

Correspondence H

Publication/Creation

1843?-1909

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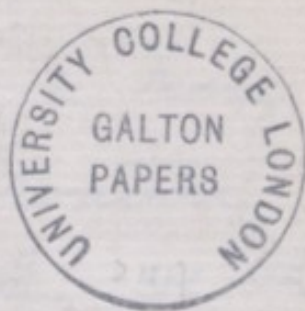
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Prof Haddon

29 F.1



Mar. 16 1891

Dear Mr. Galton,

Cunningham suggested
to me the other day the anthropological
value of the ridge of the hard palate.
In discussing the matter we came
to the conclusion that it promises
to be a character of very great
value - the ridge varies to a
certain extent with age &
probably will be found to be a



Valuable additional character
for Ethnological purposes -
do you happen to know whether
anything has been done in this
direction & can you suggest
a method for readily obtaining
the casts?

Cunningham prefat the
other volume of the "Anthropological"
to state that we not only intend
taking the antero-posterior & the
lateral measurements of the head

but we also propose in many cases to record the curvatures of these axes. To do this we shall employ the same instrument into which Cunningham has recorded lumbar & other curves - namely a strip of lead, ^{abt.} $1\frac{1}{4}$ inches in length,

N.S.

to which wire points are soldered - by pressing this down firmly on the head, ^(flat side down) the lead takes the curvature of the head. Then the lead is put on a piece of paper, edgewise - ~~with~~ ² the points are pressed into the paper; by running a pencil along the lead

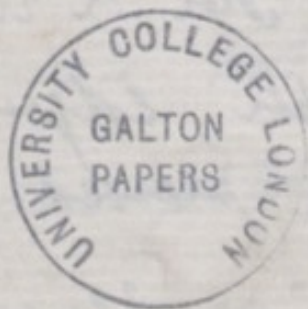
The exact curve is reproduced - At
points preventing the head from
shifting - The hair does not appear
to make much difference - We know
of no other means, except by photography,
by which the curvature of the head can
be recorded & this is an important
character.

With kind regards,

Believe me to be -

Yours faithfully -

Alfred C. Haddon.



13 Palmoreta Road

Prof Haddon

Dublin F.S.



Dec. 1 1891

Dear Dr. Galton,

You may remember
that we talked about the Imperial
Institute and a Bureau of
Imperial Ethnology some time ago.

I have at last put my ideas
into shape at the request of
Dr. Flower. As he knew

Mr. Knowles of the 'XIXth Century'
he kindly offered to forward
my MS. with a letter. Unfortunately

it was declined on the score
of "want of room" -

As I am unknown in
London - may I ask you to be so
kind as to take this matter in
hand - I do not regard it as
a personal right at all and
sincerely believe that some such
scheme as that which I advocate
would be supremely important
for the nation.

May I ask you - I - to

read & enclosed & to make
what alterations you deem
advisable. Flower accepted
it in bloc!

If you approve of it - Could
you place it for me? I hear
that you know 'everybody' and
I also hear that articles are
accepted more by personal
introduction than by any other
way - I should like to put
it in the 'Contemporary' or
'Fortnightly'

I may add that the scheme
has the approval of such men
as Flower, C. H. Read, & others
in London.

Macalister - J. E. Waga -
 von Hugel, etc in Cambridge
 & of several Continental
 Anthropologists - Gipholi -
 Topinard - Blinck - etc.

I would like the Editor
 to know that the article is not
 written to sell - but because it
 had to be written - and it has got
 to be published - somewhere or other
 in some form or another - the
 sooner the better - as the Institute
 will be finished in May - at
 least so they told me when I
 went to enquire.

I am sorry to trouble you -

Prof. Haddon

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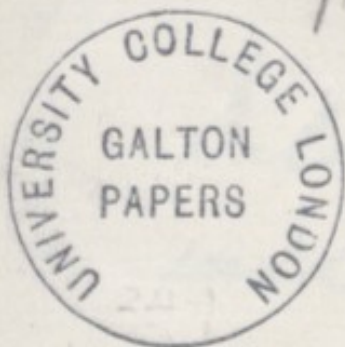


but I have no one else to
turn to -

Our laboratory here is now in
working order & we have
secured an enthusiastic young
doctor to take measurements -
he is already devising improvements
in our appliances - I hope we
shall do some good work in
the near future -

Yrs. faithfully -

Alfred C. Haddon



Prof Haddon.

1894 F.13

INISFAIL,
HILLS ROAD,
CAMBRIDGE.

Dear Dr. Galton,

A friend of mine
Dr. A. Willey is next
month going to New Britain
to work on the embryology of
the Nautilus, etc. He is
interested in Anthropology
and is going to take measurements
etc.

Could you send me
one of your little boxes
for taking paper prints
He has offered to do
what he can for you
in that line, & it
would be a good
opportunity to get
not only New Britain

Melancians - but he
could probably be able to
get a ~~large~~^{number} of these
peoples as well.

His address is -

17 Acton Lane,
Harlesden,
N. W.

If you have any other
suggestions to make I am
sure he would do his
best to carry them out

Yrs. faithfully

A. C. Haddon

(+)
I can find
his initials!

A. C. Haddon

Apr. 29. 96 ¹¹⁷

INISFAIL,

HILLS ROAD,

CAMBRIDGE.

Dear Dr. Galton,

I have just made
the acquaintance of a Mr. (+) Robinson
8 Spring Terrace, Richmond.
Who is going to New Guinea in
about a fortnight's time to
collect Nat. Hist. Spec.
especially, if he can, among the
Mountains & the interior & the
watershed of the Fly River -
Of course I put in a strong
claim for Anthropology & have him!



literature. to do him justice
he had intended doing something
& I told him however much he did
he would - when he got home - be
sorry did not do more!

I have had a chat with Dr
Rivers about the possibility of his
doing any psychometry - and he
said you could but advise on this
point. Would you be good
enough to see the young chap &
to give him advice - and if possible
a little demonstration -

I am asking Abney to put

him on to 'colour-blind' tests -

For vision I am going to get a special ~~set~~ card set up - containing only 2 letters - say O & V. We must remember that people can't read - or only a few miseducated ones - but they could soon be taught to discriminate between 2 letters, which might be called by any name -

Would it not be well for him to test tactile sensibility on the back of the neck - also ~~some~~ hearing test - As some tribes are archers & others are not, the 'bow-drawing' dynamometer would be interesting and perhaps the grasping strength.

I'm sorry the last man did nothing with the finger-prints doubtless this one will.

Mr. Robinson will have a chance
 of studying all the Polynesian
 mission-^{teachers} attached to the L. M. S.
 in New Guinea -

The main tribes of Brit. New
 Guinea - including the aborigines
 ("Papuan") & the immigrants (i.e. Motu,
 most of the Louisiade people etc - =
 "Melanesians")

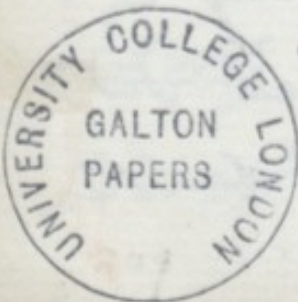
Some Australians - probably -
 Some Malay & other nationalities

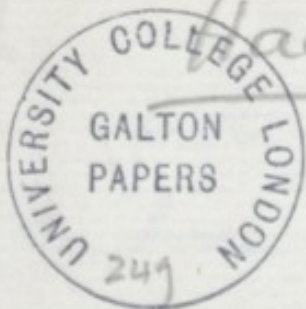
I saw an appeal by you in Nature
 for personal histories. I think I can
 be some filled up for you & you
 will send me a few schedules -

Believe me to be

Yours faithfully

A. C. Haddon





Haddon.

Dec. 23 '97

INISFAIL,
HILLS ROAD,
CAMBRIDGE.

Dear Dr. Galton -

You issued a small
pamphlet in connection with your
labry. containing several essays -
one being "How & Why we measure
Man" - (I think that was the title).

I have lent my copy & can't
get it at just now - Could
you please lend me a copy
as I ~~want to~~ refer to it in a
book I am writing. I am
now in a proof stage & am

1812
HILLS ROAD
CAMBRIDGE

'stuck' for want of it.

You remember you sent me
a few years ago one of your
finger print boxes. I am
sorry that I never heard from
you my correspondent. Could
you let me have another.
This time I will see to it
myself.

I believe you have heard
that I am going out again to
Tower St. & I shall finish off

with 3 months in Borneo -
 I am taking out 6 Anthropological
 students with me - mostly
 Cambridge men - so I hope
 we shall do a good turn for
 Anthropology & Cambridge @
 the same time.

I remember - now - you
 interested yourself with the
 R. G. I. for me - The
 Council gave me £150 - Thanks
 for your help in the matter
 With seasonal greetings
 Yours faithfully A. C. Haddon

(Haddon)

f25



Royal College of Science for Ireland.

Stephen's Green, East,

Dublin, Jan. 25 1901

Dear Dr. Galton -

Many thanks, indeed,
for your kind letter.
I feel I have done so
little to deserve such
confidence - at all
events my heart is in
the work and no man
can do more than his best.



I am sorry for your
failing hearing -

You have lived long
and worthily and it must
be a satisfaction to you
to find your labours fully
recognised and your
example and character
honoured - - Believe me
ever to be yours faithfully
Alfred C. Haddon

Copy

Misfail Hill Road
Cambridge

F.29

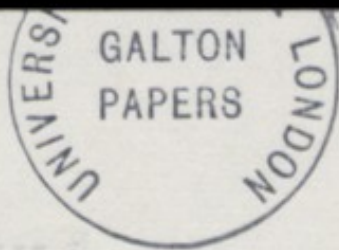
24 June 1901

Anthropological Institute
3, BERTIE TERRACE,
LEAMINGTON.
8 Hanover Square London

My dear Mr. Galton,

I have been commissioned
by the Council of the Anthropological
Institute to ask whether you
would do us the honour to deliver
the Huxley Lecture this Autumn
or early winter, & at the same
time to receive the Huxley
Medal.

We would like in this way
to emphasize our appreciation
of the value of your researches
which have placed biological
data on a prime mathematical



F.30

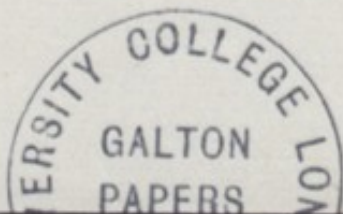
basis. You have been the
pioneer in the Mathematical
School of evolution, and
anthropology has benefited
enormously, not only by
your own investigations,
but by those which you have
directly & indirectly instigated
& inspired. -

Who then is better fitted to
discourse to us than a pioneer
investigator in one corner of
that field of which in other
departments Huxley was a
brilliant exponent?

we sincerely trust that you
will add another self denying
good deed for the sake of
anthropology & will favour
the Institute & benefit
our Science, by acceding to
our ~~wy~~ request.

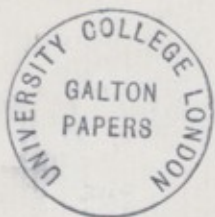
Believe me very dear Mr. Galton
Yours most faithfully
Signed Alfred C. Haddon

Mr. Haddon is President of
the Anthropological Society, & was the
Leader of the late Cambridge
Expedition to Torres Straits &
North Borneo & was previously
known as a Scientific Traveller



F33

Inisfail, Hills Road, Cambridge



ANTHROPOLOGICAL INSTITUTE,
3, HANOVER SQUARE, W.

June 24 1901

My dear Dr. Galton,

I have been commissioned by the Council of the Anthropological Institute to ask whether you would do us the honour to deliver the Huxley Lecture this Autumn or early Winter and at the same time to receive the Huxley Medal.

We would like in this way to ~~emphasise~~ emphasise our appreciation of the Value of your researches which have placed biological data on a firm mathematical basis. You have been the pioneer in the mathematical school of Evolution, and Anthropology has benefitted enormously not only by your own investigations but by those which you have directly and indirectly

ANTHROPOLOGICAL INSTITUTE,
3, HANOVER SQUARE. W.

instigated and inspired.

Who then is more fitted to discourse to us than a pioneer investigator in one corner of that field of which in other departments Huxley was a brilliant exponent!

We sincerely trust that you will add another self-denying good deed for the sake of Anthropology and will favour the Institute and benefit our science by acceding to our urgent request.

Believe me, my dear Dr. Galton, to be

Yours most faithfully

Alfred C. Haddon.



June 26. 1901

F35r

My dear Professor Haddon

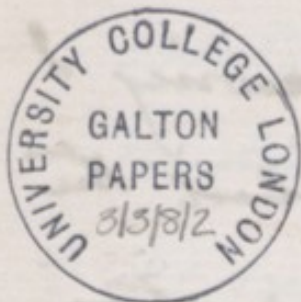
I am very sensible
of the honor ^{by the Council of the Anth. Inst.} of being asked
to deliver the Huxley lecture
& to receive the Huxley medal,
and ^{especially} thank you for the very
kind ~~way~~ ^{terms} in which you ask
me to accept

This I will do with
pleasure, ^{the lecture can be given} if in the autumn;
but I could not pledge
myself to a later date,
as the doctors may urge

by going abroad ^{again} to avoid the
winter. Please then allot
me ~~the~~ the earliest
convenient day.

Y^r
H





G Lutterland Place.
W.

Feb 20: 92.

Sir,

In a recent correspondence with
Professor Tyndall, in which I put
before him the following facts, in
view of ascertaining what, or if any,
knowledge he might have of them,
he mentioned your name to me as
more likely to have met with them.

— I therefore am addressing you with
the same object, and should be most
interested to hear what you say of
them. —

In the course of a professional
Francis Galton, Esq. F.R.S.

practice in teaching Drawing I
have thoroughly established the
fact by continuous observation
that students when making their
errors do not do so according to
the bias of superior or inferior in-
tellect (stupid or clever): by suggestion
of individual ideas, but uniformly,
consistently, invariably alike, thus
indicating errors made by definite
laws of their organisation. When
I had discovered this, I looked
for the phenomena in specimens
of drawing made by ignorant
draughtsmen, like lithographers

oriental designers (Japanese, Chinese,
Hindoo) and found them accordingly.
At present I say no more, except
that I have communicated with
several men of eminence (Spencer,
Huxley, Sir P. Lushington, Tyndall,
Dr. Sully) who claim no acquaint-
ance with them, and (although
there is a touch of irony in it)
I found Professor Huxkorn,
(Hude Prof?) and L. J. Poynter
of S. Kensington disinclined to
answer me at all.

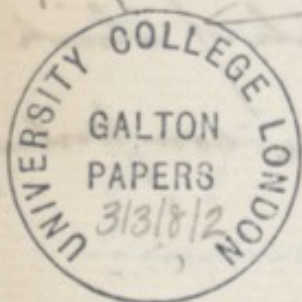
Awaiting any notice you may give to
this letter.

Yours truly

Arthur L. Haddon.

A. L. Haddon

15



9 Lutherland Place
W.

Feb 22: 92

Dear Sir,

I am much gratified by
your interesting and appreciative
reply to mine of the 20th inst.

Your illustrations of obliquity in
drawing seem founded on the im-
aginative faculty, but many phenomena
are purely mind results. To show
this, I take the liberty to trouble you
with a specimen — the laws as they
affect those who attempt to draw
The Cylinder.

This specimen is only one of a number

of geometrical forms, each of which
in turn develops its own compensatory
errors.

I need have no fear of the man.
Lament of these facts - they are daily
and hourly and yearly exemplified
in the work of my pupils, of true
constant scientific recurrence.

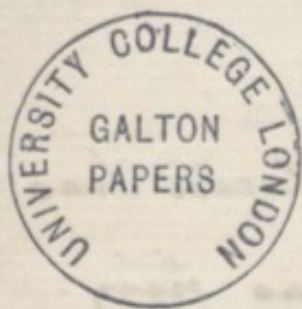
As it is my desire to bring these laws
before the Royal Society - itself, and
the Assoc. Sci. I inform me each
paper must have a sponsor who
is a F. R. S., it might be possible
that you would lend me any such
assistance in so doing?

One result I think most singular and significant - there is here an apparent demonstration of the automatic nature of mental process in conceiving a definite idea - there is no flexibility or play in the mind but a hard domination by necessity to do but one thing in a given case.

Yours faithfully yours

Wm. L. Garrison

Francis Galton, Esq. F.R.S.



9 Rutland Place. W.
Feb 23: 92

Dear Sir,

I thank you for your second letter, yet perceive there have been mis-conceptions by you of the nature of my facts. I found that in the case of Sir P. Lightfoot, but they are simple enough in essentials: — All forms (not merely squares) of a geometrical kind set up in the mind a series of false conclusions at first view. These errors occur with the invariability of a law.

However the correspondence has
been effectual so far as my
object went — at Prof: Tyndall's
instance to ascertain from you
if you knew of anticipation of
my discoveries, on your own part
or others. I gather you do not.
Had you been able to foster my
work I should have been glad,
but it appears impossible,
yet you may rest assured my
caution has induced me to wait
till the evidence of years has
left no doubt — the thing is,

else
Who knows of the facts?

The curious facts you drew my
attention to are very interesting
but none seem to me to be more
connected with the intellectual
structure we all possess.

Thanking you very much for your
attention,

Yours truly,

James Lind

A. L. Haddon.

Francis Galton, Esq.

F. R. S.

19

The Causes of Error as they appear in drawing The Cylinder.

—
In four positions (definite.)
—

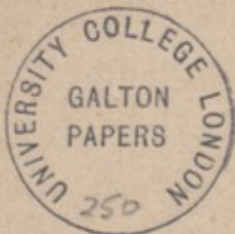
1. Place the cylinder upright on its end immediately on the line of sight (in your front.)

1st error. — A circle may be drawn for the top instead of an ellipse.

2nd error. — The base curve, or any circles that may occur on the cylinder (or as part of it) at intervening heights between base & top will be drawn flatter and flatter as they descend, the lowest being flattest.

Note. Of course the reverse should occur.

2. Place the cylinder about a yard, or less, to right or left, and let its circles (or ends) be in right angle planes, its length parallel to the picture plane (which is always par^t. to the surface of the cheek & forehead.)



2nd error. — The ^{length} lines (parallel) of the figure will be drawn opening out, not closing to a vanishing point.

3rd error. — The curve of the ellipse (if ellipse drawn, as most would) will be greater in the near end, and flatter at the far end. Exact reversal of fact. But the inclination of axis line of ellipse will now be seen and shown properly.

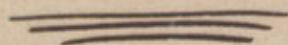
4. Place the cylinder at about a yard, or less, to right or left of your line of sight, and with its length now in the direction of a right angle with your picture plane; ends parallel to the same (of course.)

1st error. — An ellipse will be drawn for the near end, instead of a circle.

2nd error. The rectilinear lines of the cylinder, that run off parallel to the line of sight, will be drawn on the paper as vertical

lines.

Note. Of course, as these lines are parallel to the line of sight (or centre line) which is a right angle, they must be right angles, and vanish to the V. Point on the horizon on the line of sight, or slope across the paper, but this is never done.



General Note.

It is in all cases assumed the mind put to this task (or tasks) is a tabula rasa in the matter of drawing, or the raw material of intellect. But pupils constantly sit side by side (and even look over each other) and yet perpetrate the errors.

P.S. Where the word may is used (thus) it means there is evidence of compulsion to the absurdity, but common sense saves from the doing of it.

A. L. H.

Kindly preserve this paper.

f12v

A. L. Haddon



Haddon

F17



Long Lodge,
Lanbury Park Road,
Kingston-on-Thames
Oct 15: 94

Dear Sir,

I called upon you today in the hope I might have a personal interview to speak on a subject about which I corresponded with you some two years ago — The Fixed Errors in Drawing. Circumstances have hindered me from developing the matter, but I have now prepared a portion of the diagrams, and submitted them to a firm, Messrs. Benrose & Co., Publishers, of Newgate Street, E.C., who propose to consider them.

Thinking you might desire to per-

Thus the promulgation of this matter
 as ^{one} ~~a matter~~ of scientific interest I
 acquaint you of this because I think
 if you were to see these diagrams with
 their beautiful accuracy to those
 laws of error you would do me a
 service by impressing those publishers
 as regards their interest and prac-
 tical use.

My idea is (but subject to better opinion)
 to bring out the diagrams in a form
 to be handled by all teachers in the
 subject, and also by scientific bodies,
 who can see here evidences of uni-
 form description implying a mono-
 tony of conception that must be

important, as bearing on mental action.
 But I need not enlarge on that - that
 has been grasped by all to whom the
 matter has been divulged with the
 examples.

I am dear Sir,
 yours truly
 A. A. Haddon.

Francis Galton, Esq., F. R. S.
 42 Rutland Gate,
 S. W.

The present diagrams are at Mount. B.
 & C., but I shall complete them with
 others.

Hale 1887
Ontario
Clinton, Ontario, Canada,

July 12, 1887



Dear Sir,

I do not know whether
you will have seen a pamphlet
containing an address on the "Origin
of Languages and the Antiquity of
Speaking Man," which I had occasion ^{to deliver}
at the last meeting of the American
Association for the Advancement of
Science. I sent a few copies to
my friend Mr. Bloomer for distribution,
and think it possible that he may
have handed you one. If not, I
shall have much pleasure in sending
you a copy, if you will favor me
with a line to let me know that this
letter reaches you.

This Address was the summary of a portion of a work in which I have been engaged for several years. It was put forth chiefly in the hope that it might awaken an interest in the suggestions it contains, and thus bring me some additional data which were needed. In this object I have not been disappointed. Many facts have reached me illustrating the views thus proposed, and in some respects correcting them.

There are one or two important points in which I think materials exist in print, which have not come within my knowledge. As these facts are in the line of your researches, it has occurred to me that I

might venture to trouble you with
some inquiries as to the works in
which they will be found. If you
will be kind enough to let me
trespass upon your time in this
manner, I will endeavor to make
my queries as brief and as little
burdensome to you as possible.

I send you at a venture
two small pamphlets and a copy
of "Science," which I hope
will reach you. One of the
pamphlets contains a magazine
article, abridged from a paper
read by me at the Montreal
meeting of the British Association,
under the title of "The Origin of
Warmness." My good friend,

the editor of the Magazine, thought
proper to rechristen it with a finer
and perhaps too comprehensive
title.

Let me take the opportunity
of thanking you for the great
pleasure and instruction that I
have derived from your works,
which may almost be said to be
making anthropology one of
the "exact sciences."

I am

Very truly and respectfully yours

Heratio Hale

Francis Galton, Esq.





X

H. Hale

F.S.

Chatham, Ontario, Canada,

April 9, 1887

Dear Sir,

I am much obliged for
your courteous response to my request.
I shall look with interest for the
appearance of Prof. Ferriar's memoir.
It is indeed surprising that our
great anatomists, while rejecting
utterly, and doubtless on good grounds,
the theories of the Gall and Spurzheim
school, have been able to give us
thus far so little in the way of
assured results, to supply their place.

I wished to ask you whether
anything important has been published
on the question of the special effect
produced on the offspring by impressions

f6

made on the minds of the parents,
either at the time of conception
or during gestation. We are all
familiar with cases of monstrous
births, supposed to be due to such
impressions. I enclose a paragraph
which I have found in a newspaper
since my letter to you was written,
and which furnishes a specimen of
the sort of cases referred to.

As regards similes (supposed)
results of a physiological character,
I may mention two. The parents
of the famous calculator, Zerah Colburn,
lived in Vermont at the time when
most of the cloth used in a family
was spun and woven by the housewife.

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It is said that his mother, while with child, lay awake one night for a long time computing with intense effort the quantity of yarn which she must spin to make a certain measure of cloth.

You are doubtless familiar with the story of the first Napoleon's antenatal experiences — how, when he was, as we say in the legal jargon, en ventre sa mere, his parents became involved in Paoli's war, and were brought into circumstances of peril and excitement, resulting in his premature birth.

This, you will observe, is not the ordinary question of the hereditary transmission of mental and bodily traits, nor yet that of the influence of the environment, in the usual sense. It is a specific question, and one, as it seems to

P.S. I send you a 12th of Science, containing an article on Miller's "Inheritance"

18

me, of great scientific importance. I have had occasion to consider it while gathering materials for a work, of which my Buffalo address is in part a summary. It has struck me that the secret of the apparently sudden origin of species, in many cases, might be found in the study of this class of facts. Its bearing on the origin of varieties, and also on the causes of the mental and moral differences among children of the same family, is evident enough.

I dare say that the subject has been treated by scientific writers - possibly by yourself - in publications which, in my secluded position, have not happened to come under my notice.

This letter has extended to a greater length than I had anticipated. Kindly excuse this trespass upon your time, and believe me
Yours sincerely,
H. Hale

—Mrs. Krettschner, a German lady of Bridgeport, Conn., gave birth recently to a male infant which has an elephant's head and in place of a nose, a short trunk. The mouth and lips are like those of an elephant. The child weighs about nine pounds and can be fed only with a spoon. The mother visited the circus winter quarters during the past winter and was terribly frightened by the elephants.

American paper

March, 1887

f9r

mouth organ
n, was kept
a, after a few
visitors, the
parently well
programme.
pupils present
rs wers count-
s increased to
ight. Show-
No. 6 are
of education.

well filled. We hope
ings may be the mea
good.

His Lordship the
Huron intends mak
through this section o
some time in May w
hold a confirmation
Episcopal church here
Mr. Parke will organi
Friday evening next, i
for the rite of confirma



f.9v



x Stanley Hall

F.1

Johns Hopkins University
Baltimore Md. U.S.A.
Oct 31.

Dear Sir,

May I ask you if any catalogues
report on description of my articles
be obtained if its apparatus for
orthography or testing. I have recently
asked its little French reputation in London.
I have looked & asked for it in vain.
Could I also learn (so far as it
may have been made public) what
plans are matured for an orthographic
Bureau of wh. Dr. Billings told
me the other day.

With great respect
very truly
S. Stanley Hall



Stanley Hall

Johns Hopkins University
Baltimore Feb 17 87

My Dear Sir.

Hippi's chronoscope is not quite accurate, as there is probably a slight retardation when the revolving wheels are thrown into place by the magnet but this is very slight, & with its reset spring adjustment on the fly wheel I think reliable enough for all comparative measurements, & it is so rarely used that we have made one recorded, ten reactions per minute with it.

I am not quite clear from your words whether you have a little psychiatric instrument & like very much with some improvement.

15v

As I use it modified. the spring is
heavier, longer stiffer & nearer the
glass than in the german instrument.



so heavy that its action is not retarded or
damped by the friction of the tinsel point
a. & still heavy so as to be easily moved to
the 8th of one vibration after it has been
lifted off. The axis of the spring where
it passes ^(c) has to be very stiff of course.
I have tried to connect with rod b,
by which the spring is loosened & electric

connection broken, a sound-test,

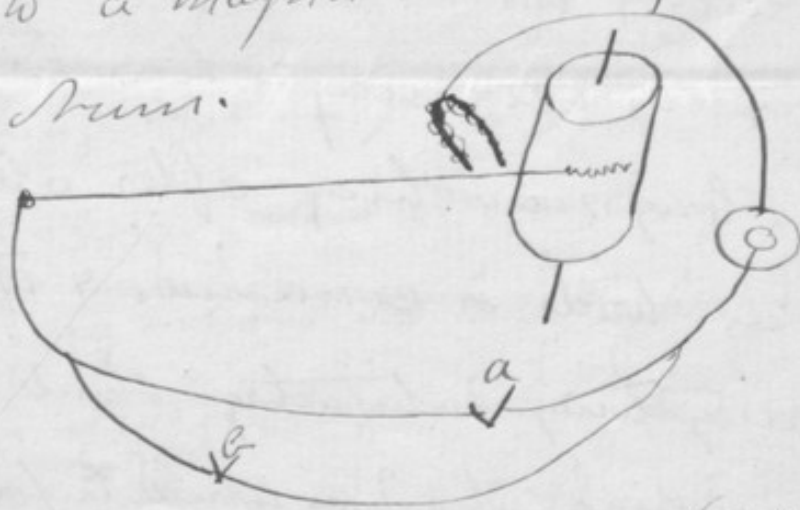
made of a spiral spring. loosened from
& striking on its same plate ^{each time} (concave)
& passing when loosened through the
same space. but with a force graduated
measured with a graduated thumb

screw at the center to which it is hung ^{for}
but not as yet with entire success.

I have used a long spring striking a solid
block of paraffin or ^{hard} rubber, &
connected from a clamp sliding on a
graduated scale, the block also sliding.

I found a test found is about as hard to
get as a standard class has been.

The simplest & surest measure for
reaction times I know is a simple
rod vibrating by its own elasticity some
50, or 60 times per second. & driven
on to a magnet. Turning directly
in a drum.



The experimenter opens the key a. (b being open)
& lets the rod play till the subject closes it b.

& show it ^{to the magnet} on again. This record can ^{flv}
be made still faster than with the Hipp.
& if a Marey's horizontal drum is used
with his sledges attachment, 100 records
can be made without once stopping the
drum & they can be counted at leisure.

Your tests, especially those of "quickness
& steadiness of hand, judgment of range,
of movement by sense of effort only"
seem to me of the highest value & interest.
I do not quite understand what you
say of "discrimination of quality of
sensation", but about the "appreciation
of varying & varying stimuli". I have
been long muddling after it so
far as touch is concerned. & if you
find anything satisfactory should be
greatly obliged if you would inform me
what it is.

as to the requirements of our laboratory

You would often be greatly disappointed.
 Most of our apparatus is extemporized
ad hoc, & our appropriation is small
 but this year I have six pretty good
 men attempting psycho-physiological research
 & that is all we can accommodate or
 seem attracted to.

Before closing may I take this
 first occasion to express my very great
 indebtedness both for insights & stimulus
 Weyn makes - & especially the Human
 Faculty. It has suggested a scheme of
 quartering children & young men up through
 our colleges, which would bring in
 very many returns & is interesting
 teachers of all grades. When the new series
 of lists is printed I will send you a set.
 I have asked the Aggenert here to send

a series of 26 Sargent physical
measurements, which most of
our Collge boys submit as a basis
for exercise in the gymnasium.

Very faithfully yours

G. Stanley Hall.



JOHNS HOPKINS UNIVERSITY CIRCULARS.

PHILOSOPHICAL COURSES.

PROGRAMME FOR 1884-85.

A. For Advanced and Special Students.

PSYCHOLOGY AND PEDAGOGICS.

PROFESSOR G. STANLEY HALL will direct the studies of all advanced students who wish to take up the study of Psychology or Pedagogy upon the following plan.

1. He will lecture twice a week in the Biological Laboratory on Psycho-Physiology. Though in the main, a continuation of the course begun in February, 1884, these lectures will be open to other graduate students who have heard Professor Martin's course in animal physiology or done work elsewhere which can be accepted as its equivalent.

Beginning with compound reflex-action and instinct in animals, such topics as memory, association of ideas, attention, volition and feeling in their morbid and normal forms will be discussed as far as possible on a physiological basis. The contributions of psycho- and neuro-pathology to the understanding of the normal function and histology of the cerebro-spinal nervous system will receive special attention. In connexion with this part of the course demonstrative and observational exercises in human neurology will be offered to those who desire them. The psychology and pathology of speech and writing will be illustrated. The psychological parts of anthropology, the evolution of the psychic faculties in children and in the race, etc., will be summarized and will introduce the psychology of national and other comprehensive systems of opinion and thought. In short, the endeavor will be to give as briefly as possible a general survey of the vast field of modern scientific psychology, with such details, demonstrations and illustrations as the time will permit.

This course is intended:

- For those who desire to carry on the study of biology by experimental methods into the study of the psychic functions of animals and man;
- For those intending to give attention to the study of psychiatric medicine;
- For those interested in medical jurisprudence or in linguistic psychophysics;
- For special students of philosophy.

2. He will encourage and direct Psycho-Physic research with carefully selected original themes approved by him, with a view apart from results, to the educational significance of these methods as a field of applied logic.

3. He will lecture once weekly on the History of Modern Philosophical and Educational Ideas, beginning with the scholastic period.

The views of representative modern philosophers will be sketched; and, as the basis of educational ideas necessitates a broader survey, selected chapters from the history of science, medicine, and belief will be added. In tracing the application of these to education in the broader and higher sense, such topics will be discussed as *e. g.*, the organization and operation of learned societies and scientific and other academies; the constitution and methods and history of European universities from the Renaissance; the educational value of philosophical systems; professional schools of law, medicine, theology, technological and industrial schools; the French, English, German and American school and college system in their method and idea; the development and nature of student life; history and theory of examinations and degrees and academic festivals and traditions; special methods and problems of pedagogics at the present time.

These lectures are especially designed to serve:

- Those graduate students desiring to become teachers or professors;
- Students of history, and more particularly of philosophical and educational opinion and method or those intending to plead or preach;
- Those intending to teach philosophy.

4. He will hold a weekly conference during a part of the year at which others whose names are to be announced later will assist.

5. In connection with the work of the above courses, rooms, apparatus, and books are to be provided, and bibliographies of a special and descriptive kind will be printed as guides to reading and reference.

HISTORY OF PHILOSOPHY AND ETHICS.

PROFESSOR G. S. MORRIS will give the following courses:

1. Lectures on the History of Philosophy in Greece.

Twice weekly, first half-year.

Topics involved:—

The beginnings of science. Anticipations of the modern doctrine of development. Establishment of elementary conceptions of physical science. First application of mathematical conceptions to the comprehension of the universe. Beginnings of abstract speculation. First successful development of concrete or substantial idealism, including science of method (logic), and philosophy of nature, man, the State, art, and education. Systems of practical philosophy.

2. Ethics, or the Science of Man.

Two lectures weekly, first half-year.

A consideration of the *principles* and content of ethical science, together with an historical survey.

Topics involved:—

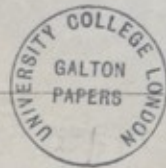
The different forms of science. Relation of ethics to anthropology, physiology, and psychology. The distinction and the concrete unity of body, soul, and spirit. Ethics proper, the science of man as practical intelligence. Man prefigured in nature. Self-consciousness. Its relation to animal instinct. Its realization in the moral organisms of family, State, and religion. Conscience. Will. The good of man: Happiness or pleasure? Character. The system of virtues and duties. The types of ethical opinion, as illustrated in the ancient and modern history of philosophy.

3. Professor Morris will further be prepared, according as the demands or needs of students may require, to lecture on the lessons of Modern Philosophy, the philosophy of the State (with special reference to Aristotle, Hobbes, Hegel, and Spencer), or "Real Logic" ("Metaphysics,"—with special reference to Aristotle, Leibnitz, and later German Philosophers).

BOOKS OF REFERENCE.

COURSE I:—1. Mollach, *Fragmenta Philosophorum Graecorum*;—2. Ritter et Preller, *Historia Philosophia Graeco-Romana ex fontibus locis contexta*;—3. The works of Plato and Aristotle;—4. E. Zeller, *Geschichte der griechischen Philosophie*, (German and English translation);—5. Ueberweg, *History of Philosophy*, Vol. I;—6. Noack, *Philosophie-geschichtliches Lexikon*;—7. Numerous monographs on special topics (to be found in the Library of the University and in the Peabody Library).

COURSE II:—1. I. H. Fichte, *System der Ethik*, 1 Band: *Geschichte der Ethik*;—2. H. Sidgwick, Historical Article on "Ethics," *Encyclopaedia Britannica*, 9th edition;—3. Aristotle, *Nicomachean Ethics*;—4. Martensen, *Christian Ethics*;—5. Spinoza, *Ethica*;—6. Bishop Butler, *Sermons*;—7. Kant, *Ethical Works*;—8. Fichte, *Works*;—9. Hegel, *Philosophie des Geistes*;—10. J. S. Mill, *Utilitarianism*;—11. H. Spencer, *Data of Ethics*;—12. H. Sidgwick, *Methods of Ethics*;—13. F. H. Bradley, *Ethical Studies*;—14. T. H. Green, *Prolegomena to Ethics*.



B. Course Required of all Matriculated Students.

This course will comprise five hours per week throughout the year, and includes Logic, Ethics, and Psychology (hence known as the L. E. P. Course). A special instructor will be appointed to assist under Dr. Hall's direction in this work, which will consist of lectures, recitations, themes, epitomes, etc. These subjects will be taken up in the following order.

1. Inductive and Deductive Logic.

Text-books: Fowler, with references to Jevons, Mill, Venn, Sigwart, and Wundt.

2. General Psychology.

Text-books: Sully's Psychology in selections, with references to Porter, Ryland, Carpenter.

3. Positive and Practical Ethics.

This part of the course will be taught in part by lectures and will comprise such topics as mental and physical regimen and hygiene, methods and general ends of study, the needs and sanctions of positive personal convictions and purposes in the conduct of the understanding and of life, mental self-knowledge as opposed to self-consciousness, and the utilization of individual experience in self-education, social ethics, need of religious sentiments for the maturity and sanity of conscience, etc.

Books of reference: Maurice's *Social Morality*, Grote's *Treatise on the Moral Ideals*, Wuttke's *History of Christian Ethics*, Wayland's *Moral Philosophy*, Calderwood's *Moral Science*.

4. In addition to the above required courses a series of lectures will be given by Dr. Hall, during the latter part of the year intended at once to conclude matriculate and introduce advanced study of philosophy.

For further information, during the summer vacation, letters should be addressed to the "JOHNS HOPKINS UNIVERSITY," Baltimore, Md., and not to the individual Professors, who are likely to be absent from the city.

Declined
April 4/99

Stanley Hall

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CLARK UNIVERSITY,
WORCESTER, MASS.

PRESIDENT'S OFFICE



March 15 - 1899

Sir Francis Galton,

My dear Sir,

This University will celebrate the close of its first decennium July 5-8 next & it is the purpose of the Faculty & Trustees to mark this event by inviting two or three of the most distinguished representatives of science to visit us on the above dates & to give three or four conferences or lectures on as many successive days. To these conferences we shall invite, as our guests & without fee, a few dozen of the best Professors in the various American Universities, all of whom are your admirers & would esteem it a great pleasure to see, hear, & know you personally. I beg, therefore, to extend to you in the name of the Faculty an invitation to visit us upon this occasion as one of the lecturers.

The compensation which we propose is Five Hundred Dollars (£100.) which can be

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sent at once upon your final acceptance of
this invitation. If this does not meet your
approval, perhaps you would suggest an ap-
propriate sum.

This University is the only one in the
country which is devoted entirely to post-graduate
work & to research, so that while we have had
to limit its numbers every effort has been
made to insure the highest practicable
quality of work.

Should you visit the United States, the
older institutions would, I am sure, be anx-
ious to see & confer their honors upon you.

We earnestly hope that this new sci-
entific bond may be established between us.

I am, with high esteem,

Very Respectfully Yours,

E Stanley Hall

President of the University.



P10

Ottawa, Ontario, Canada,

May 20, 1887

Dear Sir,

I am greatly obliged for the information with which you have favored me in your letter of the 24th ult. It does not, however, fully cover the purport of my inquiry.

I was desirous of knowing whether anything had been published on the subject of the origin of the great variety in physical and mental characteristics, which is found to exist among the offspring of the same parents. The subject of hereditary genius, which you have so well illustrated, is highly interesting and important. But still more

F. 11

important, as it seems to me,
is the question why one child in
a family is a genius - like Napoleon,
for example, - and another is
dunce, like his brother Jerome, -
why one brother has a passion for
music, and another cannot distin-
guish a note, - why one is stout
and fair, and another tall and
dark, and so on.

Everything has its cause, or at
least its invariable antecedent - and
the question is, what is the necessary
antecedent of ^{any} such variety? Judging
from the story of Jacob and his
manipulation of Laban's sheep, the
ancient Israelites seem to have held
the opinion that impressions made on

the mind of the mother at the time of conception had an influence on the physical traits of the offspring.

In the case of General Colburn, which I referred to, the mother's intense effort of computation might have dated at about the time of conception; and so might some special excitement of the father was in the case of Napoleon. Some very curious facts within my own knowledge seem to show strikingly the effect of impressions made at about this time.

It is clear that if, for the reasons you mention, the origin of these nerves is not to be found in impressions made during pregnancy, it must be sought in those made at an earlier period, - either at the time of conception, or while the ovum is forming, or possibly earlier still.

I had hoped that the work of

Prof. Cope in "the Origin of the Fittest" might throw some light on this question, but it can hardly be said to do so. He extends and applies vigorously the Lamarckian view of the effect of use and effort, but gives us nothing precise on this particular head.

I am not a physiologist;—but it strikes me that, in the present condition of biological science, there can hardly be a more important or interesting subject of inquiry than that which I have mentioned. I am surprised to learn that it has not yet been studied by any competent investigator.

With renewed thanks for your
reply, I am

Very truly yours,

H. Hata



the next month - I want to know
 how you are getting on without Wemyss.
 Many thanks for your offer of grouse.
 I think the governor is stodged with
 mince for the present so do not deviate
 from the correct line with Fazakerley to
 procure him a surfeit, unless particularly
 impelled by benevolent persistence - but the
 obliging offer shall be duly repeated at head $\frac{1}{4}$
 near grouse in want of coon or 3 Hallan
 Edinburgh
 Tuesday Sept. 12.

My dear Galton



Your letter was received by me at Aber-
 -feldie with mixed feelings of pleasure
 & disgust. the pleasure being that in-
 -ferable from hearing of your doing
 anywhere, the disgust, I confess, the child
 of envy & disappointment. I have
 been shooting myself in the most wretched
 manner occasionally killing a bird with
 a cartridge at 100 yards & then missing
 a dozen fair shots consecutively. The bird

however were really wild & hard begun
 to hunt in coveys of 40 or 50. Still
 I am game as a pebble (to use a favorite
 expression of Livingston's) & more
 bent than ever on becoming a good
 shot with serious thoughts of a moon
 next season if I can afford one or part
 of one. My stay at Taymouth was
 prosperous in all respects but shooting
 but it is an awful thing to go out with
 crack shot men who take the name of
 100 brace in vain perpetually as
 if it were a bad day's sport - &
 in a place where 6,000 hares were
 killed last week in a month by
 one man in a quarter of an hour -
 I had one 'day's' deer stalking if you
 apply that name to the pursuit of
 fellow deer who are however quite as

wild as the red - I never enjoyed anything
 so much in my life, the excitement
 being heightened in crawling on all fours
 & holding one's breath in sight of
 the brute - With all my exertions I only
 came up with one fair shot & that

I missed in the most provoking manner.
 I was out with Landseer who is a
 crack shot never missing & quite up
 to all the dodge of the sport; he had got
 to shot & killed his animal very neatly -
 at the close of the day I got up to
 a beast about 50 or 60 yards off who
 was standing full front of me not
 seeing me - I was on my face & whispered
 to Landseer "Shall I fire" - he said as
 I thought speaking to me "Wait" whereupon
 I missed my opportunity & a minute
 after the deer turned sharply round &
 bounded off at an immense ^{pace} - it turned
 out that the keeper was nudging
 him to fire & he was wishing me to

have the chance instead - He was not
 speaking to me at all - but I had
 heard so much caution' inspired a faintish
 The tailor like habit of putting a bullet
 into the haunch that I was determined
 not to fire till I knew whether the
 brute was in a right position. Was
 it not provoking? I would have given
 my eyes to have brought the animal
 down & I think I could really have
 done it had I fired. Taymouth is certainly
 a splendid palace & a very easy
 house to live it - I fell in with
 a pleasant party - always, excepting the
 awful Lady Jersey who with her daughter
 were coming the fine London ladies at
 a tremendous rate - I fancy my
 shooting experiences are over for
 the season as I doubt whether I
 shall go out at the place I am now
 going to. I shall be at Clifton with
 my family by the beginning of next
 week. Write please to 1. Prince's Building
 Clifton with my probable residence for

- cultural, and intend to come
out stirring on the Potato disease
next term
Yours most sincerely
H. T. Galton



Warrall Lodge
Thursdy October 3rd

My dear Galton,

I have been deliberating since
I received your letter on the
desirability of joining you, and
though finally overcome by the prospect
of certain ruin & highly conventional
difficulties relating to degrees and
other matters equally contemptible
I envy you exceedingly. The pleasure
of shooting at so large a mark

as a hippotamus of respectable
size ~~is~~ peculiarly attractive
to the mind of the infant sportsman
who like myself have been vainly
indulavouring to wit creation of
an or two or three member of partridges
during the last month. I trust
however that the terror of my arms
is beginning to be spread in the
neighbourhood as I have been
given to understand that a number
of highly respectable pheasants
the fathers of families whose
custom it has been for many years
to receive their levis on the first
of October have this year been
either totally refused or accepted
only on the payment of such an
extravagant sum by their respective
offices as must obviously have
reference to the introduction
of some new element into the
Sporting world to which it would

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be indelicate in me to refer more closely. Still as I said I fear after the blood of Pachydermata, and under proper encouragement would direct my artillery with great hope of success against any inoffensive animal, of large size, and easily vulnerable whom I might find sitting on the banks of the Nile.

Duty however calls on me to be serious. It is incumbent on me to point out the vast moral responsibility you incur, to warn you of the irretrievable disgrace in which all your friends will hold you, if when you are fairly committed to the pelagic streams, and bracing atmosphere of an Egyptian river you stop short of penetrating to the court of the Negus and repose for awhile under the shadow of the Arghum of the Universos. If you will follow my advice you will go right ahead

till you reach the Mountains of the Moon,
then taking the first turning to the
right continue your course until
you find it necessary to ask your
way; by which means you may
immerse ~~habit~~ yourself by discovering
the Great Central Sea, and by
which time I hope to be able to join
you there on any where else -

As you are anxious to have your
Dignity supported at foreign courts
you may rely on a handsome case
of brickbats with 'Robert Peel' or
'by her Majesty's command', 'From
the East India Company, private',
or addressed to you at every large
town, postage of course not paid.

Are you going before the end
of next week; on Friday the
10th or Monday the 13th at latest
I shall make my transit over
the London Dock & will attempt
to find you, if possible. I am
sorry you never came into this
part of the country as we should
have been delighted by a visit.
I am grown tremendously aghast



April 25th

My dear Galton,

Though my zeal for the Welsh
tour is as great as ever I
am afraid it will be impracticable
as I shall be kept here
under the douche until the
entire limit of my
tether - Sunday Subvenatorial

Scram have already
been uttered about
my not reading, and
I expect that the
instant - I am released
from the hospital I shall
be set down to following
guiding -

Meanwhile you cannot
do better being so close
than come over to the house
for the rest of my stay
here - There is hunting, and

though the mule is the only
animal procurable for
equestrian purposes, their
size appear quite in reply
to Oriental habits. There
are capital excursions
to be taken in the high-
-bouring country, and
between itself itself is
tremendously well scenery.
Please come and that soon
but I be washed away
and leave nothing behind
to mark my existence, but

a disassembled liver attached
by packing, and a few
open pores.

Ever very sincerely

H. F. Hallam

I wish

Gr Jolly '1

St. Malvern





Friday

My dear Galton

I should be most delighted to
dine with you at the Wyndham
but hope rather you will be induced
to change the place of our tête à
tête and come to dine at Wilton
Crecent - My respected Governor is
anxious to hear your adventures

and I will provide you with
an unlimited stock of weeds
to a late hour - Please come
as you do not seem engaged
to your Club - I suppose
the same hour (7) will
be equally convenient

Yours ever sincerely

H. J. Hallam

Wilton Crescent

I shall expect lessons in Figherea, and the summer exercise
 your going up mediculizing is a great blow, who
 is I am forth to tell me pleasant stories about Lepus,
 and purpuristic elephants and of the pea water: you had
 much better not become a person, but come with me to
 Maimachten in 3 or 4 years - you must inevitably go
 & Hallen

Wilton Crescent

June 24th 46



My dear Galton

Your letter was such an enormous time reaching me
 that if this to be similarly long in arriving at its destination
 I entertain serious doubts as to your getting it, particularly
 as I have been lazy and have put off writing till the
 day before I start for Ostend, amidst the infinite humors
 of packing. I am I ought to have written or brickbatted
 earlier but Ray positively told me it was useless,
 as you never acknowledged him, and that he did not
 know where to direct. Your letter is a great work
 of art worthy to be ranked with the most ingenious
 productions of modern times: of course I don't believe
 it, and am inclined to think you have been all
 the time in 105 Park St. concealed, and examining the
 map of Africa. If I really could put my faith in what
 you tell me I should look upon you as the real
 Carlyle hero, the "coming man" of whom I once used
 to talk at the dinner, and I should prepare to fall

down and kiss your supper or perform any amount
of ritual observances. As it is ^{now} in thinking you
either destined to be the greatest man of your age or
as having been the perpetrator of a gigantic hoax.
So I give you conditional, but unbounded admiration
and I express humble but ardent gratitude for
the monkey on the hypothesis I fear a most improbable
one, of the dear animal not turning out a monkey
of the mind, a simious Hovio, a beautiful delusion.
If you have taken me in it beats the famous Campbell hoax, for
proud in my confidence of your veracity I have been enjoining
every one at dinner, breakfast, evening party, man, woman
or child to commit themselves to an opinion on the sources
of the Nile, when I have been forthwith down upon them
with geographical facts, and have by means of them tyrannized
over sundry meek and respectable members of scientific
societies. Whenever there is a pause in conversation I never fail
to say in a calm manner "I had a letter from Abyssinia the
other day - very hot season at Darsour I believe" whereat
Horners, Murchisons, Sam. Rogers &c gaze with
expectful awe.
I suppose you want to know what is going ^{on} here (always
on the supposition that you have not been duly to Silk
Buckingham). Just to tell to read the papers. In public
matters great things, come laws repealed, ministers

expected to go out in a week; in Cambridge things very little
 Evans got the University Scholarship; Huntington head of the
 trip, of course; your humble servant 9th, a Turin man
 I have off the second class, however fortune favoured me
 and I got the 2^d medal. Since this I have been three weeks
 at Paris, and a month reading at Hastings - tomorrow
 I start for the Riviera, Geneva, Venice, and Milan - family
 party - alarm about cholera which the papers say is
 coming westward with great rapidity, and cases of death
 in London last week. If you have got Kay's letter you will
 probably have heard that he published a volume costing 14^s
 nominally at the desire of the University, whereas Whewell was
 greatly indignant, and had him up before the Senate - Campbell
 has nearly given up P. L. and now tells nothing but uncom-
 - promising Evangelicism to the great annoyance of his friends.
 It is even becoming a matter of doubt whether the chief end of
 education is to increase population. But no doubt the plan of
 the Poor Law articles in the Times will soon fan the dormant flame.
 My Paris trip was eminently successful, I went with Huntington
 Mansfield, & Hawthorne, and for 3 weeks we eat the
 most glorious dinner in the world, at 18 francs a
 head, went 16 nights running to the play, and polished
 off some French literary parties without any opinion
 is that they are eminently *trumpet*.
 I take it for granted that you will come leisurely back
 through Italy, and therefore hope to catch a glimpse
 of you at Venice or Milan, monkey and all - I am

afraid the amiable animal must be the source of considerable inconvenience when you return to civilization. I can occupy few more comfortable positions than that of looking after an ape in a railway cage. To you I had better pack him up in brown paper boxes.

Mr
F Galton
Esq
Barnard

care of Major's lack



him (I believe her & I beg her pardon) and with postage stamps & direct her to my gyp or to the Hon. Ancestral where I trust every satisfaction will be afforded. I find of course on the eve of separation that all one's German has vanished or used, and I shall have to begin the old story again with Ollendorff, satisfying a most anxious as to the hunger of the good baker's dog &c.

(J. F. Harris)

Permanent address

(Mr. Millan)

WEST GRANGE
GRANGE LOAN
EDINBURGH

65 Bank Street
Hillhead
Glasgow

Oct: 16th. 1892.



Dear Sir

I see from Landolt's
and Stirling's Text-Book of
Physiology that you have
devoted special attention
to the subject of the Assoc-
iation of Colours with forms
- words, numbers &c.

I therefore take the liberty of
addressing you to tell you that,
since ever I can remember, I have
associated definite colours
with the hours of the day I-XII.

Thus —

With one P.M.	Brown (like leather)
" Two "	Pale yellow
" Three "	Whitish-grey
" Four "	Indigo-blue
" Five "	Very dark brown.
" Six "	White
" Seven "	Maroon (colour of claret)

With light P.M.	Black
" Nine "	Yellow
" Ten "	Dark brown (same as V)
" Eleven "	Green
" Twelve "	Same as seven.

These are amongst my earliest
I recollect associations and
have undergone no change.

On directing special attention
to them I see that the times
A.M. have just the same colours.

I may say I associate colours
with words, numbers &c but
not so definitely as with the

F4

hours of the day.

I have colours too for the days
of the week & for the 12 months.

I would be greatly interested
to know if my "subjective" sen-
sations are at all the same as
any other person's or persons'.

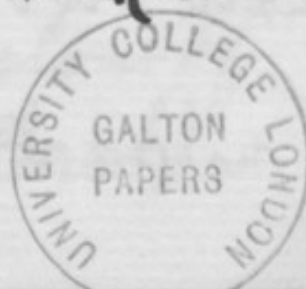
Apologising for thus bringing
myself before you;

I have the honour to be

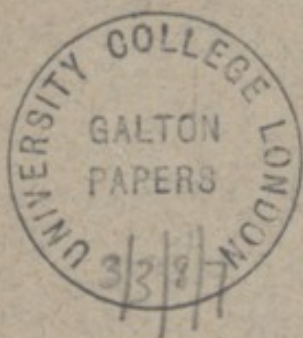
Dear Sir

Yours faithfully

J Fraser Harris. B.Sc. (Lond.)



Harrison



22 Clancer Road

Herne Hill SE

Feby 5th 1893

Francis Galton Esq. F.R.S.

Dear Sir,

Could you kindly
favour me by Monday
night, with a rough
pen- & -ink diagram of
the cardboard disc-
you used at last
Friday^{week's} lecture & I was

yes

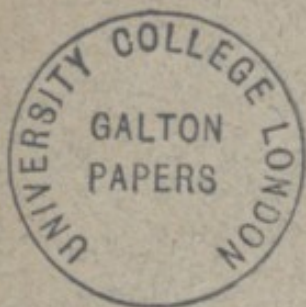
yes

no

The protractor was ~~always~~
moved parallel to itself, its
upper edge being parallel to the
top edge of the paper — or rather
to a T rule,

too far off to clearly see its nature, but assume that you put the centre of it on each new dot in succession, and — having a zero — turned it round guided by letters, to the right place, then made the next dot through a second hole. I took notes for the Engineer newspaper, & will also send something about it to Photography. In the latter could do it at some length, if you chance to have a spare proof of that part of your lecture. Could you also kindly give me the approximate date of a lecture of yours some years back, on the influence of women on scientific research.

Truly Yours W. H. Harrison



22 Chancer Road
Herne Hill SE

Feby 7th 1893

Francis Galton Esq. F. R. S.

Dear Sir,

Thank you for
your letter and diagrams.
I have sent the latter
on to the Engineer, with
description of ~~your~~
your method of working.
It would not do to

send exactly the same
thing to another journal,
and I have no
additional particulars,
so will send nothing
to Photography until
I have ~~seen~~ seen your
lecture in this weeks
Nature.

The other lecture
I mentioned was delivered
at the Royal Institution

Harrison

71

❖ SCIENCE LABORATORY. ❖



BOARD SCHOOL,

ICKNIELD STREET,

BIRMINGHAM.

Jan. 30

189

2

Dear Sir I have
read your kind letter
with great interest.
I am indebted for
your book that Mr.
Spencer had suggested
the superposition of
paper strips; but with
the exception of Mr.
Whipple's use of this
method for the getting
of a mean from the
meteorological strips
at Ken I did not know
that the method
had been actually tried.

For composites, photi-
graphy has a great
advantage in its
wealth of half-tones
which melt into
one another so readily.
The reversing method
you mention I allude
to in my paper and
find useful.

The
disadvantage of a-
mounting the films
together (which can
be readily done by
a solution of celluloid,
etc.) is that one
loses the power of
rearranging or sub-
tracting from the
components.

The first rough specimens

of my plan I
sent to a son
in New York; and
last week Mr. Geo.
Davis (of the
Camera Club) borrowed
my only remaining
one for a lecture
in London. But
I will send you
some specimens
as early as possible.
I am waiting for
better light to get
some more suitable
negatives.



I suppose you have
seen the Amphibians
in the "Idler"; they
are truly wretched
though they may
do good in calling
attention to the idler.

I am pleased that you
like my method; it
is a very slight ad-
dition to your dis-
covery - "a meteorite
added to the earth" -
but "every little helps".

Faithfully yours
W. Jerome Harrison

Grosvenor College⁴¹
Hastings Ostend 3/3/8/9
(see Rayner) 20 Feb: 1892.

Sir

My brother, who is
headmaster of this Coll.
is an enthusiastic advocate
of physical training & has
been most successful with
his pupils for the last
eighteen years - His Coll.
having lately been removed
from Twickenham here

My object in writing
you, at the moment,
is to ask you if you
can furnish me with
any information that

F2

may be useful in helping
to prove to the Belgian
Government! That the custom
of measuring - weighing
& examining^{re} boys, is
advocated by others
in England & elsewhere.

I showed one of our
farms to the British
Minister at Brussels
Lord Ribblesdale.

The Belgians have some
extraordinary laws with
regard to "la pudeur"!

to see a boy stripped
is more or less a crime.

My brother has always

endeavored to accustom
boys to strip when bathing
& to make them take an
interest in their physique
to have nothing to be
ashamed of. However

he has got into trouble
over "la pudeur" of the
Belgians & I shd be
extremely grateful for
any information ~~proving~~
advocating physical
training as conducted
elsewhere.

I am Sir

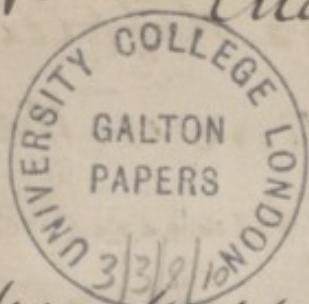
Yours faithfully

M. Bathorn



^{L. D. Hawley}
26 Sheen Park, Richmond, Surrey

+ May 7th 1885.



Sir,

Thank you for your letter
of May 5th

I fancy that yellow or yellow-
green eyes (they may be of chan-
ging colour) are the most common
in white short-haired cats, and
that blue eyes are not common.
The little that I have noted down
does not show the blue eye to be
always connected with deafness.
An "albino" ~~is~~ a person or animal
with "skin and hair preternatu-
rally white" — may I suppose have
eyes of any colour, or two colours.

62

It would be beyond me to give statistics, there is difficulty in setting information in these things, and imperfect hearing might escape notice, also the same cat might be counted twice, if more than one person contributed notes, ~~in the same neighbourhood~~

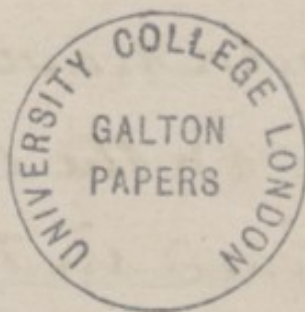
In my book I refer my readers to the interesting passage in the subject of deafness in cats in Darwin's "Variation of Animals and Plants under Domestication", Vol. 2, p. 329. My way of working is to copy sparingly. I have had Dr. Mirart's work for some time, and have looked into it occasionally, & have made use of it.

Tortoise-shell, or tortoise-shell & white, must be classed with red tabby and red tabby and white. It is remarkable that that kitten, being coloured, should be deaf. I should have liked to know the colour of the cat, which is not mentioned in the paper in Nature. If she was white, I should have liked to put the instance of whiteness and deafness in my book, but I see that you do not wish me to quote your letter. When I read it, I was reminded of the guinea in the Miss Primroses' pockets, which the good vicar liked them to have, but in no account were they to spend it!

Again thanking you, I am, Sir,

Yours truly

L. J. Hawes





Hawkesley

357. Oxford Street.
(OPPOSITE MARYLEBONE LANE.)

London, 15th June 189¹

Dear Sir.

The interest you
have taken in my ex-
treme deafness. & for a -
measure of its degree is
my excuse for troubling
you with this letter.

I find that a wound
made 4 times a week
is better than a continuous
wound. as the latter won-
derfully persuade all
the surrounding. and

^{f2}
felt as well as heard.
Do you know what
note of say a man's
voice would be the
best average to use
as a test? One of the
sounds I have made,
i. e. I think like the
bleating of a sheep,
or rather penetrating.

Of course the pitch can
be raised or lowered
by altering the resonating
tube. but I should like
your opinion of self-

¹³ adding too much, as to what pitch
of the voice one should imitate.

I do not want to measure how high
or low, a note, a patient can hear -
but to measure his degree of deafness
to human voices, & thereby determine
the course of the disease. If you do not
get on well with the cone series I shall
esteem it an honor to be in chiropodist.

I am dear Sir yours truly

H. H. Fuller Esq

Wm W. Rollins

Rec'd. and
Answered
March 14

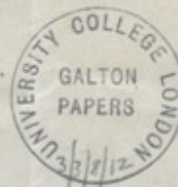
DEPARTMENT GEOLOGICAL SURVEY.

ERASMUS HAWORTH.

THE UNIVERSITY OF KANSAS.

Lawrence, Feb. 8th, 1900.

Sir Francis Galton,
South Kensington Museum,
London, England.



Haworth

Dear sir:-

Our American press some weeks ago stated that you were interesting yourself in agitating the question of having a better record of the form of pure bred live stock. It stated in substance that you had taken up this subject, that you had found the herd books furnished a good geneological record of the various animals recorded but that there were no records kept throughout all England which showed anything whatever regarding the form, that is size, weight, height, length of body etc., of any of these animals, and that you had devised a system by which a series of photographs could be taken of each animal studied so that measurements could be made of the photographs. If therefore, such photographs are preserved as public records they will include records of the body forms of the various animals.

I am very much interested in this subject as for years I have been thinking that the live stock breeders of America and the world were neglecting a very important matter in these particulars. I will appreciate it as a very great kindness if you will kindly drop me a line giving the exact facts regarding your connection with this subject and outlining briefly what you hope to accomplish in the future and also to what extent the live stock men of England seem to be interested in the subject.

Yours very truly,

Erasmus Haworth,

Haycraft

Anib: Coll: of South Wales & Monmouthshire.

Cardiff.



April 21st

My dear Sir

I have to thank you for your very kind letter, & for your suggestions as to the diagrams. In reference to the table on page 63 its accuracy is certainly vitiated in the way you mention. An instance of this is to be found in the case of Diphtheria, which disease has rapidly increased since the payment of a half crown fee for its notification. Under these circumstances, & because it would be impossible to supply corrections, we are prevented from placing absolute

F2

reliance upon these ^{tables}, & must wait
as I suggest on p 68 for more extended
information, especially for the statistics
of these countries. In the meanwhile
we may at any rate now I think
with alarm that our statistical
information, such as it is, points in
the direction of race deterioration, &
indicates what we as biologists would
expect from the conditions of race
environment. As to segregation, I cannot
but agree with you that an attempt
to segregate $\frac{1}{3}$ of the population, would,
in our present state of knowledge, lead

to the loss of a large percentage of types of great value, but I cannot but believe that the segregation of $\frac{1}{10}$ might at once - were the public prepared for it - be undertaken, & to the great advantage of the community. By the time the public are educated to these steps, I am inclined to believe that scientific men will be able to point them out the next, & I cannot but think that while passion can now be fully gratified without the production of children, increased sobriety for there may be shown by the public at large. It is hard to tell people who have that they may not marry, but it is not hard to show a product of that marriage is prevented^x. I am trusting you once again for your 1890 letter believe me to be

Yours very sincerely

John Perry Hays



James S. G. F.D.

It is a dangerous doctrine to preach at present.

Heape

F.1

HEYROUN,

CHAUDER ROAD,

CAMBRIDGE.



Greyfriars

Southwold

20. Aug 1908.

Dear Mr. Galton,

I came across the following
reference the other day which,
in view of your inquiry on the
Effects of castration may be of interest
to you - if you don't already know
of it -

Hoppe-Seyler. (Phosphine metabolism
& castration, male & female) Zeit. f.
Physiol. Chemie. (date not given)

Yours very truly Walter Heape.
May do not trouble to reply.

Heerwagen
Dagpat, den 17^{ten} März 1889.
Johannisstr. 9.



Hochgeehrter Herr!

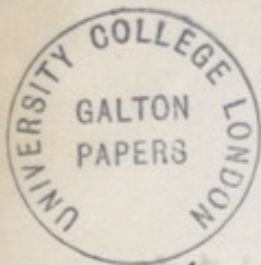
Zu meinem lebhaften Bedauern bin ich durch eine Verkettung unvorhergesehener Umstände bis jetzt verhindert gewesen, meinem Versprechen nachzukommen, und ich bitte Sie, dies gütigst entschuldigen zu wollen, da es mir in der That bisher unmöglich war, Ihnen zu schreiben.

Wenn ich im Nachfolgenden eine Beschreibung der von mir beobachteten Ermüdungserscheinungen zu geben versuche, so versteht sich, dass alles, was ich sage, nur für meine Person gelten soll.

Ich muss die Erscheinungen, um welche es sich hier handelt, in 2 Kategorien theilen, welche in mancher Hinsicht verschiedenartig sind. Die erste Abtheilung wird diejenigen Erscheinungen ~~ent~~

Form der Ermüdung enthalten; welche ich nahe alle Tage beobachten kann, bei welcher die Periode & Ermüdung - Erholung von kürzer Dauer ist. Ich möchte diese die normale Ermüdung nennen. Die zweite Abtheilung soll die Ermüdungserscheinungen beschreiben, welche nach lange andauernder (Wochen; Monate) angestrengter geistiger Arbeit auftreten. Diese scheinen mir mehr krankhafter Natur zu sein.

I. Soll ich das Verhalten meiner geistigen Leistungsfähigkeit im Laufe eines normalen Tage beschreiben, so muss ich sagen, dass ich am Vormittage (9^h - 2^h a.m.) in jeder Hinsicht am besten disponiert bin. Am Nachmittage gelingt es mir nur selten gut zu arbeiten, allenfalls später gegen Abend, etwa von 6 Uhr ab. Hatte ich mich am Nachmittage von der Vormittagsarbeit gut erholt, so kann ich nun wieder in die Nacht hinein arbeiten. Aber nun zeigt sich, wie die



verschiedenen geistigen Fähigkeiten in verschiedenem
Maasse von der Ermüdung getroffen werden. Soll ich
mich möglichst allgemein ausdrücken, so muss
ich sagen, dass zuerst die Fähigkeit abnimmt, einem
fremden Gedankengange zu folgen, auch das Gedäch-
tniss, kurz alle receptiven Fähigkeiten beginnen
zuerst zu schwinden. So kann ich zum Beispiel
physikalische Abhandlungen, besonders mathe-
matisch-physikalische nur lesen wenn ich frisch
bin. Bin ich auch nur wenig ermüdet, so finde
ich nicht mehr den Weg, auf welchem der Autor
von einer Formel auf die nächste übergegangen
ist. Schwierig geschriebene mathematisch-physikalische
Abhandlungen sind wohl das schärfste Kriterium
für vorhandene Ermüdung. Schreitet die Ermüdung
weiter fort, so wird es mir schwer, selbst einfachen
Rechnungen, schliesslich sogar Zahlenrechnungen
zu folgen, dann die Beschreibung experimenteller
Anordnungen zu verstehen, u. v. f. Das Gedächtniss

leidet ebenfalls. Ein hübsches Beispiel dafür ist dies:
Vor einigen Jahren hatte ich bei einer grösseren
Arbeit sehr viele langwierige Rechnungen nach der
Methode der kleinsten Quadrate auszuführen.
Es fiel mir leicht, diese mehr mechanische Arbeit
des Abends zu besorgen. Ich arbeitete immer bis
zur äussersten Ermüdung, weil das Ganze zu einem
bestimmten Termine fertig sein sollte. Das
Aufsuchen von Logarithmen, oder von Producten
in Multiplicationstafeln, ebenso Subtraction
und Addition nur zweier Zahlen ging bis zuletzt.
Wurde ich aber sehr müde, so scheiterte das Weiter-
arbeiten, sobald längere Columnen zu addiren
waren. Ich blieb plötzlich in der Addition stecken,
weil die Zahl, welche ich im Kopf hatte, dem Gedächtnisse
entschwunden war.

Wie sehr die Leichtigkeit und Mannigfaltigkeit
der Associationen unter der Ermüdung leidet, habe
ich regelmässig beobachtet. Dies ist ein Punkt, welchen

17 März / 89

f. 5

Sie in Ihrer Abhandlung auch hervorheben. Ich habe auch gefunden, dass das ^{unwillkürliche} Hervortreten solcher Associationen, welche nicht an die Bedeutung, sondern an den äusseren Klang eines Wortes anknüpfen, wie z. B. Reime, etc. ein Zeichen von Ermüdung ist.

Nun finde ich es merkwürdig, dass productive Arbeit nur in ausserordentlich geringem Grade von der Ermüdung beeinflusst wird. Sagen mir, ich will einen Apparat construiren zu irgend einem Zweck, oder ich will die Theorie irgend eines complicirten Versuches entwickeln, mit Rücksicht auf alle Nebeneinflüsse, Fehlerquellen, u. s. f. Dies gelingt vorzüglich, ja es ist mir eine Erholung, wenn ^{ich} zu müde war, um Arbeiten Anderer zu begreifen. Bedingung ist nur, dass meine Gedanken, zwar auf ein festes Ziel gerichtet, doch ganz frei, in einer Art ^{schöpferischer} Phantasie Thätigkeit spielen können. Ebenso kann ich mich durch Rechnen erholen. Mit reproductiver Thätigkeit verhält es sich anders, diese

ist der Ermüdung unterworfen, namentlich dann, wenn es sich darum handelt, aus heterogenem Material eine einheitliche Darstellung irgend eines ^{Themas} ~~Themas~~ zu geben. Dies wird wol in der Erschwerung der Assoziationen seinen Grund haben.

Dies wären die hauptsächlichsten Ermüdungserscheinungen der ersten Art, welche allesamt durch eine gute Nachtruhe zum Verschwinden zu bringen sind.

II. Nach Monakelanger angestrengter Arbeit komme ich dahin, dass einmal die obigen Erscheinungen der täglichen Ermüdung sich rascher einstellen als sonst, dass ferner die productive Thätigkeit schwieriger wird, und dass namentlich ein allgemeines Missbehagen, eine Mulust zu arbeiten, mich ergreift. Kurz, ich werde Pessimist, und verzweifle an der Zukunft. Ich werde zugleich etwas nervös, und träume häufiger, während ich im normalen Zustande nur sehr selten träume. Ich muss aber bemerken, dass diese Art der Ermüdung auch nach der größten Anstrengung nicht eintritt,

wenn dieselbe gute Früchte getragen hat, wenn ich mit sichtbarem Erfolge gearbeitet habe. Der Erfolg compensirt diese Ermüdung vollständig, er muss aber sichtbar sein, so dass es Anerkennung im Gefolge hat. Freilich habe ich nie versucht, ganz ohne Erholung weiter zu arbeiten. Im Sommer und im Winter verbringe ich immer einige Ferienvochen auf dem Lande bei meinen Eltern, in welcher Zeit ich mich von der Arbeit des Semesters erholen kann.

Sollten die obigen Darlegungen, in welchen ich die hauptsächlichsten von mir beobachteten Ermüdungserscheinungen zu beschreiben versucht habe, Ihnen von irgend welchem Nutzen sein können, so würde mich dies ausserordentlich freuen.

Ich verbleibe mit der vollkommensten
Hochachtung

Ihr ganz ergebener

J. Heerwagen,

Assistent am physikal. Cabinet d. Univ.

Dorpat.



Herrn

1877

Verehrtester Herr Doctor

Ihren Brief habe ich erhalten
und gebe Ihnen hiermit über den
Apparat die gewünschte Aufklärung.
Das Nouamöbimeter von Exner
wurde von Doctor Obersteiner,
Inhaber einer psychiatrischen
Heilanstalt in einer Abhandlung
beschrieben. Herr Doctor Obersteiner
gab aber diesem Instrument den Namen
Biphotometer. Was nun den elektrischen
Anker betrifft so dient derselbe dazu
den Moment des Aufzugs der Schwingung
der Feder fühlbar zu machen indem
durch diesen Anker eine galvanische
Kette geschlossen wird in welche
ein Inductionsapparat eingeschaltet
wird. Berührt man nun die beiden

Pole der Inductionsspirale oder des
primären Stromes mit zwei Finger,
so erhält man bei dem Schluß der galv.
Kette durch den Anker einen elect. Schlag,
man kann aber auch den Anfang der
Schwingung dadurch wahrnehmen dass
man das Überspringen des elect.
Funkens beobachtet.

Herr Professor Exner hat die Güte
jeden Apparat welchen ich auffertige
selbst zu prüfen.

Was den Preis betrifft so kostete
der erste Apparat welchen ich
für Professor Exner auffertigte
20 fl ö. w. Dieser war aber von Zink
und ohne elect. Anker. Da ich
aber alle anderen Apparate
welche ich später auffertigte von
Messing auffertigte, ~~da~~ welches
Material viel theurer ist, als Zink,
und seine Bearbeitung auch mehr

Mühe verursacht so erhöht sich
natürlich hierdurch der Preis des
Instrumentes. Es kostet demnach
ein Neurocymeter ohne den
elect. Anker 24 f. (von Messing)
angefertigt, und mit dem Anker
30 f. ö. W. Wenn aber Herr Doctor
einen solchen Apparat von
Zinn angefertigt wünschen, so
kostet ein solcher ohne Anker
20 f. und mit Anker 26 f.

Ich bitte mir nun umgekehrt zu
schreiben, ob Sie einen Apparat
mit Anker oder ohne Anker
wünschen, da für eine Irrenanstalt
in der Schweiz ebenfalls ein solches
Instrument bestellt wurde. Ich
könnte dann beide zusammen
auffertigen.

Was nun die Zahlung betrifft so
bitte ich mir eine Anweisung

an ein Bauplanierhaus hier zu senden.
Ich glaube dass dies die einfachste
und bequemste Art ist.

Indem ich mich Herrn Doctor
empfehle zeichnet mit
gröster Hochachtung

J. Meinitz

Mechaniker

W. Theresianumgasse 31

Wien am 27. November. 1877



HENRY B. HEMENWAY, M. D.
1243 Chicago Avenue
Evanston, Ill.

Har

June 16, 1909.

My Dear Doctor Galton:



I enclose herewith the review which I wrote for the Chicago Post.

It was published during my absence from home.

I regret to report that the bill for the sterilization of "undesirables" did not pass the Illinois legislature. Such a law is giving good satisfaction in our neighboring state of Indiana, and we shall try it again. Eugenics is attracting more and more attention in this section of the country, and I look for some decided advances in the next decade.

Very truly yours

Henry Hemenway

flav

USA

Henry Hemmings

x

The next year he received a gold medal from the Royal Geographical Society for his explorations in Africa, and those explorations were also the cause of his election in 1856 as a Fellow of the Royal Society, and also a member of the Athenaeum Club. Later and through these associations he became the chairman of the Kew Observatory.

Toward his cousin, Charles R. Darwin, he expresses the utmost veneration and affection. "I think his intellectual characteristic that struck me most forcibly was the aptness of his questionings; he got thereby very quickly to the bottom of what was in the mind of the person he conversed with, and to the value of it."

As one of the bases upon which to study heredity, Galton established anthropometric laboratories, and devised instruments and methods for measuring keenness of sight and of hearing, color sense, judgment of eye, breathing power, reaction time, strength, size and weight. Galton's whistle for determining the highest audible note is used by ayristis generally. In his laboratory he developed the finger print as a means for the identification of criminals, proving that the pattern is invariable through life and that there are a very great number of patterns which may be so classified that it would be possible to tell, by reference to a directory, whether a similar set had been already registered. This system is now exclusively used in England, India and Argentina, and with other methods in Brazil, Egypt and other countries.

The author developed composite photography, as a result of a request from the H. M. Inspector of prisons, for a classification of types of criminals according to their features. He later undertook a reverse process which he calls analytical photography, to discover that which is peculiar to the individual. By placing a composite negative in front of the positive of the individual, both of them being in half tone, the typical portions are abstracted, leaving the individual character. "Alice in Wonderland would have called it 'the grin without the Cheeshire Cat.'"

His first publication upon heredity was in 1865. The book on "Hereditary Genius" soon followed, and the study has constantly gathered force in his mind, until now it has merged into his work in eugenics. While speaking of his own marriage he refers to the "far greater importance of being married into a family that is good in character, in health and in ability than one that is either very wealthy or very noble, but lacks these primary qualifications. . . . I protest against the opinions of those sentimental people who think that marriage concerns only the two principals; it has in reality the wider effect of an alliance between each of them and a new family. Moreover the interests of the unborn should be taken far more seriously into account than they now are."

The study of heredity naturally led to that of eugenics, or race improvement.

Galton relates that while at dinner at the Athenaeum Club one day Herbert Spencer remarked: "You would little think it, but I once wrote a tragedy." Huxley answered promptly: "I know the catastrophe." Spencer declared it was impossible, for he had never spoken about it before then. Huxley insisted. Spencer asked what it was. Huxley replied, "A beautiful theory, killed by a nasty, ugly little fact." In some regards Galton was the antithesis of Spencer. Yet in everything that he has done one may notice the hereditary effect, so to say, of his father's rule. He was not a theorizer, but he sought for measurable facts from which he might deduce definite formulae as expressions of law. His whole life, directed on lines of ardent but patient investigation, deserves to be marked and considered.

Memories of My Life, by Francis Galton, F. R. S. [E. P. Dutton & Co.]

The extreme versatility of Dr. Francis Galton, and his unusually long career as a leader in scientific thought, gives uncommon interest to his Memories. The book combines autobiography with stories of African explorations and various scientific discussions. It is frequently lightened with anecdotes of other famous men. For over half a century the narrator has been a Fellow of the Royal Society. Four times he has been the president of a section; for four years he was the general secretary, and for many years he was a councillor of the society, and he refused the general presidency on account of physical disability. Geography, meteorology, psychology, criminology, heredity and eugenics have each been enriched by his labors.

Francis Galton was born in 1822, the year that also gave us that other great student of heredity, the Abbe Mendel. His father was a banker, scientifically inclined, whose constant companion was a sliding rule adapted to various uses. The grandfather Galton "was a scientific and statistical man of business." His mother was the daughter of Dr. Erasmus Darwin, "physician, poet and philosopher."

His earliest education was under the instruction of his sister Adele, of whom he says: "She passed her life under an abiding sense of the presence of God and duty to man, without which few persons have ever done great things." Like his famous cousin, Charles R. Darwin, he began, but early abandoned, the study of medicine. Unlike his cousin he took an active interest in his professional study, and at one time, when only 16 or 17 years old, at the Birmingham Hospital, he had sixteen fractures, dislocations or other injuries of the arm practically under his sole care. He left Cambridge to care for his father, and after the father's death he spent some years in seeing the world.

In 1833 he married and settled down.



ing was large and imposing, if the staff had a certain degree of common efficiency, that was all that could be expected. Today another idea prevails, according to which building and staff alike are but the means whereby a living institution may meet and fulfill some of the manifold sociologic needs of the modern city.

But though a university may exist in the atmosphere a library must have a roof. The house in which Chicago's library is housed is, therefore, a matter of some importance.

This building, a stone structure a city block in length and half that in width, represents the expenditure of some \$2,000,000. It was erected in 1893-7, in the days when a vague civic pride took the place of any thorough knowledge of library architecture. There is no doubt that an enlightened city council would have built two or three libraries with the money, and located them away from the downtown district. As a result of that unwisdom, the city has on its hands a white elephant which eats up \$260,000 a year in maintenance; and it is hampered in any plans for the development of a system of branch libraries.

The building, situated at Michigan avenue and Washington and Randolph streets, rises to the height of three stories by the aid of successive classical styles of architecture, and looks across Grant Park and the Illinois Central tracks to the waters of the lake; surmounted by a Roman entablature, an upper part with slender Ionic columns rests upon a lower part with broad, arched windows in the neo-Greek style; and this in turn is lifted into the air by a plain granite base, like the wall of a warehouse, which was perhaps intended as Archaic.

The Randolph street entrance leads from a Greek portico into a big, wasteful corridor, connected by staircase and elevators with the reading-rooms, and—though the sweet reasonableness of this latter inclusion is not so obvious—with a Grand Army Memorial Hall.

It is the Washington street entrance, however, that leads to the "show" part of the building. A wide arched doorway opens into a grand staircase hall, where in a green-and-white mosaic floor is embedded a large bronze replica of the corporate seal of Chicago. And overhead is the heavy elliptical arch of the main staircase, which leads by broad marble steps and balconies to the second floor, where beyond three open archways lies the delivery-room.

It is an official tradition that this part of the building is very beautiful. The handbook issued by the library describes it after this fashion:

Italian statuary marble from the famous quarries of Carrara is used in this portion of the building, richly inlaid with mosaics of glass, mother-of-pearl, and semi-precious stones, and in the balustrades on the staircase, with small centerpieces of the rare and beautiful Connemara marble. On the third-floor landing panels of mosaic design, with suitable inscriptions and the names of great writers, are set in the walls.

The delivery-room is similarly ornamented. The impression it all gives is that of a richly frosted birthday cake. In the panels of the balustrade there are to be seen geometric designs of a terrifying crudity—the "small centerpieces of beautiful Connemara marble" being flanked by mosaic T-squares and isosceles triangles.

Take the marble of Carrara—sang Gautier. But he did not say to take and spoil it with abjectly modern designs in bits of enamel and colored glass. For these attempts at decoration Tiffany is responsible. To anyone with the rudiments of an aesthetic faculty they must be objectionable.

However, the taste for reading may be expected to survive even such discouragement. And for the delectation of read-

Ever since the city's financial crisis in 1902, the circulating department has been closed at 6:30 o'clock in the afternoon. As this curtails the opportunities of working people to get books and causes an unseemly rush at certain hours, it has very sensibly been decided to restore the closing hour to 8:30 p. m.

The library has in all 365,000 volumes, a large proportion of which are issuable. A card is given each borrower on which but one book may be drawn at a time. The only exception to the rule is in the case of teachers, who may draw six books on a special card. Undoubtedly the rule is not liberal enough, and will probably be changed.

One of the most important departments of the modern library is conceived to be the children's department. In the Chicago Public Library there is none—the nearest approach being the Thomas Hughes reading-room, with lectures and a story hour in connection. But the children select their books in the delivery-room without assistance or supervision.

For such plain reasons as the downtown situation of the institution, "no effort is made," as the library's handbook states "to attract the very young to the central building." The solution of the problem is believed by the present library officials to lie in the erection of branch libraries which shall "bring the books to the people," with departments where the needs of the children will be looked after carefully by specially trained workers. However, it is also thought that the needs of the library neighborhood alone are sufficient to require a children's department in the central building. This may necessitate a rearrangement of the interior.

At present there are maintained several branch reading-rooms—a rather feeble response to an obvious need; and many delivery stations—a comparatively expensive and inefficient method of distribution. Both these makeshifts would be sup-

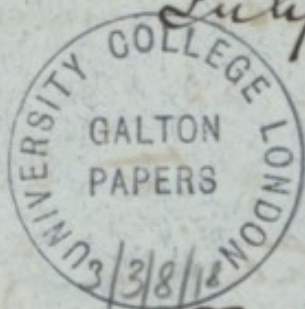
I send 14/7/18
Autumn

(Hewrick)

F1

34 Clarendon Rd. W.

July 12. 92.



Dear Sir

I saw yesterday at the Meteorological office, two Instruments designed by you. The one is the Pantograph for reducing or enlarging curves unequally in two directions. I did not know that such an Instrument had been made. The other instrument, for determination of vapour tension interested me much on account of the introduction of a given function of two variables in form of a surface. You have yourself undoubtedly a number of other instruments of interest to Mathematicians and you might be inclined to lend some to the

Exhibition of Mathematical
Models & Instruments to be held
in September at Nuremberg under
the auspices of the German Association
of Mathematicians. Of this I enclose
a Programme. To further the
objects of this Exhibition, which is
somewhat of on the lines of the
doan - Exhibition held in 1876
at South Kensington, an English
Committee has been formed, as
given below.

The Instruments at the Meteorology
Office, at least the second, would
I fear require that a man like
Mr. Curtis was sent also to take
charge of them in unpacking &
putting them together, and for
this we have no money; even the
cost of transport has to be borne
by the Exhibition. But the Pantograph

of which I understand there is a duplicate, might possibly be lent. If not it would be desirable to send descriptions, and I should feel much obliged if you could provide me with these. Possibly photographs exist, or could be taken. I should be glad to translate descriptions for the catalogue into German.

If you are able & willing to send any other exhibits, & I very much hope that this is the case, please let me know as soon as possible, and to fill up the enclosed form.

Prof. Greenhill & I are going to forward all exhibits together if they are sent to the Central Institution, Exhibition Rd before the last week in August.

The Annoucement of the
Exhibits however should be in
Munich before the end of this
month.

Trusting that you will have
something to send.

I remain, Dear Sir
Very sincerely yours

Henry.

Francis Galton Esq. M.A.



Committee.

Lord Kelvin . Chairman

Lord Rayleigh

Prof. Sylvester

" Lodge

" Fitzgerald

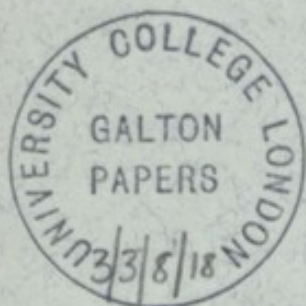
" W. S. Adams

Sir R. Ball

a. a. Common Secy.

Prof. Greenhill } Secretaries
" Henrici }





34. Clarendon Road. W.

July 28th 1892

Dear Mr Galton,

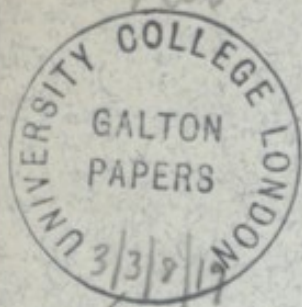
Many thanks for the interest
you take in the Numismatics Exhibition.
I have safely received your Quittance.
It has been well packed. The description
I have translated and have also
the clichés received.

With regard to the clichés
of the ^{young} Instruments at the Meteorological
Office I am in correspondence
with Mr Scott. He tells me

that they are all to be had and
I shall now write to him which it
would be desirable to get.

Very sincerely Yours

Hervey.



Rev. F. Hargrove

Rayton Home

f.1

Salisbury

Oct 25th '88

Dear Mr Galton.

I have just met with
an interesting case of
"coloured figures"; what
I thought you might like
to have: A little boy,
whom I knew, aged $5\frac{3}{4}$
years, named George
Herbert Tom-Bruggenkate
asked his mother "What
colours are your figures?"
It was a purely spontaneous
question for his mother
had never alluded

to the subject; or in
 fact I doubt whether
 he at all knew what
 he meant. At all events
 he wrote them down
 as he repeated them.
 And he has been
 "tested" since: & always
 gives the same: as follows.
~~Where~~ The colours of the
 'digits' govern the "tens" →
 He also gave the shape
 of his ears &c. !
 Hoping this may interest
 you. Ever yours sincerely
 J. Russell

- 1 Black 1000 Red only
 2 White Redder "
 3 Red Nullin, Black
 4 Black
 5 Black The shape of a
 6 White Year is "oblong"
 7 Red of a month "Square"
 8 Black of a week "o."
 9 Brown small square"
 10 Black & White
 20 White
 21 Black & 20 on up to 29
 30 Red
 40 Black
 50 Black
 60 White
 70 Red
 80 Black
 90 Brown
 100 Red



2. Henry
Drayton House
Salisbury
Nov 10. 88

F5

Dear Mr Galton

I should like to consult
you about a project
in my mind, as follows:-
Having had an opportunity
of witnessing the phenomena
of mind-revealing. I wrote
out the results as they
appeared to me: and sub-
mitted the M.S. to the
Thought-revealer. Mr Sloggs
and he has been good
enough to amplify parts.
I should be very much

Obliged if you will
kindly read it through
so that I'm maybe able
to let me know what
I'm think of the following
idea. Namely for me
to be allowed to read it
at the Anthropological
Society & to get W.R.
to care & give illustration
& then to subject him
to some of the experiments
in taste, smell, & hearing
to which I have alluded.

You will see by his
letter that as Time
money is of importance,
he could not come
gratis: so that this
is the important
point I should like
to speak to you about,^{1.2.}
if you thought the
idea of reading the paper
for free

Mean let me know
what you think of the
idea, & I will call

upon when convenient
 & have a talk on
 the matter -

Yrs Sincerely

Yrs. Hewlett



Charmington's Vineyard May 11th 1895
Dorchester

Eating

19
1
Linn. - W.

April 12th 1895

Dear Mr. Eddin,

In reply to your queries in Nature (Ap. 11. /95, p. 570.) I should like to observe that plants — as it seems to me — should not be altogether regarded, so to say, exactly as, or in the same category with, at least, the higher animals, in the matter of evolution: because, as far as they stand in the scale of life, plants are no "higher" than corals; since they are all so far comparable beings that pretty well any fragment can reproduce the whole being. Hence, there may be natural laws governing, e.g., Butterflies, which can have no application to plants; while, on their part, plants have powers of reproduction ^{and evolution} by their vegetative system, which butterflies cannot enjoy.

Secondly, the element of the Environment must never be left out of count: because numerous illustrations can be given from cultivated plants answering to your three questions; but, then, if it be asked how far as the character of sports and variations hereditary, the answer is, as long as the environment is more or less the same.

Take as an example, Parsnips. Mr. Houch long ago (early forties or before) raised several well marked varieties: but Prof. Buckman sowing the seed of the wild plant (*Pastinaca sativa*) in a prepared border of the Agricultural College, Arrington in 1847, raised forms similar to the foreign types. Conversely, he has had pendulous forms of the long and short or

Turnip-rooted radishes for ages: yet M. Carrière experimenting with the seed of the wild radish (*Raphanus Raphanistrum*), raised similar forms by growing them in a loose and a heavy soil in France, respectively. He thus found that the "environment" was the direct "cause" of the long and short variations - an old fact recorded by Pliny (and lately corroborated with the carrot) which Carrière re-discovered for himself.

These and other forms of radishes, carrots &c. become fixed by selection and are quite hereditary by seed. Similarly, Buckman, neglecting all his varieties but one, "fixed" this parsnip in 1890. It was a "hollow-headed" form, according to gardeners' terms, and he called it "The Steward" (whether from that reason or not, he has not recorded!) It is still the "best in the trade," according to Suttons.

Another instance, Spring plants owe their spinescence to drought; but if they be grown in a moist atmosphere, they tend to, and do lose their spines; or rather they are not developed. As long as they grow in a dry place, it would be said that spines were hereditary; but as long as they grow in a moist one, it would be equally said that non-spinescence was hereditary, but only in the sense that what causes either trait in the parent, continues to cause it also in the offspring.

Characters have every degree of persistence. Some cannot be "broken" down, but the plant dies sooner than change in adaptation to a changed environment. Others ~~can~~ retain their morphological

characters but alter their anatomy to suit
new positions. Others alter both.*

Now, whenever any question arises as to heredity
in sports or any other varieties in plants, the
question should not, I think, be in an absolute
form, but framed somewhat thus: - Are the varietal
or specific characters constant under a changed
surroundings? If not, to what extent are they
hereditary or how do they alter?

The rule is that you cannot trust a
plant to be absolutely constant, either in
itself or its offspring unless the surroundings
be constant. - E.g., *Brassica oleracea*, the Wild
Cabbage has no varieties in Nature. They are
innumerable under cultivation, and each "race"
comes true by seed. - *Gracile maritima*, the
Sea Kale, has also no varieties in Nature,
but it has also none under cultivation; so
that while the former is excessively plastic,
the latter is excessively conservative.

In reply to your query No 1. - "Instances
of strongly marked peculiarities whether in
form, in colour or in habit" - Such are
countless among cultivated plants: - but
"sports" rarely appear in Nature. Many
garden plants show innumerable varieties
without hybridizing which increases them / -
as either two species of the same genus
are not in cultivation, as the Sweet-pea, Cabbag,
Pauzy, Cineraria: or else the species will
not cross with others, as the many "races".
which have been established by selection
among seedlings of the Chinese primrose.

* I have added something about this in my "Reply"
to Wallace - a copy of which I send for your
kind acceptance.

You say, we do not wish for records of "monstrosities"; or "such other characters as are clearly inconsistent with health and vigor". It may be so with animals, but it is not at all necessarily so with plants, so that it may be worth while mentioning the fact about a "fasciated" variety of *Celoxia cristata*; — Tomatoes are often "symplochia" (a fusion of 2 or more flowers in one mass); a *Myosotis*, or the "Victoria" forget-me-not, is a floral monstrosity, lastly many double flowers are cult. All the preceding are perfectly healthy and their characters are hereditary.

No 2. With reference to the query of different parents producing the same variations, I have already alluded to the Carrots and radishes, the same varieties being raised in the "cattinets" and in England.

What happens in nature is this: — If different plants are grown in the same climatic conditions, they all tend to put on the same general facies. Thus, speaking generally, Alpine plants are dwarf; desert plants are spinescent and hairy; Aquatic plants have finely divided or the ribbon-like submerged leaves: although the plants may have no close affinity whatever: ^{in their, but externally} = must be made by growing plants ^{unaccus-} = tained to these surroundings, they at once begin to acquire the ^{same} features, as the plants habituates to them.

The "adaptation" occurs, in any individual plant, or in its offspring, or in any raised by the vegetative system i.e. without the aid of sex cells.

Thus, the Newtown Pippin Apple originated in Long Island, New York, and has been widely disseminated by grafts: but in Virginia, it has varied to the Albemarle Pippin; in the U. S. States it has quite altered its form being much larger and bearing distinct ridges about the apex. It has varied again in New St. Wales. - As a proof of the effect of the environment generally, it is found that most N. E. apples take on the elongated form in the Pacific N. West, and become heavy-frained and coarse-striped in the Mississippi Valley. This experience of American cultivators is strictly parallel to the above mentioned natural phenomena: and proves the importance of always considering the influence of the environment in the origin of varieties and species, and in the persistence of characters.

The appearance of the same variety or spot in different plants of the same kind is probably very common with such peculiarities as "cut-leaved" varieties and variegated leaves. As a rule there are not hereditary, but they are so occasionally: but the influence may be felt by the stock: Thus when a cut-leaved bud was grafted on an ordinary beech-tree all the buds which were developed higher up the tree on the same side as the graft - became "cut-leaved". This is a sort of hereditary influence, though not by seed.

Again "Regular" flowers often appear on terminal shoots of Papaver, Foxgloves, Linaria, Horsechestnut, Pelargonium &c. and Darwin has proved that in Linaria

At least, it was hereditary by seed.

Qn. No 3: - As long as the "form" once obtained is cultivated in more or less the same kind of soil and climate, it remains constant: but it may vary again, or be "improved" as Hortists say; and the improvement may be relatively constant in its turn; or it may "degenerate"; "revert" & according to the nature of its environment.

All garden "races", I should suppose come under your third question.

Since then, Monstrosities may be hereditary and involve no detriment to health and vigor - since Evolution can take place by the vegetative system alone, responding to changed conditions - and since a graft or scion can change the scion or graft respectively - Plants must, in these respects at least, be considered as on a different footing to the higher animals.

Replying generally to your three questions, I should say that there are plenty of facts in the plant world supporting each of them.

In all cases, however, the influence of the environment must be invoked as far as the most important factor is (1) - Originating any new sport or variation and (2) in maintaining its existence whether by heredity or otherwise.

Yrs Very sincerely

George Henslow

Rev. George Hadow

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With the Author's Compliments

Reprinted from "NATURAL SCIENCE," Vol. V., No. 32, October, 1894.

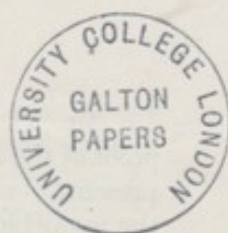
The Origin of Species without the Aid of Natural Selection.

A REPLY.

BY

REV. GEORGE HENSLOW, M.A., F.L.S.





The Origin of Species without the Aid of Natural Selection.

A REPLY.

I AM much indebted to Mr. Wallace for his interesting paper (*NATURAL SCIENCE*, vol. v., p. 179). As he was the joint propounder of Natural Selection with Darwin, I could not hope for a weightier critic. Still, I am not in the least shaken in my opinion by it.

In reply, I would first observe that I take the terms "definite" and "indefinite"—which Mr. Wallace says he does not understand—from Darwin himself, who says: "The direct action of changed conditions leads to definite or indefinite results;"¹ while of the former he writes: "By the term definite action, I mean an action of such a nature that, when many individuals of the same variety are exposed during several generations to any change in their physical conditions of life, all, or nearly all the individuals, are modified in the same manner. A new sub-variety would thus be produced without the aid of selection."²

These words really strike at the root of Darwin's theory; and, indeed, the whole of my contention, if it were not founded on facts and observations, might be based on this passage; for Darwinism may be compared to an inverted pyramid, the apex being the *mistake* Darwin made in supposing variations in any seedlings of a plant (or variety) in *nature* being "indefinite." *They are always definite.* Though hundreds may perish, *the survivors all vary in the same direction*, viz., towards adaptation to the environment.³

In a correspondence with the late Professor Romanes last spring on this subject, he wrote me as follows: "Of course, if you could prove that indiscriminate [*i.e.*, indefinite] variations have not occurred in wild plants, but only under cultivation, you would destroy Darwinism *in toto*." (Hyères, March 12, 1894.)

Having stated my case thus briefly, I will proceed to remark upon Mr. Wallace's criticisms.

¹ "Origin of Species," 6th ed., p. 106.

² "Animals and Plants under Domestication," ii., p. 271.

³ See, *e.g.*, "Origin of Species," pp. 72, 175, 176.

Mr. Wallace writes: "It is, of course, admitted that direct proof of the action of Natural Selection is at present wanting." "At present"—why is it still wanting if it really exist? Has not one of the many biologists who have studied nature all over the world, during the last five-and-thirty years, been able yet to find one single proof?

On the other hand, I venture to say and to prove, *in the strictest sense of the term*, that Natural Selection is not wanted as an "aid" or a "means" in originating species.⁴

In the *elimination* of superfluous weaklings, in the *delimitation* of specific forms, and in the *distribution* of plants, Natural Selection may be largely credited with the results, but in the *origin* of species it is not wanted.

Darwin says that "Natural Selection has no relation whatever to the primary cause of any modification of structure"⁵; and the question with which I am solely concerned is to try and find out how and by what means variations in structure originate in plants; for new sub-varieties, varieties, sub-species, species, and genera are all based upon morphological variations; these being the only things systematic botanists trouble themselves with at all. *Then*, whether Natural Selection exists as a "means" or an "aid" in establishing these differences is a separate question altogether, as Darwin insists. To answer *this*, one looks to see, not only if Nature supplies those data upon which Natural Selection is supposed to act, but if they are of any use in the process. Mr. Wallace tells us what they are, for he says: "Offspring resemble their parents very much, but not wholly—each being possesses its individuality. This 'variation' itself varies in amount, but it is always present, not only in the whole being, but in every part of every being. Every organ, every character . . . is individual; that is to say, *varies* from the same organ, character . . . in every other individual."⁶ Now, is there any evidence, direct or indirect, that any such slight morphological differences as are here alluded to are of the slightest consequence to a *seedling* so as to enable it to survive in the struggle for life? What attempts have been made experimentally to test the truth or the reverse of this hypothesis?

Let it not be forgotten, too, that specific and generic characters are more often taken from the flowers and fruits, organs which are totally undeveloped when the "slaughter of the innocents" takes place, and, therefore, must be all put out of court so far as Natural Selection is concerned in bringing about the survival of the fittest. It has been suggested that a plant survives because, say, of some superiority in the structure of the flower, this feature being correlated with a more vigorous constitution than that of the other seedlings, which die in a premature state. I reply this simply begs the question,

⁴ The title of Darwin's book is "The Origin of Species by means of Natural Selection."

⁵ "Animals and Plants under Domestication," ii, p. 272.

⁶ "On Natural Selection," p. 266.

or is putting the cart before the horse. *A seedling survives solely because it is vigorous.* This is capable of proof, and whatever flowers it may subsequently bear, it must be contented with them, whether they be the "best" or not for fertilisation or otherwise. In corroboration of the above, I would add my own experience with small and large seeds. These show that the better nourished have a much greater chance of starting and crowding out the rest by growing into larger plants, and that if small seeds be selected for some years, they either die out altogether or a tiny race of beings is for a time procured. Hence, for the word "fittest," *i.e.*, morphologically, I would substitute "strongest," *i.e.*, constitutionally.

I note here that Mr. Willis says (NATURAL SCIENCE, v., p. 240) that "Natural Selection has to be disproved." No one, however, can be called upon to "prove a negative." It is for Darwinists to prove that the Origin of Species *does* really require the aid of Natural Selection.

On the other hand, it is for me to prove that the Origin of Species can take care of itself; in other words, to establish the truth of Mr. H. Spencer's observation: "Under new conditions the organism immediately begins to undergo certain changes in structure, fitting it for its new conditions,"⁷ and that what is true for the individual is true for its offspring, the result being, to adopt Darwin's words, a new sub-variety without the aid of Natural Selection is produced.

I will now give illustrations of "definite" and "indefinite" variations. In 1847, Professor J. Buckman sowed seed of the wild parsnip in the garden of the Agricultural College at Cirencester. The seedlings began to vary, but in *the same way*, though in different degrees. By selecting seed from the best rooted plants, the acquired "somatic" characters of an enlarged root, glabrous leaves, etc., became fixed and hereditary; and "The Student," as he called it, having been "improved" by Messrs. Sutton & Sons, is still regarded as "the best in the trade." This is *definite variation*, according to Darwin's definition, for those weeded out did not differ from the selected, morphologically, except in degree, the variations towards improvement not being quite fast enough to entitle them to survive.

M. Carrière raised the radish of cultivation, *Raphanus sativus*, L., from the wild species *R. Raphanistrum*, L., and moreover found that the turnip-rooted form resulted from growing it in a heavy soil, and the long-rooted one in a light soil.⁸ Pliny records the same fact as practised in Greece in his day, saying that the "male" (turnip form) could be produced from the "female" (long form), by growing it in "a cloggy soil." Both forms are now, of course, hereditary by seed.

When a plant has been *long cultivated*, the relatively fixed nature, characteristic of most wild forms, generally breaks down; and the seeds from one and the same individual plant cannot always be

⁷ "Factors of Evolution."

⁸ This has been corroborated by M. Languet with the carrot. *Soc. Roy. et. Cent. d'Agricult.*, 2nd ser., vol. ii., 1846-7, p. 539.

depended upon "to come true." Thus, an eminent agriculturist once said to me (a trifle hyperbolically, of course) speaking of the varieties of wheat: "You can almost get a different variety from every grain in a single ear."

Sir J. D. Hooker records no wild variety of the cabbage (*Brassica oleracea*, L.). Theophrastus (300 B.C.) only knew three cultivated forms. Pliny speaks of six, but who will count them now? It would seem as if plants underwent two courses of variation. First, in adaptation to it, by responding at once to a new environment, *i.e.*, definite variation. Then, when this has been thoroughly established, as with all of our ordinary vegetables, they may vary indefinitely, but why they do so no one can tell. Still, taking a broad view of the whole process, it is obvious that all such variations were primarily due to the environment of cultivation; because *they never occur in the wild state.*

Hence, to test the reality of specific characters of wild plants, as Mr. Wallace describes, by their degree of stability under cultivation in a garden, cannot possibly give but the most untrustworthy results. Some may resist for a time the influences of the new artificial environment, others may succumb to them; but it will be *the very best means of forcing them to change*; for, as Darwin and Weismann assert, cultivation induces variability. Suppose this test had been supplied to the wild and tall *Cineraria cruenta* with its small flowers; what would a systematist now say if he had never known the origin of the modern dwarf kind with large flowers of innumerable colours? He would undoubtedly call it a new species.

The rule may be laid down that *a species may be constant as long as its environment is constant, but no longer.* I have changed the spiny *Ononis spinosa*, L., the Rest-harrow, both by cuttings and by seed, into a spineless form undistinguishable from the species *O. repens*, L., in two years; but it would have, I doubt not, at once reverted to *O. spinosa* if I had replanted it in the poor soil from which I took it. It seems, therefore, to be a very hazardous and fallacious method of testing the value of specific or other characters by cultivation. A wild plant may or not change at once. Thus the carrot, *Daucus Carota*, L., proved refractory with Buckman, but not with Vilmorin, who converted this *annual* to a hereditary *biennial*, by sowing the seed late in the season, till the character of flowering in the second season became fixed.

Indeed, the proposed test is not unlike trying a man's guilt by making him eat an ordeal bean!

Mr. Wallace illustrates his remarks by the case of species of *Arabis*, but quite fails to perceive that it goes to prove my contention altogether. He says: "*A. anachoretica* has tissue-papery leaves—*due to its growth in hollows of the rock*" (my italics.). "Seeds of this plant, when cultivated at Kew, produced the common species *A. alpina*. The same thing occurs with many plants, as every cultivator knows."

If the rocky environment is to be credited with species-making in the one case, so must Kew be in the other. In both cases there is neither mention made nor need of any selection at all. Mr. Elwes told me that the various bulbous plants he introduced from the East into his garden at Preston, Cirencester, changed so greatly in a few years in all their parts that he could scarcely recognise them again.

Mr. Wallace adds: "Other forms, with no greater peculiarities externally, preserve their characters under cultivation, though exposed to the most varied conditions."

This is equally and quite true; but any investigation into the causes of the origin of species by *variation* has nothing to do with any other question of the causes of preservation of the type-characters, or *heredity*. Evolution accounts for all living beings by variation; but it does not attempt to offer any explanation of the existence of "survivals." *E.g.*, *Nautilus* and *Lingula* have lived on from the Silurian days till now; *Equisetum* has flourished from, at least, the Carboniferous epoch till to-day. Therefore *change is not absolutely necessary in organisms under changed conditions*; but when it does occur, then I maintain, with Dr. Weismann, that all changes are primarily due to external influences. He says: "We are driven to the conclusion that the ultimate origin of hereditary individual differences lies in the direct action of external influences upon the organism."⁹

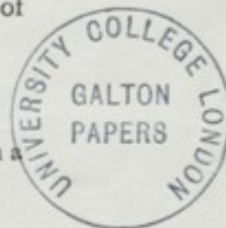
Mr. Wallace is good enough to call attention to my book, "The Origin of Floral Structures by Insect and Other Agencies,"¹⁰ and attacks, very rightly, what I fully admit may be regarded as a weak point in it; *i.e.*, I can bring but few positive illustrations to demonstrate my view that irregular flowers have been formed through the direct action of insects from regular ones; but he quite ignores the whole line of argument running through the book in support of the probability. It is one which Dr. Weismann recommends in support of evolution, which "may be maintained with the same degree of certainty as that with which astronomy asserts that the earth moves round the sun; for a conclusion may be arrived at as safely by other methods as by mathematical calculation."¹¹ It is the well known argument of the accumulation of coincidences which can furnish probabilities of so high an order that they may be regarded as an equivalent to a demonstration. Thus, physicists tell us that they *know* the composition of the sun, but their knowledge is solely based on the coincidences between the lines of the solar spectrum and those of vapourised substances.¹² Similarly with flowers: when we find innumerable coincidences all tending in one direction, coupled with an indefinite capacity for varying in response to forces in all parts of

⁹ "Essays on Heredity," etc. Eng. trans., p. 279.

¹⁰ *International Scientific Series*, vol. lxiv.

¹¹ "Essays on Heredity," etc., p. 255.

¹² The "fact" that udders have become enlarged by hand-milking is based on a similar accumulation of probabilities.



plants, I still maintain that "Mr. Henslow's theory [does not] utterly break down." Mr. Wallace contends that the negative evidence derived from "regular" flowers, as gentians, tells against me, as they ought to have long ago become irregular, since their "lower petals have been always subject to irritation and have never developed irregular flowers." This is scarcely fair; for not only do all botanists believe—on precisely the same grounds of probabilities—that all irregular flowers have descended (somehow) from regular ones; but that, if he will refer to the chapter on "Peloria," he will see that existing regular flowers, being mostly "terminal," have no "lower" petals at all, but are so situated as to offer access to insects from all points of the compass. Moreover, whenever a plant with normally irregular flowers (which are always situated close to the axis, so that insects can only enter them in one way) produces a blossom in a terminal position (as foxglove, larkspur, horse-chestnut, etc., often do), it at once becomes quite regular. These differences between regular and irregular flowers represent two of those groups of coincidences respectively, to which I referred.

Mr. Wallace adds: "The very first essential to this theory is to prove that modifications produced by such irritations are hereditary." Quite so. But this proves itself, if my contention be right; for plants with irregular flowers *are* all hereditary. So that there is no need to prove this point, provided the "previous question" as to the origin of irregular flowers themselves be answered. But the converse change can be readily shown; for flowers, normally irregular in nature, often revert to their ancestral regular form under cultivation in the absence of insects, and then come true from seed, as do Gloxinias. Unfortunately, one cannot make a regular flower become irregular. How long it required in nature to do so no one can tell; but all the innumerable minute details of structure coincide to one end; a multitude of correlations all fit together for one effect; so that we may put the alternative thus—Which is more likely, that some one common cause has set up these minute, often microscopic, details in unison together; or that they have arisen by selection out of innumerable wasted variations, which no one ever saw in nature, nor can even ever see a trace of under cultivation?

When, however, we come to variations in the vegetative system of plants, there is nothing easier than to prove, first, the direct action of the environment, and secondly, the hereditary persistence of the result. I need go no further than to take Buckman's parsnip, Carrière's radish, Vilmorin's carrot, or anybody's variety of cabbage. What are all these and many other instances but experimental verifications.

Mr. Wallace alludes to my last paper on "The Origin of Plant-Structures by Self-Adaptation to the Environment, exemplified by Desert and Xerophilous Plants,"¹³ and attacks my inferences with

¹³ *Journ. Linn. Soc. Bot.*, xxx., p. 218.

regard to spinescent processes of desert plants ; but he again ignores the primary argument of innumerable coincidences ; while in the case of vegetative organs this argument has been in many cases " verified by experiment." When, however, Mr. Wallace calls in question my statement that spines are correlated with a dry soil and atmosphere, he controverts those of Belt, Aitchison, Scott Elliott, Grisebach and others, for he says : " There is no such general coincidence of aridity of soil and atmosphere with abundance of spiny plants, as very little enquiry will show." Having seen and gathered them myself in the Libyan desert and even on our own sandy heaths, I cannot accept this statement ; and if those eminent travellers I have named are misleading us, where are we ? He then mentions the Galapagos and other islands, where, though of a desert character, plants are *not* spinescent. Here, again, I am not concerned with what does *not* occur, but with what *does*. Moreover, any cause that may tend to arrest an axis likewise may tend to render it spinescent, and more than one cause may produce the same result,¹⁴ so that it is not altogether strange to find spinescent processes away from deserts ; but I *do* maintain that spinescence is one and an important element in the *facies* of hot and arid deserts with a barren soil.

Gamarell
Curt

Mr. Wallace advances the well-worn theory of the interaction of mammals and spines. In the first place, if I may still believe in the prevalence of spines in deserts, they occur where no herbivorous quadrupeds live. Secondly, if a mammal wishes to eat a spiny plant, it somehow often gets over the difficulty ; thus donkeys knock off the spines of *Opuntia* ; horses eat gorse. I had a cow which was partial to holly, another rejoiced in nettles ! But all this is beside the question. It seems to me that there is a lurking element of teleology in this view : for any structure which arises *in anticipation of its use* savours of natural theology¹⁵ rather than of evolution by natural processes alone. I fully admit that plants, when once they have got their spines, may be able to keep animals more or less at bay ; but they originate, I maintain, as a mere accidental and inevitable result of an arrest of the organ in question, such arrest being mainly due to drought.

Camels

If teleology in its old dress of *Design in anticipation of Use* is, and ought to be, extinct, we may accept Darwin's form of it, that Evolution is the Deity's method of creation. Let us, then, recognise protoplasm as having been impressed with the power of self-adaptation—such being the inference from direct observation of its behaviour ; and, consequently, enabled to build up structures in an automatic response to the environmental forces, whenever it is necessary to bring about a better degree of equilibrium between the internal and external forces.

¹⁴ I observe Mr. Osborne makes a corresponding statement. NAT. SCI., p. 223.

¹⁵ Indeed, such anticipation is absolutely necessary for the theory of Natural Selection in general.

On the last page but one of his paper, Mr. Wallace alludes to the case of the hard shells of nuts, and asks if the direct agency of birds, monkeys, etc., has anything to do with them. He admits the question is absurd. I do not therefore know why he asks it. I have not myself written a line on this branch of the subject, but will suggest, from what one knows of all other parts of plants having the capacity of varying, that I see no reason for inferring that hard coats of fruits should be subject to any different law. Soft fruits vary readily enough, as melons, pea-pods, apples, as well as pears in their degrees of "stoniness." Moreover, under cultivation, varieties of forms of nuts and walnuts have arisen, as well as of olives, almonds, and dates, and other hard-coated or hard-seeded fruits. The fact seems to be that cultivation affects the whole organisation of the plant; for the environment is not always solely concerned with an isolated bit of a plant, as a nut or a root. Many visible changes are due to secondary causes within the individual; but in all cases, as I believe with Dr. Weismann, they are *primarily* attributable to the direct action of the environment, simply because *they never occur unless the environment itself is changed*.

Finally, to return to my starting point. The whole question lies within a very small compass. Thus, first, no one disputes the fact that the environmental forces can act upon an organism. Secondly, that the organism can respond to those forces. But now follow two views. Darwinites say that the resulting variations are indefinite in Nature, just as they so often are in cultivation; and that the environment *selects* the best fitted to survive. I say that they are always definite in Nature: and not only exceptionally so, as Darwin thought; and that the environment *induces* the best fitted to arise.¹⁶ Therefore, Natural Selection has nothing to do in aiding the Origin of Species.

For additional facts I would refer the reader to a paper entitled, "A Theoretical Origin of Endogens from Exogens, through Self-Adaptation to an Aquatic Habit"¹⁷; and to a companion volume to the "Origin of Floral Structures," which I hope will be shortly published in the "International Scientific Series," and entitled "The Origin of Plant Structures by Self-Adaptation, in Response to the direct Action of the Environment." In this, similar lines of argument, with illustrations, will be applied to Desert, Aquatic, Maritime, Alpine, and Arctic, as well as Climbing Plants, and to the Origin of Peculiarities of Roots, Stems, and Leaves.

GEORGE HENSLow.

¹⁶ See "Animals and Plants under Domestication," ii., p. 272.

¹⁷ *Journ. Linn. Soc. Bot.*, xxix., p. 485.



NATURAL SCIENCE:

A Monthly Review of Scientific Progress.

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No 28, June, 1894.

- I. Cell-Division. Part II. (Illustrated.) By M. D. Hill.
- II. Can the Sexes in Ammonites be Distinguished? By S. S. Buckman, F.G.S., and F. A. Bather, M.A.
- III. The Palearctic and Nearctic Regions compared as regards the Families and Genera of their Mammalia and Birds. By Dr. Alfred Russel Wallace, F.R.S.
- IV. Some Current Problems in Experimental Psychology. By Professor E. B. Titchener.
- V. Notes on Ground-Ice. By R. D. Oldham, F.G.S.
- VI. The Significance of the Bird's Foot. By Frank Finn, M.A., F.Z.S.

No. 29, July, 1894.

- I. Some Shell-boring Algæ. By Professor T. Johnson, B.Sc., F.L.S.
- II. An Address to the Museums' Association on the Museums of Dublin. By Professor Valentine Ball, C.B., F.R.S.
- III. Recent Progress in our Knowledge of Earthworms and their Allies. By F. E. Beddard, M.A., F.R.S.
- IV. Nearctic or Sonoran? By G. H. Carpenter, B.Sc.

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- Special Illustrated Supplement—Taxidermy as a Fine Art.
- I. The Evolution of the Thames. By J. Walter Gregory, D.Sc., F.G.S. (Illustrated).
 - II. Some Account of the Gall-making Insects of Australia. By Walter W. Froggatt.
 - III. Books of Reference in the Natural Sciences. By C. Davies Sherborn, F.G.S., F.Z.S.
 - IV. Some Reforms in the Oxford University Museum. By E. S. Goodrich. (With Plates I.—III.)
 - V. Hertwig's "Preformation or New Formation." By P. Chalmers Mitchell, M.A., F.Z.S.

No. 31, September, 1894.

- I. The Rev. George Henslow on Natural Selection. By Alfred Russel Wallace, LL.D.
- II. Hertwig's "Preformation or New Formation." By P. Chalmers Mitchell, M.A., F.Z.S.
- III. The Parasites of Malarial Fevers. By J. Walter Gregory, D.Sc., F.G.S. (Illustrated.)
- IV. A British Palm. By A. B. Rendle, M.A., F.L.S.
- V. The Bird's Foot. 1. By F. A. Lucas. 2. By Frank Finn. 3. By P. Chalmers Mitchell.
- VI. Notes from the British Association, 1894.

No. 32, October, 1894.

- I. The Origin of Species without the Aid of Natural Selection: A Reply. By Rev. George Henslow, M.A., F.L.S.
- II. Horticultural "Sports." By Charles T. Druery, F.L.S.
- III. On the Geology of the Plateau Implements of Kent. By Professor T. Rupert Jones, F.R.S. (Illustrated.)
- IV. The Effect of Temperature on the Distribution of Marine Animals. By Otto Maas, Ph.D.
- V. On the Dispersal of the Nuts in certain Labiates. By Miss Dorothea F. M. Pertz. (Illustrated.)
- VI. Hertwig's "Preformation or New Formation." By P. Chalmers Mitchell, M.A., F.Z.S.

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Henslow

Granby Hotel
Barrogate
Sept 8. 97

Dear Mr Galton

Will you do me the
favour of running your
eye, through the accom-
-panying "proof": and if
you would make any
correction, - suggestion,
criticism, &c &c - that

you may think desirable
I shall be very much obliged

If you would care for
a copy of my paper on
"Hybrid Rhododendrons"

I shall be very pleased to
send one.

Yours truly

J. Henslow



Dr M. J. Mallet, author of the Standard work on "Vegetable Teratology" and a writer on "Sports", observes that in comparing wild with cultivated plants, it is important to remember that the great majority of cultivated plants, and especially flowers, are hybrids, and that there are exceedingly little to vary, so that when they sport - as they so often do - it is often due to sterility or to a "dislocation" of the characters of the individual parents, since some of them have 4, 5 or more "specific bloods" in their constitution.

If, therefore, we put on one side all such "reversional" sports, there remain sports due to the influence of the environment which are "innovations", so to say, and not "reversions". Here, again, although the proportion of sports under cultivation to those occurring in nature would be nearer equality; still the soil of gardens carries such wonderful alterations in wild plants; when Nitro-duced, that Mallet says he does not think any statement was too strong. Take two examples. The Garden Hyacinth was first introduced into England in 1586. But since then it has "sported" into a great variety of colours and into "double" forms. Again the Cabbage (*Brassica oleracea*) like the Hyacinth produces no variegated in nature; yet its "sports" are innumerable.

under cultivation: so that they can be classified into "Green" (Cabbage, Brussels-Sprouts, Kale, &c.), "Rosettes" (a Cauliflower) and "Kohl-Rabi". —

A "POT" is simply a rather well-marked variety, and appearing somewhat suddenly in new cases. —

Again "Dwarfs" appear much more commonly under cultivation, according to a French writer than in the wild state: — This is apart from the normal "nanism" of alpine and Arctic regions: —

Drayton House
Ealing.

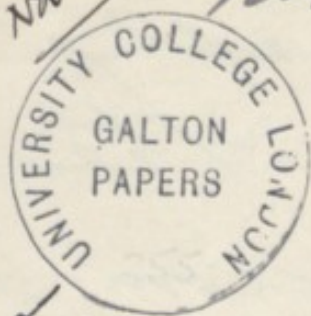
Geo: Buslow



Answered
Nov 23.

f22

Nov 12/08



Drayton House,
Leamington.

Dear Mr Galton

I have much pleasure
in sending you a pair
of my 2 books on
Ecology and Heredity.

I am very anxious
that you should clearly
understand why I
never could accept
N.S. as Maat with the
beginning of species. So

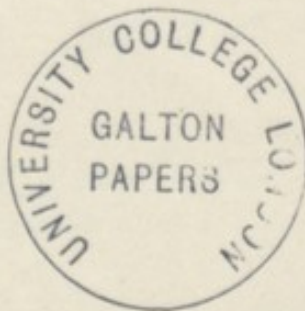
I have tried to put
Matters as briefly
as possible in the
4 pp. of M. S. accom-
-panying this. I
should like you to read
it first; so that you
will be able to carry
my position in your
head, when reading
the book itself.

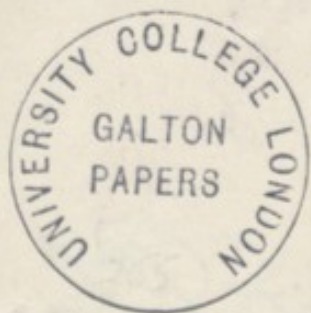
I shall value your
criticisms immensely.
Which ever are good

Enough today you
will find me.

With kind regards
Yrs sincerely

Geo: Bushaw





Nov 9. 08 ^{F26}

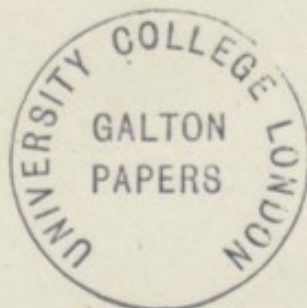
Drayton House,
Leamington.

Dear Dr. E. Allen

I am reading your
most delightful
"Memories" and it
has occurred to me
that - if you have
not seen it - I
should like to send
you a copy of my
"Recollections of the retired"

Characters w/ Plank,
 So, will you please,
 just say on enclosed
 proband, whether
 you have or have
 not seen it: & if
 the latter, I will
 send you a copy.
 I should be very grateful
 if you could send me

as to whether I have
proved my point
or otherwise
With kind regards
Sincerely
Geo. Sumner



(1) Drayton House
Leamington
Nov. 24. ^{f30r 1} *Hemlock*

Dear Dr. Gellon

First, let me thank you heartily for your kind criticisms. It is just what I wanted. I ask others, but ask in vain. A "conspiracy of silence" is all I get!

(1) The point you bring out clearly is that I do not depend sway on experience. This is quite true; for I base my argument far more on induction from what goes on everywhere in Nature. The conclusion of Harning and Costantini (Quidity & p. 27) is exactly that which Nature has forced itself upon me for many years; so that now, any alternative is practically unthinkable. — Let me try to explain my meaning. Take Spinescence and Drought. There



two go together, whether in the
tropical "thorn-forests," tropical and
subtropical deserts in all countries,
warmer and cooler temperate
regions, &c. Hence that drought is
the immediate cause of sterility
is a conclusion drawn from a
world-wide induction. An analogous
induction applies to aquatic
plants. Now, whenever experi-
ments are made; whether with
terrestrial under moist conditions;
or aquatics under dry, the converse
results ~~are~~ invariably ^{tend to be} produced.
Such corroborates the induction.

Note: The time it may take to produce
the changes by seed varies
greatly, from ~~one~~ one year to
— no change at all. Pestharrow
lost its spines in two years.

Read pp. 62, 63 the Logic Classics
for "Natural Selection" in the 6th
Ed. of Origin of Species (or p. 80 in the
first edition); and contrast his
words "favorable" and "unfavorable"
and although he does not explain
them, it is quite clear from other
remarks he means "Inadaptive"
and "Adaptive" Variations. See
e.g. his parable of the House built
with "accidentally adaptive stones".
End of 2nd Vol. of Am. & Pl. under Dom.

All the young which die from
"defective" structures and con-
=stitution, do so in the struggle
for life; but such are not
NEW Variations; upon which
the origin of Species entirely
depends.

You allude to—

(a) The effect of close inbreeding

(b) The size of seeds.

I fully admit all you say. I remember Mr. Fegetmeyer lecturing on pigeons, and he said it was a common complaint that "the best die in the nest." Whether this was the result of "inbreeding" or crossing varieties, I do not know; but it has its parallel in plants. After continued "inbreeding" in *Cyclanthes*, *primulas*, ^{sc, by crossing} ~~the~~ "They" cease to produce seed: for "crossing" produces only a temporary stimulus, and in a few years the production of seed by self-fertilisation far surpasses that of crossed plants, as a rule; as I showed 30 years ago (see *Self-fertilisation of Plants* Trans. Am. Soc. 1877). This is now generally accepted by botanists.

with regard to dwarfs, "Nanism" as "Gigantism" may be perverted, as every horticulturalist knows: and so become fixed varieties; because, there need be nothing "injurious" about them. On the other hand, "if small seeds be selected for some years, the plants either die out altogether by failing to produce seed, or a tiny race of beings is for a time maintained." (Quoted from my Origin of Plant Structures, 1895).

It is all a question of degree; just as there may be a race of tall men, or pygmies; or intermediate, like the Malters.

What Darwin meant by "inferious" (Origin of Sp. 6th Ed. Sp. 153); did not apply to the above at all,

It does not refer to mere "size" or
 weakly constitution or Malfor-
 = mation, &c.: but to a supposed
 development of some kind of
 structures which are maladaptive
 to changed conditions of life.

A vast amount of Elimination
 goes on in Nature, among such
 beings as you refer to; but - Evolution =
 = being that it is the Origin of
Species which is the point, all
 such are beside the question.

I maintain that Nature never
 produces New, maladaptive structures
 in developing seedlings: so that
 Darwin's ~~the~~ "Indefinite Variations",
 necessary for Natural Selection,
Never arise.

N.B. "Defects" are not New Varia-
 = tions; they are defects in the
already existing specific charac-
 = ters of the organism.

I do not know whether I have
made my points clear to you,
but I would especially ask you
to note Aluplopsis Veitchii;
Ranunculus heterophyllus: and the
wide induction upon which
I have the theory that all
Monocots: are descended from
aquatic dicots.

I have just seen a remarkable
case new to me. You know the "Sea-
holly" - Eryngium: well, there
are several species growing
on humid ground in Brazil; one
of which I saw in a garden in Jersey;
it is ^{exactly} like a Pandanus ^{from the};
hence, it is called pandinaefolia. The
anatomy of the leaves is identical
with submerged leaves; and full of
long air-chambers: yet it is now
a land and aerial plant!
Again thanking you -
Yrs most sincerely
E. Huxley

F34r

Why Natural Selection cannot be
the MEANS in the Origin of Species

The Notes Classiques of Natural Selection
will be found in the Origin, etc. (1st Ed.
p. 80; 6th Ed. p. 63) commencing: —

"Can it then be thought improbable
..... Natural Selection [or the Survival
of the fittest:]" (6th Ed.)

Darwin here makes no suggestion as
to the Cause of Variations; but
in his An. and H. under Dom. (1868)
he attributes them to the "Direct
Action" of "changed conditions of life"
[Passage is quoted on pp. 1, 2, in
my book]. His "Definite or Indefinite
Results," correspond to his "favourable
and injurious" + a few favourable
individuals.

By "favourable" he means "adaptive"
by "injurious," he means "maladaptive".

M.D.

This appears from his Parable²
of the Architect (A. & Pl. under Son.²
II. p. 430, ff.)

Now, Natural Selection requires
Indefinite Variations (= good
+ bad) in order that there
may be materials for "selection".

Darwin gives plenty of examples
of Definite Variations [see his
letter to Prof. H. Dapner: Quoted
on p. 8. of my book]; but neither
he nor Wallace nor any
one has ever mentioned a
single instance of Indefinite
Variations!

Note: - If any seedlings among
a batch, trying to grow up in
"changed conditions of life", develop
"injurious" characters; then

F35r 3

Since these are maladaptive, they
will be Mortal, and the individuals
Must die, whether there be
any struggle for existence or
not.

Hence Natural Selection, in Darwin's
use of the phrase, stands or falls
according to the existence or
non-existence of the young of
Animals and plants developing
"Malignant" = "maladaptive" = Death-
Bringing Variations.

BUT -

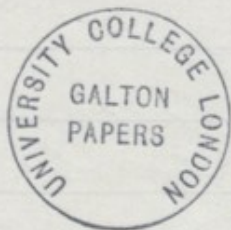
Nature Never produces such.
Hence Darwin's theory falls
to the ground.

CONTRA

Universal Law: All the seedlings
grow up on the seed in adaptation
to the new conditions. [See my
Lect. on Water Crowfoot. p. 34]

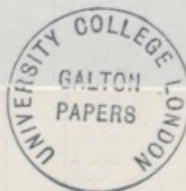
Result— Evolution is worked out by the Response of the Protoplasm & Nucleus to the Changed conditions (Redirection of Life); the Result being 'Definite', i.e. all vary alike in adaptation. These assumed adaptations, may become permanent; so that a new Variety or Species is established.

This fact is the main substance of my book.



Hereditary pads

F36a



Ampelopsis Vitis

Tendrils with incipient adhesive
pads before contact: see
Frontier to completion of pads

f.36b



UNIVERSITY OF LONDON.

The Francis Galton Laboratory for National Eugenics.*

The reply to this letter should be addressed to the undersigned—

Eugenics Laboratory, 88, Gower Street, London, W.C.



6th March 1907

Heron

Dear Mr Galton

The missing part of "Biometrika"
was brought here on the following day so we
have now the complete set.

We are looking forward to seeing you
here when you come back to London.

I am

Yours sincerely

Herbert Heron

* That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.

UNIVERSITY OF LONDON.

*The Francis Galton Laboratory for National Eugenics.***The reply to this letter should be addressed to the undersigned—***The Galton Eugenics Laboratory, University College, Gower Street, London, W.C.**18th March 1907.

Dear Mr Galton

I am sending you today a copy of the current number of the British Medical Journal which contains a note on Cancer Incidence - an extension of part of my Birth-Rate paper.

The number also contains a synopsis of lectures delivered by Dr. Ureghart on whose records of insane families I am at present working.

We are looking forward to seeing you here tomorrow.

I am
yours sincerely
David Heron.

*That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.

Heron

UNIVERSITY OF LONDON.

*The Francis Galton Laboratory for National Eugenics.***The reply to this letter should be addressed to the undersigned—***The Galton Eugenics Laboratory, University College, Gower Street, London, W.C.**10th June 1907.

Dear Mr Galton

We duly received the copy
of your Herbert Spencer Lecture.

We noticed with regret however that
you were not able to deliver it in person and
hope that you may soon be all right again.

I do not know if you can spare any
more copies; it might be well for us, in certain
cases to be able to give it to enquirers
who might be of service to the Laboratory.

I am
yours faithfully
David Huxon

* That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.

UNIVERSITY OF LONDON.

*The Francis Galton Laboratory for National Eugenics.***The reply to this letter should be addressed to the undersigned—*

The Galton Eugenics Laboratory, University College, Gower Street, London, W.C.

1 Oct. 1907.



Dear Mr. Galton,

We are now all at University College although we have not quite settled down yet as the alterations have not yet been completed. I enclose a rough plan of our quarters. The rooms have been freshly done up and I think we shall be very comfortable.

We are extending our book cases but otherwise there is no change.

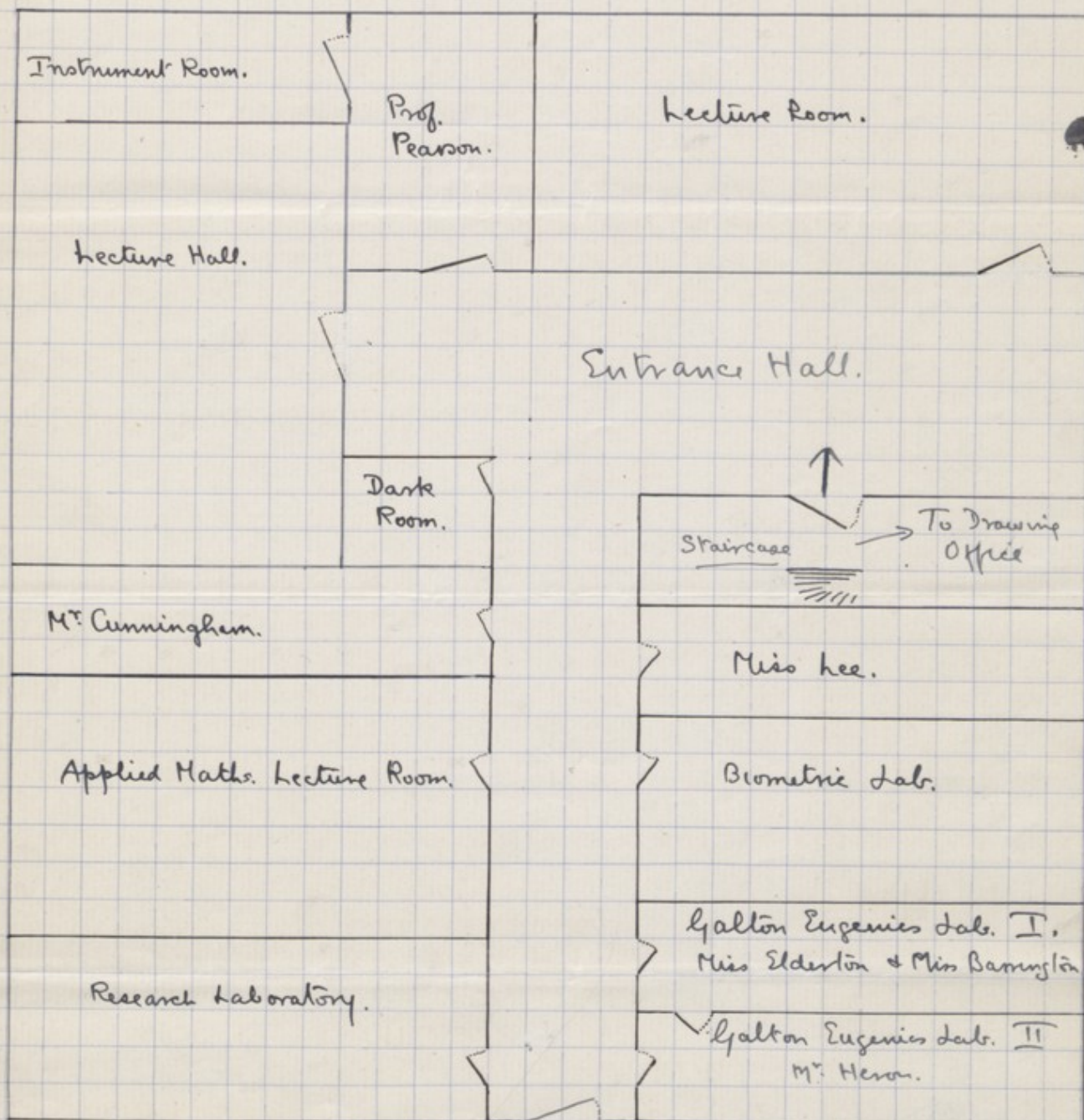
We are all looking forward to a good winter's work and hope to soon to see you here.

Yours

yours sincerely

David Huxon

* That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.



Heron

UNIVERSITY OF LONDON.

The Francis Galton Laboratory for National Eugenics.*

The reply to this letter should be addressed to the undersigned—

The Galton Eugenics Laboratory, University College, Gower Street, London, W.C.

Dear Mr. Galton,

Professor Pearson asks me to return the enclosed note. In the Table you give, $\frac{\sqrt{1-w^2}}{w}$ - in each case ought to be multiplied by 10.

I have made out a table of the percentage efficacy of "causes taken into account" & also send a rough diagram of this table. I shall be glad to draw this accurately if you wish it for publication.

Professor Pearson suggests that you should give a note on this point for "Biometrika".

With all good wishes for Xmas to you and to Miss Beggs

I am

yours sincerely

David Aron.



* That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.

"Effective Percentage" for values of
the correlation coefficient.

(= regression coefficient when the variants are
expressed in terms of the S.D.)

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%

.1 .2 .3 .4 .5 .6 .7 .8 .9 1.



Efficacy of the neglected cause of variation compared to that of the causes which are taken into account, in two normal systems of variables that are linearly correlated (F. Galton) Dec. 1. 1908

A & B are two systems of normal deviates having respectively the p.s. (or the S if desired) of a & b

A and B are transformed into A' , B' by dividing every deviate in A by a, & every deviate in B by b. So the p.s. both of A' & B' = 1

w is the coefft of Regression from A' to B' .

$$w^2 + f^2 = 1$$

Here w is the p.s. of the means of the values in B' that are associated with each value in A' . f is a constant & is the p.s. of the Scatterage of the individual values about their respective means as above.

So w refers to the causes that are taken into account & f to those that are neglected

and $\frac{f}{w} = \frac{\sqrt{(1-w^2)}}{w}$ is the desired fraction

<u>w</u>	$\frac{\sqrt{(1-w^2)}}{w}$	<u>w</u>	$\frac{\sqrt{(1-w^2)}}{w}$
0.1	.995	0.6	.133
0.2	.490	0.7	.102
0.3	.318	0.8	.075
0.4	.229	0.9	.048
0.5	.173	1.0	.000

When $w=0.1$ the regarded and the neglected are about equal in efficacy.
 $w=0.3$ the regarded are about as many as efficacious as the neglected ones.
 $w=0.7$, they are $\frac{1}{10}$ th.



LONDON.W.C.

LETTER CARD

2.

Alv.



UEG 0 188

Francis Galton, Esq^r/2 F. R. S.,
Meadow Cottage
Brockhouse Grove
Betchworth
Surrey.

Galton Eugenics Lab.
9th Dec. 1908

F.11 v

Dear Mr. Galton

Mr. Elderton's lecture
passed off splendidly. He seems to
have a natural gift for public
speaking. The audience was quite
enthusiastic and altogether it was
most successful. We had a good
audience.

Prof Pearson unfortunately is ill -
with lumbago & was unable to
present. He came down to college
today but ought not to have done so
as he was far from well.

Please forgive this hurried note - I
thought you would like to hear of
Mr. Elderton's success.

Yours sincerely
David Allen.



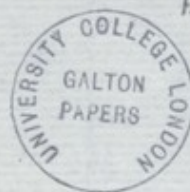
IF USED FOR TRANSMISSION ABROAD THE ADDITIONAL POSTAGE REQUIRED SHOULD BE
SUPPLIED BY MEANS OF ADHESIVE STAMPS.



1117

UNIVERSITY OF LONDON.

*The Francis Galton Laboratory for National Eugenics.**



The reply to this letter should be addressed to the undersigned—

The Galton Eugenics Laboratory, University College, Gower Street, London, W.C.

5th March. 1909.

Dear Mr. Galton,

We were all very sorry to hear of your bereavement and tender you our deepest sympathy.

I have seen Col. Melville. He seems very much interested in Eugenics. I sent him a card for our course of lectures and he has attended one of Professor Pearson's & means to come to the others.

I don't yet know how we may be able to make use of his assistance but probably he himself will know after he has become familiar with our work.

He intends to come up here some afternoon to look over our work.

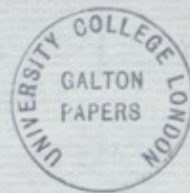
The Report of the Commission on the Feeble Minded arrived safely. It will be very useful to us.

So far the lectures have been very successful.

*That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.

UNIVERSITY OF LONDON.

The Francis Galton Laboratory for National Eugenics.*



The reply to this letter should be addressed to the undersigned—

The Galton Eugenics Laboratory, University College, Gower Street, London, W.C.

Prof. Pearson has given two introductory lectures instead of one - to an audience of about 50, and as no ~~be~~ tickets for single lectures were issued, we shall probably have a good audience throughout.

Prof. Pearson himself has been in very fine form while lecturing & has got some very interesting points.

It seems to be a general law that 60% of any generation die unmarried leaving 40% who may possibly have children -- also 25% of the married population produces 50% of the next generation thus of any generation $\frac{25}{100} \times \frac{40}{100} \times 100 = 10\%$ of one generation produces one half of the next generation. He ~~has also~~ also obtained some interesting illustrations of the selective death rate.

Yours sincerely

David Storer

*That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.

UNIVERSITY OF LONDON.

The Francis Galton Laboratory for National Eugenics.*

The reply to this letter should be addressed to the undersigned—

The Galton Eugenics Laboratory, University College, Gower Street, London, W.C.



6th July 1905.

Dear Sir Francis,

I am very glad to hear that you are improving. I do hope that the promise of reasonable - & seasonable - weather will be fulfilled.

I have written to Mrs Pennington to the effect that I should like to see her material and have asked her either to send it here or - as it seems to be somewhat voluminous - to arrange that I may see it at her house.

I shall let you know the result in due course.

Professor Pearson has now deserted us but I do not go away till the middle of August - when I go to Germany to improve my reading powers in German.

Yours

Yours sincerely

David Aaron.

*That is, for the study of agencies under social control that may improve or impair the racial qualities of future generations, either physically or mentally.

Mr. Hertz

F1



40, LANSDOWNE CRESCENT,

NOTTING HILL, W.

March 31st 1894

Dear Mr. Galton

Mrs Alfred Hunt, the wife
the painter, told me yesterday
of a circumstance, which I imagine
may be of some little interest
to you who are so industrious
a collector of out. of. the way
physiological facts. In her
childhood, Mrs Hunt knew
a Mr. Davies, who lived at
Winchelsea, & was the 24th
child of a 24th child! There
was a peculiarly falling off

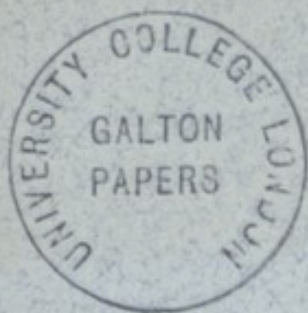
of the family possess in his case,
 for his own offspring reached
 only the modest figure of 12.
 When Mrs. Went paid him a visit,
 he was 84 years of age, & still
 so vigorous & active that he
 completely walked the younger
 people off their legs. If you
 should care to verify this state-
 ment, & to obtain fuller in-
 formation on the subject, you
 can do so by applying to Mr.
 Edwin Northfield of Hamlet
 Spire, who is either a great grandson
 or a great nephew of the said
 Mr. Daves. - It is long since we

have had the pleasure of seeing
you & Mrs. Fulton. Do you both
keep well? Will you not find
your way hither some Sunday
afternoon? - We chafe for news
from afar what you are doing
with your interest. Your "finger-
prints" are clearly going headfore-
to play a considerable part
in the detection of criminals.
You will not be in the good
books of "Merveux les Amis".
With kindest regards to Mrs.
Fulton

I am

Very sincerely yours

Samuel Hertz



ms 2 Herz

f5

40, LANSDOWNE CRESCENT,
NOTTING HILL, W.

November 17.th 1896.

Dear Mr. Galton

I enclose a leaf torn out (rather roughly)
from the Programme received of the
Popular Concert last Saturday. It strikes
me that the facts therein related concerning
Mozart's celebration, if you have not already
come across them, might be of interest to
you. To me it seems little short of
miraculous that he could write out that
setting composition, the overture to "Don
Giovanni" while his wife read aloud to him.
Indeed the statement that he did so during
the night before its performance excites much
doubt in my mind. For he would have had to write

the part of each instrument separately,
 & then could the members of the orchestra
 have studied & rehearsed their parts?
 Nevertheless it seems probable that Otto
 Jahm, his biographer, a writer of repute
 & standing, took trouble to verify the main
 point, which is that he had the faculty
 of thinking out a composition in its full
 detail & completeness, before he set pen to
 paper, & that he could then write it down
 correctly, while devising a fresh composition,
 or while concentrating his mind on some
 quite different subject. Have you met
 with any other such surprising manifestations
 of the hoped simultaneous action of the
 brain? — Do you & Mr. Salmon
 keep well? Are you on the track of people

Discoveries about the animal, those behaviors
 & those actions grow more & more puzzling
 & perplexing, more & more difficult to control,
 guide & regulate?

With kindest regards to Mrs. Allen

I am

Yours always sincerely
 Daisy Hertz



mixture of melancholy and mirth, bring this wonderful quartet to a close in a very original manner."

SONG. "Non t' accostar all' urna." SCHUBERT.

Schubert set music to fifteen Italian lyrics, including eleven by Metastasio. The present example is the first of four Canzonets, and was written, as to its music, in 1820—the year of the Grand Fantasia in C, so well-known at these concerts. Kreissle von Hellborn, in his biography of Schubert, credits Monti with the authorship of the lyrics, but in the new critical edition of the master's works (Breitkopf and Härtel) they are assigned to Metastasio.

"Non t' accostar all' urna" is written strictly in aria form, but the episode is brief and begins with three bars of recitative, ending with three bars of *Largo*. The composer of the "Erl King" and the "Young Nun" is not seen here. He puts on an Italian disguise—or, rather, that disguise as modified by Mozart, whose influence is easily detected.

AIR FROM "THEODORA."—HANDEL.

Handel's penultimate oratorio, "Theodora" was produced in Covent Garden Theatre, on March 16, 1750, and given again on three occasions during the composer's life. Its publication by the German Handel Society, in 1860, was followed by a public performance at Cologne, under the late Ferdinand Hiller, the work exciting most lively interest. "Theodora" was heard in London, for the first time after Handel's death, as recently as 1865, when Sterndale Bennett conducted a performance at the house of Miss Frith, in Wimpole Street.

The present air is sung by Theodora's lover, Didimus, who obtains access to her prison for the purpose of aiding her escape. He finds her calmly sleeping.

BEETHOVEN'S SONATA IN F MINOR.

It may amuse the reader to hear enthusiastic Herr von Lenz in praise of this work. He calls it—

- (I.) An explosion—of more than a volcano.
- (II.) "A deed without a name."
- (III.) Wild, luxuriant fantasy.
- (IV.) A volcanic eruption which rends the earth and fills the air with projectiles.
- (V.) A downright break-fingers.
- (VI.) Beethoven's "jeu de paume."

SONG. "Premier Miracle de Jésus." PALADILHE.

A song by the composer of the once famous "La Mandolinata" cannot fail to excite interest. Paladilhe

was born at Montpellier in June, 1844; entered the Paris Conservatoire when nine years of age; took the first pianoforte prize in 1857, and won the coveted Prix de Rome in 1860. On his return to Paris, he made a "hit" with "La Mandolinata" and, aiming at higher things, composed several works for the lyric stage, his best achievement being "Suzanne," an opera comique in three acts. Paladilhe's songs, of which there are a goodly number, are generally admired by his countrymen.

BRAHMS' QUINTET IN F MINOR.

This work—admittedly among the finest of the composer's productions—was written in 1865. Brahms had then been three years settled in Vienna, but, after resigning his post as conductor of the Vienna Choral Society, he often quitted the Austrian capital to become a temporary resident in other towns. Baden-Baden was a favourite resort, but not for idleness. The master worked hard all through this period, writing, as well as the present Quintet, the first two pianoforte Quartets, the Trio for pianoforte, violin, and horn; the Sonata for piano and cello; the Variations on a theme by Paganini, and many less serious compositions.

An avowed admirer is, of course, liable to exaggerate merit in the admired, but the following remarks of Dr. Deiters upon the Quintet in D minor are such as even the most disinterested critic would endorse, with, perhaps, a single reservation.

"Brahms attains perfection in chamber music in the Quintet for piano and strings in F minor (Op. 34); which, in our opinion, surpasses in value all other modern productions of this kind, not excepting Schumann's magnificent Quintet. Grandly conceived, deeply pathetic in its expression, rich in inspiration and imagination, it breathes throughout a tone of proud passion and energy, while by its incomparable depth of sentiment and warmth of tone, especially in the *Adagio*, it again recalls Beethoven's later style. The boldness and freedom of the subjects in the first movement (the dimensions of which are so large that they admit the full development of a third theme) have never been surpassed in modern music. The working out, the recapitulation of the theme and the coda are masterly. The Scherzo, with its combination of several small sections, departing entirely from the customary form, surprises us by its wealth of motives; restlessness, violence, a sense of triumph, possess by turns the troubled mind. The finale, introduced by a slow movement full of emotional tension, errs by being overcharged with subject matter and appeals more slowly to the understanding."

SONGS	a. "Premier miracle de Jésus"	... PALADILHE
	(Poésie de Stéphan Borlèse.)	
	b. "Sandmännchen"	... BRAHMS

Madame BLANCHE MARCHESI.

"PREMIER MIRACLE DE JÉSUS."

Alors, au quartier des Lépreux,
Dans une case abandonnée,
Vivaient de pauvres malheureux,
Jetés là par la destinée.
En passant on les insultait ;
Les enfants repoussaient leur fille.
Seule, la Vierge visitait
Avec Jésus cette famille.

L'enfant tomba malade un soir,
Le lendemain elle était morte,
Et, quand la Vierge vint les voir,
La mère pleurait à sa porte.
Jésus, pressentant un malheur,
Demande à voir sa jeune amie.
"Non," dit la mère avec douleur,
"N'entrez pas, elle est endormie."

Mais l'Enfant Jésus s'avancant,
Près de la morte s'agenouille,
Et dit : "Mon Père, Dieu puissant,
Rendez la vie à sa dépouille."
Alors l'enfant rouvre les yeux,
Et murmure, en voyant sa mère :
"J'avais été pour vous aux cieux
Demander la paix sur la terre !"

"SANDMANNCHEN."

Die Blümelein si schlafen schon längst im Mondenschein,
Sie nicken mit den Köpfchen auf ihren Stengelein.
Es rüttelt sich der Blütenbaum,
Er säuselt wie im Traum :
Schlafe, schlafe, schlaf' du, mein Kindelein !

Die Vögelein sie sangen so süß im Sounenschein,
Sie sind zur Ruh gegangen in ihre Nestchen klein.
Das Heimchen in dem Aehregrund,
Es thut allein sich kund :
Schlafe, schlafe, schlaf' du, mein Kindelein !

Sandmännchen kommt geschlichen und guckt durch's Fensterlein,
Ob irgend noch ein Liebchen nicht mag zu Bette sein.
Und wo er nur ein Kindchen fand,
Streut er ihm in die Augen Sand.
Schlafe, schlafe, schlaf' du, mein Kindelein !

Entr' Acte.

THE PROGRAMME—ADDITIONAL NOTES.

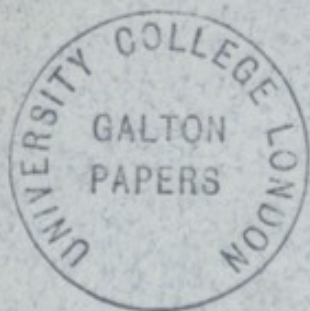
MOZART'S QUARTET IN D MINOR.

This work is sometimes mentioned in illustration of the remarkable power which Mozart had of settling all the details of a composition in his mind before sitting down to write, and, in the act of writing, being able to give attention to other matters. It is well known that he penned the overture to "Don Giovanni" during the night before its performance, his wife reading to him as he did so. Again, in a letter to his sister, accompanying the MS. of a prelude and fugue, he apologised for having placed the prelude last by saying, "The reason was that I had already composed the fugue, and wrote it down while I was thinking out the prelude."

"External distraction, so far from annoying him," writes Otto Jahn, "served to divert his mind during the mechanical labour with his pen. He made Constanze (his wife) tell him stories, or played bowls; his wife tells us herself how she was confined of her first child while he was composing the second of his quartets dedicated to Haydn (the work played to-day). This was in the summer of 1783, and he sat at work in the same room where she lay; indeed, he generally worked in her room during her frequent illnesses. When she complained of pain he would come to cheer and console, resuming his writing as soon as she was calm. This is a striking proof how unshackled Mozart's musical activity was by external circumstances. It is not given to many to remain so completely master of their ideas and powers during an event which would naturally appeal to the tenderest feelings of the heart." Schubert was never tried in the same way, but it is clear that he possessed the same faculty of laying out his work in his mind before writing. This kindred genius, when music-master at Count Carl Esterhazy's, was asked to "set" De la Motte Fouqué's poem, "Gebet vor der Schlacht" for the family quartet. He retired with the verses, thought out the subject, and within ten hours reappeared with the MS., in which there was not a single correction. Those who are acquainted with that profound and noble piece will understand what such a feat involves.

Jahn styles the Quartet in D minor "an affecting expression of melancholy," but he regards the slow movement as "consolatory," and the Menuet as "bold and defiant." Regarding the Variations in the Finale he writes: "The Variations, which are as charming from their grace and delicacy of form as from their singular





40, LANSDOWNE CRESCENT,
NOTTING HILL, W.

October 11th 1897

Dear Mr. Galton

I have sent your Royal Society Paper
& your letter, accompanied by a few words
from myself to Mr. Edwin Bramph (Windygate,
Scarborough) & I do not doubt that he will
think it an honour & a privilege to place
at your disposal whatever facts bearing on
your present investigation he may have
collected in the course of his long experience as
a breeder of blood horses. — Has it occurred
to you to make any inquiries about the Queen's
Cream-colored State horses? They all come
from Haumur, where the breed is of great
antiquity & I should think that probably the

Pedigrees of these much prized creatures
 have been treated as seriously as though they
 had been Kielmarsegges or other high born
 ones, and to produce their 36 quarters, before
 they could be recognised as having enjoyed any
 nativity at all. Perhaps the "Master of
 the Horse" might be able to enlighten you on the
 subject. It would be rather satisfactory to find
 that ornamental fractionary something & do
 for once that was useful - Could you spare
 the encloses copy of your paper to send
 to my cousin, Dr. Edmund von Lippmann of
 Halle, the writer of the pamphlet. I gave
 you on B. A. H. Meyer? - Your paper would
 interest him profoundly, I read as much
 of it as I could grasp, with keen interest,
 but my weak brain is not equal to the

effort of following you in the working out
of all those abstruse calculations. —

Muzzles me much is how it comes that the
offspring of any given pair, who have the
same father & mother & ancestors should differ
so much from one another. — Do you not find
it to be the case among your Beant Herms?

I suppose the brothers & sisters are not all
tricoloured, or un-tricoloured? Well! Some
day when you have a thing better to do, you
will come & clear up my befogged mind.

We greatly enjoyed your visit on Saturday.

Yours with kindest regard
Fanny Hardy

F 11

UNIVERSITY COLLEGE LONDON
GALTON PAPERS
3/3/8/20

A. HILGER,
204, Stanhope Street, Hampstead Road, N.W.

List of Spectroscopes and Spectroscopic Accessories.

No 1 Spectrograph with Camera & Quartz train = 35.15.0

MARCH, 1899.

Student Table Spectroscope £ 4

Table Spectroscope No. 1.—The divided circle is 6 inches in diameter, divided all round, the position of the telescope being read by vernier to 1 minute of arc. The prism table rotates, and has a clamp for the prism. A division for the prism table is provided for setting to minimum angle. The vernier is read by a moveable reader. The prism supplied with the instrument is $1\frac{1}{2}$ inches high, the face being $1\frac{1}{2}$ inches long, and it can be of either light or dense flint. The collimator has a well-made adjustable slit with platinoid jaws, wedge for reducing the aperture, protective cap, and comparison prism, also adjusting screws for getting jaws of slit to close parallel. The telescope has rack and pinion focusing, high and low power eyepieces with spider webs for measurement, and tangent screw for slow motion. The objectives of both telescope and collimator are good achromatics of $11\frac{1}{2}$ inches focal length, and $1\frac{1}{2}$ inches clear aperture. The above, mounted on a strong iron tripod stand.

Price £10 0 0

Same with 2 Verniers to Telescope & 1 to prism table 19.0.0

Photographic Scale adapted on a third tube uniform in design with telescope and collimator Extra £2 0 0

Table Spectroscope No. 2.—The divided circle is 8 inches in diameter, the division being on platinoid. The division is to $\frac{1}{2}$ degree, the telescope vernier reading to 30 seconds. The levelling table for the prisms is worked optically flat, and stands on three levelling screws which fit in three radial grooves in the lower prism table. This latter rotates, and is provided with a vernier which reads to $\frac{1}{2}$ minute. It also has a slow motion by rack and pinion. One flint prism, light or dense, is supplied, $1\frac{1}{2}$ inches high by $1\frac{1}{2}$ inches length of face, and refracting angle 60 degrees. The verniers are read by a moveable reader. The collimator has a well-made adjustable slit, with platinoid jaw, wedge for reducing aperture, protective cap, and comparison prism. The telescope is supplied with high and low power eyepieces, with cross spider webs for measurement; and steel tangent screw for slow motion. Both telescope and collimator have rack and pinion focusing, and divided drawtubes, the divisions being in millimeters. The objectives are of $11\frac{1}{2}$ inches focal length, and $1\frac{1}{2}$ inches clear aperture. The fittings of collimator and telescope are secured by double clamps. The above is mounted on a stable tripod stand with three levelling screws.

Price £25 0 0

do with 2 Verniers to Telescope & Prism table 34.10.0

Photographic scale on a third tube, uniform in design with telescope and collimator Extra £2 0 0

Wood camera with 6 exposures 3.10.0

Table Spectroscope No. 3.—The circle is 9 inches in diameter, and is divided on platinoid, the dividing being on the edge; and both telescope and rotating prism table read by *double* verniers to 15 seconds of arc. The levelling table for prisms is worked optically flat, and stands by its three levelling screws in three radial grooves on the rotating prism table, which has a slow motion by rack and pinion, and to which the verniers are attached. One extra dense flint prism $1\frac{1}{8}$ inches high by 2 inches length of face, and 60 degrees refracting angle is supplied on a separate levelling table. The collimator has a slit adjustable by a good steel screw and divided drumhead, wedge for varying aperture, protective cap, with parallel glass window, comparison prism, and adjusting screws for getting the jaws to close parallel. The telescope has the following eyepieces:—1 high power, 1 low power, each with cross spider webs; 1 shutter eyepiece with a bright pointer, which is illuminated by revolving mirror and has a lateral adjustment. Both collimator and telescope have rack and pinion focusing and divided drawtubes (millimeter division), and the focusing is by motion of the objectives. The tube fittings for telescope and collimator have ring clamps at each end. The objectives are achromatics of the highest quality, of $13\frac{1}{2}$ inches focal length, and $1\frac{1}{2}$ inches clear aperture. The above is mounted on a stable cast iron tripod stand with three levelling screws, and the collimator and telescope are provided with stays for greater rigidity.

Price £50 0 0

ditto on strong Gifford stand .. extra 15:10:0

Table Spectroscope No. 4.—(No. 3 modified so as to be suitable for either the visible spectrum, or work in the ultra violet by photography or fluorescent eyepiece). The divided circle is the same as in No. 3. The prism tables are the same as in No. 3. Two prisms are supplied, ~~each on a separate levelling table~~—1 extra dense flint prism of $1\frac{1}{8}$ inches high by 2 inches length of face and 60 degrees refracting angle. 1 quartz prism (combined right and left rotation) accurately cut with respect to the axis, ~~$1\frac{1}{8}$ inches high by 2 inches length of face~~, and of 60 degrees refracting angle. The collimator is the same as in No. 3, but the slit has a quartz comparison prism. The combined camera and telescope has rackwork and millimeter division for focusing, is fitted with bellows and metal camera, dark slide, and fine ground grey plate. The camera has tilting arrangement with division for getting the whole plate to focus at one and the same time, and takes six photographs of the spectrum one beneath the other on a $\frac{1}{4}$ plate. ~~The grey plate can be examined from end to end by a special arrangement of the eyepiece.~~ There is a slow motion steel tangent screw. The verniers on telescope and prism table are the same as in No. 3. The focusing is by motion of the objectives. The following eyepieces are supplied:—1 high power, 1 low power, both with cross webs; 1 quartz eyepiece and 1 shutter eyepiece with lateral adjustment for the bright pointer; 1 'Living' fluorescent eyepiece for visual work in the ultra violet. The objectives are:—1 pair $13\frac{1}{2}$ inches focal length and $1\frac{1}{2}$ inches clear aperture, glass achromatics of the highest quality, with cells for same; 1 pair of quartz lenses of 13 inches focus for D and $1\frac{1}{2}$ inches clear aperture, with cells for same. The above, mounted on stable tripod stand with three levelling screws.

Price complete £80 0 0

ditto on strong Gifford stand .. extra 15:10:0

Sensitive circular levels for setting up these instruments, showing from 10 seconds of arc

£2 0 0

Gifford's universal Goniometer & Spectrograph £125:0:0

The above four Spectroscopes are designed to be useful for general spectroscopic work. Mr. Hilger will be glad to supply designs and estimates for instruments for any *special* work.

Pocket Spectroscopes for Rainband and Chemical Observations.

Direct vision pocket spectroscope with fixed slit, in brass case, 3½ inches long	£1 5 0
Ditto, 2 inches or 3½ inches long, with adjustable slit ..	2 0 0
Ditto, 5½ inches long, with adjustable slit and large compound prism	2 10 0
<i>Ditto with Photo scale in Morocco case</i> £	<i>3 10 0</i>
Ditto, very powerful, with condenser in front of slit, in brass case, 4 inches long	3 0 0
Ditto, 8½ inches long, dividing D lines easily	4 10 0
<i>Ditto with Micrometer arrangement</i>	<i>8 10 0</i>
Morocco case for above	10 6
Direct Vision Spectroscope with large compound prism, two positive eyepieces, tilting slow motion to telescope for observing different parts of the spectrum, in case ..	8 10 0
Photographic scale adapted to any of the above	1 4 6
Comparison prism	10 6

Ditto all in Aluminium complete Weight 3 lbs from £15 0 0
Stellar Spectroscopes from 20 0 0

Solar & Stellar Spectroscope with position circle and rectangular slides, collimator and telescope 7/8 inch aperture, with rack motion, best quality slit with comparison prism and wedge for varying the aperture. 1 finest Rowland grating in mounting with levelling screws, parallel worked glass over the ruled surface, and revolving motion for the various orders. Telescope and collimator with divided drawtubes, and three positive eyepieces. Also finest white Jena flint prism on separate levelling table, easily interchangeable with the grating. Cylinder lens in front of slit for stellar work.

Price £70 0 0

Automatic Spectroscopes with from one to six 60 degrees flint prisms
Price from £12 10 0 to £40 0 0

Automatic Spectroscopes with reversion by right-angled prisms, from one to six prisms.
Price from £20 0 0 to £80 0 0

Spectroscope Accessories.

Slits with jaws of platinoid, steel, platinum iridium, or quartz, adjustable by finest micrometer screws.

Double and symmetrical slits for absorption experiments, etc. (These slits are constructed on good mechanical principles, and are entirely free from the "lash" and uncertainty in adjustment to which symmetrical slits are usually so liable).

Schulze cells for absorption experiments. *open 25/6*

closed 32/6

Micrometer eyepieces, shutter eyepieces, with lateral adjustment for the bright pointer, fluorescent eyepieces for work in the ultra violet.

Rowland diffraction gratings. *best Quality £ 8:10:0*

Quartz-calcite lenses. *Ditto mounted £ 12:10:0*

These are supplied in three types:—

1.—The best achromatic and aplanatic combination for the visible spectrum, *i.e.*, from W.L. 7951 to 3612. This is a better combination than any glass gives.

2.—The best combination for achromatism and aplanatism of axial pencils throughout the complete photographic spectrum.

3.—The best combination for aplanatism of both axial and oblique pencils throughout the photographic spectrum, achromatism being neglected. This lens is, however, still fairly achromatic, and by a very slight tilt of the photographic plate can be sharply focused over the whole spectrum.

Owing to the great range of light transmitted by these quartz-calcite lenses, the greatest care must be taken in the computation of the curves and in reproducing them on the material. A badly computed lens, though it may give good achromatism and definition of the visible spectrum is, for photography of the extreme ultra violet, quite useless, worse indeed than plain quartz.

No. 2 above is for use with a fluorescent eyepiece; the focus is as nearly as possible the same for rays of all wavelengths, from 7951 to 2147.

No. 3 is specially designed for photography, and is admirably adapted for the purpose.

The ratio of focal length to clear aperture in these lenses may be anything from $6\frac{1}{2}$ to 1 upwards.

Prisms of glass of all refractive indices from 1.50 to 1.96, and of any size.

Prisms of quartz, calcite (Iceland spar), fluor spar, rocksalt.

Lenses " " " " " "

Liquid prisms with glass or quartz plates.

Metal cameras adapted to any spectroscope.

Coelostats for spectroscopic work.. .. from £7 10 0

Heliostats " " from £15 10 0

Parallel wire micrometers from £8 10 0

Quartz jaws for spectroscope slits up to 25 millimeters long the pair £3 0 0

The price increasing at the rate of £1 per centimeter additional length.

Photomeasuring micrometers, with steel screw of 1 millimeter pitch, large divided drumhead and reading microscope with high and low power eyepieces from £16 0 0 to £25 0 0

Colour patch apparatus, as used by Capt. Abney, symmetric slit on collimator, triple slit at spectrum end, good objectives, and two light flint prisms from £40 0 0 to £80 0 0

Rotating sector for use with the above .. from £10 0 0 to £14 10 0

And all other accessories for spectroscopic work.

For Astronomical Instruments see separate list.

A. HILGER,

204, Stanhope Street, Hampstead Road, N.W.

Price List of Stock Prisms.

Glass Prisms, refracting angle 60° unless otherwise ordered.

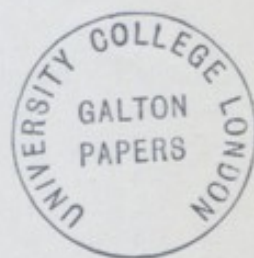
Light Flint. ref. ind. for D=1.578			Medium Flint. ref. ind. for D=1.617			Dense Flint. ref. ind. for D=1.649			Extra Dense Flint ref. ind. for D=1.673			Extra Dense Flint ref. ind. for D=1.78			Densest Flint. ref. ind. for D=1.96		
Height of Prism.	Length of face.	Price.	Length of face.	Price.	Length of face.	Length of face.	Price.	Length of face.	Length of face.	Price.	Length of face.	Length of face.	Price.	Length of face.	Length of face.	Price.	
in. mm.	in. mm.	£ s. d.	in. mm.	£ s. d.	in. mm.	in. mm.	£ s. d.	in. mm.	in. mm.	£ s. d.	in. mm.	in. mm.	£ s. d.	in. mm.	in. mm.	£ s. d.	
1 19 1 25	1 33	0 17 6	1 25	1 0 0	1 28	1 28	1 5 0	1 32	1 32	1 10 0	1 32	1 32	2 5 0	1 32	1 32	2 15 0	
1 25 1 33	1 42	1 5 0	1 33	1 10 0	1 35	1 35	1 16 0	1 44	1 44	2 4 0	1 44	1 44	3 12 0	1 44	1 44	4 10 0	
1 33 1 42	1 51	1 17 6	1 42	2 0 0	1 44	1 44	2 10 0	1 54	1 54	3 4 0	2 54	2 54	5 10 0	2 54	2 54	6 10 0	
1 38 2 51	2 51	2 10 0	2 51	2 16 0	2 54	2 54	3 10 0	3 54	3 54	4 15 0	3 54	3 54	8 5 0	3 54	3 54	9 16 0	
1 44 2 57	3 57	3 3 0	3 57	3 16 0	3 60	3 60	4 15 0	4 54	4 54	6 10 0	4 54	4 54	12 0 0	4 54	4 54	14 10 0	
2 51 3 57	4 57	3 17 6	4 57	5 0 0	4 59	4 59	6 10 0	5 54	5 54	8 10 0	5 54	5 54	16 10 0	5 54	5 54		
2 57 4 59	5 59	5 5 0	5 59	7 10 0	5 60	5 60	9 16 0	6 54	6 54	12 10 0	6 54	6 54		6 54	6 54		
3 57 5 59	6 59	7 0 0	6 59	10 10 0	6 60	6 60	14 0 0	7 54	7 54	17 10 0	7 54	7 54		7 54	7 54		

LARGER SIZES TO ORDER.

Hollow Prisms, with plane parallel sides of glass or quartz
and well ground stopper.

Diameter of cylindrical hole.		Price with plane parallel glass plates.	
in.	mm.	£ s. d.	
$\frac{1}{8}$	12½	2 5 0	
$\frac{1}{4}$	19	3 10 0	
$\frac{3}{8}$	25	4 16 0	
1	33	6 10 0	
$1\frac{1}{8}$	38	8 10 0	
$1\frac{1}{4}$	44	10 10 0	

LARGER SIZES TO ORDER.



Prisms of Quartz and Iceland Spar.

60° refracting angle.

(Guaranteed cut accurately with respect to the axis, and free from double image. The quartz prisms are composed of two prisms, of right and left rotation).

Quartz.							Spar.								
Height.		Length of face.			Price.			Length of face.			Price.				
in.	mm.	in.	mm.		£	s.	d.	in.	mm.		£	s.	d.		
$\frac{3}{4}$	19	..	1	25	..	5	0	0	..	$1\frac{1}{8}$	28	..	3	0	0
1	25	..	$1\frac{1}{4}$	33	..	6	15	0	..	$1\frac{3}{8}$	35	..	4	17	6
$1\frac{1}{4}$	32	..	$1\frac{5}{8}$	42	..	9	10	0	..	$1\frac{3}{4}$	44	..	8	5	0
$1\frac{1}{2}$	38	..	2	50	..	13	5	0	..	$2\frac{1}{8}$	54	..	13	4	0
$1\frac{3}{4}$	44	..	$2\frac{1}{4}$	57	..	18	0	0	..	$2\frac{3}{8}$	60	..	20	0	0
2	51	..	$2\frac{5}{8}$	65	..	24	0	0	..	$2\frac{3}{4}$	70	..	29	0	0

NOTE.—In cutting quartz and Iceland spar prisms as little material is cut away as possible, hence the dimensions will not as a rule coincide with those given above. The list will, however, serve as a guide as regards price, and Mr. Hilger will have much pleasure in forwarding enquirers a list of the quartz and Iceland spar prisms he may have in stock at any particular time.

The prices of quartz and Iceland spar objects are subject to alteration from time to time according to the market price of the crude crystal.

Fluor spar and rocksalt prisms and lenses, Nichol's, Foucault's, Wollaston's, and other polarising and double image prisms, Tourmaline and Selenite preparations, quoted for on application.

Price List of Objectives.

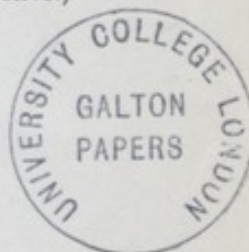
GLASS ACHROMATIC OBJECTIVES.						QUARTZ OBJECTIVES.					
Diameter of clear aperture.			Price.			Diameter of clear aperture.			Price (single objective).		
in.	mm.		£	s.	d.	in.	mm.		£	s.	d.
1	25	..	1	0	0	1	25	..	2	0	0
1¼	33	..	1	5	0	1¼	32	..	2	5	0
1½	38	..	1	10	0	1½	38	..	2	12	0
1¾	44	..	1	15	0	1¾	44	..	3	0	0
2	51	..	2	4	0	2	51	..	3	14	0
2¼	57	..	3	0	0	2¼	57	..	4	14	0
2½	64	..	4	5	0	2½	64	..	6	5	0
2¾	70	..	6	0	0	2¾	70	..	8	10	0
3	76	..	8	0	0						
3¼	84	..	10	0	0						
3½	89	..	12	10	0						

LARGER DIAMETERS TO ORDER.

QUARTZ-CALCITE COMBINATION OBJECTIVES.

(See under Spectroscopic Accessories for description).

Diameter of clear aperture.			Price (single combined objective.)		
in.	mm.		£	s.	d.
1	25	..	5	0	0
1 $\frac{1}{4}$	32	..	9	0	0
1 $\frac{1}{2}$	38	..	14	10	0
1 $\frac{3}{4}$	44	..	21	0	0
2	51	..	24	0	0



Thorp's film replicas of Rowland's diffraction gratings, 14,500 lines per inch.

- (1) Mounted on plate glass, for use with table spectroscope £0 18 6
- (2) *Levelling mount for ditto* Mounted on plane parallel worked glass „ „ £2 2 0
on parallel quartz 3 10 0
- (3) Mounted in 3 $\frac{1}{2}$ in. long or 5 $\frac{1}{2}$ in. long direct vision pocket spectroscope, with adjustable slit, in brass case. Visible spectrum over 20° .. £3 0 0
- (4) *mounted in fixed slit* Mounted on hand telescopes or binoculars (adapted to customers' own instruments) for eclipse observations. 1 15 0



N.B.—This list cancels all previous ones, and is subject to alteration without notice.

Terms: Cash with order, or good London references.

Foreign Orders should be accompanied by a remittance, or credit with an English Bank or first-class firm, who will pay on presentation of invoice or bill of lading.

Cheques to be crossed "London and Westminster Bank."

The very greatest care is exercised in packing, and Mr. Hilger cannot hold himself responsible for breakages, which should be claimed for from the carrier.

Registered Telegraphic Address: "SPHERICITY, LONDON."



Lewes Hill F.I.
73 Widmore Road
Bromley Kent
Dec 29. 08

My dear Sir.

allows me to express
the great advantage and
pleasure I have derived from
the perusal of your "memories
of My Life".

I have always done
what little came in way to
furnish information which I
learned you desired to possess.

I well remember filling
up, as regards what we call
the Bill family, the folios of
Family Records which to my
great surprise I learn from
your book were asked for more
than 30 years ago.

Every one in the several
branches of the family was
willing to furnish such
information as he possessed

but we, including myself, were greatly surprised to find how little we knew of your ancestors.

Your account of the hallucinations, ~~another hallucination~~ of Sir Rison Bennett leads to tell you briefly of delusions I have at times. My delusions (which as a child troubled me very much) are that I have seen or heard before things which I have not. It is only in my old age (I shall be 75 in a fortnight's time) that these delusions have returned and so far as I can judge they recur when my mind is overtaxed.

Here is an instance. Last summer I was staying at Bove and had occasion to visit the Bove Police Station to enquire for a Book which I had put down somewhere.

f3

In the Room, besides the
Police Inspector, there was a
man who proved to be the Police
Medical Officer and who on hearing
my story proceed to tell me of
a serious accident to one of his
boys last winter, as he went on
with his narration I felt certain
that during my previous visit
to Bove a year or two before
I had visited the Bove Police
Station, had met the same
gentleman and heard from
him the same story. I had
no doubt of this at the time
and it was only 2 or 3 hours
afterwards that I convinced
myself that mine was a
delusion.

In a little book
which I brought out last
summer "Vern, Fire and
Epitaphs" I quoted your
definition of Eugenes (p
150).

I wish all authors would
adopt your plan of giving
the dates of the birth and
death of those they mention.

Every Biography should,
I think, in the opening
sentence give the full name
and places of and dates of
birth and death; but
I few Biographies do
this. Where it is not
in my ^{own} copy. I write ⁱⁿ these
dates at the beginning for
as I go on reading I often
want to refer to them.

I do not think of
replying to the ramblings
of an old man.

Believe me

Yours truly

Lewin Hill (C.B.)

Crown 8vo Cloth Extra.

Price 2s. net.

"Verse, Prose, & Epitaphs,"

Selected from the Commonplace Book of

E. B. LEWIN HILL, C.B.

"To start a Commonplace Book is usual enough, but I do not know any one else who has kept up such a book for so long as sixty years.

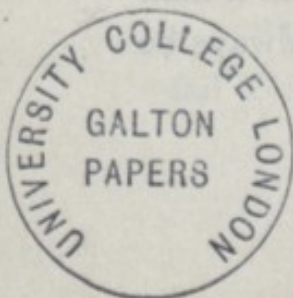
At the suggestion of friends I have made a selection of these extracts in the hope that they may afford pleasant reading to others, who, like myself, have no pretences to scholarship."—*Preface.*



BROWN, LANGHAM & Co., Ltd.,
78, New Bond Street, W.

And all Booksellers.

[PRESS NOTICES SEE OVER.]



Extracts from a few Press Notices.

"There are plenty of good things in it and it gives a pleasant impression of the leisure moments in the life of a civil servant."—*The Globe*.

"The prose portions of the book are interesting and abound in proverbs, epigrams from writers past and present representing many lands."—*The Northern Whig*.

"Mr. Hill is to be congratulated on an unusual achievement. In publishing it he has provided a book which furnishes any amount of entertainment, since his extracts are for the most part refreshingly unhackneyed."—*The Birmingham Post*.

"But, as we said earlier in this notice, a commonplace book is a revelation of personality and, speaking for ourselves, we are specially delighted in the selections in his volume."—*St. Martin's Magazine*.

"Mr. Lewin Hill, C.B., in 1848, began at the age of fourteen to keep a commonplace book in which he jotted down or copied out the things that caught his fancy in books, in churchyards and other repositories of wisdom, wit and quaintness."—*The Scotsman*.

"Mr. Hill possesses an individual way of looking at things and a sense of humour, and what such a man notes down in his journey through life will always be interesting to others."—*The Civilian*.

"It would be easy to go on multiplying the quotations of quaint and humorous verses and prose which are here brought together in a very happy and readable form."—*The Essex Weekly News*.

'To the ordinary reader the special value of the book is double: it contains *in extenso* many pieces of which even well-read people know only a snatch of a first line, and also many extracts from contemporary journalism that serve to recall both the figures and events of the recent past. Mr. Hill very conveniently supplies illuminatory notes wherever necessary."—*The Glasgow Herald*.

"This volume contains an interesting series of excerpts on attractive and various topics, in combination with axioms from the works of famous writers old and new. We commend it without reservation to lovers of verse."—*The Publishers' Circular*.

"The passages have been chosen with admirable judgment," after quoting several verses the reviewer adds, "There are many amusing quotations among the prose portions."—*The East Anglian Times*.

"From the literary standpoint this book cannot fail to interest."—*The Surrey Comet*.

ORDER FORM.

Please send me _____ cop. _____ of "VERSE, PROSE, AND EPITAPHS,"

by E. B. LEWIN HILL, Crown 8vo, price 2/- net, by post 2/3 net.

To _____

Bookseller

BROWN, LANGHAM & Co., 78, NEW BOND STREET, W.

Galton / 3/3/8/24

f.1a

THE BARN,

WARGRAVE, BERKS.

20th June 09

Dear Sir,

I was very pleased to see your letter
- 'Deterioration of the British Race' in 'The
Times' of the 18th inst. For a lawyer
it was a curious non sequitur for
Lord Halsbury to make. I am desirous
in support of your view to call attention
to my article: - 'National Breakdown and
Military Service' in the May number
of 'The Empire Review', in which I have

F.16

Lt. Colonel W. Hill-Climo,

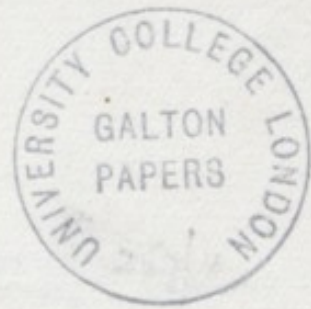
The Sun.

Army Med. Staff. (ret.)

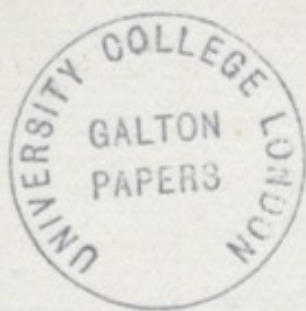
Weymouth. Bury. ~~20. Richmond. Mass.~~

* The Constitutional Club.

~~Estab. 4. C. W.~~



Official sources I have brought together
a mass of facts. which shows that the
determination of the British Race is real
and progressive. For the first time a
comparison has been instituted between
the health of certain foreign armies
and our Home army. The mortality
per 1000 from constitutional diseases
and from heart disease is much
greater in our army during at home



than in either the French, German, or
Austro-Hungarian Armies, or even in the
Russian Army. Whereas the death rate
from zymotic diseases is about the
lowest. Showing clearly that, though
our neglect of the individual he is more
liable to constitutional disease, though
better protected from the external causes
of disease, there is but one remedy,
the physical training of our young men.

with compulsory military service.
I enclose my card.

Yours truly

Wm. C. C. C.

Francis Galton Esq

7
- The regulations of candidates on
enlistment are for heart disease the
third highest on the list.
Wm

Hillier

3/3/8/25 f.1

ST. ALBANS AND HERTS ARCHITECTURAL AND
ARCHÆOLOGICAL SOCIETY.

Beaconsfield Road

ST. ALBANS.

I have said that
I am forwarding
this. A.F.B.

Nov. 3rd 1902.

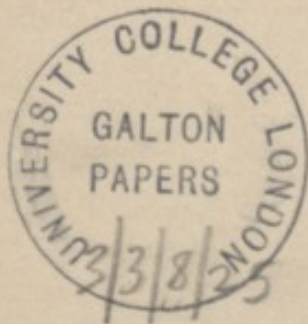
Dear Sir

I have been asked as a
medical man and as one of the
Honorary Secretaries of the above Society
to examine and report on the Skull of
Humphrey Duke of Gloucester who as
you doubtless know is buried in the
Cathedral here. I am afraid I
hardly know what measurements
to take from an Anthropological
view and I should be much obliged
for any directions you could give
me. The Dean has given me permission
to enter the vault and examine the
skull and I have written to him to
ask him if I may bring someone else

who has expert knowledge of the ^{f.2}
Subject. If therefore I have his per-
-mission (of which I think there is
little doubt) would it be troubling
you too much to come down here
or in the event of your being unable
to do so would you kindly name
someone who would be competent
to make the examination. The
only remains are, I am told, the
skull and one femur, but I think
it would be interesting to have a
report on the remains of so celebrated
a man. With apologies for troubling
you I remain

Yours very Sincerely

Robert. J. Kilmer.



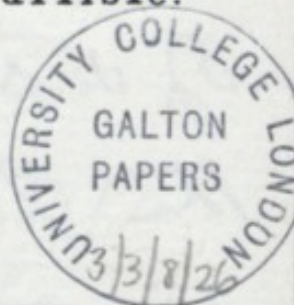
Ans'd
Sep 22
Telegrams,
Southwaite 4 Miles.

Mrs Hills

f1

Highhead Castle,
Carlisle.

Sep. 20th
1906.



My dear Mr. Galton.

I should so like
some news of you - Have
you kept well through
the summer, & where did
you eventually go to?
We had a wet horrid
August, but have done
better of late - we have
had a constant run

of visitors: & now have
the daugs with us, &
Fustace & his children,
& one or two other people.
Fustace seems distinctly
better & less sad, I am
thankful to say, & his
little ones are well
& very bright - my husband
also is quite well -
Colinde was up here



F.3

last week for the
partridge shooting,
& has now come to
Venice - He went
through the Aix - les -

Bains treatment
earlier in the summer,
& had glorious weather
all the time -

Lord Carlisle was over
here yesterday, not looking

at all well —

I am writing hurriedly
as the house is full, &

I have been called
away three times! <sup>while writing
this!</sup>

but please let me
hear exactly how you
are & how been,
when you have time
to write — I do hope
I shall have a good
report. My ever sincere
Anna Hills



replied May 5
Amherst College
Amherst, Mass
March 22, 1889.

Dear Mr. Galton

Some months ago in a very kind letter from you, it was suggested ~~that~~ something might be done with our gathered material of Anthropometric data.

I think you suggested something upon "the interdependence of measures of different kinds & characteristics."

Now I shall be pleased - God willing - to spend a part of my summer vacation in

some such work as
this. But I want
you to give me
a detailed schedule
of work from.

It is really
but little more than
clerical work, as
we keep our books
posted carefully
every few weeks.

But I shall be pleased
to do it for your
sake, & for that of
the general science.

If then you
can find time to set
me to work in some
way which you
can so easily suggest
I shall be very grateful,

will

& do my best
Most cordially
E. Hitchcock

Mr Francis Galton
42 Rutland Gate
London
England

Upland, Mass.
Hitchcock



Amherst College
Amherst, Mass.
April 16, 1889.

Dear Mr. Galton

I have
just made out a
few more statistics
for the benefit of
our students, & I beg
you to do me the
favor of glancing
over them.

And as I
remember your
kindness of old in
suggesting a line of
work. The results of
which you have so

Kindly published, &
I again want to
crave a direction of
work. Do you think
of some line of work
which I can take
up, making use of
the data I have at
my command.

I think you once made
some suggestion about
what I should call
relative proportions.

Next summer I have
some time which I shall
be delighted to give to
this work. I want to
know how is the best
way to do this work.

Most Cordially
Edward Hitchcock

Accurate measurements and tests of the physical condition of every student are taken when he enters College, and near the end of his course. By these we may learn something about the increase of the individual by the two records, and also much about the average of a college student: so that any student may have a standard of more than ordinary information of what he ought to have and show of himself.

The following table of the average of eight items of the most importance has been gathered from the data of sixty members of the class of '89 in Amherst College, the first of which were recorded in October, 1885, and the last in February, 1889. The per cent. of each increase is indicated and the results placed in the English and Metric systems. The number of men is sixty, and the average age in February, 1889 was 22 years and two months.

	October, 1885.	February, 1889.	Per cent. of Increase.
Weight.....	Kilos 61.6 Pounds 135.8	65.9 145.3	7
Height.....	Millimeters 1717 Inches 67.6	1737 68.4	1
Breadth of Head....	Millimeters 153 Inches 6.02	157 6.18	3
Breadth of Shoulders,	Millimeters 421 Inches 16.6	444 17.5	5
Breadth of Hips....	Millimeters 320 Inches 12.6	329 13.0	3
Stretch of Arms ...	Millimeters 1786 Inches 70.3	1964 77.3	10
Lung Capacity.....	Litres 3.83 Cubic Inches 233.7	4.32 263.6	13
Total Strength.....	Aggregates 328	524	60

The per cent. of increase is the least in the BODILY HEIGHT, and it has usually been considered that this datum is determined before eighteen years of age. And the BREADTH OF HEAD stands next in increase since the full size of the Brain is attained much earlier in life than the perpendicular height, and the bones of the skull will change but little after their contents are established within.

The largest increase is seen in TOTAL STRENGTH, and this really means the "condition" of the man so far as health and strength are concerned, as it is a condensed aggregate of the factors of bodily weight, muscular strength, and lung power. And the fact of a gain of 60 per cent. of these combined constants of a whole college class seems to speak well for the health of the college student.



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Climbing Rope. W. R. BARTLETT, '90, E. S. BOYD, '90,
 E. D. DANIELS, F. A. DELABARRE, '90,
 H. W. GATES, '90, G. S. HOLDEN, '90,
 G. W. HOWLAND, '90, E. T. POPE, '90,
 F. W. ALLEN, '91, R. M. BAGG, '91,
 F. H. TARR, '91, C. L. UPTON, '91,
 R. S. WOODWORTH, '91, L. W. GRISWOLD, '92.

College Record, 6 1-4 seconds.

Putting the Shot. M. H. HOUGHTON, '90, E. T. POPE, '90,
 N. D. ALEXANDER, '92, C. E. BURBANK, '92.

College Record, 33 feet 4 inches.

Standing High Jump. E. S. BOYD, '90, F. W. ALLEN, '91,
 R. B. LUDDINGTON, '91, O. B. MERRILL, '91,
 F. B. WALKER, '91, A. A. EWING, '92, L. W. GRISWOLD, '92.

College Record, 4 feet 10 inches.

Horizontal Bar. F. A. DELABARRE, '90, A. B. INGALLS, '90,
 S. B. KNOWLTON, '91, F. B. WALKER, '91,
 H. H. WAITE, '92.

Indian Club Exercise. H. A. SMITH, '90, R. B. STERRETT, '90,
 N. P. AVERY, '91, E. R. CLARK, '91, H. N. POTTER, '91.

Pole Vaulting. E. S. BOYD, '90, W. R. BARTLETT, '90,
 F. A. DELABARRE, '90, F. W. ALLEN, '91,
 R. B. LUDINGTON, '91, F. B. WALKER, '91.
 D. N. ALEXANDER, '92.

College Record, 8 feet 8 1-2 inches.

Floor Tumbling. E. S. BOYD, '90, F. A. DELABARRE, '90,
 H. W. GATES, '90, A. B. INGALLS, '90,
 S. B. KNOWLTON, '91, C. L. UPTON, '91,
 A. H. WALKER, '91, F. B. WALKER, '91.

Parallel Bars. H. W. GATES, '90, G. S. HOLDEN, '90,
 G. W. HOWLAND, '90, A. L. CLARK, '91,
 F. SHERLEY, '91, C. L. UPTON, '91, R. S. WOODWORTH, '91.

Batule Board Jumping. E. S. BOYD, '90, F. A. DELABARRE, '90,
 E. B. CHILD, '90, R. B. LUDINGTON, '91, C. L. UPTON, '91,
 R. S. WOODWORTH, '91, F. B. WALKER, '91.

College Record, 7 feet 3-4 inches.

Sparring. E. T. POPE, '90, H. A. SMITH, '90,
 E. D. DANIELS, '90, N. P. AVERY, '91, G. S. BENNETT, '91,
 H. J. LYALL, '91, C. E. BURRANK, '92,
 F. J. SEXTON, '92.

Music—"Review March."

Amherst College

Amherst Mass

U.S. A.

May 1 1888.



Dear Mr Galton

I am
very much pleased &
grateful that you
have tho't my work
worthy of your
notice. I could not
expect a greater
compliment than to
have you give it
to the public in great
& good old England.

And you don't
know what good it
does me to think that
some one appreciates
shores this work as

I do, for I don't
know how to make a
thing popular. I work
very much alone

But in a few
weeks I propose to
give myself to the
work you have
suggested. And if I
live to the latter
part of summer I
shall hope to give
you results from
all my data
exactly as you ask
for them.

And it would
be a favor which
I cannot be
grateful enough to

you. if you would
kindly suggest any
kindred work which
I might do, for I
have the material
compact & it can
be easily handled.

With much esteem
most faithfully Yours
E. Hitchcock

I have not many
English acquaintances.
But I am an old pupil
of Prof Richard Allen,
& have met Mr-
Charles Roberts.

Amherst College.

Amherst, Mass, U.S.A.

May 21, 1888.

Dear Mr. Galton



I feel that it is a great privilege to be set to work by you.

And in reply to your letter of April 13 where you suggest work in the line of variability in each bodily element, I would say that in my vacation in September I shall take hold of the matter, & God willing I can hope to offer you a large table soon.

I would however ask how many of the 41 items would you advise me to do this.

work upon. Perhaps
you will kindly
designate those you would
prefer; & yet if you
say that all the items
should be thus treated
I will undertake to
grapple with them.

With regard to the
main subject of your
last note "Head Growth"
I fear I have not at
present all the right
kind of data. I can
give the Breadth of Head
of some 1400 students
but have taken neither
of the other items.
I have however taken
the Girth of the head of
the same number.

Perhaps there would
be worth something
in this direction.

Can you find time
to drop me a note &
say if you would
advise me to take
the length & head as
well as the head ~~it~~,

also would you
advise the third
measurement. the
height above a specified
plane. ^{So} so please
designate exactly
how to secure it.

I secure all
map data in the metric
system, but give results
in the two systems.

Again let me express
what a pleasure it is to
me ~~that~~ I am doing
this detail work which
seems to interest you.

Very Cordially
E. Hitchcock



AVERAGE AND MEAN ANTHROPOMETRIC DATA

—OF—
Amherst College Students.

MARCH, 1888.



Items of Observation.

		The average Amherst Student.	The Amherst Student of average Height.	The Amherst Student of "mean" Proportions.			The average Amherst Student.	The Amherst Student of average Height.	The Amherst Student of "mean" proportions.
Heights.	Weight, Kilos.	61.2	61.7	61.5	Breadths.	Head, —	155	153	154
	Body, — Millimetres.	1725	1725	1720		Neck, —	108	108	109
	Sternum, —	1410	1408	1410		Shoulder, —	430	432	425
	Navel, —	1030	1030	1030		Waist, —	250	254	250
	Pubes, —	860	862	860		Hips, —	323	323	325
	Knee, —	476	475	478		Nipples, —	198	197	200
	Sitting, —	903	902	904		Sh'lder Elbows, —	372	372	370
	Head, —	572	572	568		Elbow Tips, —	458	462	460
	Neck, —	349	353	350		Feet, —	260	262	255
	Chest Repose, —	880	887	890		Str'tch of Arms, —	1780	1785	1781
	Chest Full, —	927	928	930		Horiz'l Length, —	1732	1730	1728
	Belly, —	724	724	730	Lengths.				
	Hips, —	900	891	900		Lungs, — Kilos.	1.5	1.3	1.5
Girths.	Thighs, —	515	518	515		Back, —	137	138	135
	Knees, —	355	357	355		Legs, —	166	164	160
	Calves, —	345	348	345		Forearms, —	39	38	37
	Insteps, —	241	240	240		Total, —	454	456	450
	R. U. Arm Cont'd, —	295	294	295					
	Upper Arms, —	257	258	255		No. of times.	6	6	6
	Elbows, —	249	250	248		Dip, —	9	10	10
	Forearms, —	260	260	262		Pull Up, —			
	Wrists, —	161	165	160					
						Lung Capacity, — Liters.	4.11	4.19	4.27
						Part of the body.	2.25	2.10	2.25
						Pilosity, —			

These are "Metric" measurements, and where the item is taken double—right and left parts—the average of the two is the record.

STATISTICS BEARING UPON THE AVERAGE AND TYPICAL STUDENT IN
AMHERST COLLEGE, MARCH, 1888.

The three columns of figures on the opposite page are the results of an attempt to learn what are the measures and proportions of *the average student, and the student of mean proportions* in Amherst College as derived from the anthropometric data gathered in the Department of Physical Education and Hygiene.

The first column gives the *averages*—in the several different items—*of all the students* who have been connected with College from 1861-2 up to 1887-8 inclusive.

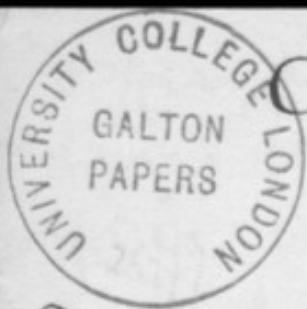
The second column gives the *averages* of the same items of those students only who were of *the average height of all College*—those whose height was 1725 millimeters, or 67.9 inches.

The third column is made up in this manner. Each item is separated into numerical groups—or columns of figures—of a small range—of a few millimeters each, and arranged side by side on a horizontal line so as to show the relative size of each one to the other, or of the largest to those of middle proportions, and of each of these to the smallest, the top of the columns representing an ascent and descent.

This will give a gradually ascending series from the left or smallest individuals to about the center of the groups, where the columns will grow shorter and shorter to the right, or to the largest individuals. The central column or the point between the two columns—if they chance to be two columns of equal numbers—will give *the mean or typical measurement of the item*.

In the item of *Height* for example, we may divide it into groups of ten millimeters or about half an inch each, beginning with 1600 to 1610 m. m. or 63 inches, and running to 1830 m. m. or 72 inches. This will give us 25 groups in all—and each man's Height as preserved in the book of Records will have been placed in the proper groups.

When all are gathered together in this manner we have an ascending series from the lowest or smallest measure to a certain point where the series begins to descend to the highest or largest measure. This point—or recorded height—where the greatest number of observations are found, constitutes the “mean” or the central point of all the heights, and is to be regarded as the typical or standard height of all the students. Hence this third column indicates the *student of mean Proportions*, while the



Amherst Mass
May 30. '89.

Dear Mr Galton

I thank
you very much for
your letter & the
valuable suggestions in it.

And I have most
hurriedly acted upon
your directions as well
as I could, & endeavored
to find the co-relation
between "Stature" &
"Total strength".

now can you find
time to tell me if I
am working aright, as you
believe is the best way. If
not please straighten me
out.

And do you
think I can go on
with this way of working

I furnish you with
something out of which
you can extract some
great truth.

I wish to say
that of all my statistics
the tests of strength are
some my most
unsatisfactory ones;
they do not come into
line like all the rest
of them.

I enclose a somewhat
hurried scrap, which I
tried to make according
to the suggestions of
your letter.

most cordially
E. Hitchcock



Ambherst College, Mass.
Aug. 15 1889.

Dear Mr. Galton

I herewith submit to you some work in co-relation of anthropometric work. It does not please me since it so imperfectly corresponds with similar work done in my manual. And yet I have worked at it with fidelity, & to the best of my ability it gives the results of the data in my record books.

There are a few results which I have indicated thus (✓) but I have gone over them again & again, & I cannot change them.

And I am tried with the results of Total Strength: as you see they are exceedingly varying, & in all my work for several years past this item has even puzzled & troubled me. And as I believe you are aware, it is purely an empirical datum made up by: $\text{Weight} \times (\text{Dip} + \text{Pull}) + \text{strength of back} + \text{strength of Legs} + \text{strength of Forearms} + \text{strength of Arms} = \text{Total Strength}.$

You speak kindly of the value which my material would be if it could be in type setting, or some other manifold. It would give me pleasure to furnish it if I could afford to have the copying done, but my condition is such that I cannot do it. And yet I could & would be most happy to have the material made use of by yourself or any one else.

If this work done amounts to anything I should be delighted to hear from you. And if you think it is worth the while, I should be pleased to reverse the order & show the relations of these items to statute.

I very much want to do something with our material in hand & yet I do not feel competent to guide myself to the work.

With great respect
Yours most cordially
E. Hitchcock

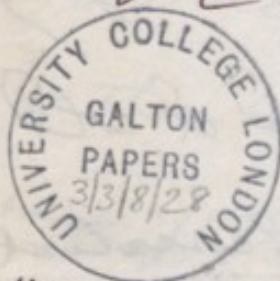
U.S. Patent Office Library

Was ~~h~~ 10/5/85

Washington D.C.

U.S.A.

Dear Prof. Holten -



I came upon your
"Color" note in "Science" of
Sept. 18, without having seen the
articles that called it out.
When I had read the part
about Mildred, wh next after
your own name was rather what
drew me on, I tho't there had
never been any color in mine
that I knew of (my color-sense
like any other senses is not keen)
but I would write & tell you
of a kindred experience, in regard
to form-arrangement, of months

I also numbers. Looking further in the paper, I saw that this had been quite largely treated; so I concluded I would just note a few differential points of my own case. My months are shaped in a perfect circle — unless for a slightly sharper curvature at the joints of the seasons — but inclined in position, like a hoop leaned up against a barrel. I do not make a diagram, wh^{ch} would not be so clear & pretty as the ideal figure is; I do not remember when I did not have it. The calendar is ignored. The 3rd Spring mo^o ascend the left side of the

loop as you face it, the 3
summer bend round the upper
quarter, the autumn descend
& the winter occupy the lower,
mid-Jan. coming where the loop
would rest upon the ground. The
movement of course is therefore
with the watch. If the immediateness
with wh. I can tell how far
one part of the year is from another
excites surprise, it seems to
come not from any calculation, but
from reference to this ideal ring.

Of my numbers, 1 appears abruptly
in the midst of space
like a Kantian category; then
2, 3, 4, rise just like stairsteps
from it; then 5 drops suddenly down,



below the level of 1, perhaps (not
moves I mean, but is found there).
This suggests a curious relation
with the primitive numerations
of mankind, where 5 is so commonly
the scale; it was as a little
boy that I first noticed this order,
tho' I believe my attention was called
to it in the beginning by my next brother
(of our large family the one least given
to abstract science or introspection).
after this, the line wiggles in a
most aimless way; it hardly gets up
to the level of 4 again till toward 20;
but meanwhile it has varied notably
in course. It started off—in no direc-
tion, & kept mostly to that till about 12;
the teens bending quite off to the right,
the 20s turning nearly back, thence zigzagging
to 100, then somewhat to the left. My
season-ring, when I look at it too
closely, may be somewhat perturbed by
these fantastic digits. Yours truly
Edw. Targuehan

PARCELS TO BE SENT
BY

~~AMERICAN EXPRESS COMPANY~~

Post.

Washburn Observatory,

UNIVERSITY OF WISCONSIN,

Madison, Oct. 8, 1885



Francis Galton esq
te te te

My Dear Sir: -

I take the liberty of enclosing to you a note of my friend, Edward Farguhar esq of the Library of the Patent Office Washington. The note was called out by a printed note of mine in Science Sept 1885 - and relates to form arrangements of months figures etc. If it is of any use to you, pray keep it. Otherwise destroy it. I will not trouble you to acknowledge this letter - I simply desire to add to your data on this question if I can.

I am, my dear Sir
Very faithfully
Edward S. Holden

Number from
Communicated by
Prof. E. S. Holden
Oct / 05

Dictated

L^d Knutsford

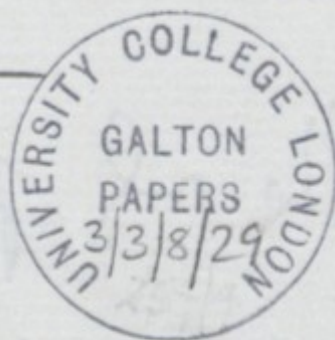
25/4/09



75, EATON SQUARE,

S.W.

June 25. 1909



My dear Galton

I am confined to bed

& have been so for a fortnight

but I must send one line of

congratulation on your

well-deserved honours.

25. EATON SQUARE
W. 2

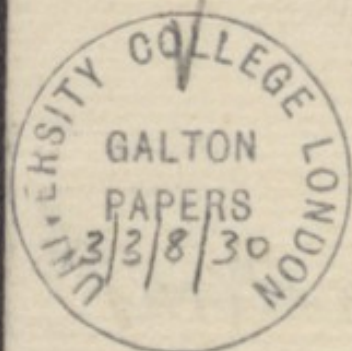
The only fault I find is
that it ought I have been
given years ago. But
still this recognition of your
work will be pleasant to you.

Yr. very sincere

Knutson

Hollander

f.1



62, Queen Anne Street,

Cavendish Square. W.

1st June 1902

Dear Sir,

It is some years since I had the pleasure of meeting you at the Anthropological Institute, of which I am a member, when you brought out your anthropometric measurements. Having followed your theories closely, I have cited them in several publications of mine.

I do not know whether you have read my book

on "The mental functions
of the Brain", but if you
have, might I ask you
to support my candidature
for the appointment as
Assistant Medical Officer
to the School Board - To
examine mentally defective
children. - The Board would
value a recommendation
coming from such an authority.
as regards qualifications
and testimonials from
medical specialists of repute
I shall be able to satisfy the

Board, but considering the number of candidates a little additional influence may turn the scale in my favour. I have devoted many years to the study of mentally feeble children, both in England and on the Continent such as Daledorf near Berlin, and the Bicêtre in Paris, that I should love the particular work, but my chief reason for applying for the post is that I believe a really scientific man could make valuable investigations.

It is for this reason that
I venture to ask you if
you could give me a line
of recommendation, in
which case I should be
very pleased to call on you
whenever convenient to you.

I am

Sir,

Yours very truly
Bernard Hollander
M.D.

The application must be sent
in on June 6th.

Francis Galton Esq.



Oliver Wendell Holmes

f1

Boston, Feb. 7th 1880

My dear Sir,

I received the copy of "Nature" which you kindly sent me, containing your very curious and interesting paper, some days ago. I have just found time to read it carefully, - for it is not a paper to be "glanced at" but to be well considered and followed out into the various trains of thought it suggests. How many experiments of this kind might be tried! I remember when I was trying my memory-experiments and then

newer transmission had I wished
 I could have a class of infants - very
 young children, I mean - of young persons,
 of middle aged and old ones; of men
 and of women; of clowns and of gentlefolk;
 of mathematicians and 'Ἀγροῦργοι' - all
 sorts of persons in short, whom I could
 manipulate and experiment on as
 the physiologists do on their frogs.
 What a harvest there is to be gathered
 by observers like yourself, inventive,
 patient, concentrated!

As for me, I am (I fear) but
 a discursive dilettante so cheaply
 and easily exhilarated with a
 single tea-spoonful of freshly distilled
 knowledge that I pass from one
 alibi to another without drinking very
 deeply of any single tap. Besides,
 I have reached my threescore and two;
 I waste my sweetness in seven month
 courses of Lectures on Anatomy to classes

F3

of green students; I am the victim
of an overwhelming army of correspondents
(like my great co-annual, Mr. Gladstone,
parv. comp. m.) most of them unknown
to me, not a few from my own
country, very few like yourself having
much to interest one except their kind
feelings and the common human
claim which Terence recognised and
heathen Rome applauded. They
want advice - they want criticism -
they want praise for their superlative
works and silly verses, they want
to be in some kind of relation with
a man whose name they have
often seen in print - they want
thousands of them (a blush here)
autographs. - My right hand is red
at this moment with the life-blood,
to speak very melodramatically, - of a
slaughtered poetasters; a painful,
but necessary act of sacrifice just
finished which consigns to the needle
and the broom one who was fast
becoming the victim of the skyming tarantula,

So there is not much chance to
be got out of me. But I should
like to have a good talk, or rather
a good listen, if there is such a
word, with you, for I find a singular
interest in your researches and it
will always delight me to receive
a paper from you on any of the
subjects you are treating so ingeniously
and thoroughly.

I hope you will meet my friend
Mr. Lowe, our new Minister.
He is one of a family connection which
has had more brains and more public
virtue in its members than any I
have ever known or can recall.

Believe me, my dear Sir,

Very truly yours

O. W. Holmes.





^{Holt House}
Hraybury Lodge
Reigate
Jan. 2. 1885.

Dear Sir

I will endeavour to
get my records completed
as soon as possible and
send them you. The data
you are specially engaged
upon now I have no doubt
I can obtain very soon
and I will arrange them
in the manner you suggest.
I find that I can learn
some medical details

f.2

of most of the great grand-
parents of both myself
and my wife.

My own plan was to con-
struct a series of tables
on the scheme of that
shown on p. 3 of the "Records
of Family Faculties" each
show some one or more
characteristics at one
view. The one series of
data, the age at death, I
know in almost every
case in the generation
further back, so that my
researches have geneal-
ogically at any rate been

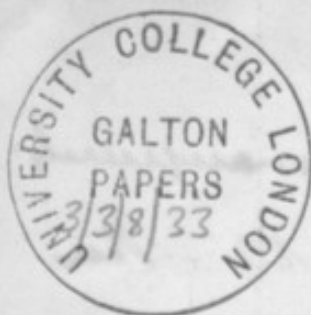
tolerably comprehensive.
I shall hope to write again
as soon as I have anything
to communicate.

Believe me

yours faithfully

Edwin Holtzhouse





Dec 14/89

THE CAMP,
SUNNINGDALE.

Dear Galton

I am very much obliged
for the light of evidence; the very
valuable information which I have
obtained. I find Bates's life to be a
very difficult one to deal with, he was
so very much being distinguished as a
Scientific man.

The time that I have spent to the
state of affairs yesterday was a great
relief to me, & I found to see the
truth, & I do hope that Henry
will hold on. Would it not be
advantageous to a private some
young Scientific man of leisure
with the A.P. Society during his

arduous duties of making arrangements
 for the meetings? There might then
 be got together a number of young
 men with the necessary experience,
 from amongst whom a despatch might
 be chosen when occasion ^{arose} ~~arose~~.

The appointment would be only for
 the one meeting, & permanent
 actual business all that would be
 expected, if that. The choice
 might be left to the Asst. Secretary
 subject to approval of the Secretaries
 or Officers.

In sincerity

R. B. Hooker

Sir J. Hooker

f5



July 13/94

THE CAMP.

SUNNINGDALE.

My dear Galton

Thank you for

"Discontinuity & Evolution", which
has interested me very much.

I have always been disposed to
regard both transiency & divergence
varieties as capable of giving rise
to ^{new} permanent centres in the
Vegetable Kingdom - as an imaginary
(perhaps) case - take the *Carob* - I
should not feel that the cultivated
form (which I think has never
been ^{definitely} ~~permanently~~ by cultivation) is
in a case of transiency, but the
seedling ^{with} form, *D. maritima*, &
have been a case of divergence -
To demand regression for all

Cause of divergent variation seems to be a "large assumption" - & to be opposed to the fact of there being so many slight varieties (having closed areas/geographical) in a state of nature.

In one sense no doubt the Musical Genius of a Bach is a sports, & so may be the intellectual of a Kiddle - but not I should think in the same sense or degree. - Kiddle's seems to be more a ~~mass~~ of ~~many~~ many than any evidence of genius, Bach's is a combination of a multitude of faculties, ^{& due correlations,} the sum of which is equivalent to a great Musician.

I have often thought that an analysis of the required faculties for a great Musician would be a

splendid study. if intended to
 the works of the great Masters - ^{It may}
 be the want of our ^{faculties} alone of ^{those} ^{has}
 of their existence is impossible combinations,
 that has prevented the musical
 abilities of it on a both parents from
 being cultivated, or made apparent.

Is it not the case that great artists
 musical powers have been accompanied
 with ^{great} others - whereas musical powers
 have been developed & accompanied
 by others? In the word that the
 Accompanied powers may be utilized
 in the way than numbering, but
 that musical powers are confined to
 their own exercise, & preclude other

You mention the case of the
 Bech giddy victims - Have you
 come across instances of the converse?
 or of the abnormal gilding in them? I
 ask for information

At p. 365 17 lines for Colton
 you introduce the word "Galls"
 It wants definition as much as
 Rare.

I am writing a spelling primer of
 all that you & Mrs have written
 up of species names varieties &c &c
 during the last 20 years.

With united regards to Mrs

Galton I remain

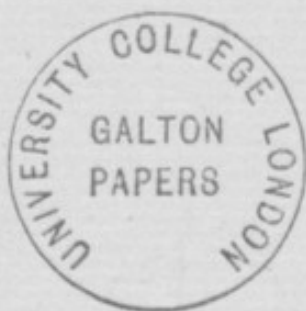
J. S. Hooker.



Mr Joseph Hooker

F9

Nov. 10 1901



THE CAMP,
SUNNINGDALE.

My dear Galton

I thank you very much
for sending me the story of Banks's
attitude towards the founders of
the Geographical Society. It is not
misinformed the Geographical was not the
only scientific society which he could
shouldered.

I have just returned from a most
pleasant visit to Mr. Darwin, who I
found in excellent health & spirits, enjoying
his wheel chair, & well able to walk about
on a level with the aid of 2 sticks, one of
which with I hope soon be superfluous
with Lady Hooker's kind regards.

Yours sincerely

Jos. Hooker

My closing -
in right - sense
be my warm
best sending you
such
an united
letter.

Baron V Hagel

F.1

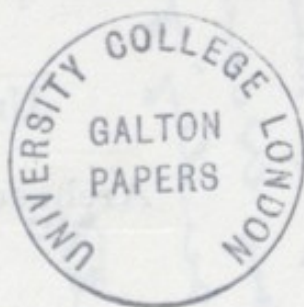
3/3/8/34

University Museum
of
Archaeology and of Ethnology,
Cambridge.

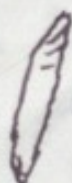
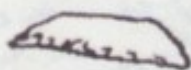
Nov. 26, 1900.

My dear Mr. Fallon,

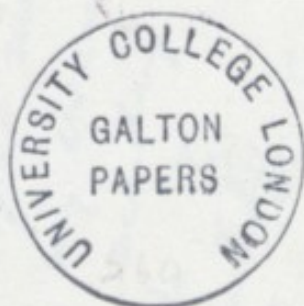
I herewith send you
the Schweinfurth Helman
map which you so kindly
lent me & which I have
so much long kept from
you. I am indeed much
ashamed of myself. The fact
is that since I made two
abortive attempts at giving
it to you in person, I have
always remembered it as the
wrong moment when I could
not give it. All I can say
is that I am truly sorry for
my neglect. A more serious
business which I have to defer
to is having disappointed you



map with an ant note in
ink, by absence of mind
 not having used a pencil?
 The note refers to the
 "Friedstetter or Kieselsta-
 bacte" to the W. of the
 Town which are correctly
 marked by Schumann. All the
 implements then
 so far as I could recall
 are of those very minute
 types which we
 find near
 from the Vinchya
 Hills, India; and
 since have been
 discovered in Lancaster
 Cambridge & elsewhere.



core



- charmingly worked dolls?
 plant knives, &c. - I took mine
 little sister together but could
 not on account of my hand
 & fingers do half what I
 wanted.

I sincerely hope this
 very miserable weather is
 not being too cold & that
 your niece, to whom please
 to remember me very kindly, is
 also keeping well.

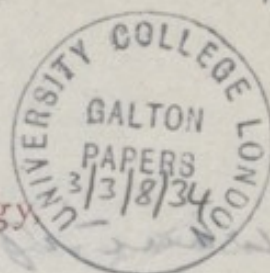
My poor sister is still
 in a very critical state &
 the strain on my dear mother
 is terrible. I shall feel for
 the further & truest implanted
 in us. How could one come up
 without it! I am your very truly
 affectionate & grateful

Recd. March 7
March 8
Can't come to office of
particular matters which had
not been forwarded to me

Baron V. Hügel

f.5

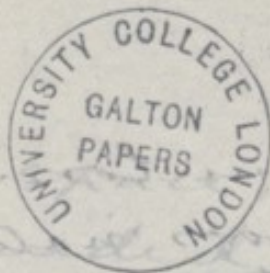
University Museum
of
Archaeology and of Ethnology
Cambridge.



March 2, 1905

Dear Mr. Galton,

I am loathe to appear
before you in the news paper of a
trapper & it is only desperation that
gives me the courage to do so.
If you could kindly help us
with your name, we shall be most
truly grateful for the smallest sub-
scription. As you know the new
halls are not a wealthy body & the
but to have some promises & no doubt
will be able in time to collect a little
from residents. The University
has given us an excellent & va-
luable site for a New Museum on
the Downing property, adjoining the
Squire's Library & the Sedgwick Me-
morial Museum, opened last spring
by the King, but we cannot expect
much more from the chest, & now



are compelled to seek the net's help.

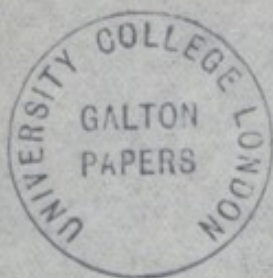
Our collections have increased so rapidly during the last few years that we are being literally crowded out, & can only exhibit a fraction of what is on hand. And now with a steady though this expansion of the entire building is made difficult & much of what ought to be done has to wait for better days.

I have now been working - & very uphill work it has been - for twenty one years with insufficient means, insufficient staff. Our collections are the only thing there. They are good - and both the archaeological & the ethnological series have increased most satisfactorily. But now

I am losing collections, because donors naturally refuse to give if their donations cannot be properly displayed. Quite recently a distinguished Cambridge graduate, a man who has served his country in many lands, told me that he had ^{naturally} wished to give all he collected to his University, but that he had since then instead to deposit his collection in the Pitt Rivers Museum was in a position to exhibit his things, & we were not. And only yesterday a Commissioner from East Africa spoke of the condition of our African collections as presenting "not an encouraging sight," and so, no doubt, we have lost his valuable help also.

I need not point out to you, that if we are now compelled - even for a few years to cease collecting for

21
78
want of funds & space, we
shall be left stranded;
for in Ethnology & in Archaeo-
logy there is no waiting possible.
Each day the native races are
losing something of their primitive
condition by contact with
Europeans, and every plot of
ground once robbed of its anti-
quities is made useless to us
collectors for ever after.
Besides, if we begin to refuse
objects brought for sale, they
are sure to find some other
market, & once that happens,
I know by sad experience, that
it is impossible to divert back
to the fold these stray lambs of
sellers. I have been too long
already, but it is such a fruitful
theme. None it is difficult to be
short. I venture to enclose a
proof of our Annual Report shortly
to be printed, and some copies
of a statement by Ridgway &
myself (the first part of which
is written by him, the second part by me)



f9 260

2

University Museum
of
Archaeology and of Ethnology,
Cambridge.

Perhaps you would be so very
kind as to remember these leaflets
should you chance to come across
any one who might be interested
in the subject. Of course if we
could get the ear of some gentleman
who would tell his name perpe-
trated in the new Museum all
would be well. I have so far
written in vain for him, & fear
that the Museum will have to
be built by small subscriptions.

And now that I have
written all this I feel tempted
to burn it, but I will send it
trusting in your kindly under-
standing & sympathy. -

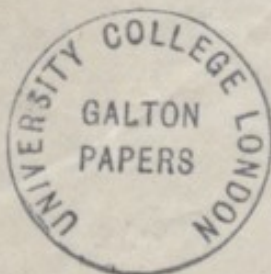
My one eye is tired so it will
require additional kindness on
your part ^{to forgive} ~~to forgive~~ so badly
written a letter.

I trust you are keeping well.
Yours very sincerely
Quatrefages & Huet

Barn & Hugel

F10

University Museum
of
Archaeology and of Ethnology,
Cambridge.



March 11, 1905.

Dear Mr. Galton,

I am touched by your
kind postcard & deeply grateful for
your most kind sympathy.

I am sending you here-
with a fresh set of appeals, &
a rough corrected copy of our 20th
annual report - not yet published.

We are (i.e. a committee of
representative men on which the Anthropo-
logical Board, History & Archaeology
are represented) considering a fresh
slightly shorter form of appeal to
concern the Museum only & hope to
issue it ere long.

In it we are pointing out
how Oxford & the University of
Gt. Britain possess a Museum worthy



F11

G.S. The Anthropo-
logical Board set me
lecturing this term, and
I am just finishing
a course of eight lectures
on Fiji, illustrated by
my own collections, which
I am then exceptionally
well attended & am
glad to say.
a.v.B.

of the University & how its collections
are arranged so as to illustrate
the evolution of art, & of man's
objects; and that our prospective
Museum will show the culture
of mankind all over the world
& during all ages for the good
of future historians as well as
ethnologists & archaeologists.
Also its use in depicting the social
condition of the indigenous races
of our colonial Empire. &c. &c.

These points seem to me im-
portant & though obvious not generally
considered.

Kindly forgive so hurried a note
I do not wish to miss a post.

Yours very sincerely A. V. B.

7 seal £10/

F.12

University Museum
of
Archaeology and of Ethnology,
Cambridge.



October 26, 1905.

Dear Mr. Fother, ,

We (that is a committee,
whose names you will find
attached to the enclosed cir-
cular) have begun in earnest
to try & raise the funds re-
quired for placing this
Museum on a sound footing.

When last I had the plea-
sure of seeing you, in June,
you kindly said, that when
the time had come you
would give us the support of
your name. We hope
shortly to issue this appeal,
but before circulating it,



are very anxious to secure
 a strong list of backers.
 Owing to one thing & another
 - chiefly the difficulty of working
 in Committee - nothing has
 been done until now; -
 but we have so far secured
 the very cordial support
 of all the Heads of Colleges
 (including, of course, that
 of the Vice-Chancellor (Beck
 of Trinity Hall)) bearing
 Sir John & Cooper, who have,
 so far, not replied; of Mrs. Sidg-
 -wick, Sir Richard Jebb, Prof.
 Clark, Brewster & Macalister,
 of Fulkerson (the Librarian), of
 Flinders Petrie and Sir Clements
 Markham.

I am quite sure that
it will be futile work
to appeal to the general
public, unless we can
show a thoroughly good
& representative list
of well-wishers.

If you will be so kind
as to allow us to add
your name to our list, it
will, I think, be of real help
to us & we shall be very grate-
ful for the privilege.

I hope that this sharp
reminder of winter has not
troubled you as badly as it has
more of us here. On all sides

one hears of colds; and those
who have returned from
the Cape, are miserable indeed.

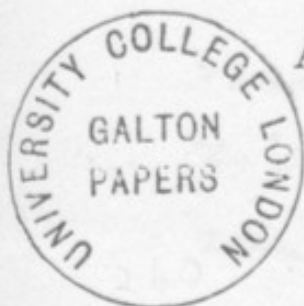
You have always been so
kind & sympathetic about
my poor eyes, that, I think,
you will be pleased to hear
that, now, thank God, I
have recovered the sight of
both eyes. Life feels very dif-
ferent in consequence, &
the world around me looks
more beautiful than ever.
before. With kindest regards
to yourself & Miss ~~My~~ & believe
me to remain

Very sincerely yours

Anatole von Hügel

G.S.

I am still learning to use my
two eyes together - so you may
forgive some blots & faults.



University Museum
of
Archaeology and of Ethnology,
Cambridge.

November 1, 1905.

My dear Mr. Galton,

The pleasure of seeing
your handwriting & receiving
such kind & encouraging
sympathy from you, was
heightened by the news of your
being again persecuted by
bronchitis. I sincerely
hope that you may
soon find yourself under
a general anaesthetic in the theatre
& so be soon relieved of
this trouble.

It is indeed very
kind & generous of you
to spare a £10 loan.

building fund when you
are beset with so many
other pressing claims.

I was glad to say that
I have been quite surprised
by the kind interest & prac-
tical sympathy manifested
~~forward~~ in this scheme for
setting on foot this Museum
by our resident members
of the Senate. That is a
real source of comfort
& help to me, but our
hope of ultimate success
must lie in our building

Some well disposed
rich outsiders, for-
we here in the fold
are sadly lacking in
worldly goods.

It does one good
to hear of Mrs. A'Court.
To hear with admiration
what she has to suffer
is indeed heroic. A day
like this, the communion of
Saints, makes one realize
very strongly that, thanks
be to God, the trials of
this life are worth much.

It is indeed delightful
to see our friend Alice Fother-
so vigorous & full of work
and promise.



With kind regard
to your niece & wishing
you a pleasant journey

I am
Yours very sincerely
& faithfully

Antole v. Wye

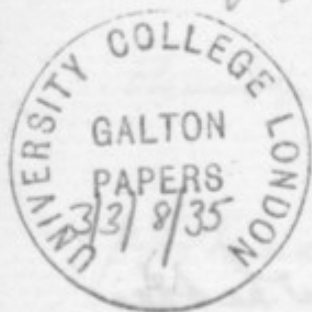
O.S.

Our appeal has just
been traded by

Tylor, C.H. Read,
(and previously by)

Frederic Petrie
and Clements Markham
which is good as we have
not begun ^{iniquity} to resist as yet
names of distinguished outsiders

C. W. Huggins



90, UPPER TULSE HILL, S.W.

19 March 1901

Dear Mr Galton,

There has been
 some discussion in the papers
 as to the period of life at which
 the late Queen should be re-
 presented in any Memorial of Her.

I suppose the recollection of
 Her in most men's minds is
 founded upon "blended memories",

I was wondering whether
you had been as successful
in composite portraits of Hor,
as you were some twenty
years ago in blending
portraits of Napoleon,
Alexander, Cleopatra
and others.

Even if it were not thought

desirable to use a blended
portrait directly, such a
portrait might suggest the
period of life at which
the portrait approached
most nearly what may
be called her typical
~~and~~ appearance and ex-
pression.

It seemed to me that you
could probably offer some

suggestive & helpful
words.

Yours very sincerely
William Huggins



f.5

Sir W. Huggins



90, UPPER TULSE HILL, S.W.

March 28, 1901.

Dear Mr Galton,

I have sent an extract from your interesting letter, with a few words of introduction, to the "Times". The letter appears in to-day's issue.

I take it, the most characteristic period would be about the middle period of her life,

V.2.1111 22111 22111 02

about 40, or a little
earlier.

We are so sorry to hear
that you have been suffering
from influenza. Here the
weather continues very in-
clement; northeast winds
and some snow!

With united kind

regards, and best wishes
for your complete recovery

Yours sincerely,
William Huggins

Er W. Huggins

f9



90, UPPER TULSE HILL, S.W.

21 June, 1901,

Dear Mr Galton,

I send you the card
of the wherry we want in Cork gear,
and which we have taken again
for the middle of August.

You should take a larger wherry;
the second cabin you would find
uncomfortably small. We use it as
a luggage room.

There are plenty of larger wherries
to be hired, but many of them

we simply trading wherries,
fitted for the summer with
removable partitions. You would
find them rough.

Mr Gimself, is a sort of
gentleman, who has had his wherry
made originally for his own use.

If you write to him, mentioning
my name, no doubt he could
tell you to whom you could
apply, with confidence, for a
really good & large wherry.

The "ladies' Cabin" is usually
 roomy with two beds. You could
 have a wherry with one or two
 more cabins. If cut up too much,
 the sitting room accommodation
 suffers.

It is important to have good men,
 We have always found them ^{very} civil,
 & one of them to be a really
 good plain cook. One fault
 they are liable to, to go off
together at night, if a public
 house is near. It would be
 well to make a condition, that

both men should not leave
the wherry at the same time.

It is well to have such stores
as will keep, as coffee, tea, hams
marmalade, & especially tinned
tongues (the best one not to be
got in Norfolk) &c, &c, sent down
beforehand from London.

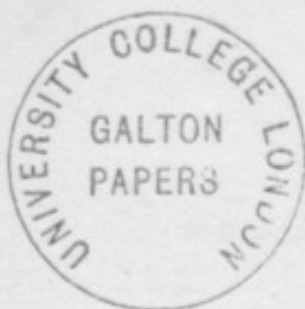
The best arrangement is for
the wherry to meet you at

the Norwich railway station;

this is not a joke, for the

river runs by the wall of





f13

2

90, UPPER TULSE HILL, S.W.

the station, and the wherry can
be moved within a stone's throw
of where the train stops.

It might be well, if you
can conveniently arrange it,
for you to send someone down
to see the wherry and its
accommodation before finally
taking it. A day's excursion
would do it.

We pay nine guineas weekly;

this includes the men's wages.

You have to feed them & give them beer; and they look for a tip at leaving.

Probably a larger wherry might be one or two more furnished weekly; but you had better offer a little less than they ask.

Lady Huggins has put down some names of

books.

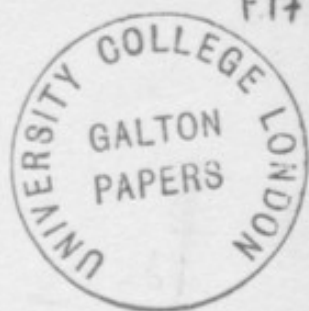
We consider the air in the
more northern parts of the
Broads, such as Hickling
Broad, very fine. It is partly
sea air, you can see the
masts of the ships on the
sea.

Yours very truly
William Huggins

Most important book is that
by Davies, in boards 1/-

Higgins

90, UPPER TULSE HILL, S.W.



25 June 1909

Dear Sir Francis,

I sent a telegram
this morning to Ralshworth, your
address in the Year Book, but
notice has come from the post office
to say it cannot be delivered as
you have left, and your address
is not known there.

I am sending this letter to
the Royal Society to be correctly

addressed.

May I now repeat the message
of the telegram, to beg you to accept
the expression of our united warm
congratulations on the honours you
have received today - inadequate
and belated as it is.

Yours sincerely
William Sugden

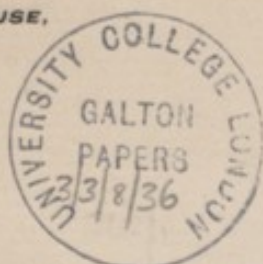
John Francis Fulton D.C.L., F.R.S., M.A., &c.

Tom Hughes f1

POSTAL ADDRESS:—
UFFINGTON HOUSE,
CHESTER.

County Courts,

Circuit No. 9.



23 . 5. 1894

Dear Galton

A few of Oswell's old school fellows
have got Percival's leave to hang a
picture of him in the big school at
Rugby. We have been joined by Sir
A Arbuthnot & other Indian friends
of the mighty hunter & friend of
Livingstone, but not yet by any
African, to several of whom I am
now writing. I am told that
you ^{were} ~~are~~ a friend of his as of
course I know you were an
African explorer in the forties
or early fifties. If so will you
give your name & a small

donation towards the cost of the picture which is to be hung on Speech day June 23rd - I have promised to write a short paper for the occasion to sh^d value any hint you can give me - I never saw him after he left school in 1835 when he was my hero though being a small boy of 11 & he a big one I doubt if I ever spoke to him -

I always watch your sayings & doings with much interest but can make nothing of the finger prints -

Shall perhaps catch you some day at the Athenaeum & be converted.

Ever yours very truly

Thos Hughes



POSTAL ADDRESS:
UFFINGTON HOUSE,
CHESTER.

If you have a
spare half hour it will be
kind if you will look
in at L. Duckworth's Place
studio I all hope to see him
Portland near Brixton
see the post office at
Dear Estlin on he to

Tom Hughes
f3

25th 5. 1894.

Many thanks for your gene
towards the Oswell portrait for Rayby
I even more for your note which
will be of the greatest use to me in
my task of giving a short address on
Oswell at the hanging of the picture
at Speech day July 23rd - You
more than confirm all that I had
gathered of him from African books
& reports, for I am sorry to say I
never saw him after he left school
where he was the athletic hero in
1834 when I was a small boy in the
3rd - Bother finger prints. I can't
make head or tail of yours & must
try to suck your brains on the subject
next time we meet at the Athenaeum.

Ever yours most truly
Thos Hughes

3/3/8/37

k.1

NEW OXFORD & CAMBRIDGE CLUB,
68, ~~PALL~~ MALL. S.W.
90 Dr Thresh
Chelmsford
Essex.

Dec. 18. 1904

Dear Sir,

I write to acknowledge
with thanks your letter on
the interesting paper which
Dr Thresh duly received &
handed on to me.

If I am able to collect
any statistics on the
lines which you suggest
which I think in any
way worthy of your
consideration, I will
send them to you. I should

you have any forms which
you would like filled in,
they would be a great
help.

Yours faithfully,

Henry. L. P. Hullbur



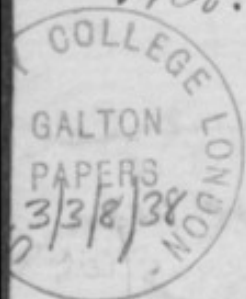
Dr. Kate Hardy

34 Wolvern Square - F.I.

W.C.
30/3/1890 -

Mr. Francis Galton -

Dear Sir -



I was much disappointed not to find you at your home on Friday for as Secretary of a new Anthropological Association in America there were many questions and subjects concerning which I was very anxious to speak with you.

Our President is Dr. W. S. Hall, Prof. of Biology at Haverford College, Penna - and having organized a club with ten members in Sept - we are increasing quite surely and as each member has resources

to some hundreds of Statistics
of measurements - We are working
with all the light which your
writings can give us -

While in Dr. Largent's Summer
Gymnasium last year we became
interested in Anthropometry, but
though Dr. L. has through long years
measurements established his
"means", as yet he holds them secret
and we, in order to know the
comparative standing of our
individual measurements
must send them to him to be
charted - He gives as a reason
for this secrecy that his M. is
not yet immutable though he
has taken tens of thousands
of measurements - We, as a
society feel that we must
be able to make our own charts
but to do this we need

the data - I appeal to you asking if you can aid us in any way - or if the thousand measurements of college students which we can take in a year will be of any value to you -

Would it be possible for me to have a short talk with you before I leave London - Apr 9 -

Shall you be in town any day before that time - if so could you allow me to call at some given time to see you -

I am much interested in your laboratory - and must ask where I can obtain the apparatus for testing Eyesight by the diamond numerals - also that for testing Hearing (by whistle)

and the one for "Time Reaction
to sight and hearing—

Some questions as to the
value of Composite photographs
and as to groups as to
ages of students and many
others make me very
desirous of seeing you
before leaving London—

Believe me Sir,

Yours respectfully

Kate Campbell Hurd M.D.

Bryn Mawr School
Baltimore

Md.—



B. Kate Hard

11-9-1890.

F5



Dear Mr. Galton -

I have just completed taking the measurements of one hundred and fifty girls with your various tests and apparatus. I have also their thumb marks - Would any of these statistics be of value to you or is the number too small? - Their ages vary from

you in April last? — I am very
anxious that Americans shall
know what scientific work is going
on in your laboratory for we are
very lax in most of our tests —

Begging pardon for thus
troubling you, believe me
Yours truly

Kate Campbell Hurd.
Bryn Mawr School
Baltimore, Md.

F6

12 to 18 years — We
are very much pleased
with your methods of
testing "Velocity of Blow" &c
and I find that I am the
enemy of all my Anthropo-
mometrically inclined friends.

I have been invited to
read a paper on the
"Galton Method of Anthropo-
metry" — before the 'American
Association of Physical
Education' in April — Will
you kindly tell me if you
have or are about to publish
anything new since I saw

J. Kate C. Howard Baltimore - F1

11 Read St. East.

1-14-1891.

Mr. Francis Galton,
Dear Sir:—

It is with great
pleasure that I write
to tell you what benefit
and enjoyment I have
found in your apparatus
for the "touch reaction", in
the little "whistle", the
"diamond type" test, the
"division of a line", the
"thumb marks", and
the "velocity of motion".

+2

D. Largent of Harvard College has asked me to write a paper on your System of Anthropometry before the Am. Asso. of Physical Education at Easter time. I undertake the task very humbly, fearing that in no way can I do it justice.

I have had so little experience and very few statistics of my own. One hundred and fifty girls of the same conditions of life and parentage, aging from twelve to

nineteen years is my sum total -

These I have grouped as you suggested
to me last April, and have drawn
my Ms & 2's - which are of course with
very little - However, I write back
if your laboratory assistant can
give me any additions to these in re-
gard to the special sense appa-
ratus - The velocity of motion averages
9 in all, without respect to ages -
and the diamond type, 21 inches -

Have you published your 13

Mr Jonathan Hutchinson

f.1

Romilly House.

54, Gower Street, W.C.



July 4 1909

My dear Sir Francis,

Please accept my
heartiest congratulations
on a long well deserved
honour. I feel my
own kinship much
increased in value by your
accession to our ranks

I hope you will visit
Harlem again this

hopes that I may
be favoured to see more of
you. Please give my
kind regards to your
wife & children me

Yours sincerely

John Hutchinson

