

A. Vibert Douglas

Lectures and Speeches

1960s 23.
1970s

Loc 2303.9
Box #1



OLYMPIC
A I R W A Y S

C 1 1 A

Kingston Branch

Antigua 1964

My first thought of going to Af.
was to attend The Uganda



OLYMPIC

"Conf. for Af. U. W.

CIA

Egypt: Nasser popularity
Personal
Policy - Desert
Dom.
Resettling -

Arab University

Amer. Univ. in Cairo



OLYMPIC
AIRWAYS

CIIA

Sudan

Nationalism - Islamic
Arabic in all schools -
secondary & primary

Univ. of K.

D v Dafala

1st yr failures -

External Examiners

Screening of pg student

for abroad -

30% redn in budget

Need for teachers & profs -
70% primary failures

Cult of Mahdi

Amidman

Refugees from R C South
in Ethiop. Uganda, Congo.



OLYMPIC
AIRWAYS

CIFA

Ethiopia

International atmosphere
one to Africa House
+ Organ. for Afr. Union

[Unity a far off dream]
debate on ~~mixed~~ ^{arranged vs free} marriage
Influence on 2dnd
esp. of women.

Taffara de Gimphe
Univ. ~~of Addis~~ Research

Agric. - Oklahoma
Emp. Haile Selassie
schools - Coptic priests



OLYMPIC
AIRWAYS

C118

Uhuru 4

Uganda

Late Vic Dr Barkett
Africanization - deBunsen
Lule & Wasawa.

Kabaka of Buganda
in Pres. of Uganda.
Provincial rivalries.

Relations with Kenya
+ Tanganyika
in E.A.
Economic.



OLYMPIC
AIRWAYS

CIA

Kenya Prosperity

Large no. of Asians
Africanizations

Comm. Scholars : 1 U

2 W

3 R

4 K

5 K.

cf Suez

United Kenya Club

Debate on Intermarriage

Univ. College

Research

Tanzania

Law & Arts

New Campus

~~200~~ students +

25 w

Pr. Cranford Pratt

50% children no
primary edⁿ

May Abraham Inst.
Mtoni

Clinic at Mgomoni
Norman Berlis's

Chauffeurs.





OLYMPIC
AIRWAYS

CLIA

Southern Rhodesia -

Education - 2 Sec. Sch. for Rhodesians
1 admits 25% girls.

Poor primary teachers -
Penalty for any insubordination

Failures at Sec. Sch
Univ. entrance level

Univ. prelim 1st year.

Univ. policy - complete
integration
Q. M. Other-Chanc.

Research - Phys & Geophys.
Art gallery.



OLYMPIC
AIRWAYS

CUA

Nigeria - teeming pop.

Gen. Stinke -

Corruption - no Wiloughby

Univ. Med. Sch.

new arts & law campus

CWSO teachers

Ibadan - Dr. Dicke

Research in Afr. Hist.

Provincial rivalries



OLYMPIC
AIRWAYS

CIA

Cameroon

Donala

Yaounde . Charpentier

Corruption + misspending
new Palace with fr.
Tapestries

Shops without staff
or equipment.

Yanny Niwa . bilingual
Fr + Br + Aus

Need for 1 Grad Med. Sch. for
Cameroon, Gabon, Chad
Congo-Braz, Central Afr.

but national jealousy + rivalry.
C USD 15 teachers -



OLYMPIC

AIRWAYS

CIIA

Ghana

Safety precautions
at airport
& at gate block
on way.

Nkrumah & Edⁿ

primary sch - free.

Sec - soon -

Edⁿ of women -

10 women MP's

one is Asst Min of Edⁿ.

Miss Addison.

Ruthless re operation

Mr. Mair's remarks

Dismissal of Profs.
1 Englishman.

Canadians on Univ Staff

CASO teachers.

There is an urgency about
helping educate these African people.



OLYMPIC
AIRWAYS
CSIA

South Africa

Beauty

Contrast to East Afr. or West.

Separate schools + Universities

The Locations. Barbed wire

Complacent self righteousness
of the Africans.

Anglican Cathedral -
St Georges.

on

5746 4795

СТАВЬС





OLYMPIC
AIRWAYS

over

Greetings

To Stuart Tyfe ✓. Mrs Gee.
Kampala.

✓ Joyce.
Merris 425716 } Helen (not known)
Gibsons 469631 } Small
Wendy Thorburn } Lagos

To David Keys. Mr Ware

To Q. Harriet Thompson
Mrs D Mitchell
Kampala

To Joe Brooks ✓ Prof Hunter
Phys - Nairobi.

To Mrs Shortt. ✓ Jerry Shortt
Kiplin Harrison

To Ethel Stewart. R W Beechey

To Ron Watts York Shai (Jaw)
To Mr Cranville Ottawa ✓ Mrs Osborne - Uganda
Doris Selvan

To Spooner.

Mr T Fred
mackenzie
Lagos (Mackenzie)

To Prof Hodgkiss

Bob Byrd
Am Soc Friends
[met at Gate, House]
Yaounde +
Drouala

Hodgkiss

Dr Brown
Q. R. College

OLYMPIC

Telescopes & the Universe
They Reveal

Engineering Institute of Can.
Kingston Branch.
Ellis Hall Dec. 6, 1961

Telescopes & The Universe They Reveal

No man works in a vacuum - astronomer least of all
indebted to physicists, chemists, engineers, biologists - and
tremendously to mathematicians.

SLIDES Long before the invention of telescopes in 17th C.
as far back as about 2000 BC engineers & astronomers
were working together on such famous monuments
of antiquity as

- | | | |
|-----|---|---|
| 1. | Pyramid | |
| 2. | Stonehenge | |
| 3. | | |
| 4. | Godpare | Jain Singh's Obel. 1700 AD. |
| 5. | Brahm's Obel. | |
| 6. | Galileo - 1610 | |
| 7. | 40 - in Yerkes. | |
| 8. | Y. O. | |
| 9. | 42 - in lenses, Sir Howard Grubb - Person. | |
| 10. | Greenwich Ch. 11 1675 | |
| 11. | " Transit 0° 0' Long. | |
| 12. | Newton 1672 | |
| 13. | von Herschel 1795 40 ft focal. 4 ft mirror. | |
| 14. | } Lord Rosse 6 ft mirror - Birr 1845
in Charleston | |
| 15. | | |
| 16. | Mt. W. 100. inch | 34 3 21 - in signals
with 8" objective |
| 17. | " Interferometer | 35 Chart of Galaxy |
| 18. | Mt. P. 200. inch | 36 Leyden + Amstelredam chart |
| 19. | " Hale dedication | 37 Cygnus |
| 20. | " 48 - in Schmidt | 38 Orion Horse head |
| 21. | Monoceros 48" | 39 Serpens neb. |
| 22. | " 200" | 40 Crab neb. Supernova
2400-1300 1054 AD |
| 23. | Sec. Sky. | 41 Cygnus Loop. |
| 24. | } Pleiades series | 42 Components of our Galaxy. |
| 25. | | |
| 26. | } Solar Tower 150 ft high 80 below | 43 Chart of our Gal. neighbors |
| 27. | | |
| 28. | Spectrograph | 44 nearby Fornax spiral |
| 29. | Spectra | 45 more distant whorl spiral
Can Ven |
| 30. | Mills Cross 500 ft each arm | 46 " " Triangulum |
| 31. | " aerial view | 47 Rel sizes. 00 etc. |
| 32. | Jodrell Bank 250 ft dish | 48 M 33 |
| 33. | Ohio section of a dish | 49 Cluster of galaxies. |
| | | 12. Coloured slides 35mm. |

8" 790 ± 0" 001
A = 93015.000
I per m

The Scale of the Universe

Physics Club
Ontario Hall

1963 March 7

2005. 1942 $8''.790 \pm 0''.001$

a.u. = $93,005,000 \pm 9000$ mi.

2848 plates

from 24 obsys. in 14 countries.

1960 Jod. Bank - Venus reflex.

$8''.8020 \pm 0''.0005$

M.I.T.

$8''.8022 \pm 0''.0001$

1961

Palmer
May 3.

M.I.T.

$8''.79450 \pm 0''.00008$

a.u. = $92,975,500 \pm 900$ mi

or $149,597,700 \pm 1500$ Km.

Immensities of Time

He. Lon. News Jan 21/61
M. W. Woerden

- 10^6 years primitive man
- 10^7 young star like Rigel was born
- 10^8 earliest terrestrial fossils
- $2 \cdot 10^9$ crust of earth
- $5 \cdot 10^9$ proto-earth
- $6 \cdot 10^9$ birth of sun
- $2 \cdot 10^{10}$ our galaxy formed

Space

out Sun 6 inches
Earth pin head 50 feet distant

limits of Mt Palomar 200 in $6 \cdot 10^9$ l.y.
" " Radio Tel. $25 \cdot 10^9$ l.y.

<u>Time to</u>	<u>25,000 mph</u>	<u>c</u>	<u>to Moon</u>
Moon	9 h.	$1\frac{1}{4}$ sec.	Moon
Venus	43 d. (as crockies)	8.5 m.	Sun
Mars	58 d.	35 m.	Prox.
Pluto	12 y.	6 h. 5	Pluto
		4.3 yrs.	L. Centauri
		50,000 yrs.	limits Milky Way
		$2 \cdot 10^6$ yrs.	M 31

$$\frac{483 \cdot 10^6}{186 \cdot 10^3} = 2.6 \cdot 10^3 \text{ sec.}$$

$$\frac{2.6 \cdot 10^3}{60} = 43 \text{ min to Jup.}$$

$$\frac{3500}{1050}$$

$$2446$$

The Scale of The Universe

1. Man's position - 2 scales
2. Diagram inner orbits (1)
3. " outer " (2)
4. " solar system
5. Hair & 1" arc.
6. 25 nearest stars
7. Sizes of giant stars
8. " " degenerate stars
9. Pleiades galaxy
10. Linné galaxy
11. 21-cm. 3 peak. spiral arm.
12. plot of arms (Leiden)
13. M 31
14. M 31
15. K-line red shift.
16. Plot of nearest ext. galaxies
17. Fornax barred spiral.
18. M 81 Wrs maj.
19. Copernicus
20. Galileo
21. Kepler
22. Isaac Newton.

1³/₄ hours Seminar
with J. Hoza's Cosmology class

Dec. 1961
Carnegie Hall.

2. Magnitude scale.

$$-22 \quad \log \frac{L_1}{L_2} = 0.4(m_2 - m_1)$$

1. Parallax

in p.m. *Strom* p 25

p 314.

Smart p. 212

20 plates with
3 or 4 exposures
on each

Refraction

Z D	0	0
	20	0" 21
	40	0" 48



Ages — Binary

$$\log \frac{1}{p^2} = 0.4(m - M)$$

$$-2 - 2 \log p = 0.4(m - M)$$

$$-5 - 5 \log p = m - M$$

$$M = m + 5 + 5 \log p$$

Range of masses.

Stability

Hertzprung Russ diagram

1. Tray II^x to 300 L_\odot .
2. Grouped Cluster II^x
3. Dyn. II^x $n_1 + n_2 = \frac{a^3}{p^3 p^2}$
Binary stars
4. Spec II^x
5. Cluster variables A0-F5
RR Lyrae
6. Cepheid variables
Type I 8 Cent η Cy ϵ Ori
Type II in Clusters + novae
C. G.

M
-4
-1
0

7. Blue stars $\log P_{\text{ev}} =$
8. Novae ord -6^M to -8^M
Super 2 -13^M
1 -15^M

9. Glob. clusters $\left\{ \begin{array}{l} \text{any diam} \\ \text{intermittent in} \\ \text{RR Lyrae} \\ \text{Type II Cepht} \end{array} \right.$

See Strom p 258

10. Red shells
approx mag.

Telescopes and the Universe
they reveal

Brockville
Phillips Electrical Co Ltd
Foremen's Assocn

Nov. 18 - 1960

1960 Nov 18.

1. Chinese OS
2. Pencil
3. Galileo
4. Tel 1610
5. Paris 1667
6. Newton Statue - the marble index
7. Tel 1672
6. Greenwich 1675
7. "
8. " Transit
9. Herschel 4' 1793
10. Rosse
11. y. O
12. 40"
13. Mt W
14. 100"
15. 200"
16. DAO
17. 72"
18. more sky 5 Pleiad
19. Macollum 1579
20. Galileo 36
21. Orion neb
22. Hornhead
22. Perseus cl 5m

- 23 Cygnus
- 24 apha
25. } c. 1775
26. } ← spent 2 (Roscoe Schmidt " 25ky.
27. M 31
28. M 31 40 apha V.
29. M 31 npha
30. Whirlpool M 51
31. M 33 Δ 2 to 3 106 ly
32. 3 spirals
33. several spirals Coma?
34. Jodrell Bank 250 ft
35. " rada
36. Hornhead 60 ft
37. } Mills X
38. }
39. spiral arms plotted
40. Doppler shift
41. Cas A
42. MBI

Some Outstanding Women
of Other Lands.

Ottawa
Univ. W. Club.
1960 Jan. 11

- i Professor Caroline Spurgeon 1
- ii Dean Virginia Gilderstone 2
Barnard College, Columbia 4
- iii Professor Winifred Cullis, C.B.E. 4
- iv Dr Ellen Gleditsch, Oslo 3
- v Professor Johanna Westerdijk 5
Bacon (U. of Utrecht
+ of Amsterdam)
- vi Dr Stanisława Adamowicz 7
State Inst. of Hygiene, Warsaw
- vii Mlle Jeanne Chaton 11
Lycee, Paris
- ~~viii Rosa Garibaldi~~

Univ. W. Club, Ottawa
1960

1. Professor Carolyn Spurgeon - Bedford Col. U. of N.
Chaucerian Scholar.
Centuries of Chaucer Criticism.
- Shakespearean Scholar.
Shakespeare's Imagery
- Lectures on Melville - Recent Poetry
in C. B. 1920.
2. Dean Virginia Gilderleeve - Barnard Col. - Columbia U.
many a good one - U. N.
3. Dr. Ellen Gleditsch - Norway. Oslo U.
Intl. Fellowships
4. Professor Wimpred Callis M.D. - Univ. of L. - Physiology
5. Professor Johanna Waelderik - U. of Utrecht
& U. Amsterdam of Baarn.
Intl. Institute of Fungi
6. Dr. Stanisława Adamowicz - State Inst. of Hygiene, Warsaw
Between the 2 yr was advocating greater
awareness in the part of women & their
participation in local, nat & intl. affairs
1957 - 46 - 48 - 54.
7. Mlle Jeanne Chaton
8. Rosa Garibaldi

1-7 all these women have served or are still serving
the cause of education in its narrow & in its broadest
sense. They have proved themselves notable women,
citizens of distinction - not only citizens
(respectively) of C. B., the U.S.A., Norway,
the Netherlands, Poland and France, but
world citizens and as such they have set for
us a high and inspiring example.

They have fought the evil of ignorance,
the evil of prejudice, the evil of intolerance
& to some extent at least they have
prevailed - this task is likewise our task

And let us never forget Whitehead's
words: The instability of evil is the
moral order of the world.

Prof of Eng. Bedford College.
Spragueon - Chancery scholar. 3 vol. Five Hundred
Shakespearean Research year of Chancery
The Imagery of Shakespeare's Imagery Criticism CUP
Keats' Shakespeare Oxford Press 1928. 1925

These women of 6 nationalities
C. T. Geans local
national
intl

fighting evil - of ignorance
of prejudice
of intolerance

Their task is our task

Whitehead The instability of evil
is the moral order of the world

1960 Jan 21

- (1)
1. Meanings of words. metaphors & symbols for abstract ideas
 2. A scientist as scientist is no more qualified to expound religion than a man whose major training is in any other field - lawyer, artist, business man, historian, economist.

3. Eddington: S & UW p 25-26

Facts of observation include man's impulse to worship - to awe, reverence.

We thus have both our sense impressions and our mystical experiences and the same urge within us to explore the validity & implications of both - but the tools for exploring one are not the tools for the other.

Eddington: You will understand the true spirit neither of science nor of religion unless seeking is placed in the forefront.

4. We must not seek for the truth of the spiritual realm in the realm of the natural i.e. in science. This has led through the ages to conflict.

That wh. is seen is temporal... unseen - spiritual.

Science is not static - ^{St Thomas Aquinas} ^{Copernicus} ^{Kepler}, ^{Galileo} ^{Newton} ^{Einstein}

Weizsäcker: P 157

Do not try to deduce God from Science

Jean's - The Mysterious Universe D. p 140

Eddington - Indeterminism 10 p of p 140

Bostrom's Russell - famous - happy epigram

Eddington. D. p 140 - et seq.

Faith in reason is trust that the ultimate natures of things
lie together in a harmony which excludes mere
arbitrariness

Thomas à Kempis
Blessed are they that enter far
into inward things

2
Science & Religion both depend on intuition

Certainty is a goal we dream of

overwhelming probability is what in
scientific "proof" we sometimes
achieve ^{winged} imagination attain

Sincerity in our search, critical judgment
The avoidance of preconceived notions
& sentimentality - honesty of all
time scholars
Chman p. 51

→ Faith (anw)
Faith (Chman) p. 71

Creeds - makers. Edd. p. 50 (S.W.W.)

micah: What doth the Lord thy God require of thee?
To do justly, to love mercy, to walk humbly
with thy God.

anw. Religion is the vision of something which
(S.W.W. p. 75) stands beyond, behind and within the
passing flux of immediate things...
The vision recurs in history, under nobler
form & with clearer expression... It fades
and recurs with an added richness
and purity of content.

Doubts: our spiritual progress is usually
uneven
moments of insight are facts of experience

Wm James -

3
A. Einstein 1937

All religions, arts &
Sciences are branches
of the same tree.

All these aspirations are
directed toward enabling
man's life, lifting it
from the sphere of mere
physical existence and
leading the individual
toward freedom.

Both churches & sciences
insofar as they live
their true function
the ennoblement of the
individual

Einstein "Ideas & Opinions"

p. 42

Fundamental ends & valuations
--- come into being not
through demonstration but
through revelation ---

The highest principles of our
aspirations and judgments
are given to us in the Jewish -
Christian religious tradition.

He that hath eyes to see ---, can't hear...

If I were not a Jew
I would be a Quaker.

Photos of Gandhi

4
Prof. of Anatomy Univ. of Manchester

" F. Wood Jones

The misfortune that has overtaken the spiritual outlook of man is that as his universe expanded, his conception of the deity did not expand with it.
(S.R.F.): Raven p. 64

Chas E. Raven Biologist & Theologian

S + CM p. 21 As a man I cannot know or conceive God as he is in Himself. But all that I can know of Him I find in the Universe and in Jesus and these two as far as my experience goes belong together -

p. 53. our religion must not be confined "to a few ritual acts and pious emotions" it must grow out of "a real belief in the indwelling of the divine in ourselves and in the world" This is the doctrine of the Holy Spirit.

If in truth there be a spark of the divine in each of us then Whitehead is not exaggerating when he says "Every act leaves the world with a deeper or a weaker imprint of God" which is a very solemn thought.

Elsewhere Whitehead wrote (R in M. p. 64) "If the modern world is to find God, it must find him through love, not through fear"

That is the message of Christianity:

Wingspread. - (overleaf)

cf von Weizsäcker (WVOP) p 8.

What we need is "an attitude of mind
from which right decisions can possibly
spring... I have not been able
to find any convincing solution that
avoided Christianity."

p. 8.

AN Whitehead 1941. Harvard Divinity School

The self-confidence of learned people
is the comic tragedy of civilization.

Alfred Whitehead: Essays (Philos.) p. 90.

The emphasis upon the divine factor
in human nature is of the essence
of religious thought.

The power of God is the worship He inspires.

The worship of God is an
adventure of the spirit.

Add

Renan

We are happy to have as our guest
Dr. Mary Quale Dennis - a native of
Ohio, a citizen of Canada for nearly 40 yrs
and an honorary graduate of Q.

- As an able, sympathetic + inspiring
wife + mother, Dr. Dennis is the
kind of Canadian citizen who is
making a lasting contribution to
what is best in our country.

- 4 ch. - Dr. Donald Dennis
Mrs Wendy Dennis valued

- Grad in Eng. - U. of Chicago,
Economics - author of
an Economic Hist. of Can.
used as text or ref. book in
our colleges.

Dr. D. has written what is at least
to some extent a family autobiography
& when she wanted a name for it
imagination supplied the answer
Stand on a Rainbow

Another book from her facile
pen is based on 19th century
travel journals when our west
was a little known region for
intrepid adventurers.

A further book of similar
nature is now in press

Five years ago Dr. D. was
appointed D. of W. at Univ. of
Tor. & has brought distinction
to that position.

Last year she was named a
delegate to the Commonwealth
Edn. Conf. in Gt. B. From this
most interesting experience, she
draws the material for her address
to us this evening - we welcome
our distinguished guest this evening
& call on her to address us - Dr. Mary Q. - Dennis

EMERALD Jetliner
SERVICE

Exploring Space & Time

Sarnia Univ. W. Club

25th Anniversary Dinner

23 May 1961

TCA DCB *Jettliner*
SERVICE

Exploration of Space & Time

Hist of Astron has been exp of Space
& since the Greek Embedacles 450 BC
also an exp. of Time

Try survey with an earth base
for scale of solar system

Moon 240,000 mi 1.3 sec

Venus at nearest about 27,100 mi

Sun 93 10⁶ mi 8 1/2 min Mars 48 10⁶ mi

Jup. min

Pluto " 35 min

Space within solar system

H gas, meteoric dust, ice crystals
mols of CH₄ & NH₃

Satellites & V2 rockets & now
all manner of missiles
instruments & 2 men

Explorⁿ of Space Time -
TCA DC-8 Jettliner
SERVICE

Close around our earth -
atmos & upper atmosphere
Troposphere stratosphere
& ionosphere
Van Allen belt

Moon no atmos. & there

V. CO₂
man. J. S. U. N. P.

Sun - 93% H 6% He 1% other

Star distances - Bessel, Struve
& Henderson
1838-40

L Cent 4.4 l.g.

Sirius 8

Betelgeuse 300 ly + back in
time.

Galaxy -

Other galaxies 16.9 light & radio

The Chemistry of the Stars

Commitment to develop the course in connection
with the work on the subject
of the matter - physical conditions
of the stars - and the
chemical reactions

Chem. of the Stars

Kingston R.A.S.C.

1961 Feb 9.

To Dr Jones group of
Grad students.

The Chemistry of the Stars

Convenient to divide the energy of the Universe
into Bound and Unbound

Bound - matter - protons, electrons
neutrons.

Unbound - radiation

Total no of atoms in Universe

1926 Einstein + Hubble 10^{81}

1930 Lemaitre - Eddington 10^{78}

1944 Eddington $2.36 \cdot 10^{79}$

$= 10^{55}$ grams

mass of av. star 2×10^{33} gm

\therefore no of stars order of 10^{21}

mass of galaxy $10^{11 \pm 1}$ stars

\therefore no. of galaxies 10^{10}

Our Galaxy

100,000 ly \times 10,000 l.y.

nucleus - oldest stars least metallic

halo - gas + stars

spiral arms

Content

S. Zr oxide ZrO, Y₂O₃, LaO,
absorbers of Zr + Technetium.

Problems. He 1874 Janssen, Lockyer.
Yellowline

Coronium: Fe XIII, XIV, XI
Ni XII, XV, XVI
Ca XI, XIII

Nebulium - O + N
(O⁺ O⁺⁺, N⁺)

Education in USSR.

Q. Debating Dinner
Peter Gallop.

LaSalle Hotel 14 Jan
1961.

1954 USSR 200,000,000 people

25% Soviet budget for
edn + culture

10 yr compulsory free edn

380,000 public libraries

Byelorussia SSR

1917 80% illiterate

1954 11,600 schools incl

1300 secondary sc.

27 universities

9 research institutes

85% children now have 7 yr
edn

Translations of Cervantes, Moliere
Maupassant, Byron, Shakespeare

Ukraine universal 7 yr edn
beginning primary

60% of budget edn + culture

teachers 50% men 50% women
with equal salaries

Spec courses for workers.

1958 Georgia SSR + Armenia SSR

1917 85% illiterate

New Belles -

Library.

Selected students:
no 2nd chance?!

New aristocracy

Opening of Queen's Observatory

- Notes on
- i. 100 years astron at Q - Ann.
 - ii. Origin of Solar System - Thos Gold
Cornell

1960 Nov 25 -

Pluto too many unknowns -

Small planets not condensed from cool gas
but from solid fragments crystallized out
+ snowballed in 10⁹ yrs. with planet sticks before
grav. in potent. collisions (as in asteroid region)

Sat's ring - if further out wd condense
meteorites smashed up larger bodies of large as moon
by rock formation + temp hot - slow cooling -
Fe + silicates separate -
collisions -

moon -

dust + chunks - agglomeration story -
Some surface smearing in places
due to lava? erosion -

Sag clouds - mostly slow rolls
∴ probably - planets -

2001

Before the close of the present session
100 years will have elapsed since Queen's
University first became involved in Astron.

This was when they took over from the City of K.
the small observatory which had been established
in what is now Macdonald Park in 1855.

The Principal, Rev D. Leitch & the Professor
of ^{maths} ~~Natural Philosophy~~ Rev D. Williamson were
deeply interested in astronomy & concerned
that ~~no accurate measurement of the~~
~~longitude of K. was known~~. They gave
a series each year of lectures to which
students and the public were invited.

Dr Leitch published a remarkable little
book on Astronomy in 1862 published
both in London & N.Y. running
to a 3rd edⁿ in 1866.

Prof Williamson who later became
prof. of math, lectured in astronomy
in a cold wooden observatory behind
Carruthers Hall into the 1890's when
one of his students was the late
S.A. Mitchell of stellar spec & solar
eclipse renown.

The name of Prof. Nathan Dupuis comes

^{from 1899-1911}
next a born teacher of math & science
^{inventive group - 1910s}
He was responsible for getting the beautiful
little grey stone observatory built ^{in 1908} at

foot of Univ. Ave on ground given by
Mr Justice Macleanman. Here the observational
work of the undergraduate courses in
Astron were given successively by Prof Dupuis,
Prof Buchanan, Prof. Johnston & then in
1940 by myself.

1950 demolished for Mech. Eng. Bldg

1960 new obsy.

Thanks to Dr Lash, Pres. M. Dr McNeill
Members of Building Committee -

Just about the time that actual plans for
the obsy. were to be drawn a fortunate
thing happened. The Physics Dept. was
strengthened by the appointment of
Dr Geo. Hannover with Radio Astronomy
as his major interest. Our cooperation
has been very fruitful. Much, indeed most
of what you see around you in this
observatory is due to his vision and
vigour. Assoc. with us are also Prof. Chisholm & Prof. Hazard.

Ten miles west of here are the fields
where his radio telescopes are erected.
Overhead here under the old dome
of Dr Dupuis' observatory, reerected
here, are 4 telescopes on one equatorial
mounting - 15 in. reflector ^{p. et. photometer}
3 in. finder ^{& grat. spectrogr.}
6 in. catadioptric
3 1/2" astrograph. Fester.

mt. 25
T. Gold (Vienna)

4 109 yrs

older than geol records are chem, nuclei orbits

moon - old surface

meteorites

bits of stars -

Orbits same dir. $3\frac{1}{2}^\circ$ planes of orbits / 2 exceptions

Satellites planes close to parent equator + not in same dir.

Sat 27° incline. 1, we see up.

Ur - tipped + Pluto orbit.

∴ friction in gas.

Large gaseous mass around sun → disk in wh. pl. born

stars with high spin. others low (sun)

$50 \times$ sun

If any mom of planets were in sun it wd be a fast spin

Despinner a satellite

nebular gas + turbulent v. condensed stars are fast
how despinner?

Sun 99.9% of mass + 2% rot momentum. $\frac{740}{741} = 99.9$

Magnetic effects. mag interaction. But to
many radii.

Corona to 10 radii + at equator

Sun's net matter with solar wind

T Tauri stars in far masses v. young.

Li lines str. + also on earth surface

Li formed at surface of T T stars +

∴ later on planets by movement out +

mag. effect on its rot.

solidification of planet after the gases have

soaked up the solar rot. mom by mag

interaction.

J + S. mostly H; U, N, C, N, O;

Temps of condensation - give right result

but H. only with massive planets + cool
i.e. far out from sun

CANADIAN SCIENTISTS REPORT-X

ASTRONOMY AT QUEEN'S UNIVERSITY

By A. VIBERT DOUGLAS

Queen's University, Kingston

In what is now Macdonald Park a building known as Kingston Observatory was erected in 1855 with funds provided by some generous citizens and by the Corporation of the city. By deed of Corporation in 1861 this observatory was transferred to Queen's University.

The new Principal, Rev. William Leitch who had been appointed in June 1860, and the professor of mathematics and natural philosophy, Rev. James Williamson who had been appointed to the Chair in 1842, were equally interested in astronomy and desirous of determining the exact longitude of Kingston. They devoted much time to the Observatory. The equipment included an Alvan Clarke equatorial with a 6¼-inch objective lens; a Short reflecting telescope with 7½-inch speculum mirror presented by Principal Leitch; and a small refractor presented by A. J. Macdonnell, Esq. The University erected a new building with a central dome, a transit room and a room for observers and the public. A Beaufrey Transit lent by the Royal Astronomical Society of London arrived during the session 1863 and was soon in operation. "A course of not less than six lectures in astronomy, open to the public, is delivered each year in the City Hall and the Observatory"—this announcement appeared in the university calendar for that year.

Nathan Dupuis, while an undergraduate, was appointed Observer in 1863 and subsequently became a member of the staff giving lectures in chemistry and natural history. He was made professor of mathematics in 1881, and was Dean of the Faculty of Practical Sciences from 1894-1911. He was a gifted teacher of mathematics and a genius in mechanical design and construction. He built sidereal and mean clocks for the Observatory and in 1887 he gave the university a clock with batteries to ring class-room bells. He designed and directed his students in the construction of the clock still operating (at least three of its four faces show the progress of the hours) in Grant Hall Tower.

model stellar atmospheres and its observational tests. The University's first Doctor of Science by examination, Gerard de Vaucouleurs, submitted publications on scientific photography, atmospheric and planetary physics and the study of galaxies, to all of which subjects he had made distinctive contributions during six years at Mount Stromlo.

As one may readily imagine, the transformation from a government department to a university devoted exclusively to research at the post-graduate level involves a major change of outlook for the Mount Stromlo Observatory. The Department of the Interior provided very generously for the accommodation and equipment of the Observatory during the generation before the Australian National University became a physical reality in Canberra. Within the University more flexible arrangements for the appointment of staff, and perhaps a more sympathetic appreciation of the needs of research work, should make possible the most effective use of the facilities available. The transition coincides with the appointment of Prof. B. J. Bok, formerly of Harvard, as Director to succeed Prof. Woolley who has become Her Majesty's Astronomer Royal. Prof. Bok's previous familiarity with optical study of the southern Milky Way and also with the observing techniques of radio astronomy augur well for a co-ordinated investigation of the southern sky from Australia.

Since no major courses of study in astronomy have been offered to undergraduates in any Australian university since 1890, it has been difficult to obtain locally young people interested in making a career in this field of science. The Australian National University offers very favourable opportunities for graduate study, and is considering co-operative arrangements under which lectures may be given in the State Universities. Positions are available, as in past years, for seasonal assistants who may obtain some experience of astronomical research during the university summer vacation. Through the University's provision for study leave, members of the academic staff may travel abroad to keep abreast of new developments in their fields, and the exchange of information is further encouraged as facilities are offered to astronomers visiting Mount Stromlo.

REFERENCES

- Eggen, O. J. 1952, *Pub. Astr. Soc. Pacific*, vol. 64, p. 62.
 Hogg, A. R. 1953, *Jour. Roy. Astr. Soc. Canada*, vol. 47, p. 1.
 Pawsey, J. L. 1953, *Ibid.*, vol. 47, p. 137.

In 1886 the university calendar promised that "Facilities for obtaining a knowledge of Practical Astronomy will be given students who apply to the Professor"—presumably Professor Williamson.

In the university calendar for 1891-92 an insert at the page listing the courses offered in physics under the direction of Professor Marshall, reads: "Fortnightly lectures and examinations on Astronomy by the Professor of Astronomy are to be attended by all students in the Junior Class in the Department of Physics." A student of that year, now Mrs. Etta A. Newlands, recalls that the professor was James Williamson, then 50 years on the Queen's staff and in the eyes of the students very old, very absent-minded, but highly revered. The lectures were given in a small frame building in the rear of the present Carruthers Hall. A stove provided inadequate heat, the professor wore two overcoats and one muffler about his neck and one around his waist! One of Professor Williamson's students of this period afterwards became a professional astronomer, S. A. Mitchell, who took his M.A. in 1894 and during the next session was appointed a tutor in physics and put in charge of the Observatory. In more recent years he has been widely known as the Director of Leander McCormick Observatory in Virginia, U.S.A.

In 1899 astronomy came under the control of Professor Dupuis in the Department of Mathematics where it has remained to the present time. Seven years later the instruments were moved to the foot of University Avenue and erected in a small but impressive limestone observatory built on a site purchased by the Chairman of the Board of Trustees, Mr. Justice Maclellan, and presented by him to Queen's University in 1906 for this specific purpose.

For several sessions beginning with 1899-1900 a course was given on Spherical Trigonometry, Geodesy and Astronomy. In 1907 it became Spherical Trigonometry and Astronomy, still under Professor Dupuis. In 1912 Theoretical and Practical Astronomy was substituted with Professor D. Buchanan in charge. He offered two courses in his last year at Queen's, 1920-21, Descriptive Astronomy and a one-term course in Spherical Trigonometry and Astronomy.

The following year Professor K. P. Johnston was appointed to the teaching staff in mathematics and until his retirement in 1946 he gave these courses with enthusiasm every winter and most summer sessions.

The present writer joined the staff of Queen's University as Dean of Women in the autumn of 1939 after seventeen years of lecturing in physics and in astronomy and astrophysics at McGill University with research work in the fields of spectroscopic absolute magnitudes, the

atmospheres of pulsating stars and high temperature stars showing Stark effect. In the summer of 1940 and on subsequent occasions she was invited to give Professor Johnston's courses. In 1946 the Department of Mathematics decided to drop the half-course in Spherical Trigonometry and Astronomy and the writer became acting Professor of Astronomy. Thereafter the course entitled Descriptive Astronomy became more heavily weighted towards astrophysics and it is now listed in the Arts calendar as An Introduction to Astronomy and Astrophysics. For some years it was given also every Summer Session. At the present time it is available every winter and at least every second summer.

In 1950 the writer offered a more advanced course for postgraduate students who were working towards the Master's degree or the Ph.D. in mathematics or physics. This course is now available every year.

The Observatory at the foot of University Avenue was a useful adjunct and was often used in the evenings, less often in the early morning hours before dawn, for the undergraduates in astronomy. It was demolished in 1946 to make way for the erection of the new Mechanical Engineering building, McLaughlin Hall. After that date students' observational work was restricted to the use of a small portable telescope, binoculars and the naked eye.

When plans for a new Civil Engineering building were under preliminary consideration in 1955, the writer approached the Principal, the Deans of Arts and Science and the Professor of Civil Engineering with the proposal that an observatory be erected on the roof. This suggestion met with their general approval and at Meetings of the Trustees and in the Building Committee it had also the wise and invaluable support of Dr. W. E. McNeill, Vice-Principal Emeritus of the University.

About this time, 1955, Dr. George A. Harrower became a member of the Department of Physics. With a background of wide training in electronics at both the University of Western Ontario and at McGill, and with research experience in physical electronics at the Bell Telephone Laboratories, New Jersey, and in radio astronomy with the Defense Research Board in Ottawa, he at once proceeded to establish radio astronomy at Queen's University. In two years much has been accomplished. Three postgraduate students are now enrolled, one at the Doctoral level and two for the Master's degree. A ten-acre site was leased in 1956 a few miles west of Kingston. A building was erected to house the necessary apparatus and provide observers' quarters. A radio telescope was built and put into operation early in 1957 and the construction of a second larger system was commenced.

Dr. Harrower has published seven papers on his researches before and

since coming to Queen's. His work on the cause of scintillations in discreet radio sources has already brought him distinction. His own brief description of his equipment in operation and under construction follows:

"Two types of measurements are being made: the study of the scintillation of the discrete radio sources and the recording of transient radio emissions from the sun. Both are intended to improve our present knowledge of the earth's ionosphere and of the factors which influence its behaviour.

"Scintillation measurements are made on the two brightest radio sources—those in Cassiopeia and Cygnus—which are monitored continuously. A second receiving system, including an antenna of somewhat greater resolving power, is intended to be used to study scintillations of the Taurus and Virgo sources. These two systems will permit comparison of scintillations in the northern and southern skies, the former being affected by the auroral zone. The scintillating signals are analysed both with regard to amplitude and frequency of the scintillations.

"The solar measurements are made on a radio spectrograph which scans a 25 Mc./s. range centred on 100 Mc./s. at the rate of once in three seconds. The measurements are recorded by means of an oscilloscope and photographic camera. This system permits the study of transient radio emissions occurring at the time of some solar flares, the distinguishing features of the phenomena being a duration of about three minutes and a downward frequency drift of approximately 0.2 Mc./s./s. The effect is believed to be caused by an outgoing stream of particles, the rate of radio frequency drift being determined by the velocity of the particles and by the properties of the sun's corona. These particles may reach the earth several hours later, contributing to the scintillation of cosmic radio sources and to other ionospheric phenomena."

The new optical observatory will be on the roof of the Civil Engineering building now being constructed on the west side of University Avenue about 300 yards north of Lake Ontario. The plans call for a dome room, two offices, two rooms for the use of graduate students, a seminar and library room, a workroom and a dark room. In the dome room it is expected that three instruments will be mounted on one polar axis, a 15-inch Cassegrain reflector, a 6-inch Catadioptric guide telescope, and a 3-inch astrograph. These instruments are now on order from J. W. Fecker Inc., Pittsburg. Attachments for spectrographic and for photoelectric work will provide simple research possibilities.

With this observatory functioning within the next two years Queen's University should have the necessary facilities to provide good undergraduate and graduate training in the oldest of the sciences.

One hundred years ago Professor Williamson taught astronomy and made a few observations in the little Kingston observatory in the Park, his determination of the longitude of Kingston* being $76^{\circ} 32' 07''$. Fifty years ago Prof. Dupuis planned the grey stone observatory on Stuart Street and gave instruction in practical astronomy there. Now with the new optical observatory equipped with modern instruments and the radio observatory developing rapidly, astronomy at Queen's University should move forward with new vigour.

It was recently announced in the daily press that the Atkinson Charitable Foundation of Toronto has approved a grant of \$25,000 to Queen's University. The grant is for the purchase and installation of the optical telescopes in the dome room, described in the above article—Editors.

*R.A.S.C. Journ., vol. 13, p. 7, 1919.

AAVW NY Dinner

Oct 12, 1961

TCA DC-8

Jetliner
SERVICE

1. I come to you this evening to bring the greetings of the Int. Fedⁿ of Univ. Women. We all wish that in my place you could have had Dr. Meribeth Cameron ^{11th Pres of IFUW} but as you know historic functions at her own college keep her from being here tonight.

And so at her suggestion and on the invitation of your President, my friend of many years in active IFUW work, I have the honour & privilege of being with you -

2. I congratulate the N.Y. Branch of the great AAVW. You have behind

you 75 years of great achievement

& you have a tremendous challenge before you - Your country needs,

the world needs, The sanity & faith in goodness, in tolerance & sympathy and integrity which woman can impart.

Rabindranath Tagore has given us our challenge

TCA DC-8

Jetliner
SERVICE

3. The IFEW is one answer to this challenge. We remember tonight that it was a member of this N.Y. Branch of the AAVW, Dr Virginia Gildersleeve, who in 1919 together with Prof Spurgeon at the Univ. of London dreamed the dream & saw the vision & established the IFEWs. Dr Spurgeon became the first Pres. & Dr Gildersleeve the second. ^{in 1920} Canada became the 3rd member, the fourth. Today there are 44 member national associations or federations -

4. 2 1/2 mos ago I was in Poland. Several old members of the Polish Fed. of Univ. women, which under political pressure had to disband in 1948, welcomed me, showed me hospitality, gave me introductions to Univ. women in other cities, showed me with pride the reconstruction of Warsaw - IFEW still remains

To strengthen - always in the spirit of St Augustine's great admonition
of - Courage my mind & press on my

First my job

I wish to hear

16 comes like the

white light

of dawn

Quisite animi

mens et ceteris

habitu

Admire sibi

Abstract

Ventes

ICA DEB

Jetliner
SERVICE

a strong influence in their lives.

In Austria I had long talks with Dr Antoine for whom in the greatly years of German & then Russian occupation, the friendship & assistance which came through IFUV ~~have~~ were a source of encouragement & support beyond words to express.

Through its activities in the fields of research fellowships, relief, high educational standards, cultural relations and through its consultative status with UN's, Ecosoc & Unesco, IFUV is playing an increasingly important part in the world today.

You are one of the strong links in this great chain - I greet you as such - may your branch 90 Fox Street

Astronomy Group

Thursday Lunch Address

1961 Nov. 9.

Doppler. 1803-53. Fraunhofer & Wien

$$1842. \quad \frac{\delta\lambda}{\lambda} = \frac{v}{c}$$

✓ 1. Radial Vel. + Space Vel. λ
p.m. + λ known.

✓ 2. Rotation of Sun

3. Rev. of rings of Saturn.

✓ 4. Binary star orbits.

✓ 5. Spectroscopic binaries.

✓ 6. Cepheid variables.
Pulsating

✓ 7. Rotation of stars

✓ 8. Rotation of galaxies.

✓ 9. Expanding universe - red shift.

10. Einstein effects on light coming
a) gravitating star.

✓ 1948 Cd. λ_{vac} 6438.4696 Å

1961 Kr⁸⁶ λ_{vac} 6057.802105 Å

$2p_{10}-5d_5$ λ_{air} 6056.125253 Å

Standard metre 1650763.73 \times

This replaces standard metre bar at Sevres.

Stars + Gases Near + Far

Fac. W. Club.

Ellis Hall

1961 Nov 15.

Stars & gases near & far.

1961 Nov. 15.
Ellis Hall

SLIDES

1. Galileo's tel 1610
2. Newton " 1672
3. sea sky
4. Maestlin 1574
5. Gal. Pleades 1610
6. Pleiades
7. 200" Hal
8. 200" . . . Ceremony June 3, 1948.
9. Schmidt 48" / 72" mirror
10. Monoceros Schmidt
11. " " Hale 200 in
12. Orion . no filter 2 min exp. Red filter 20 min
13. Glob. Cl. in Her.
14. Cygnus N. Am. Neb.
15. Perseus Double Cl.
16. Vir. Spiral
17. M31 nucleus
18. 2 galaxies
19. 250 ft radio disc. Jodrell Bank
20. Paraboloidal radio reflector Ohio State
21. Mills Cross Australia
22. H. Spiral arms in our galaxy.
23. C. of Galaxy chart
24. " Sag. Clouds
25. " Scorpio & Aps.

SCHMIDT COLOURED SET

Not shown.

1. Crab neb in Taurus
2. Pleiades " "
3. Veil " Cyg.
4. N. Am " "
5. Cyg Neb Orion
6. Ring Neb Lyra
7. Saeq. neb.
8. Dumbbell neb Volpuctulae
(S. & Cygnus cross
& 2 of Lyra)
9. Sag. Trifid
10. Triangular Galaxy
11. Sculptor "
12. Androm. "

Arts and Letters

Local Council of Women.
1962 Mar 15 - Annual Meeting

Art and Letters

And what about trying to be creative yourself? If you
A great French citizen, chemist, physician and statesman,
Raspail, wrote, "After bread, education". Bread is essential
but man does not live by bread alone.

In our community and in our homes we want to enrich life
by surrounding ourselves and our young people with good art,
well designed furniture, good music, and good books.

Children who come out of homes and communities where
there are none of these things are starting life under a great
handicap. Their thoughts, their imaginations, their tastes
are undernourished, impoverished, undeveloped.

This is why community efforts like The Art Collection
Society, The Symphony Orchestra and Choral Society, The Public
Libraries are so deserving of our support.

This is why it is important to bring to our city art
exhibitions, concerts, drama and opera.

And in our homes, what more valuable present can you
give to your children than a well chosen book - a book of
art reproductions, or architecture and archaeology, or a book
which is of literary excellence on any subject - biography,
historical romance, science, travel, fiction, poetry. Start
giving them books when they are very young. You never know
what spark of interest you may awaken and do not be afraid
that the child is too young - he will grow up to the book.
He will value the book partly because you have paid him the
compliment of giving him something which is not childish and
'written down' to below his level.

And what about trying to be creative yourself? If you or your children have a spark of creative urge, give rein to it - in music, in handicrafts, in the graphic arts and painting, and if it is the urge to write, then make time to write.

Perhaps in your attic there are old books, the letters or journals of grandparents which are of inestimable value as historic records of a Canada that is passing or has already passed. Do not destroy these - get advice from a trained librarian as to their value. Treasures of our past may be waiting for you to uncover them.

So too, there is value in utensils made and used in earlier years by our pioneers - such things are treasured in museums such as Upper Canada Village.

Finally, I draw your attention, ~~and here I link my thoughts with those of the previous speaker,~~ to the fact that our vast heritage in art and letters has come to us over many centuries and from many countries - from the Orient and from the west, from every country of Europe and from South America and Mexico. Here is one way for every parent and every teacher to inculcate a spirit of international goodwill and understanding. Draw the attention of children to the nationalities of the great musicians, great artists, writers and poets.

Remember the advice of A. N. Whitehead that we can only attain our fullest development of mind and spirit if we have before us the habitual vision of greatness, goodness, and excellence.

Immanities of Space & Time

Redpath Museum
McGill University
1961 March 27

Immensities of Space + Time

Almost every thing in our experience is relative.

Sp + T are no exceptions.

Do you think of 1 min as a long or a short interval of time

short rel. to the 3 score + ten ± of a human life

" " " 10^6 years of human life on earth

" " " the thousand's of 10^6 yrs life of earth

but long " " the $\frac{1}{186}$ thousandths of a sec for light ... 1 mi

Do you think of 1 mile as a long or short interval of distance

short indeed rel. to the distance to Vancouver - to the Moon

to the Sun, to the nearest stars $> 25 \cdot 10^{12}$ miles.

+ to the remotest stellar galaxies $10^9 \times$ that

that is one of the great achievements of astro in the last 35 years.

long rel to the diam of a human hair, or to 50

to smaller + small things, a drawn out spider web.

or the effective diam of an electron

that is the achievement of the atomic physicists of this century.

Even Pascal with prophetic insight could speak of the immensities within an atom.

SLIDES

- Sizes Sun + planets Sun 6" @ a pinhead 50 ft distant
- Orbits 36, 67, 93, 141, 483 ... \rightarrow 3000 10^6 mi
- USA Venus rocket planned for 1959 150 days
USSR achieved Feb 1961
- Dec sky Sirius 8 + 41. B + R 600. Pleiades
- Maestlin 1579 "
- Galileo's Tel. 1610
- Pleiades 36
- " Hertzsprung 2600
- March sky Orion ~~Antares~~
- Orion
- Home head

Voltaire - Trans from his dedication of
his essay on Newton's restored philos.

That vast expanse, of Being the Abode,
Space which reveals the Infinity of God.
Seen in her breast this bounded System move
Of Planets, Worlds, beneath us and above
Whose whole extent, so wondrous to our sense
Is but a Point, an Atom in The Immense.

12. July 5. Milky way Cygnus to Sco
 13. Cygnus gull Mt W. 7^h
 14. " Loop
 15. Neb. in Serpens.
 16. 48" Schmidt + Halble 68.
 17. Monoceros. Sky Survey.
 18. 200 inch Hale Mt Palomar limit 6 10^9 ly.
 19. Cone neb. in Monos.
 20. Dedication of Hale.
 21. Model of our Galaxy - Wm Herschel 1784
 22. " JHJ 1930 Scale
 23. J.S. Plaskett diagram 1935 circa
 24. C. of Gal.
 - 25.
 26. Entire Milky way + halo stars. 1960 Lund.
Ages. 10^{10} - 10^9 old
 $2 \cdot 10^9$ most recent
 10^8 ^{10⁸} " fossils
 10^3 young stars
like Rigel.
- Distances
27. Trig Survey. 25 nearest stars 10^3 young stars like Rigel.
 28. Abs Mag Criteria
 29. Cepheid curves
 30. Nova Aq. 1918
 31. m curves
 32. Spectrum nova Gen 1912
 33. Crab Neb. Lick 120 in 3500 l.y. 1054 AD
Radius 2446 pc.
 34. M 31 and
 35. M 51 CanVen
 36. M 33 Δ
 37. Red Shifts
 38. Spirals in cluster.
 39. Local cluster of galaxies (diagram)
 40. Focus on + edge on.
 41. 250 pc radius tel
 42. Colliding galaxies
 43. "
 44. Fornax Banded Spiral Pictoria

The Space Age

Zonta Club Kingston
Jan 22, 1962

The Space Age

Space age began on Oct 4, 1957.

USSR Sputnik I. orbit out to 500 miles
no II in view.

1st USA. Jan 1958. Explorer I. 103 Mc.
orbit 252 mi to 1500

vel. escape 7 m.p.s.
25-300 mph.

orbital paths - hazards

1. meteors,
2. temps.
3. penetrating radⁿ
4. psycholo^gical

USSR 1959 Photo of far side of moon.

Rel. distances in Solar System

moon

Sun to E. $8\frac{1}{2}$ min
to Pluto 32 min

To nearest star $4\frac{1}{2}$ years.

To limits of Milky Way 100 000 years.

to Androm Galaxy - $2 \cdot 10^6$ years.

To most remote galaxies $7000 \cdot 10^6$ years.

Nature of Planets.

A healthy rivalry = Imagination
& Perspective.

Merc $1930'' = 32'$
 Jup. $25000'' = 400' = 7h.$
 Pluto $197000'' = 3300' = 550^h = 2\frac{1}{2}d$

vel. 100,000 mph

From Earth

To moon $2\frac{1}{2}$ hours

To Merc. 540^h $9d$

To Venus 260^h $4\frac{1}{2}d$

To Mars 490^h $7d$ by orbit 2 or 3 mos at minimum

To Jup 3900^h 65d

Trafalgar School for Girls



**SENIOR
SCHOOL CLOSING
JUNE 9th, 1966**

Hymn

Turn back, O Man, forswear thy foolish ways.
Old now is Earth, and none may count her days,
Yet thou, her child, whose head is crowned with flame,
Still wilt not hear thine inner God proclaim—
'Turn back, O Man, forswear thy foolish ways.'

Earth might be fair and all men glad and wise.
Age after age their tragic empires rise,
Built while they dream, and in that dreaming weep:
Would Man but wake from out his haunted sleep,
Earth might be fair and all men glad and wise.

Earth shall be fair, and all her people one:
Nor till that hour shall God's whole will be done.
Now, even now, once more from earth to sky,
Peals forth in joy man's old undaunted cry—
'Earth shall be fair, and all her folk be one!'

Amen

1. Congrat^{ns} - Ladder - students - joy

Guide ✓ ineradicable portrait

✓ physical

happy portrait - Trust
Kindness

✓ mental

✓ spiritual

phys. stars - joy in spots
" struggle

mental ✓ alert, not life slip by un-lived

✓ G.K. Chesterton remarks - wonders.
wonder.

X The wonder of the beauty manifest
Virginia Woolf - Ride your mind at the gallop in the world

✓ wide horizons internationally minded
debt to the past

opportunities for service & travel
CUSD, Crossroads, WVS.

Spirit ✓ let us keep alive our sense of
The sacred, The divine

✓ see the eternal in the passing
moments of life

as we sketch our ineradicable portrait
let us feel with O. Sitwell a sizzling enthusiasm
for life

Trofalgar School 1966 June 9.

1. ✓ Congratulations - may you go from strength to strength & live richly & deeply & find joy & gladness surrounds but joy
2. ✓ André Gide ^{age 22} - Our whole life is spent in sketching an ineradicable portrait of ourselves.
 - i. ✓ heart true ^{in which reverence for truth is enshrined} & spirit filled with kindness ✓
The world needs simple kindness ✓
 - ii. physically strong ✓ - Respect your bodies - they are of the stuff the stars are made of.
 - iii. mentally alert. Do not let life slip by unlived.
 - a) Drink deeply of nature -
✓ J.R. Chesterton The World will never starve for want of wonders - but only for want of wonder.
Alert
* Be keenly alive to the Wonder of the beauty that is manifest in the world.
 - b) ✓ Keep abreast of the great movements in thought & politics of your time.
Be internationally minded & full of sympathetic understanding of sympathy understanding
CMSO Crossroads & Developing Countries
 - iv. ✓ Finally let us keep ourselves aware of the sacred & the divine - seeing always the eternal in the passing moments of life.
✓ Marcus Aurelius - You will say of Athens that it is the city of Cecrops, will you not say of the world O beautiful City of God.
And so I bid you go forward with what O Sitwell called a sizzling enthusiasm for life.

Grad Dinner
1967

Levana Graduation Banquet

on Sunday evening, March the twelfth

nineteen hundred and sixty-seven

Ban Righ Hall

Dinner Menu

Fruit Cocktail
Filet Mignon
Mushrooms and Onions
Green Peas Potato Croquettes Baked Tomato
Tossed Salad
Hot Dinner Rolls Assorted Relishes
Black Raspberry Parfaits
Coffee Fruit Punch Mints

Toasts

THE QUEEN

Miss Patti Peppin
Arts '68

THE UNIVERSITY

Dr. J. A. Corry
Principal at Queen's

LEVANA

Dr. A. F. Johnston
Honorary President of Levana

Sue Cheshire
President, Levana

THE GRADUATES

Mrs. Edwin Bryce
Dean of Women

Miss Betsy Anderson
Arts '67

ALUMNAE ASSOCIATION WELCOME

Mrs. J. W. Brooks

PRESENTATION OF EXECUTIVE PINS

Miss Sue Cheshire

Guest Speaker; Dr. Douglas

THE CONVENOR'S MESSAGE

My best wishes and congratulations are extended to all the Levana graduates of this centennial year, and my thanks to Miss Richard and her staff, and to the girls of Ban Righ I for their help in the preparations for the last Levana Graduation Banquet at Queen's.

Lynne Webb

1928-67

160 fellowships

50 grants

33 nationalities

1918 Summer - Prof. Caroline Spurgeon
Shakespeare + Chaucer - U. of L.
Miss Rose Sidgwick
Host - Bham.

Dear Virginia Geldersleeve
Med. hist + literature.

Prof. Dr Winifred Cullis

1919 July London. IFUW formed.

1920 Summer " 1st Conf.

47 B. USA - Can - France, Neth.

Italy Czechoslovakia, Spain +
Australia Denmark, Belgium Norway
Sweden, India, S. Africa.

Subsequent conferences Paris, Oslo
Amsterdam, Geneva, Edin, Cracow.

1939 Stockholm.

47 Tor.

50 Zurich - London, Paris, Helsinki

62 Mexico, Brisbane

68 Karlsruhe in Germany.

Council 1966 in Iceland. U. of Reykjavik
1967 in New Delhi

Concern for Ed.

for Fellowships for Scholarly Research

" Bursaries for potential
scholars in developing
countries

" Relief for Refugee Univ. W.

Consultative Status with ECOSOC.

UNESCO -

UNICEF -

Purpose "To promote understanding +
friendship betw. Univ. women of the
nations of the world + thereby to further their
interests + develop between their countries
sympathy + mutual helpfulness -
membership without distinction of colour or creed

Intro^d.

I deeply appreciate this invitation to address you - as you come to the last hurdles before your degrees.

We counsel for you 3 things
that you may feel with sensitivity
thinks vigorously
& act with wisdom,

that life may be full & rich for you all.
I want to tell you about 2 women who exemplified these three qualities

C Spurgeon & V Geldersleeve.

see notes on IFUW.

Conclusion

Join Alumnae or U.W.C. & then automatically belong to CFUW & ∴ to IFUW.

Widen your horizons beyond the local scene, beyond Canada to the world

Much that is tragic also, much v. encouraging
Live with zeal - Chris Fry Reilly is incredible
Life can be full of richness & wide interest
if you make it so.

The Joy of Retirement

Q. Alumnae Montreal
1966 April 27

It is a very great pleasure to meet with a group of Queen's Univ. graduates, for of my 46 years in active university work, 24 were as a member of the Q. faculty.

Throughout my undergraduate years ^{at McGill} - or my years postgraduate years at McGill or Cambridge University I was always intensely interested in observing how my professors presented their subjects as well as in the matter presented.

When I broke my undergraduate course during the first Great War & was a Civil Servant in the War Office in London, my brother on leave from France gave me two books which were & have continued to be a source of inspiration

T. H. Huxley's Essays (1854 - 1888) on Science & Education and Cambridge Essays on Education edited by H. C. Benson, Master of Magdalen Col. Camb.

Then before I began my first lecturing at McGill in 1921, I already had something of a philosophy of education. Subsequently I derived much value from the writings of A. N. Whitehead and still later from Sir Richard Livingstone - who quoting Whitehead urged the "habitual ~~vision~~ ^{vision} of excellence", the pursuit of excellence ^{the great & the good.}

I should like to remind you of some of these great passages which I first read, read and reread in 1917 - almost half a century ago!

Thomas Huxley in his 1868 address A Liberal Education suggests a game of chess as "an image of human life" and then says

"What I mean by Education is learning the rules of this mighty game - Edⁿ is the instruction of the intellect in the laws of Nature under which name I include not merely things and their forces, but men and their ways, and the fashioning of the affections and of the will into an earnest & loving desire to move in harmony with those laws"

"That man, I think, has had a liberal education who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that, as a mechanism, it is capable of; whose intellect is a clear cold logic engine with all its parts of equal strength & in smooth working order; ready to be turned... to any kind of work and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great & fundamental truths of Nature & of the laws of her operations; one who, no stunted ascetic, is full of life and fire, but whose passions are trained to come

to heel by a vigorous will, the servant of a tender conscience; who has learned to love all beauty whether of nature or of art, to hate all vileness, and to respect others as himself."

From Dean Inge's essay, I quote the following: "The ideal aim of education is that we should learn all that it concerns us to know, in order that thereby we may become all that it concerns us to be. In other words, the aim of edⁿ is the knowledge not of facts but of values. Values are facts apprehended in their relation to each other and to ourselves. The wise man is he who knows the relative values of things. In this knowledge and in the use made of it is summed up the whole conduct of life."

Education is essentially a training in values was, of course, Plato's teaching for whom the supreme aim of edⁿ is human goodness in the widest sense, a habit of mind attuned to ultimate reality "intimate with the eternal order of things and the music of the spheres"

But while a beautiful phrase like 'the eternal order of things' conveys something almost mystical to ones mind, I early learned the importance of the fact that Truth is never static

In 1922 I heard Sir Joseph Thomson say to a class in the Cavendish lab. in Cambridge 'A theory is a tool not a creed'.

This I passed on to, I suppose, every class of students I have lectured to. Knowledge progresses by using the truths of today as stepping stones, as rungs in a ladder, as tools towards a fuller richer statement of truth and the truths of yesterday become ^{part of} the history of ideas.

"Truth only is living
Truth only is whole" wrote Swinburne,

and nothing that is living can be changeless

Our horizons are forever being widened in every realm of experience - religious, artistic, sociological and scientific. and we want our students to feel something of the thrill & excitement of the chase as new ideas appear over the horizon and are run to earth. We know that all our students cannot be participants in research, but we covet for them all appreciation of true scholarship when they see it.

+ Virginia Woolf
 Ride your mind at the gallop
 across country in pursuit of ideas.

One of the great pleasures of retirement is to have time to reminisce about the things that have inspired one in the past - as I have just been doing.

And about interesting people who made an impact on our lives - professors and students and many others ^{whom} I have ~~met~~ met in many lands -

Another of the joys of retirement is having more time to read:

Rothschilds, Michael Angelo, Remon, Picasso
 Violet Bonham Carter's Life of Churchill, Dunsen, Butler, Keats
 Moreheads books on The Nile, Cottrell on Egypt
 A history of Australia & New Zealand
 Everything I could lay hands on about
 Cambodia, & Thailand - next Iceland & The Sagas

This brings me to another joy of retirement freedom to travel when I wish & without the sense of rush to be back for the opening of another college session -

- 1964 - Africa, Ireland, Germany, Greece
- 1965 - Japan, Hong Kong, Cambodia, Thailand, Malaya, Singapore, Australia, N.Z., Fiji, Hawaiian Isls
- 1966 Feb. Mexico

Q. graduates met in

Egypt - Miss Chapelaine, D. of Ambassador 148

Uganda - Makerere Univ. Col. Hist. RW Bengey

~~Kenya~~ - ~~Harriet Thompson Mitchell~~ 158

Kenya - ~~Harriet Thompson Mitchell~~ 2nd Mrs. Harrison (Jerry Shortt) Zool.

Rhodesia - B.M. chief - Ed. Sompoti 148

Nigeria - Helen McManis Small. MA, Hist. '69

Ghana - Mr Cornett - High Commissioner

Germany - at I.A.U. D. Hogg MSc
S. Samquist MSc

Athens - Theras Calli. 1 yr at Q.
now Social Worker with
U. of Ottawa degree.

Hong Kong - Barbara Roske - Prof. of Eng.

N. Z. Auckland - Barbara Excell - Ph.D. Phys. Biology

Time to dabble into ones hobby - for me
The history of Science in general &
astronomy in particular

- 1) Early Scientific Writings in Cosm. part of Can. lit. Ch. 24
- 2) Gods glory in the Heavens.
- 3) Genghis Khan - 1226 -

Enjoyment of Cuisine -

Matted

The I.A.U.

Rose Kingston Centre
1978 Feb 21.

Pres. Leo Enright
Recorder John Levy.

The I. A. U.

oldest member of I.C.S.U.

Refs. Edd p. 95
Orig Hist p. 204

Early cooperative groups - 19th & early 20th C.

Intl. Geodetic Union

Carte du Ciel

Intl. Solar Union

IAU founded July 1919 - in Brussels at a meeting of Intl. Research Council

11 nations - 32 Commissions

Com. 1 Relativity - Chairman Eddington

1st Congress IAU - Rome May 1922 Pres M. Boullaud
Dir Paris Obs.

1st Secretary A. Fowler, London

17 countries -

2nd IAU. Cambridge 1925

3rd " Leiden 1928 W. de Sitter, H.A. Lorentz

4th " Cambridge, Mass. 1932

~~4th~~ following total eclipse, 31 Aug '32.

Public Lecture MIT by Edd. "The Expanding Universe"

see Edd p 105 Top para.

5th IAU Stockholm 1938 Pres Dr Eschagon, Paris

New Pres. A.S. Eddington

war years Edd died 1944.

6th IAU Copenhagen 1946 - only 11 countries
+ Vatican 1 delegate

7th IAU Zurich 1948 Pres Sir H. Spencer Jones [USSR] ^{refs.}

Com. 40 Radioastronomy began. Long radio wave
15 cycle detected from Sun by Mangel.

hematite confident Edd's Fund. Thy. important

Klein of Stockholm on statistical distribution of
elements in a hot dense nucleus of star - a diff.
approach from Chandrasekari.

Lyot France - Corona without or total Eclipse

Hindblad (Sweden) succeeds Spencer Jones (U.K.)

Stromgren (Denmark) " Oort (Netherlands)

8th IAU Rome 1952 - Met Rosa Garibaldi at
 Inaugural at Campidoglio on Capitol Hill.
 Baade from 200" plates announced new zero pt
 for Classical Cepheids. \therefore extra gal. neb. twice
 as far away. \therefore M31 as large as 7 own galaxy.
 Lemaître on effect of this on Fund. Thy.
 USSR papers given in Russian.
 Evolⁿ of stars - many theories - melting pot.
 To Vatican observatory at Gaiola Castle in
 Alban Hills. Papal audience - address in French.
 Hoyle on continuous creation of matter.

9th IAU - Dublin 1955 - Struve. [Mag red Saha on
 ionization equilibrium]
 Advances in infrared photography
 Invitations to Moscow '58 & Calif, '61.

10th IAU - Moscow '58 Dr Danjon, Pres, ^{new Pres Oort} Sadler Sec
 Dr Essen - caesium clock.
 1st Sputnik was up - Symposium Artificial Satellites
 Pulkova Obs - Leningrad (1839) + rockets + unmanned balloons
 Symposium on Origin of Earth - Sir Harold Jeffreys
 believes core of earth liquid.
 Planets - how formed Kuiper vs Hoyle - Urey vs.
 Evolⁿ of stars - Hoyle, Manneick
 Luminosity of Cepheids - Payne-G. & c
 Galactic Centre - Sag A source? Oort
 Hoyle 1% mass of Universe now in heavy elements
 by nucleogenesis. [AVD to Com 46.]

11th IAU Berkeley Calif 1961 Pres Oort, next Pres Amherst Juniors
 Taiwan admitted & \therefore China withdrew
 24:5 with 3 absolutions i.e. 32 countries.
 Radio astron - Mills X, Oort
 Matkovski 730 planetary neb in Palomar plates
 (Cf under 100 HW Russell 1929 "probably complete list")
 Zwicky on Supernovae - most distant known 800 million l.y.
 Radio sources elongated & crescent 174 known

11th IAU Berkeley '61 cont'd.

Cooperation in Space Research COSPAR

10 scientific Unions - 18 countries involved.
Visits to Mt Wilson 5700 ft, Mt Palomar 5560 ft.

12th IAU Hamburg 1964 Pres Ambarzumian.

Report on Quasi-stellar objects (QSO) & Radio Galaxies.
OH absorption bands in spiral arms of our Galaxy.
OH formed by slow pos. ions.
Ranger VII photos reduced back from moon.

13th IAU Prague 1967.

Martin Ryle on quasi-stellar objects now over 100

14th IAU Univ. of Sussex, Brighton 1970 - Pres. Heckmann

French estimates 20 to 40% more He in young stars
A Underhill protested - no reliable criteria for abundance
Mars: Never had terrestrial phase. See Cap CO₂.
evidence from Mariner's fly-past. UV + infrared
42 not-associations present & absent = 46

15th IAU, Sydney 1973.

Carl Sagan on Mars 1971 Probe - water worn river beds
evidence of 4 epochs of glaciation before present one.
Interstellar mols. the organic basis for living cells.
" clouds are predominantly mol screened from UV
disintegrated by dust particles
Cosmology of Sciama converted from Steady State th. to
Expanding Universe.

16th IAU, Grenoble 1976.

X-ray binaries and neutron stars
Mag. fields of planets.

Mars Carl Sagan on Chem. test of soil. many inorganic mols.

Pic du Midi Obs. alt 9350 ft 2 m reflector

Lyt was astronomer here - solar corona.

2200 at this Gen. Assembly 40 commissions now
49 countries active, though some are
numbered up to 50

17th IAU Montréal Aug 14-23 '79.

May this continue to be a happy society —
happy because each individual member
in spite of all the disharmony in the
world around us — is filled with
what Alexander Pope called

"The soul's calm sunshine".

McGill Alumnae — 20 May 1971.