle is greater than, equal to, or less than a right angle, according as the segment is less than, equal to, or greater than a semicircle.

The sides AB, AC of a given triangle are bisected in E, F. AD is perpendicular to the base BC; prove that if ED, DF be joined, the angle FDE is equal to the angle BAC, and the area of the quadrilateral AFDE is equal to one half of the triangle ABC.

8. In a given circle inscribe a triangle equiangular to a given triangle (IV. 2).

Also inscribe such a triangle with the further condition that one of its sides shall be parallel to a given straight line.

9. Describe an isosceles triangle having each of the angles at the base double the vertical angle (IV. 10).

Shew that the smaller of the two circles used in the construction is equal to the circle described round the required triangle.

Turn over

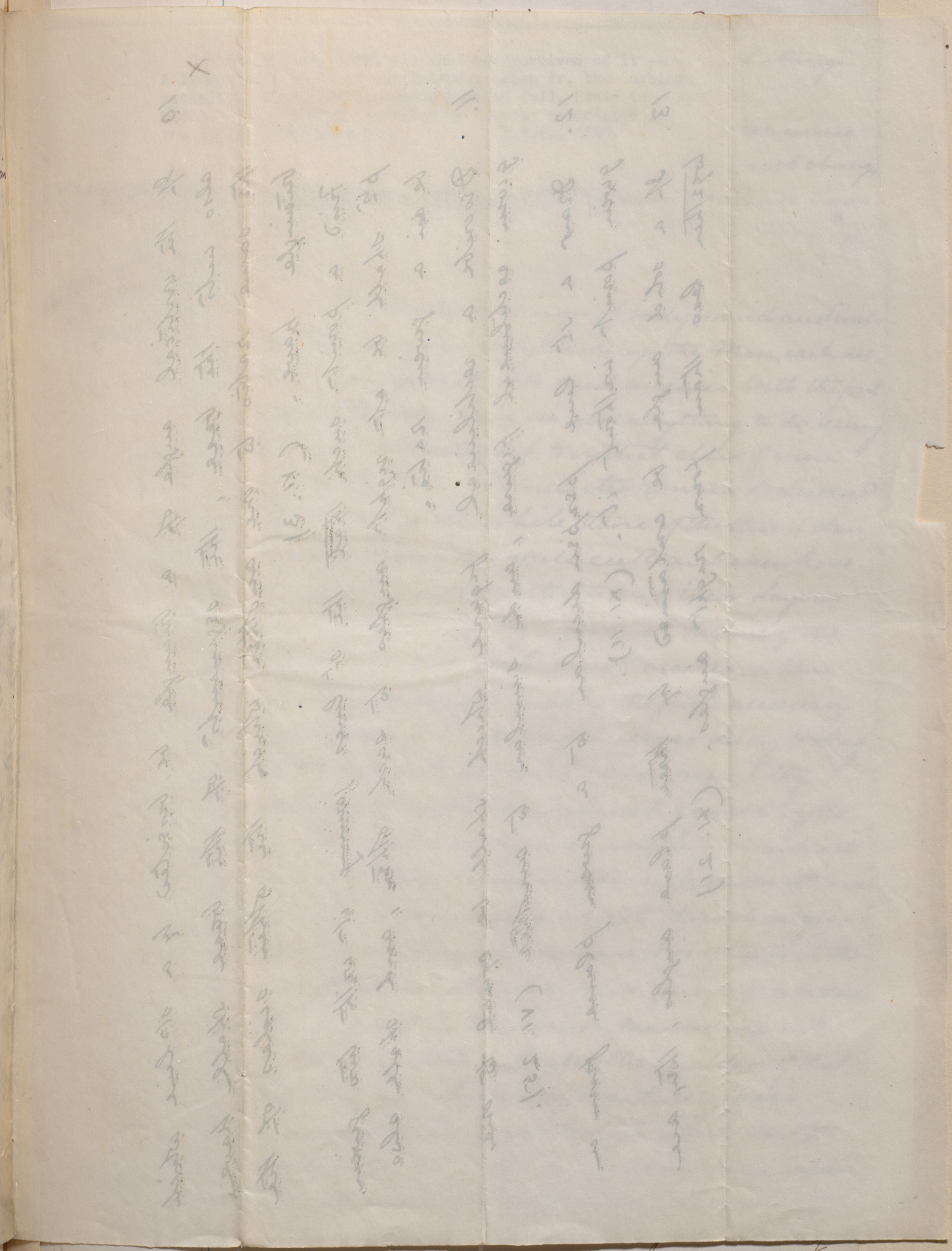
Euclid

June 1868

H. Osler

Coll. 587 mm

7639



10 If the vertical angle of a triangle be bisected by a st. line which
X also cuts the base, the segments of the base shall have
the same ratio to one another which the other sides of the
triangle have. (VI. 3)
Find a point such that the st lines joining it with two given
pts shall be at right angles to each other, and shall also
be in a given ratio.

11. Describe a rectilineal figure which shall be equal to one
given rectilineal figure, and similar to another (VI. 25).

12. Draw a st line perpendicular to a given plane from a
given point without it. (XI. 11).

13. If a solid angle be contained by three plane angles, they are
together less than four right angles. (XI. 21).

well make us exclaim with the Poet-

Osler's Thesis, 1872, all that has survived of it -- 3 leaves of a draft of the introd., taken fr. the Cushing material, #8303, for insertion here as foll. 28a-c in #7639. The passages pencilled by Cushing he printed in the Life, #7746, i, p.85. W.W.F., 1940.

d strings"

examine

uch change

have gone on in them as to render existence imp-

The Introduction to W.O.'s unpublished Thesis is 18pp W.C.

In that Trinity of being - of body mind and soul - which so marvellously make up the Man, each one has its own special ills and diseases. With the first of these - the body - have we here anything to do, leaving the second to be attended to by that class of men whose duty it is, "to minister to minds diseased" i.e. the Psychologists, while those of the third class beyond a Physician's skill seek aid elsewhere Few indeed are permitted to end their days in a natural manner, by a gradual decline of the vital powers, till that point reached, where nutrition failing to supply the fuel, necessary to keep the lamp of life alight; leaves decay to drag back the fabric to the dust. +++ More frequently perversions of nutrition, induced as well by the countless external agencies, hostile to mans welfare; as by those more subtle influences at work in his organism; bring about those changes which we recognize as disease. Too often is it the case, that by unnatural modes of living, or excesses in things good in themselves, Men become not only the Architects but also the builders of that Portal through which they eventually pass The number of avenues through which death may reach us, the natural frailty of our bodies the delicate and intricate machinery which maintains us in a condition of health may

cont'd
Manuscript. W.W.F.

well make us exclaim with the Poet-
"Strange that a harp of thousand strings"
Should keep in tune so long"
To investigate the causes of death, to examine carefully the condition of organs, after such change have gone on in them as to render existence impossible and to apply such knowledge to the prevention and treatment of disease, is one of the highest objects of the Physician. But to interpret aright the pathological changes, and to appreciate as well the coarser lesions observed by the natural senses, as those more delicate deviations from the standard of health revealed to us by the Microscope, requires qualities such as few possess. In the first place an accurate knowledge of the condition of organs in a healthy state is indispensable. secondly such skill in manipulation as will enable him to prepare specimens suitable for the finer means of research and thirdly a well trained intellect, capable of reasoning on the facts adduced and drawing conclusions from them. To such a standard of excellence, it is obviously impossible for a student to attain. Well for him if in his student life he lay the foundation by habits of careful observation, for a superstructure to be erected as years roll on and experience widens. Being fortunate enough to possess that amount

of microscopical skill neccessary for the preperation of specimens and having a predelection for Pathological Anatomy, I have at the suggestion of a kind friend undertaken to record the results of twenty post-mortems for my graduation Thesis and prepare a few specimens to illustrate it. I naturally felt some diffidence in undertaking this, for to record aright what one sees is itself no easy task and one that requires as its basis some knowledge of the distinctions between diseased and healthy states; otherwise mistakes will arise, important lesions which an expert would not think of passing over, a mere tyro will throw aside in ignorance This I fear may have happened in the present instance & renders the record somewhat imperfect but in every case in which it was possible a doubtful lesion was submitted to me of the attending Physicians. Another source of imperfection, though not as serious - for it is a record of post mortems not of cases - is the scanty history afforded in many of the cases; in fact this often proved the most arduous part of the task as but little was taken before death. Other imperfections will be noticed as in some cases where the brain unavoidably remained unexamined as. For the specimens they must speak for themselves I could have wished they were better in quality and more in number, but my time and appliances would not allow it

Introductory
Essay
Thesis
1872

My 'My thanks are
M M

.My thanks are due

.Yh

Ack'd by p.c. 30.V.42.

Rep. [illegible] with The Evans MS. when it comes back from M.L.

University of Toronto
FACULTY OF MEDICINE
TORONTO 5, CANADA

DEPARTMENT OF
HISTORY OF MEDICINE

11 Spadina Road
May 19. 42

Dear Dr. Francis,

MacDermot advises me he will publish in the C.M.A. Journal the paper I read at Wpg last June on Osler's Class at the Toronto School of Medicine.

Herewith I send you photostat of the MS. which formed the basis of my enquiry into the careers of his classmates. This for your collection. The article will follow, of course, when published.

Sorry you could not make the annual meeting at the Chalfonte – the attendance & interest were both good. Drake gave us an excellent talk on Rowlandson's medical cartoons – at the dinner, vice Hugh Young – in bed with T. 101° – Insolation – fishing for a day with his shirt off – hot sun! But Hugh appeared next morning & gave us a good talk.

Kind regards Jabez H. Elliott

Toronto School of Medicine 1869-70

Folio	Name		Anat & Phys	Anat Path	Practical Anatomy	Lectures	Due	Due	Due
287	Case W. H.	V	44	44		44			
289	Metcalf. W. G.	V	90	90	8	82			
291	Robinson Jonathan		90	90	8	82			
293	Hamilton R.	V	54	49	8	41	5		
222	Henning R.	V	36	36		36			
188	Moore C. G.	V	44	44		44			
241	Jacks G. W.	V	78	78	8	70			45
295	Whiteman R.	V	42	42	8	34			
111	Reynolds J. R.		36	36		36			
247	Zimmerman C	V	78	78	8	70			
215	Wilson W.	V	90	90	8	82			
83	Burt								
251	Paterson C. A	V	78	20	2 06	1 7 94	58		
297	Harwell G. Wm	V	66	66	8	58			
299	Morrow C.	V	54	54	8	46			45
301	Peterson H.	V	64	64	8	46			205
179	Lazier W. L	V	36	36		36			98
199	Cowan G. H	V	44				44		40
243	Johnson J. J.	V	66	66	8	58			
303	Young W. H.	V	66	66	8	58			
281	Moran J. B	V	98				98		
271	Ogle W.	V	90	90	8	82			388 00
217	Speir R. B.	V	56	56	8	48			94
101	Wayne W. J.								206
141	Burgh J. W.								
111	Saunders A								
239	Groves A	V	90	90	8	82			
305	Robinson R. H.	V	54	54	8	46			
263	Bates S. S.	V	90	90	8	82			
260	Minor S.	V	61	61		61		98	
41	Rowan F. S.	V	24	24		24			
			1709		138 06	1365 94	205 00		
321	Baldwin J.		42	42	8	34			
323	Burden W. W		62	62	4	58			
			1281		116	1067		98 00	

The line under Osler's name is a pencil mark made by some one about the time the MS. came into the possession of the Academy. It is not a part of the original MS.

I. S. M. 1869-70.

		Anat & Phys.	Paid.	Practical Anatomy.	Lectures.	Due.	Due.
235	MacDonald A A	98	98	8	90		
255	Clarke A	98	98	8	90		
257	Jones W.	53	53		53		
213	Black W. J.	44	44	8	36		45
237	Wright, H. N.	54	54	8	46		
317	MacDermid J.	54	54	8	46		
91	White J. J.						
241	Wilkinson A.	28	28	4	24		
309	Lace J	42	42	8	34		
207	Ellis W. H.	24	24		24		
251	M'Kennon A	90	90	8	82		45
103	Taylor A						205
288	Standish Jno.	44	44		44		98
135	Reid Geo.						40
145	Lett J.						
195	Graham	12	12		12		
273	Wells J. M.	49	49	8	41		
	Hatch, M.D. G. S.						388 00
311	Close, J. A	38	38	4	34		02
313	Macnutt G. A	66	66	8	58		246
233	Cole, W. J.	90	90	8	82		
315	Irwin Jd.	24	24		24		
53	Williams A D						
253	Hamilton J. R.	36	36		36		
317	M'Clellan C.	54	54	8	46		
275	Donaldson J.	98				98	
153	Smith C. M.	8	8	8			
193	Delamater R. H.	73	73		73		
319	Smellie J. J. S.						
321	Baldwin J	42	42	8	34		
323	Burden W. W	62	62	4	58		
		1281		116	1067	98 00	

DEPARTMENT OF
HISTORY OF MEDICINE

30 (Lects.)

J. S. In 1869-70,

		Mech. & Phys.	Mech. Phys.	Practical Anatomy	Lectures	Dis
	Young, J. K.	45				45
	Arnott Hy					
	Johnson A. Jr	8	8	8		
	Gilvie R.	8	8	8		
	Meldrum	86	86	4	82	
	Bell J. J.	36	36		36	
	Stone D. J.	58	58		58	
		241		20	176	45
	1st Nat.	1709		138 06	1365 94	205
	2d Nat.	1281		116	1067	98
	Dr Letts.	80	40	4	36	40
53	Williams A. 1868-69	52	52	8	44	
149	Johnson A. Jr. 1868-69	69	69	8	61	
145	Litt. S. 1868-69	44	44		44	
	Total	3476 00		294 06	2793 94	388 00
199	Govan A. H	~~44~~	44		44	44
275	Donaldson J				48	296
	H B W				24	
					2909 44	

Roman Notes

7639

17 April, 1941.

Dr. J. H. Elliott,
11 Spadina Road,
Toronto.

Dear "J. B."

I'll be glad to have that photostat.

Besides that 1st Physiology paper, endorsed and dated 1/4/68 in Osler's old contemporary hand, the volume (no. 7639, described on p. 688 of our "Bibl. Osleriana", 1929) contains two others of which I have some doubts about the dates and locale. They are alike in being written on white foolscap, whereas (i) is on bluish, unruled paper.

I suspect that (ii) and (iii) are both McGill papers, though he has endorsed (ii), in his later hand, in pencil, "Phy. paper Tor. Univ." He would hardly have had to pass two physiology exams at Toronto, whereas he did have to write on it again here -- he had to write on his "primaries" as well as his finals here in 1871-2.

(iii) is on medicine: largely differential diagnosis of (a) typhus and typhoid, (b) convulsions, (c) emphysema, and other chest conditions (and treatment) (d) peri- & endo-carditis, &c. This is endorsed, later, simply "Final paper".

He put that "Toronto" endorsement on (ii) late in life, and, I suspect, before he came across the 1868 paper (i). I think that these, with some other early efforts, came back to him in Oxford from the Gwyn's house at Dundas. Perhaps Norman would know? I don't think F. O. had them with him in Baltimore.

Yours sincerely,

W. W. F.

Roman history

Hotler

June

1868

jugerum - precarium - [illegible] - Romana quadrata - [illegible] terminatio - [illegible] - [illegible]
[illegible] desulta -

xiv. Shew that the Roman farming was in common - compare with early Germanic system [illegible] especial crops grown? Shew how the landed as opposed to urban nobility arose in Italy.
Early Traders & Trade in Rome - Inland commerce with the Italians.

xv. Shew the connection Philological in Latin & Greek of the terms:- oliva - amurca - hernas - linum - purpura - scipio - ebur - thus - amphora - comissari - obsonium - massa - placenta - turunda - patina - arvina - sentum - statera - aplustre - anquina - antenna - fides - barbiton.
Give the mutual interchange of money terms existing between the Latins & Sicilian Greeks.

xvi. Discuss the introduction of Hellenic Alphabets into Italy; or the Italo-Greco Calendar.

xvii. The earliest efforts in Italian Art - in dance - music - song - religious chants - architecture - metre - plastic - Explain: naenia - ofsa voce - canere - vates - poeta - carmen cedicum - calyx - groma - clathri. Any trace of early Hellenic influence?

xviii. Derive:- Nola - Volturnus - Juturna - Hirpini - Picentes - oppidum - urbs - quirites - Luperci - lex - Inquilini - miles - populus - plebs - pontifices - religio - triumphus - Saturnus - tereba - lego - rapa - curia - sors - heredium - aestimatio - confarreatio - In all cases shewing connection with the [illegible]

xix. Translate & explain:-

(i) Enos - Lases - juvate!
Neve lue rue - Marmar, sins incurrere in pleores!
Satur fu, fere Mars, limen salil sta! berber!
Semunis alternis advocapit conctos!
Enos! Marmar, iuvato!
Triumpe!

(ii) Quod re sua difeidens - asperé afleicta
Parens timens heic vovit - voto hoc soluto
Decuma facta polouctà - leibereis lubentes
Dona danunt Hercolei maxsumê mereto
Semol te orant se voto crebro condemnes.

(iii) Montani pagani ve sifis aquam dividunto.

(iv) Marci Acarcelini he cupa.

(v) Ταταίες ἐμὶ λεqυθος, τὸς δ' ἄν με κλέφσει θυφλὸς ἔσται.

(vi) Domum servavit - lanam fecit - dixi - abei.

Roman History

I. How many primitive Italian Stocks does Philology teach us to distinguish? Compare the Italian languages with the Greek as to - Spirants - aspirates - accent - terminations - case - number - treatment of verb. Show the characteristic differences of the Latin and the Umbro-Samnite dialects

II. Show from the evidence of Language that the Latins possessed of the common culture of the Indo-Germanic race, and distinguish Greek from Latin culture in respect to Religion and Art.

III. Derive the word Latium. Describe the clans villages - cantons and League in the early Latin settlements.

IV. Show the probabilities that Rome sprang from two villages, but was not composed of mixed stocks.

V. Sketch the original constitution of Rome. describe the Roman House and the relation of its members to each other —

VI. Give a list of the Latin communities near to Rome. Show how she acquired the Hegemony in Latium & its nature - and the treatment of her earliest acquisitions.

VII. The material expansion of early Rome - its works & buildings - to whom traditionally referred?

VIII. Organization of the Roman army - the Servian reforms and the reformed Constitution.

IX. The Tuscans - their language in its two periods - settlement in Italy - constitution & religion. Have we any evidence from their language that it was at all connected with that of Rome.

X. The Greek cities in Italy: their relation to the western Italians.

XI. Explain primitive Roman Jurisdiction as to Murder - Property - Contract - Private Process. Discuss the character of Early Roman Law.

XII. What were the distinguishing features of the National Roman Theology? Give the names with the derivations of the purely Latin Deities. Describe the priests & colleges - the representation of the Gods by images - the burning of the dead. What do you mean by Manes - Lares - Di involuti? Give all the terms connected with augury you have met with.

XIII. What do you mean by the terms:- Adsidui - proletarii - familia pecuniaque - mancipatio - heredium - jugerum - precarium - nundinae - Roma quadrata - Septimontium - Aperta - coemptio - usus - mercedonius mensis - desultor -

XIV. Show that the Roman farming was in common compare with early Germany in system. What [illegible]
[illegible]

Trigonometry
Notes
June 1868
coll [illegible]

7639

(ii) $\frac{\tan(\theta+\alpha)+\tan(\theta-\alpha)}{\cot(\theta+\alpha)+\cot(\theta-\alpha)} = \tan(\theta+\alpha).\tan(\theta-\alpha)$, (iii) $\sin A+\sin 5A+\sin 9A-\sin 15A$
$= 4\sin 3A.\sin 5A.\sin 7A.$

8. Prove that the area of a triangle $= \sqrt{s(s-a)(s-b)(s-c)}$.
If the triangle have a right angle, reduce this expression to the usual formula $\frac{1}{2}ab$.

9. Shew how to solve a triangle when two sides and the included angle are given.
Also shew how to solve the triangle by dividing it into two right-angled triangles.

10. Solve completely <u>two</u> out of the three triangles;-

(i) $C = 90°$, $A = 42°$, $c = 827$,

(ii) $a = \cdot 016540$, $b = \cdot 026645$, $c = \cdot 027849$,

(iii) $a = 27247$, $b = 8270$, $C = 42°$

11 Two trees stand on a horizontal plane. The elevation of each observed from the foot of the other, and one of these angles is found to be double of the other. Their elevations are now observed at the middle point of the line joining their feet, and these angles are found to be complementary. Prove that the heights of the trees are in the ratio of 4 to 9.

Trinity College

June Examination - 1868. Trigonometry

1. Define the common logarithm of a number. Why 'common'?
   Given $\log_{10} 2 = x$, $\log_{10} 3 = y$, prove that $\log_{100} 108 = \frac{2x+3y}{3}$

2. Prove the rule for multiplying by means of logarithms.
   If n numbers be multiplied together, shew that the number of digits in the product lies between $s-n+1$ and s (inclusive of both), where s is the sum of the numbers of digits in the n factors.

3. Find the value of (i) $(55\cdot387)^5$, (ii) $\sqrt[100]{\cdot51892}$.

4. Define the complement and supplement of an angle, and express the sine, tangent and secant of the complement and of the supplement of A in terms of ratios of A.
   What advantage is taken of these relations in constructing the tables of log-ratios?

5. Prove (i) $\sin^2 A + \cos^2 A = 1$, (ii) $\tan A = \frac{\sin A}{\cos A}$, (iii) $\sec^2 A = 1 + \tan^2 A$, and if $\cos \angle A = \frac{m}{n}$, find $\cos A$ and $\tan A$ in terms of m and n.

6. In any triangle prove the formulas:-
   (i) $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$, (ii) $\cos A = \frac{b^2+c^2-a^2}{2bc}$, (iii) $\tan \frac{C}{2} = \sqrt{\frac{(s-a)(s-b)}{s(s-c)}}$
   From (iii) deduce (or prove otherwise) $\tan \frac{A}{2} \cdot \tan \frac{B}{2} + \tan \frac{B}{2} \cdot \tan \frac{C}{2} + \tan \frac{C}{2} \cdot \tan \frac{A}{2} = 1$.

7. Prove the formulas (i) $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$

(i) $\tan(A+B) + \tan(A-B) = \tan(2A) \cdot \tan(2B)$, (ii) $\sin A + \sin 5A + \sin 9A = \sin 5A$

Algebra (C)

7639

June. 1868

W. Osler

Coll. SS Y'm

Toronto

Trinity College

Examination 1868. Algebra.

1. Add together s-a, s-b, ... s-l, where s is the Arithmetic mean between a, b, ... l.

2. Write down such formulas by the use of which the labour of multiplication is diminished, and obtain the products of (i) $x+y-z$ & $x-y+z$,
(ii) $x^2+(a+b)x+ab$, $x^2+(b+c)x+bc$ & $x^2+(c+a)x+ca$
(iii) of the n factors x^2-ax+a^2, $x^4-a^2x^2+a^4$, ...

3. Find the quotients of (i) $a^{\frac{1}{2}}b^{-\frac{3}{2}}+2b^{-1}+2a^{-\frac{1}{2}}b^{-\frac{1}{2}}+2a^{-1}+a^{-\frac{3}{2}}b^{\frac{1}{2}} \div a^{\frac{1}{2}}+b^{\frac{1}{2}}$,
(ii) $(a+b+c)(a^2+b^2+c^2)+a^2b+ab^2-c^3+2abc$ by $a+b$,
(iii) $(a^2b^2-b^2c^2-c^2a^2+2abc^2)\times(b^2c^2-c^2a^2-a^2b^2+2bca^2) \div (c^2a^2-a^2b^2-b^2c^2+2cab^2)$.

4. Extract the square root of $\frac{x^2}{y^2}+\frac{y^2}{x^2}-\frac{x}{y}+\frac{y}{x}-1\frac{3}{4}$.

5. Prove the rule for finding the L.C.M. of two expressions, and shew that every common multiple of them is a multiple of their L.C.M.
Find the L.C.M. of the three expressions in question 3, (iii)

6. Give an extended definition of multiplication, and hence prove the rule for multiplying one fraction by another.
Simplify $\dfrac{pr+(ps+qr)x+qsx^2}{p-qx} \times \dfrac{ps+(pt-qs)x-qtx^2}{p+qx}$.

7. Bracket together the equivalent quantities among the following -
$\frac{1}{a^3}$, a^2, $a^{\frac{1}{2}}$, $\sqrt{a}$, a^{-3}, $\sqrt{a^4}$, $a^{\frac{4}{2}}$, $\sqrt[6]{a^3}$, $\frac{a^4}{a^7}$, $a^3\times a^{-1}$.

8. Shew that a surd cannot be equal to the sum of a rational quantity and a surd, and simplify $\sqrt{5}-\sqrt{8-\sqrt{24+8\sqrt{5}}}$.

9. Shew that a quadratic equation has two, and only two, roots.
Form the equation whose roots are $\alpha+\frac{\beta^2}{\alpha}$, $\beta+\frac{\alpha^2}{\beta}$, where α & β are the roots of $ax^2+bx+c=0$.

are the roots of $ax^2+bx+c=0$.

10. Find the sum of n terms of a given (i) Arithmetic (ii) Geom. Progression.

The continued product of every $(n-1)$ of the n quantities, $a, a^3, a^5, a^7 \ldots$ is formed; shew that the sum of these products will be

$$a^{(n-1)^2}\,\frac{a^{2n}-1}{a^2-1}.$$

11. Find the sums of the following series:— (i) $1\frac{1}{2}+3+4\frac{1}{2}+\ldots$ to 10 terms, (ii) $1\frac{1}{2}+3+6+\ldots$ to n terms, (iii) $\sqrt{2}+\frac{2}{3}\sqrt{3}+\frac{2}{3}\sqrt{2}+\ldots$ to infinity.

12. Find the number of combinations of n things taken r at a time.
In how many of these will s specified things occur?

Find the number of ways in which the cards may be dealt at whist so that (i) the dealer may have the ace of trumps, (ii) each player may have an honour.

13. In the expansion of a binomial with a positive integral index, shew that terms which are equally distant from the beginning and end have the same coefficient.

If c_r be the coefficient of x^r in the expansion of $(1+x)^n$, prove that $c_1+2c_2+3c_3+\ldots+nc_n = n\,2^{n-1}$.

14. Solve the following equations:—

(i) $\frac{x-ay}{b}=1=\frac{ax+y}{c}$, (ii) $\left.\begin{aligned} x^2+xy+y^2 &= 37 \\ x+y &= 7 \end{aligned}\right\}$ (iii) $\left.\begin{aligned} z(x+y) &= a^2+b^2 \\ x(y+z) &= b^2+c^2 \\ y(z+x) &= c^2+a^2 \end{aligned}\right\}$

15 If the hands of a watch were to revolve in opposite directions, what interval would elapse between their successive meetings?

Latin Prose (Pass)

June. 1888

W. Osler

Coll. SS. Trin

Toronto

7639

of children. The peasants take off their hats as you pass; you salute, and they cry, God
bless you. The houses in the villages and smaller towns are painted red and are all built
of brown timber. The floors of the taverns are strewed with the fragrant tops of fir-boughs.
In many villages there are no taverns, and the peasants take turns in receiving travellers.

Nov 9th. The emperor then inspected the field of battle; and never was there anything that exhibited
a more frightful spectacle. Everything conspired to increase the horrors of it: a lowering sky,
a cold rain, a violent wind, habitations in ashes, a plain absolutely torn up and covered
with fragments and ruins: all round the horizon and funereal verdure of the earth, soldiers
roaming in every part among the bodies of the slain, wounds of a most hideous description.
Cheerless bivouacs: no songs of triumph, no lively narrations; but a general and mournful
silence. Around the Eagles were the officers, and a few soldiers barely sufficient to guard
the colours: their clothes were torn by the violence of the wind, and stained with blood;
yet notwithstanding all their rags, misery and destitution, they displayed a lofty carriage,
and even, at the appearance of the emperor, received him with acclamations of triumph.
These however, seemed somewhat rare and forced: for in this army, where each was at once
capable of discrimination and enthusiasm, each individual could form a correct
estimate of the position of the whole.

When do the yellow leaves come from? as then are printers overhead

Latin Prose

1st year.

At this time Hannibal, a fugitive from his own country arrived at the court of Antiochus. After the peace being so great in the administration as he was in the field, he had restored order especially in the financial department of Carthage, so that the city might one day again be in a condition to resume the war with Rome. For this reason the Romans, after the peace with Philip, contrived by fraud his expulsion, and hunted him wherever he was. He fled from Africa to Antiochus, whose court was the only one that was free from Roman influence, and he was at first received in a most honorable manner. This year, however, ceased very soon; for Antiochus found in him as flatterer, and Hannibal forming a correct estimate of the kings power, told him the truth about the perverseness of his measures. He made no secret in telling him, that if under the present circumstances he would undertake a war against the Romans - he would run into his own ruin. He was the only one who spoke thus.

IInd year

There is something patriarchal still lingering about rural life in Sweden, which renders it a fit theme for song. Almost primeval simplicity reigns over that northern land; almost provincial solitude and stillness. You pass out of the gates of the city, and as if by magic the scene changes to a wild woodland landscape. Around you are forests of fir; over head hang the long fern branches, trailing with moss and heavy with red and blue cones. Under foot is a carpet of yellow leaves: and the air is warm and balmy. On a wooden bridge you cross a little silver stream; and anon come forth into a pleasant and sunny land of farms. Wooden fences divide the adjoining fields. Across the road are gates, which are opened by troops

Pass Latin

Pr. Osler

June 1868

Coll. SS. 7 mo

Toronto

7639

Trinity College
June 1868
1st Year
Terence

A Heautontimorumenos ______ B. Hecyra

I Discuss the character of the new Comedy. Sketch the History of Roman Comedy. Did the Roman Comoedians attempt to meddle with Politics? Compare Plautus - Caecilius - Terence. Whom did Terence most frequently imitate? Give the meaning and authors of the following:

(i) "Accurate libertatem hanc hic superat servitus"
(ii) "Qui Obsce et Volsce fabulantur, nam Latine nesciunt"
(iii) "Postquam est Orcino traditus thesauro,
Obliti sunt Romae loquier Latina lingua."
(iv) "Dimidiate Menander!
Utinam scriptis adjuncta foret vis comica,
Unum hoc maceror et doleo tibi deesse, Terenti"
(v) "Vincere Caecilius gravitate, Terentius arte"

II Translate A {(i) Prologue v.v. 1–21
(ii) Act III. Sc. 3. v.v. 23–52
B {(i) Translate & explain the Didascalia
(ii) Act II. Scene 2.

III A Give the Plot of the Self-Tormentor. Discuss its Artistic treatment. The nature of the prologue in Terence — By whom spoken? Describe stage arrangements — Interruptions: Stataria - Motoria
B What peculiar circumstances marked the putting the Hecyra on the Stage? How does it differ in plot from other plays of Terence?

IV Explain & illustrate:- A - Studium musicum - ad regem (I.1.65) - insumpsi adeo mercede - Dionysia hic sunt - apud me sis - monitor - crepuere fores - inversa verba - relevi dolia - despolii me - optato loquere - damno auctus est - si puellam parerem nolle tolli - bolum e faucibus - curriculo percurre - cum illa familia - aequi bonique facere - scelerator - adeo ornatam adeo depexum - ~~or~~-aram paravisse - gaudeo - deos nescio (V.4.15) - quid istic? - ut hos redibant
B Funambulus - pretio emptas meo - praefinito loqui - conjici in malum - ut hos reditus - hereditas - postulatio numquam - liberos committere - ipsus foras (II.1.25) - fors fortuna - in mentem est - neque has respicere deos opinor - ancillas dedo - nostro affine - alias

V. Illustrate by parallels: A [illegible] narrat - nequid [illegible] - cedo dextram - nihil tam difficile

hereditas – postulatio – nunquam – [illegible]
[illegible]
res agere – venustatis plenior.

V. Illustrate by parallels: A. ludos narrat – nequid titubet – cedo dextram – nihil tam difficile (IV.2
deorum vitam apti sumus – si caelum ruat – dictum factum – subditum se suspicatur –
B. quemque nacta sis – cur non aut isteoc mihi etc (I.1.17) – diem adimere aegritudinem –
tempus lucis est prius quam id rescitum est (III.1.7) – homines sumus (III.3.20) – navigan
in commodum – vixit dum vixit bene – at (in prayers) – vagientis pueri – mortem
expectet meam – antiquam obtines – itidem ut tu comedis

VI. Explain constructions etc:- A. novarum spectandi Prol. 24 – mansum oportuit – neglectu II.3.116 –
lucescit hoc jam – pendebit animi – omnes dii, quantum est IV.6.6 – ne subolat (V.1.26
B. in praesentia – piabat Bacchidi – nullus dixeris – animum inducere – [illegible]
quisque vestrarum – clam – audi paucis – ne habueris praepositam – absque una h
foret – nos hoc celatos IV.4.23 – opus est mutito

VII Derive or give words connected with:- Importunus – procax – fenestra – vidua – spatium –
exemplum – lapsa – consobrinus – desiderium – refert – sodes.

VIII Explain (1) the following particles etc:- admodum – denique – prae – quasi – recte –
quin – vel – cedo – ohe – nisi – quia enim – utine? – as used by Terence – also
(2) the use of these words:- affinis – clemens – induco – retundo – flagitium – constituo –
odium – seduco – malignus – rescisco – conditio – offirmare – commemoro – consuesco –
temere – ebrius –

IX Give Greek equivalents for:- A. sermones caedimus – in aurem utramvis dormis – aquilae
senectus – illud haud multum di vivo ferent – satin sanus es? – alienum est V.4.6
uxorem deducat domum – unus omnium homo nusquam quisquam.

X Remark on various readings: A. II.2.11 – IV.5.50 – B Prol: 41–43. III.1.26 V.3.32

XI Give anomalies in government of case – of forms of pronouns; – instances of ellipse –
pleonasm – anacoluthia – modes of expressing indignation – Prayers – Execrations –

XII Instances of contraction of words for metrical purposes.

7639

Hon Classics
W. Osler
June
1868
Trin Coll
Toronto

Hon Classics
W Osler
June
1868

Trinity College
June 1868
1st year

Homer Horace

Odyssey

I. Bk III. Translate vv. 430–463 with notes.

(i) Explain & remark on:— λίμνη (v. 1) — ἄγυριν (31) — δειδισκόμενος (41) — ἀνδρὶ δικαίῳ — κρᾶ' ὑπέρτερα — μοίρας δασσάμενοι — μεγακήτεα — ἐπὶ ἦρα φέροντες — δαίνυ τάφον — τάμνετε γλώσσας — ἐπαρξάμενοι δεπάεσσιν — χρεῖος ὀφέλλεται — οὖρος Ἀχαιῶν — πείρατα τέχνης — ὀλολύξαι (Medea) — ἀνελόντες ἔσχον — ψυχὰς παρθέμενοι — ἐπὶ κτέρεα κτερίσειε — φήνῃ εἰδομένη — αἰθούσῃ ἐριδούπῳ — νῦν δὴ ἐπεὶ τάρπησαν ἐδωδῆς.

(ii) Explain the meaning & propriety of these epithets and adjectives:— ἀπευθής — ἀλεγεινῆς — ταναηλεγέος — λισσή — τηϋσίη — τρητοῖς (λεχέεσσι) — δῖα (Κλυταιμνήστρη) — (βοῶν) ἐπιβουκόλος (ἀνήρ) — ὑπονηΐου (Ἰθάκης) — ἀμύμων — τριτογένεια — κυανοχαίτης.

(iii) Forms in:— θαλασσέων — ἰκριόφιν — σύνθεο — ἦχι. In v. 476 construction & meaning of πρήσσῃσιν ὁδοῖο.

(iv) Derive:— ἀδμήτη — ἄλεισον — ἐγχεσίμωρος — εὔκηλος — ἀγειμών — ἐπιόσσονται — οὐλάς.

(v) Geography:— Ἄργος Ἀχαιϊκόν — Καύκωνας — μυχῷ Ἄργεος — Give Homeric Geography from these two Books.

(vi) Parse:— ἵξον (5) — εἵατο — οἴσεμεν — ἔστασαν (182) — πατρὶ ἑῷ (37) — ἕντο — τάρπησαν — ἐσσάμενοι (251) — ἔπεφνεν (256) — ᾦξεν — δύσετο.

(vii) Parallels of:— πολύχαλκον οὐρανόν — ἱερὰ ῥέξας — πεντάετες καὶ ἑξάετες — ἐστόρεσεν πόντον — ἐμοί γε ἐλπομένῳ γένοιτο — πολυχρύσοιο Μυκήνης — μίστυλλον τἆλλα — αὐτὰρ ἐπεὶ πόσιος καὶ ἐδητύος ἐξ ἔρον ἕντο — ῥάπτομεν δόλοισι — ποῖόν σε ἔπος φύγεν ἕρκος ὀδόντων (Virgil). Give Virgil's description of a feast — Dido's in Aeneid I. Compare with 338–341.

II. Bk IV (i) vv. 335–340 (ii) 425–463 — with notes critical & explanatory.

(i) Explain:— χλαίνας οὔλας — ἐνώπια παμφανόωντα — προτέρω ἄγε (36) — ἠλέκτρου — χρυσῷ δ' ἐπὶ χείλεα κεκράανται — μέλαν ὕδωρ — ἐμπεσέῃσι ἐνὶ θυμῷ — κείρασθαι κόμην — κερδοῖ τελέθουσιν — νηπενθές τ' ἄχολόν τε — ἀθανάτους ἀλιτέσθαι — πεμπάσσεται — θεοὺς γουνούμενος — ἐπ' ἰθύν — παρατροπέων — ζάθεη — τάφον ἀντιβολησάσης — κατ' οὐδόν — τροποῖς ἐν δερματίνοισιν — παρὰ κληῖδος ἱμάντα — ἐν ὀνειρείῃσι πύλῃσι — θεοί τε πάντα ἴσασιν —

(ii) Explain & derive epithets etc.:— τηλύγετος — διοτρεφής — χρυσηλάκατος — πινυτούς — ἀέποδες — διοπετής — καλλικρήδεμνοι — ἀμφιμέλαιναι — Ἀτρυτώνη — νήδυμος — θεσπιδαής — ἠϋγένειος — ἐπήρατος (608)

(iii) Parse:— κέκλετο — ἑσσάμενος — ἐπιπνείῃσιν — λελάβεσθαι — λέκτο — δάμεν — εἶσι — ἔκταθεν — κεκλίαται — ὤρυγεν — κίκον 754.

(iv) Derive & treat philologically:— ἔτης — νωλεμέως — ἀστεμφέως — ἐπηετανόν — ἀδευκεῖ — ὑπερφίαλον — ἀμαυρόν — ἀμολγῷ — Λακεδαίμονα — Ἐρεμβοὺς — ἀλοσύδνης — ἔνδιος.

(v) Explain forms:— ἰχθυάασκον — ἤια — τέξιν — δακρυόφι — αὐτονυχί — σπέσθαι ἐσσεῖσθαι? — εἶβεν — αὔτως 665.

(vi) Peculiarities of Homer:— in use of augment: shortening mood vowels: resolving contracted vowels and changing, instance ἰδέω.

(vii) Describe:— Homeric house — meals — servants — baths — grain — spinning — clothes & tapestry — names & epithets of sea.

(viii) Give oath by Trinity — Characters of Menelaus & Nestor.

(ix) Parallels for:— κοίλην Λακεδαίμονα — θανάτοιο τέλος — ἐμῷ κεχαρισμένε θυμῷ. V. vv. 149.150 — vv. 563 to 564 Tennyson & Milton & Lucretius — μῆτιν ὑφήνας — λάθῃ ἐς πνοιὰς ἀνέμων — χρυσέης Ἀφροδίτης — Tale of Proteus (Virgil — Horace — Ovid) — ἀπείρων — ῥοδοδάκτυλος ἠώς — πορφύρη — φωκάων ὀλοώτατος ὀδμή — ἔκβαλε ἔπος — κεῖτ' ἄρ' ἄσιτος — 706.7.

(x) Translate the following words:— ἀνωϊστί — ἐπεσβολίας — ἀοσσητῆρες — σπεῖρα — ἀβάκησαν — μάστακα — ὀλοφώϊα — διαγλάψασα — δοκεύσεις — ἀΰουσιν δόμοι — κύπειρον — ὑδρηλάμενοι — ἄφενα —

Horace

(x) Translate the following words:-

Translate (1) Bk III. ode II. v.v. 17-32.

(a) In this ode give parallels for v. ~~8~~ 8-13-14-22 negata via-23 caelum et udam humum-25-26-27-32.

(b) Remark on:- virtus repulsae-Cereris sacrum-diespiter-pede claudo.

(c) Intaminatis-give other words in these Books peculiar to Horace.

(II) Bk III. ode 23

(a) Remark on: supinas-nascente luna-horna-alumni-immunis (meaning in Bk IVth)-farre pio-

(b) Distinguish: Lares-Penates-Manes-Lemures-Larvae. Quote parallels of offerings to Lares.

(c) v. 20. may be taken in two ways

(III) Translate Bk IV. ode VII. with notes critical & explanatory

(IV) Discuss the readings in Bk III 4.38. addidit-7.20 fallax-10.7. ventis-12.11 alto-14.6 iustis-17.13 potes-
Bk IV-5.18. rura-6.17-captis-6.25 doctor 7.15 pius-8.17 incendia.

(V) Give any incidents bearing on the life of Horace in these Books.

(VI) Explain case in: Bk III.3.25 adultero-4.78. nequitiae-7.4 fide-10.7 ventis-17.16 operum-19.9-lunae-
also sume cyathos centum sospitis amici-

(VII) Explain use of adjectives:- illacrimabilis-immunis-avidus (Vulcanus)-rava (lupa)-laevus (picus)-oscinem-
albus (Iapyx)-pia (testa). densos lucidus-lascivus.

(VIII) Explain the construction in: purpurarum usus clarior-fallit beatior III. 16.32-Marte populata 5.24-
digna moveri-regnavit populorum-abstineto irarum-palluit fraudes.

(IX) Meaning of: orientis haedi-descendat in Campum-caementa demittit redemptor-capitis minor-
motus Ionicos-ex cubitu Chloe-genium curabo-Socraticis madet sermonibus-Graeco trocho-vetita
legibus alea-fraudi et vectes et arcus-despicere horreo-

(X) Give parallels for:-levis somnus-si fractus illabatur orbis (Heaut:)-vagus Hercules-Altricis (Apuliae)-
lene consilium datis-vis consili expers mole ruit sua-scopulis surdior Icari (Medea)-sidere pulchrior-
velut equa trima ludit-splendide mendax-nil cupientium nudus castra peto-late tyrannus-
arbiter pugnae-aquosa Ida-campestres Scythae etc-serpens similis sagittae-centum oppidis Creten (Odyssey?)
Lyde strenua (Odyssey)-Vixi-inter verba cadit lingua-regnum in aves-instantis vultus-
procidit late-potiore alite-splendida arbitria-belluosus Oceanus (Odyssey)-non tuae sortis.

Coh

ψυχὴ φίλη χαρίεσσα.

Medea & Hippolytus

W. Osler

June

1868

J. McColl

Toronto

1639

Trinity College
June Examination
1868

1st Year –
Medea — Hippolytus

I Medea

~~Translate~~ Translate with critical notes and illustrations:–

(α) vv. 214 — 229
(β) vv. 627 — 665.
(γ) vv. 1156 – 1180.

(I) Explain in Hypothesis:– τὸ δρᾶμα δοκεῖ ὑποβαλέσθαι τὰ Νεόφρονος διασκευάσας — ἐδιδάχθη &c.

(II) What does Horace say of the duties of the Chorus and length of a play – confirm from Medea.

(III) Explain and illustrate:– διδυμνᾷ χθονός – πισσοὺς προσελθών – ἐξῄτου θεούς – μεθορμίσασθαι μόχθων πάρα – διδύμους ὁρίσασα πέτρας – πέμπειν ξύμβολα – μὴ πρὸς ἰσχύος χέρων – ὦ Μαίας – ἔσπευν οἷον ἔσπευν. ὅτῳ μὴ θέμις (1053) – ὑπ᾽ ἀλαστόρων (1260) – Ζεὺς ἠπίστατο (1362) – ἄκροισι λαιψηρῶς κρασπέδοις – ἀκραίας θεοῦ.

(IV) Explain constructions and give comparative instances in Greek or other languages:–
πάντα χρόνον συντήκουσα (253) – ἀτιμάσας ἔχει – μὴ ὑπῆλθε μολοῦσα – φόβος εἴ πείσω – ἄχεα βοᾷ τὸν προδόντα – βροτῶν ὅστις (219.0) – συμβάλλεται πολλὰ τοῦδε δείματος – ἄλλης ἧς ἔχουσιν ὀργίας – ῥᾷον φυλάσσειν – καὶ δὴ τεθνᾶσι – πρόθυμος μᾶλλον ἢ σοφώτερα – οὐκ ἀνίεις μωρίας – ἢ κατ᾽ ἄνδρα συμβαλεῖν (675) – τρίβων τὰ τοιάδε (866) – ὄμνυμι γαῖαν – οὐχ ὡς λιποῦσα (781) – v. 910 – γυνὴ δὲ θῆλυ – οὐκ οἶδ᾽ ἂν εἰ πείσαιμι (941) ἄλλως ἄρ᾽ ὑμᾶς ἐξεθρεψάμην (1029) – καθυβρίσαι (1061) – ἀλλὰ τῆς ἐμῆς κάκης (1051) – προσελθὼ δόμους (1316)

(V) Discuss various readings:– v. 106 – 138 – 365 – 384 – 454-60 – 493 ἢ σεῖ [illegible] – 706 – 729 – 778.9 – 822 – 930 – 970 – 994 – 1015 – 1087 – 1268.9.0 – 1356 οὔτ᾽ θ – οὐθ᾽ Elmsley οὐδ᾽ – οὐδ᾽ – 1371.

(VI) Derive and give other words connected with same root in Latin – Greek or English:– δῖος – νοῦς – γένος – αἰών – πόσις – κρείων – κάρα – μοῦσα – σφάλλω.

(VII) Explain use of these particles and formulae:– Interrogative μῶν – ἄρ᾽ – γάρ – μὴ δῆτα – δ᾽ οὖν – εἴπερ – εἰ καί – καὶ εἰ; μῶν – ἀλλ᾽ οὖν – ἀλλ᾽ ἦ – ἦ μήν – ἦ που

(VIII) Illustrate by parallels:– ὡς πέτρος ἢ θαλάσσιος κλύδων – γῆ τε κοὐρανὸς λέξαι – ζῆν ἐπ᾽ ἴσοισι – οὔτι τόσσα τάυτη πω – ἄνω ποταμῶν – τὰν ἐμὰν ἀπιστοσύναν – Ὀρφέως μέλος – χρῆν ἄλλοθεν

ρρήτους παῖδας τεκνοῦσθαι - ἀνοίξαντα κλῇδα φρενῶν - τοσσεβέστατον παῖς Πιτθέως - ὁρκίοισι ἐξει

φθέγγουσα φόνον (795) - χώρας ἀπορθήτου - πείθειν δῶρα καὶ τοὺς θεούς - πρὸς σὲ γονάτων
ὀμφαλὸν τῆς γῆς - τὰ πρῶτα - ἀλλ' ἐκεῖ (1073) - οἱ προσβήσονται (1117) - τὸν γέροντα τύμβον -
[illegible] ἄραι σῶμα (1247) - τῆς Τυρσηνίδος Σκύλλης - τὰ θνητὰ σκιάν - λαμπάδας ἀνασχεθεῖν.

(IX) Remark on these words:- φαιδρός - ἀθῷος - καραδοκῶ - ἁβρός - προσάντης - τέλος - κόμη - ἀρτιδάκρυς.

(X) Give verbs compounded with μετά - κατά - ἐπί giving various shades of meaning.

(XI) Distinguish:- κνίζω - δάκνω; δεῦτε - δεῦρο; στρέφειν - τρέπειν; εὐδαιμονία - εὐτυχία (1250)
ἐπιθεάζω - ἐπιθοάζω (1140)

(XII) Distinguish clearly:- οὐ - μή; does οὐ ever go with infinitive? When are both negatives used together? With what tenses and moods may ἄν be used. What particles expect a negative what an affirmative answer?

(XIII) Give instances from this play of:- Nominative absolute - Nominative after κλύω - Ethic dative - Accusative after verbs of motion towards - and extension over surface - Antiptosis - Hypallage - Litotes - Pleonasm - Adverbial use of adjective - proleptic use of do - constructio praegnans - Use of present for past or future - participle with verbs of mental perception - emotion - demonstration.

(XIV) Give alliterative lines in Messenger - also nautical Metaphors.

(XVI) Variety of Metre according to sentiment. Give Anapaestic System - any variations from the laws - Examine v. 1396.

II Hippolytus

Translate Hypothesis - ἡ σκηνὴ τοῦ —— τῶν πρώτων.

(I) Explain and illustrate in Hypothesis - ἐπισημήνατο - εἰς ἐπιθυμίαν ὤλισθεν.
v. 1. πολλή - τέρμονας Ἀτλαντικῶν - ἐξαιρεῖ θῆρας - προκείμενα - εἰς ὄψιν καὶ πύλη - [illegible] -
Δάφνητρος ἀκτᾶς - Sources of frenzy

(II) Grammar of: οὐ πόνου πολλοῦ με δεῖ - τὸ σωφρονεῖν εἴληχεν - παιδεύματα - also v.v. 32.33.

(III) Metre of Lyric passage v.v. 63-69.