Photographing Livestock and Inquiry into American Trotting Horses

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1897-1899

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As it is going to America, would it not be
as well to use

F.R.S. ? Jan 2nd
98.

CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.
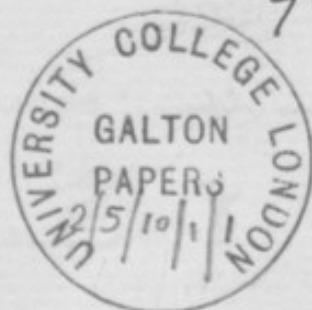
Dear Mr. Galton:

No one can
reciprocate your kind wishes
for the new year more heartily
than I do — many thanks for
them.

My own researches have
been delayed a little but
last night I was able to
commence them again: I
am glad to see that your
forms will bring grist to my

mill when they are completed.

Xmas Day brought a
most welcome letter from
Herbertman saying that he
had progressed a little with
Spencer's portrait— without H.S.
knowing it. & that he hopes
in a month there may
be something to show.

Poor Sir Joseph Hooker. &
I have had a fearful time
with H.S. himself lately:
his mind seems to be losing
a balanced view of social

affairs — of "social perspective"
shall we say. ~~it~~ It seems
almost impossible to put on
with him. It is dreadfully sad.

———

And now may "Thomas
atkins" disobey the funeral's
orders for the ensuing campaign
& make a few remarks before
reading Nature?

I return herewith the forms
you have sent me with some
remarks in the hope that
you may be able to correct
them before sending to America
if you approve.

Passing over mere verbal

suggestions. it does seem to
me that the "grandparents"
record would be more easily
understood & read (as it would be
horizontal & not vertical) if you
change the form to the one
I have written: I am some-
what afraid that the ordinary
"man = the street" may get
astray over "dozens of dozens"
& "tries of tries", while he hardly
could with "dams of 2". "sire of
3" & so forth.

—————

Now for a radical
suggestion! If folks will
fill up so many columns
as you give, they will fill

CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.

2

up one or two more. Now
in a case of this sort, why not
get all the information
you can which is measure-
able — quantitative — It is
certain to be of use either to
yourself, or to others, now or
at some future time. E.g.
Personally I should have
added a column "height
if known". You have colour
which is not quantitative
& it seems a pity not to have

height which is : I do not
forget your own researches in
this matter, & cannot but
think with the all the
trouble you are going to it
would be well to get all
the information possible.

Thinking the matter
over, some other factor
might occur to me, but just
now this is all.

———

Have you thought whether
it might not be well to

put a little flesh on these
dry bones: to give a little
interest to them, & really
show something of what
you intend to do.

How would it be to send
with each form a copy
of the nature article for
instance? There is nothing
like interesting people.
——

Would you care to let
me see your letter on
photographing before sending
it? I have been
photo-ing a good deal little

during the summer, & the matter interests me from the fact that I have previously given a little — but only a little — thought to it, & to measurements of breeding stock such as Hackneys.
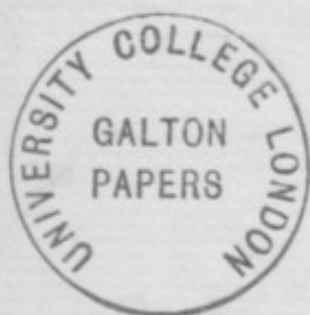
Yours sincerely

F. Howard Collins.

P.S. I have now age of each parent at birth of 4,500 sex't horses, the colour of the latter but not yet the colour of the former.

f. 5r

Francis Galton F.R.S.

42 Rutland Gate
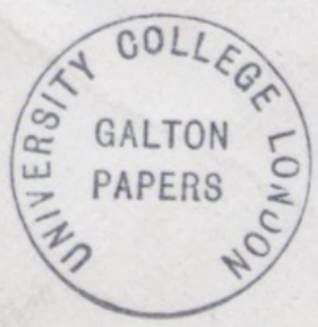
London, S.W.

f. 5v

CHURCHFIELD,

EDGBASTON.

UNIVERSITY COLLEGE LONDON

GALTON
PAPERS

SOUTH·KENSINGTON·S·W·O.C
4
2.30.AM
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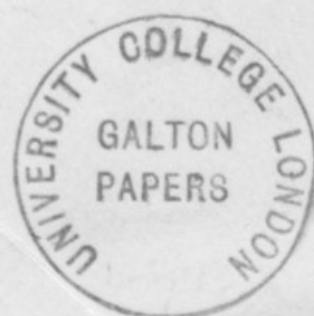
CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.

7 . I . 98 .

Private
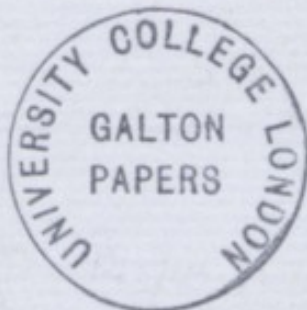
Dear Mr Galton:

On Jan 6 = 97.

You very kindly not only
sent £5. to the Spencer
Portrait Fund but also
wrote that you "would gladly
send more if thought needful".

As Herkomer writes that
he hopes to show me "a very
good "version" of H.S. at
the end of this month it
means that his fee will

soon become due .

But up to the present,
after flogging as hard as I
can in every direction known
to me, the fund is still
£90 short, & Sir Joseph
Hooker is very anxious that
if possible, the whole
amount should be given
to Hubourn which is his
fee: as otherwise it .
cannot reflect in a
complimentary manner

upon his old friend H.S.

Under the circumstances
will you forgive me reminding
you of your letter?

I have been most
interested in nature, & will
write you in a few days
when I have time to
think over one or two things
which struck me: they are
small for you have done
the thing so well all round.

Yours sincerely

F. Howard Collins,
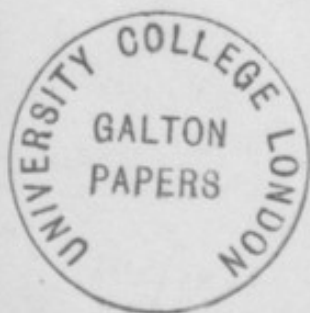
P.S. If you see Sir J. Hooker could you tell him
how very highly I appreciate all his work
on the portrait: I should be so glad if you
could, he has
worked so admirably 9. I. 98.
F.W.L.

CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.
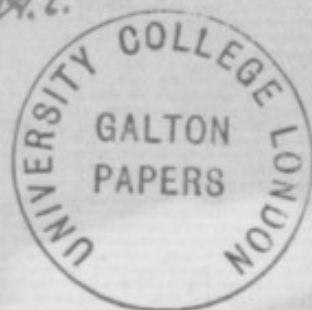
Dear Mr. Galton:

Many thanks
indeed for so kindly aiding in the
project to a satisfactory
conclusion: It enables
me to see at least the
beginning of the end, & feel
more sure that after all
we shall be able to give
to the nation what we
have paid for.

I hope you are not

f. 8

very deeply in love with
your "hippometric rectangle"
for I fancy I have been
able to excogitate a much
simpler plan, which so far
as I can see, answers
every purpose of the "H.R."
& one or two more besides,
& rather more easily.

The Photos are being developed
& I shall hope to send you
prints on Monday with a
long letter explaining even a
simpler plan which time
has not enabled me to try.
Don't publish anything till you
hear from. Yours H.R.

Churchfield Edgbaston. 9.I.98.
Stiffometry.

Dear Mr Galton:

As I have a little time now — Sunday evening —
& may not have any tomorrow I will begin a letter dealing
with nature & also your own letter about the horses, before I get
the photos about which the letter really is more really
concerned.

Your letter. " I think it worth taking a great deal of trouble
about" would it not have been well to say in nature
why you think so? or at least in a communication in the
near future? Of course there are many reasons, but it
seems just able to be questioned by some whether the
accuracy of even the most perfect photo of ½ plate size
can give you any data sufficiently accurate to be able
to draw conclusions that will be of use even when measured
by the best compasses. One — the best — reason should be
given it seems to me at least.

You say you cannot get near a suitable yard for
experiment: I think I can help you. Baron von Knoop
living at 57 Rutland Gate keeps one of the best pair of
horses in London: & presumably has stables near. Now
the Baroness (whose family I know & like — her brothers &
sisters are, as like himself, very agreeable) has told me
when stopping there how she would like to
make your acquaintance. Therefore why not call
some morning — the best time — & ask to see her, her
husband is now yachting in the mediterranean, when last

the very day he left

in town I wished him good bye & a pleasant journey; &
see whether she would not allow you at least a few
hours to experiment in their "mews"? She would be delighted
to do anything in this way I am sure for you — But of
course use my name in any way you like. Shall
I write to her for this purpose? I will with pleasure if you
wish. Mrs Meinertzhagen surely too has a
carriage & therefore a yard near? Why not
go to a dealer's some where if you don't adopt my
suggestion:— there is a good (me with well lighted) yard near
the Savile Club 107. Piccadilly.

nature. A little thought over this convinced me that if you
are to get photos in quantity you must simplify
method of work. Eg:—

(1) Have nothing whatever to do with adjustable
back cameras as they will be a delusion & a snare to
80 out of every hundred who otherwise would take
useful photos. Similarly rising & falling fronts.

(11) You must do away with troublesome rectangles
& ruling lines & so forth if you can.

~~now for a criticism~~

(III) You must if possible take photos that with
very slight re-touching will serve for "artistic"
ones, when you have had a sufficient
number for measurement printed: but I
will deal with these suggestions practically later.

Now for a criticism: you say that the camera
must be five feet high to get a good view of the
feet. Have you not overlooked the fact that
unless the camera is on a level with the centre
of the horse, the body will be foreshortened to the
legs or vice versa? This seems to me important.

I am inclined to think that no allowance
will be required for the protuberance of the animal
hiding the outline in a horse: but am possibly wrong.

The fallibility of the measurer of horses themselves
(not photos) brings up the question that each horse varies
at different times: e.g. a well known fact is that
when a saddle is being put on a horse he will "blow
himself out" as ostlers say to prevent the girths being
pulled too tight. I have often seen the circumference
of the body increased by 3" by this means: the outline
would therefore differ by 1" altho there was no fault
with the measuring.

Thinking these matters over, altho I have no daylight
leisure, I managed to squeeze in a quarter of an
hour on Saturday when the light was very bad indeed:
quite unphotographic in fact, to try an idea by
experiment.

The idea evolved in this way: what you want
is a reference measure in the median plane,

it seemed to me expressed as shortly as it could be. Now talking the matter over with our coachman he said he could walk a horse so that his legs would be on each side of a line — a piece of string. He could drive a horse so, & a fortiori could walk one still better.   Now, if this string were marked — just ½ our median plane is reached at one easy stage. I therefore procured some black twilled tape, & pinned it together in approximate lengths of 2 feet spread it on the yard & said now then walk him over it "straddle legged".   But we had omitted the

(one of our horses) animals psychology! walk over it, not he, nor near it either! He was not accustomed to such a dangerous nerve-shaking object, & go near he would not.   I inclose the tape — ipsissima tape — to show you that we must think of the horses shyness: our own (quiet one) shied, what would a thoroughbred have done? Why kicked the place down! So you must think whether one of them could be got into a Lawn tennis marked rectangle!
          Not to be done, I said hold him steady & rub-or-tickle his nose with your hand (this is a splendid quieter) first placing him where I wanted opposite the camera.   Then when exactly rightly placed I gently threaded the tape between his legs myself in such a way that he could not see it

He stood like a lamb while I did this, & walked to the Kodak I had arranged opposite his centre (or what I judged to be so — great accuracy not being needed for a preliminary) & took half a dozen photos with the tape still between his legs: half a dozen as the light was so bad in the hope that one or two might enable us to see whether the tape system would answer.

Some time after this was done it occurred to me that we could even do without any tape at all, but had not the time to try. The idea is this: Stand the horse square to the camera & then when every thing is ready quietly put what every one has a two foot rule just between the four feet, or if this be not visible on the plate a piece of white card board exactly one or two feet long.

The advantage is this, that it won't spoil the photo from an artistic point of view as such a narrow white line can be re-touched out without, as the Suchdaw of Rheims said, any one "being any the worse." One negative will do for both purposes.

If you prefer, the foot rule can be put on a crutch on the spine: but you must make the crutch, &, as I said before, the simpler you put the method the more photos you will get.

What I would suggest now is that experiments should be made with the <u>same horse</u> when he is standing at varied inclinations to the perpendicular from the camera, &, such inclinations being measured, to see how far from the absolute 90° he may go without altering for your purposes the accuracy of the photos for measurement

The Photos— the best sent just to hand: you will see I think that with a properly constructed tape measurements might be made more or less accurately. If, that is, the 2 foot rule method which I much <u>incline</u> to. as it then only wants what every one has, is not thought better.

The photo was taken so hurriedly, — they kept my sister's dinner waiting — that I had not time carefully to <u>straighten</u> the tape. I enclose the tape that you may see how <u>rough the joinings</u> were. (One could measure from the joinings under the tail)

It serves however to show that measurements = the med<u>i</u>al plane are quite feasible.

<u>In great haste</u> as I am just going out

Yours F. Howard Collins,

E.B.Morrell.
Artist & Photographer.

174 Broad Street.
Birmingham.

UNIVERSITY COLLEGE
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GALTON
PAPERS
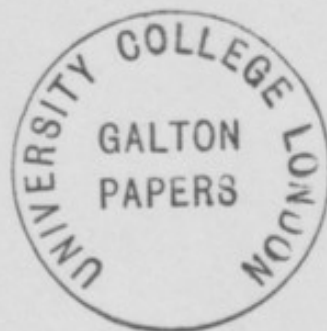
Francis Galton Esq. F.R.S.

42 Rutland Gate

London, S.W.

F. Stroud Collins

H. Collins

a much better way, but I send it
for it interested me working it out.

CHURCHFIELD, *[initials]*
EDGBASTON,   18 . I . 98.
   BIRMINGHAM.

Stiffpromily

Dear Mr Galton.

         "To begin with" —

would it be worthwhile

turning over your photos

of horses & finding if, as a

rule, the lower datum of

the height measurement

is not generally half way

up the near fore hoof, i.e.

if the middle of the fore hoof

nearest the observer would

not be a suitable approximate

f. 28r

basis for this measure.
I am inclined to think
it can't be very far out:
it would in fact chime in
with the deduction of the
fixed boot thickness to get
man's height — in your
anthrop. measurements.

———

Now there is another
way: Is height correlated
with any other dimension?
E.g. In the photo of our
one horse (I have not photo-

the other) the height is exactly
the same as the distance from
the foreleg front, where the
chest joins at the back of it, to the root
of the tail. Is it so in
other horses — it might be.

Might it not be worth
to run the compasses over a
few to see?

—

If we cannot get rid
of the concealing effect
of soft ground, a good many
artistic photos will be of
no use.

—

The measuring of horses photo

to different scales, rather
attracted me & yesterday I
worked out the scale I am
sending you as an easy way
of taking rough dimensions,
& quickly.

Suppose the horses height is
"16 hands" or 64" you find that
sloping line which the length
reaches from the base line: say
it is nine, well then, any other
length touching line 9. & the
base will be opposite the inches
which it represents. A scale like
this on tracing paper might be
slipped over each photo & read direct
without compasses.

You doubtless are sure to know

CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.

23 I. 98.

Dear Mr Galton:

Can I prevent

you "sadly needing" different

photos of the same horse?

If so, the following points

seem worth considering :—

(1) By bringing the camera
have, nearer the horse, than 20', it
would be possible to put
a photo almost double
the size of the horse, as I could
take him the long way of the plate.

(II) I could probably hire
a larger camera from a place
in London if needful, but this
would entail time.

(III) As, a base line, for
perpendicularity from camera,
I should prefer a straight
line between fore & hind legs,
that is former experience
would tend to show that to be
the most certain way of
getting right angles.

(IV) The lines formed by the stones

in our yard would also serve
supposing the camera there
were orientated a quarter
circle one way or the other.

(V) If you think I could
be of any service, why not
send me a list of positions
you want photos taken
from? marking those with
a cross which are the more
important, so that more
than one negative would be
advisable of them? I might
add one or two myself to the
list.

don't "sadly need" if you

can get help from

yours ~
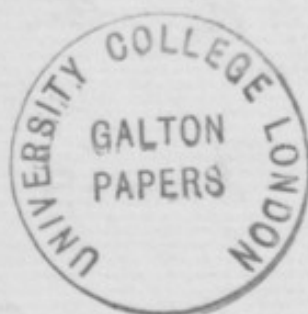
J. Howard Collins.

	4' 6"		4. 3
medium height			
high	5 0"	4.9	4.9
medium	4. 6"	4.2	4:3
low	4 0	3.7	3:9

x 1 normal, viz square at 20 or more

2 3 4 oblique 1 in 6 at 20' — at end

use the stones

agree on

x one oblique to it 1 in 6;

a make horse stand in the two position

send negatives   I will get them enlarged

back of car

f. 306

Chesterfield.   27 . I . 98.

Hippometric - photography!

Dear Mr Galton.

Pray accept my apology about that
hind hoof : I did my best, but the complexity of the
factors, & the ponderosity of the object, were too much
for me. It is so much easier to write about how
a horse should be placed than to place him! I tried
some times but when anything was right something else
went wrong, & I took this as the least evil.

You will notice three whitened bricks. Here is
their plan :—

$$\frac{12}{65 \cdot \frac{1}{2}} = 1 \times 5 \frac{1}{2}$$
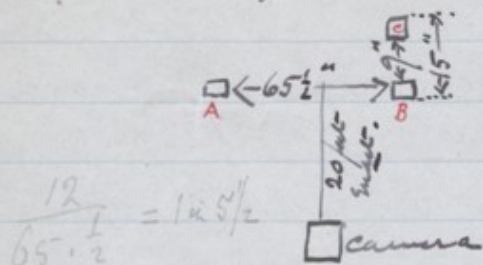
Whatever the appearance in N°s
1 + 2 Photos, the horse's ~~our really~~
~~in the~~ median plane was really
coinciding with the bricks A. + B.
I examined it carefully before photoing.
ditto, photos 3, 4, 5. 6. horse's median
plane corresponded very fairly indeed with the vertical plane rising
from bricks A . + C. I cannot assert absolute.
agreement, but careful comparison on the spot satisfied me
that it was accurate, to all intents & purposes, but
possibly yours!

The heights of the ~~camera~~ are taken from the
centre of the outside lens to the ground
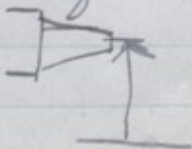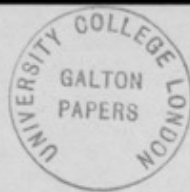
The only waste negative was the 4' 9" straight, one.

As the horse continued standing still while there were a couple of films unused, I put the camera up to 5' 3" thinking perhaps this would be of use as giving an extreme height for comparison.

The negatives are at your service if of any use — the photographer has not yet returned them or I would enclose them to you.

I may say that the 1 — 6. inclination would never happen, so long as the photo—er were trying to put the horse at right angles: it is too evident to pass for anything like a r^t angle.

The back of the camera to be vertical, I can say nothing about. My own has not a glass focussing screen to judge by, It is one of the snap shot kind, & therefore without a glass screen altho' this could be fitted, but it would entail using flaps, & would much increase complexity, & the time taken in photoing: which experience shows me must be as small as possible if you want to photo horses.

All my exposures were 4 seconds in consequence of a dark day, & were this with the largest stop. "4"

The rule fastened by two pieces of string (not $\frac{1}{10}$ " in diameter altho' appearing so thick) is 18 inches

It is exactly in the median plane I can answer for.

As regards measuring, have you consulted the chartographer at R. Geog. Soc.? The laying of various "plans" of different scales on one chart or map of one scale might help you : or rather it might me!

Can I help you any more? I will do my best if I can help you, but please remember that it is much easier to write on paper what is wanted than to get a horse to do it!

Yours
F. Howard Collins.

P.S. Many thanks for P.C. about greyhounds. As I cannot equal your ability in mathematically treating data, it occurred to me whether another set of data double the size would be sufficient if treated on your lines. I gather not. For the Pro. R.S. at least.

F.H.C.

f.25

Francis Galton Eq. F.R.S,

42, Rutland Gate

London S.W.

Collins

③

f. 26r

FIVE WA
8.30.PM
JU
1
98
BIRMINGHAM

Francis Galton Eq. F.R.S.

42 Rutland Gate

London .S.W.

CHURCHFIELD,

EDGBASTON.

		6"
		1"
	N	50
25 feet	300	50
30	360	60
35	420	70
40	480	80

CHURCHFIELD. EDGBASTON

June 1st 1898

Dear Mr Galton:
         To go through your letter of the 23rd March last
" from the middle of Corsica." I quite understand that the proportion of
the VERTICAL distances must be correctly represented on the plate if the
two- that is the plate and the wall—say are both vertical, will be as you
say proportional.whatever the height of the camera . But the point I can-
not see is to take an example with the camera five feet high photoing a five
feet strip of wood first at a height of five feet on vertical wall and then
photoing the same strip at the base of the wall but otherwise everything
else the same . When the strip is placed horizantally on the ground it
will surely be farther from the camera than when it is exactly at the same
height as the lens, the difference being of course as it seems to me the
difference of the square on the line to the foot of the wall as compared
to the square on the two lines from the lens to the five feet high staff
plus the square on the five feet line of the wall: in fact our old friend
the 47th proposition over again. Of course if the difference is too small
to be of any consequence in the photos nothing further need be said about
it- but is this so ?

         How I am to answer your next question about the markings on
the ground is rather difficult to know. For I am more than ever convinced
that you MUST HAVE NONE AT ALL . If that is, you are to get any quantity
of photos and those without exceeding difficulty. You can have no concep-
tion how all but impossible it is to get a horse with any breed in him
to stand within four inches of any mark whatever,supposing the horse to
be as quiet as a lamb the mere difficulty of locomotion where the steps
usually seem to average eighteen inches each renders the matter of even

one foot one of exceeding difficulty: you have not to move as with us
only two legs but double that number and the difficulty with each leg as
it comes up for consideration is increased in a fearful ratio when you are
trying not to move those that you have already in position.

Now the point which I should like most of all to be THOROUGHLY
threshed out before going any nearer to answering your question is this—
is it absolutely impossible to work with the measures which the horse
carries about with him ? Is it altogether out of the question to work with
the hands high of each horse as he is measured by a foot rule: if that is,
his height is not known beforehand to an inch ? If only some way of this
kind could be discovered it would do away with what will be an almost insup-
-erable difficulty: namely the getting of a thoroughbred within the range
of a camera stand for say what you will it is not the kind of thing he is
accustomed to, even with our quiet old fellow here, I should prefer not to back
myself to photo him with that in the yard rather than to do so. In fact
the whole thing sums itself up in my mind in this way: IF the necessary
work can be accomplished with a hand camera in contradistinction to a stand
camera there will be no great difficulty about it. If on the contrary, we
cannot design such a method my hopes for the future of the whole process
are very poor indeed. Therefore can you suggest any new developments in
this direction - if not, it will I am afraid be very little use developing
plans for laboratories and such like structures

I am very sorry not to be more hopeful, and can only say for
your sake how glad I should be to be proved wrong !

- - - --- -------------------------- --------

Yes. I am fairly busy. as you will see by the enclosed my fishing
expedition brought up an idea of classification which appeared in this week
Field. If anything strikes you on reading it both the Editor and myself
would be most grateful for suggestions as he seems to think there is

something in the idea and it is one , or rather a subject,which is crying
out and has been for years for something to be done in it.

Greyhounds are still slowly evolving, as the collection of data ~~that is~~
~~they~~ take such an entirely disproportionate amount of time to get them
to what they look when they are obtained. I am going for the colours which
breeders recognise first, whether any broader generalization may come up
from it remains to be seen.

And last of all I am working out an idea for a more than usually
silent typewriter: the noise of all is quite prohibitive of their use
except one has no nerves whatever or is unusually'fit'as the saying is.
Do you know anyone who would be a good man to take such a thing up ?
When I see that the idea will work all interest in it for me is practic-
ally gone . It ought to be cheaper than the regular ones of usual form
and to waer for a much longer time as it is much simpler.

Let me know what you decide as to the laboratory and

Believe me

Yours sincerely

F. Howard Collins.

Churchfield, Edgbaston.   June 7th 1898

Dear Mr Galton. (Please excuse the mistakes as Iam trying a new typewriter).

Many thanks indeed for showing me my mistake in regard to making the image on the retina to be of the same kind as on the plate. Icould not see how with my data any other conclusion was possible:: it never occurred to me that it was the data that were at fault and I am accordingly grateful for having the error pointed out. It will sure to be of use at some future time.

And now to the horses. I am rather pleased to think that by putting together a sentence from one part of your letter with another from another there is a very fair possibility of getting what you want.   We need not fear getting the marked bar skew from the horses spine if we adopt a different form of support:if for instance the rod is mounted as in the enclosed sketch there would be no fear of it becoming skew to the spine were it fastened to the horse by an elastic band, and the little saddles at each end lined on the under side with some fairly sticky substance that would not slip on the horses coat.   No ball and socket arrangement would be sufficiently stable if as in all probability the horse gave one or two jumps before settling down.   The double friction of the sketch would I firmly believe do all we want.

Now to the other point,if you may take for granted that the rod agrees with the axis of the spine would it not be possible for the measures on the rod to supply the correction not for the skewness of the rod in relation to the horse, BUT TO SUPPLY THE CORRECTION FOR THE SKEWNESS OF THE HORSE FROM THE PERPENDICULAR OF THE CAMERA AXIS ?   I feel quite sure from my experience that if this can be with the possible assistance from the known height

of the horse, comparatively speaking any number of hand camera photos could be taken with very little trouble at all : with this method of working with a hand supported camera, the eye would surely serve to get the horse at right angles so nearly that the very slightest correction would suffice to put the matter quite accurately.   As before you see Iam as strong as possible in advising the developement of a method where no STAND or fixture is necessary.

Bringing now theory to practice what I would suggest would be this that if you care to send me a rod of the dimensions you suggest, mounted as the sketch, that Ishould try how it comes out when affixed to our horse. You giving me all the directions you want as to height of camera, distance of horse, and any other details that may occur to you.   BUT PlEASE DO AWAY WITH THE IDEA OF A FIXED STAND. See if it be not possible to get all you want by means of hand work.

Let me know what you think!

Yours
F. Howard Collins

CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.

cloth or

india rubber here

Eye for Elastic
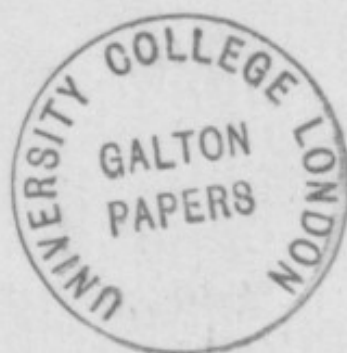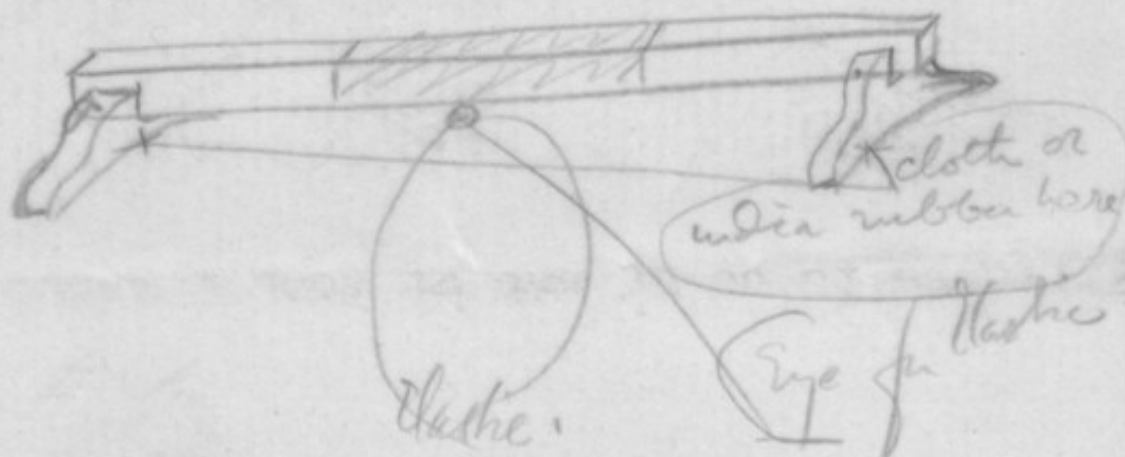
Elastic.

CHURCHFIELD, EDGBASTON, BIRMINGHAM.

September 4th 1898

Dear Mr Galton:

On measuring the uncompounded heads in the paper you have
kindly sent me, with the exception of Speedwell they all appear to be the
same length from the eye to the lip. And the glory round Speedwells nose
being counted makes his length appear to be the same as the others. Is it
possible that you have reduced all the heads to the same SIZE ? If so I am
afraid that the result will hardly be of very much use for heredity purposes
for some sires are known to have very small heads and not only this but to
transmit them in an extraordinary way to their offspring until so and
so's head in the offspring is quite well recognised by breeders.

Or is the difference in the length of heads two small to come out on
so small a scale ?

I do not know how the word compositing strikes you but it certainly did
not get the right accent when I first read it, and it reminded me very force-
bly of the printer. H ow would it be to use another word such as commixing
or compounding or to add an E after the t if you still use the same word ?

There seems a superfluous " the " before Racing Illustrated if the
article is still in proof.

Yours sincerely

J Howard Collins.

Collins.
Sept. 4. 98.
about Composites

CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.

17 . 11 . 98 .
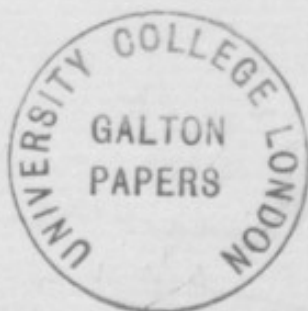
Dear Mr Galton:

In place of the
old tape which I originally
used, I have now checked
the measurements between
the two front bricks whitened
+ find them to be 5' 6"
between their nearest
sides, by two independent
tapes. So I think you
make take this as correct.

The measure tied to the horse

is 18" there can be no
question about that!

Now for independent
testimony. One reason for
photoing the horse where he
was, was to have another
check on the ground. The
front Edge of the stone slab
which is in line with the
whitened bricks measures
30" exactly. But from
front to back — viewed from
the Camera — it is but 29½"

accurately.

Personally I do not think you will be likely to put the photo. of the scale to equal the whitened brick distance, for this latter is farther from the camera than the former
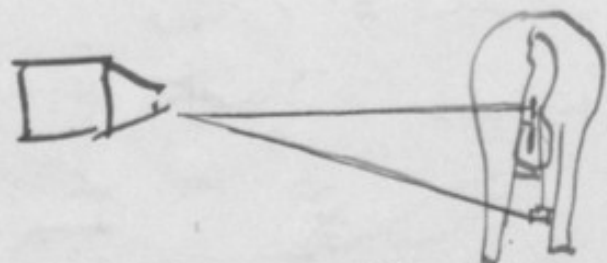
for remember the camera is more nearly on a level with the scale than the bricks.

Have you tried the inter-brick-measures, inter se with the various photos as the height of

Camera increases from
"1" ?

The distance of Camera
to bricks varies of course
all the Camera was raised
in __vertical line__.

Height of highest
part of horse towards tail
(which = I suppose "croup" — one
man did not know the term)

A is 5'. 6¼".

B = 5'. 6."

These I __accurately__ measured
against the wall with "Tee" Square
on horse to give level on wall.

CHURCHFIELD,
EDGBASTON,
BIRMINGHAM.
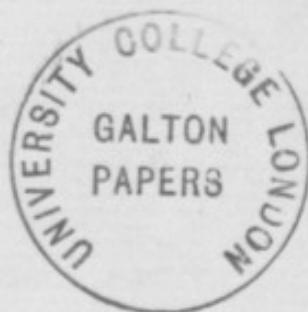
2.

Can I do anything more?

I cannot be more accurate
I am afraid than this
last attempt,

But do try that Square
Slab. That is reliable: if
nothing else be.

Many thanks for your
suggestions about Greyhounds
But there are no Grey Grey-

they are registered in the
stud books under about
12 diff. colours but not
grey anywhere.

Since finishing Index
to Tayley I have spent no
end of time on them, &
I have now 2000 about.
with parents, grand parents,
& great grand parents, in
many instances, but there
is a lot of work yet till

I get colours to all which I can in all but a few instances.

Red, Fawn, Black, White are the more usual colours. never gray, so far as register states. the colour.

Yours in haste

F. H. C.

P.S. May I include your name as one of the Com? on the H.S. portrait scheme along with Sir J. Hooker, Leslie Stephen etc. ?

F. H. C.

13 / 18. (1.3
13
60
39
1

Between bricks 9"
at 20" = 240 brick 10" = 1.24

49 / 66 (1.3673
49
170
137
330
294
360
343
170
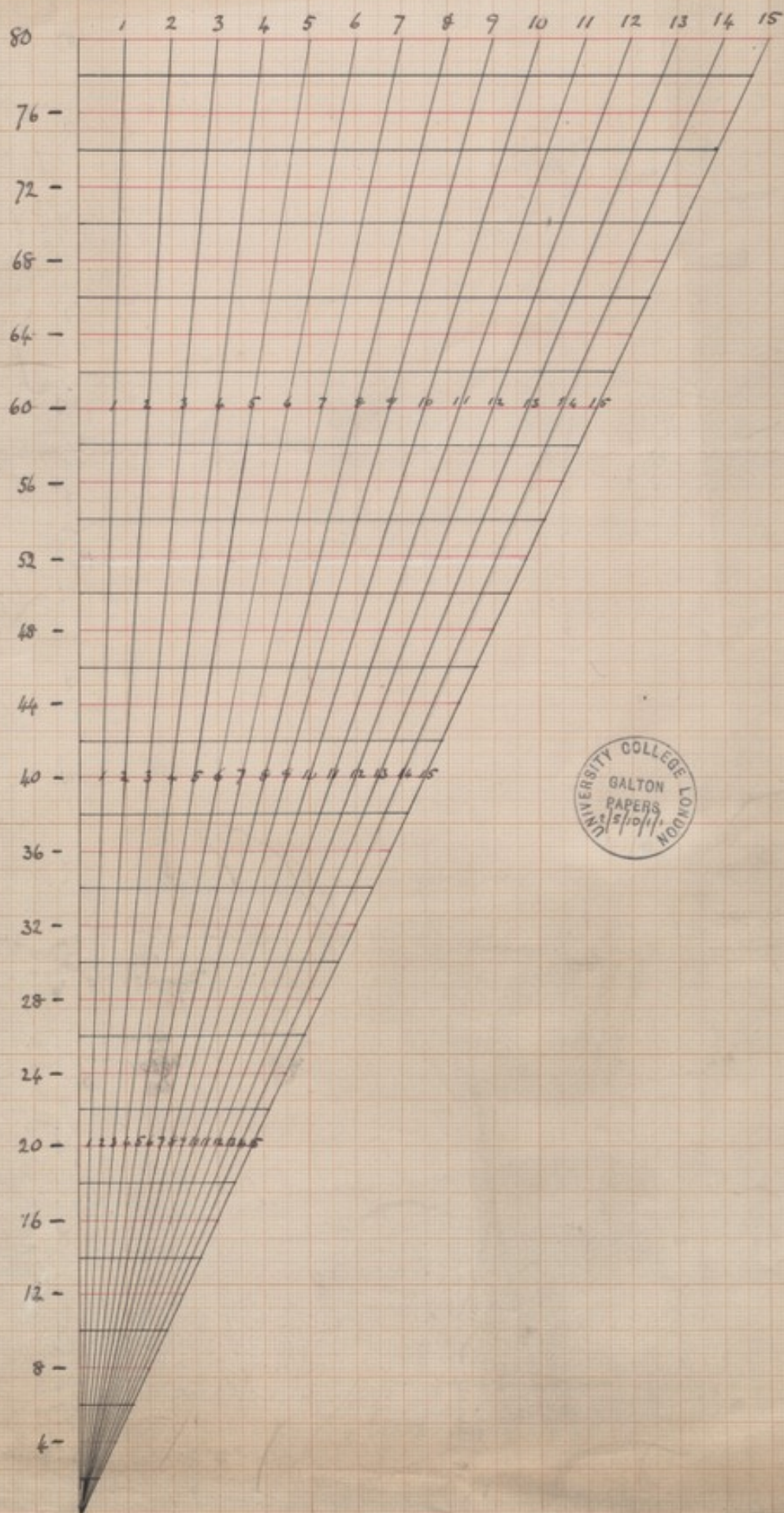
3' 7"
Straight

f. 1v

E. B. Morell
Artist & Photographer.

174 Broad Street,
Birmingham.

2
4'2"
straight

f. 2v

3
Obliqne
3'. 7."

f. 3v

4
Oblique
4' 2"

f. 4v

f. 5v

6
Oblique
5' 3"

f. 6v

University of Edinburgh
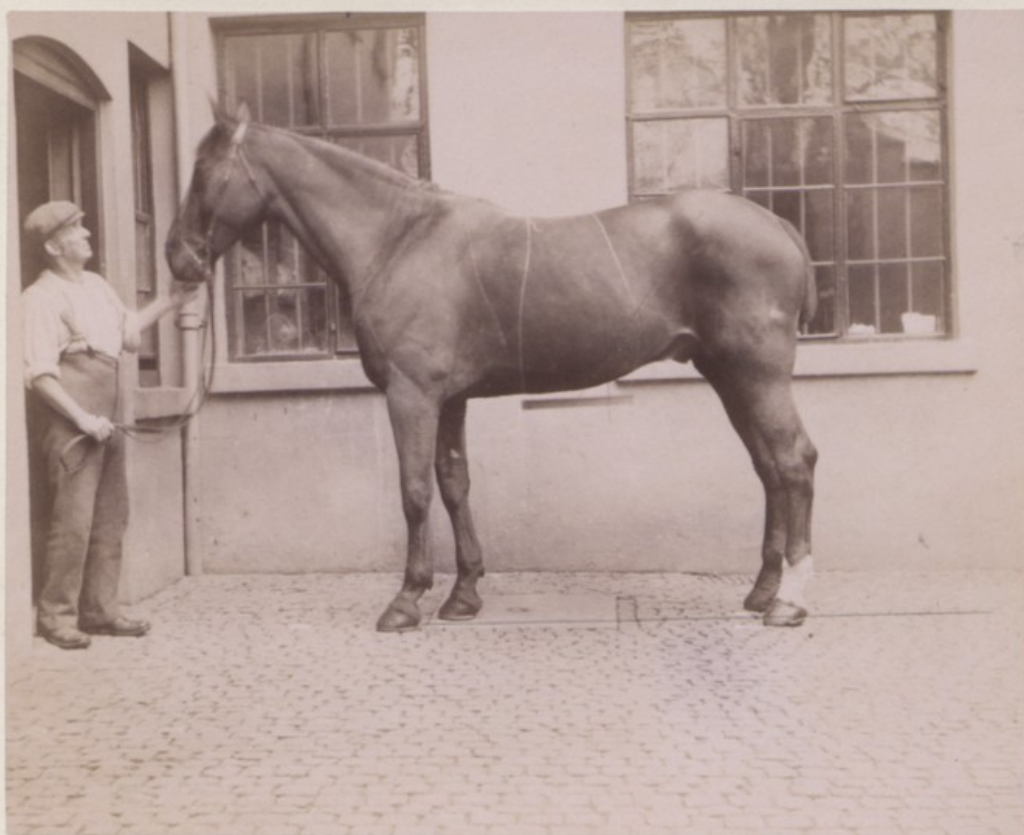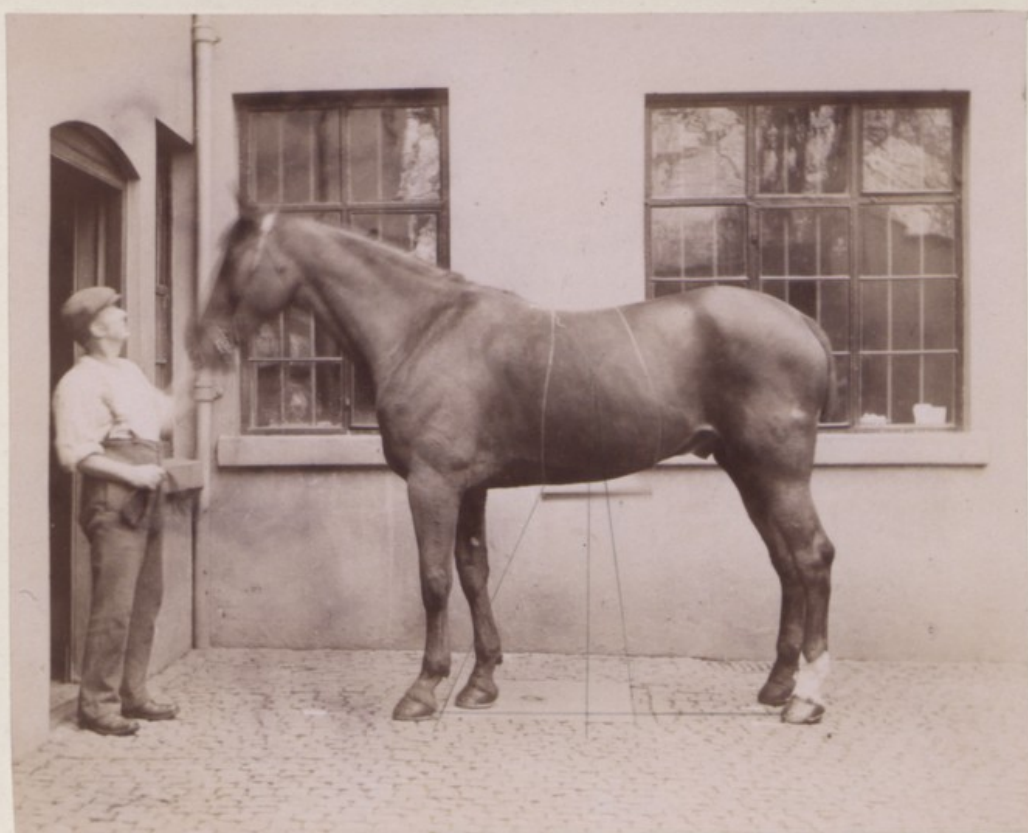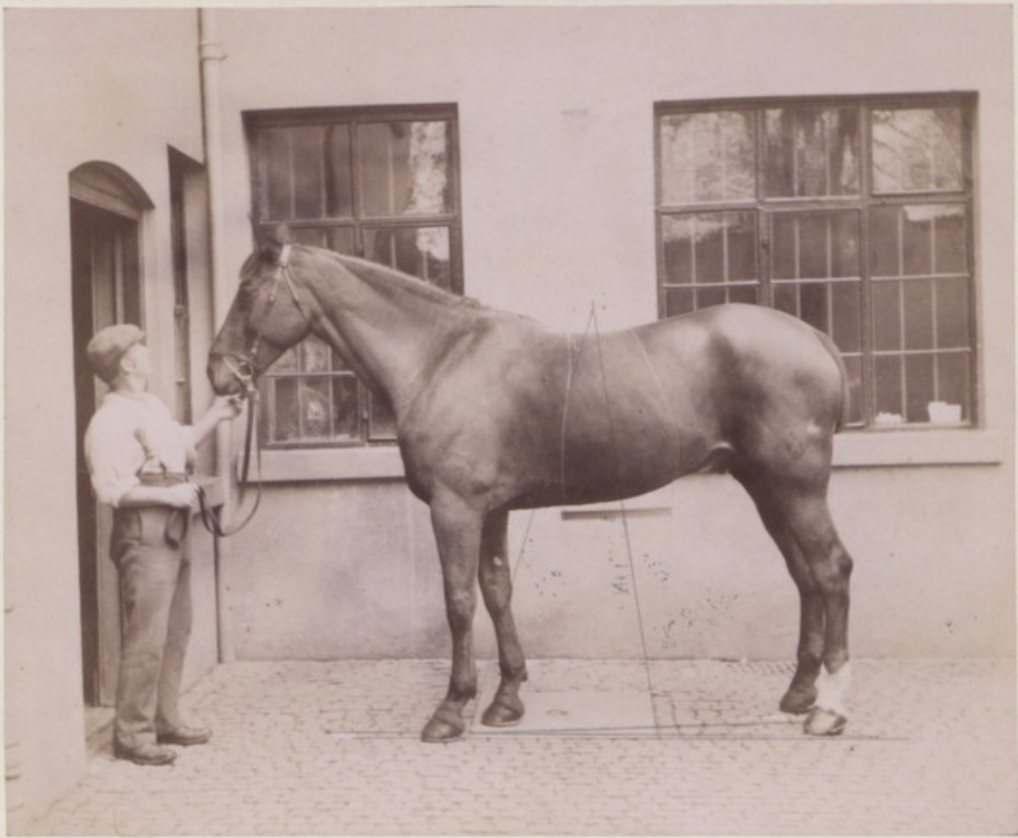
30 Jan 1899

My Lord Duke

This is to introduce
to your Grace Mr
Francis Galton who
has addressed a memorial
to the Royal Commission
on Horse breeding.
Yours faithfully
J. C. Ewart

To His Grace
The Duke of Portland
39 Victoria St̄
Westminster
S. W.

University of Edinburgh

30 Jan. 1899

f. 3r
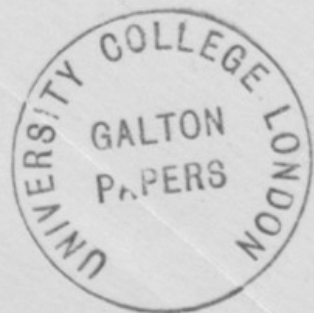
Dear Mr Galton

I have in a letter to
the Duke of Portland
and that we all swear by
you & that any help
rendered will be
ordely appreciated —
I was writing about
other matters. I have
also written to Sir Jacob

f. 3v

of the Evolution Committee. I thought I was a member of it but must have been mistaken

Yrs in haste with best wishes

J. C. Ewart

f. 4

Wilson (of the Board of
Agriculture 3 St. James
Sqr S.W.) who is the
Dukes right hand
man. I think he is
mixed up with the H.
B. Commission. He
is very nice & would
best of all introduce
you to the Duke
I am sending a line
to him also
I never hear anything

Colin Ewart

Penycuick

University of Edinburgh

9 Feb. 1879

Dear Mr Galton

I was delighted to
hear of your success
From what I hear
you seem to have
succeeded in impressing
the Commissioners with
the importance of the

I am sure for Jacob Wilson will
do what he can

Sincerely Yours

J. C. Ewart

matter. When you
have finally settled
all the procedure
you might let me
know. I might follow
your plan here & get
some Clydesdale men
to take it up. Sir
Walter Gilbey I
could also appeal
to if it wd help

Penycuik
12 Feb 1859

Dear Mr Galton

As you doubtless know
it is very difficult
to measure a horse
when "stretched" &
or when the neck is
twisted the size is
considerably reduced

I find the measurements
of two people never quite
agree though made at
the same time. Doubtless

crest to a line connecting
the upper margin of nostrils
My head measurements are
the following.

5 firstly. smallest
measurement
behind ~~the~~ withers
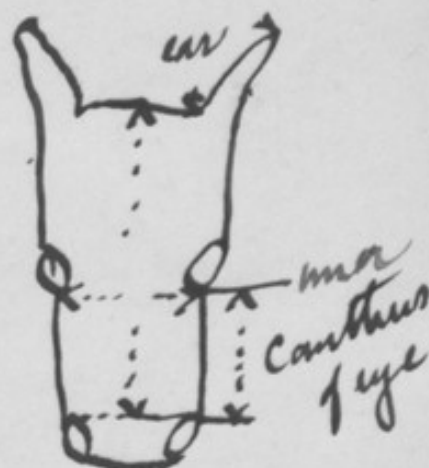
6. Fore-shank — smallest
circumference below
knee.

I also take (1) circumference
of knee (2) length from
elbow to ground o (3) length
from point of hock to
ground — the shank being

You will allow for this

1/ Withers. I always take the
highest point but this
is further back in some
horses than others owing
to the slope of the shoulders

2/ Croup. Again I take highest
point but this varies
with the slope towards
root of tail

3/ Length of back. I have
given up attempting
this — its too uncertain

4/ Length of head. I find
the best plan is to
measure from occipital

in a perpendicular position. The position
of the point of the hip is important & might
be indicated by a wafer. I dont think
it matters much about the length of the
neck. Would it not be well having
an outline made or better a photograph
as a heading for the form or schedule
showing the position the horse should be
in when photographed & measured
Yrs truly
J. C. Swart

To The Editor of the Live Stock Journal

42, RUTLAND GATE, S.W. Nov 19/98

Sir, Permit me to suggest
that it would be an interesting
and valuable addition to the
contents of the Live Stock Journal,
if the portraits ~~given in it~~ of
notable horses & cattle, used for breeding were
~~occasionally~~ usually supplemented by those
of their sires and dams, ~~to be probably presented~~ ~~on a~~
~~smaller scale.~~ ~~It would~~
add only one half to the size of
would be increased by
the illustration, if
~~their~~ scale, were 1/2 of portraits of the sire & dam reduced to
sketch of the offspring
linearly, as in the accompanying shown
diagram. ~~One~~ must
not ask for too

Sire	Dam
Animal	
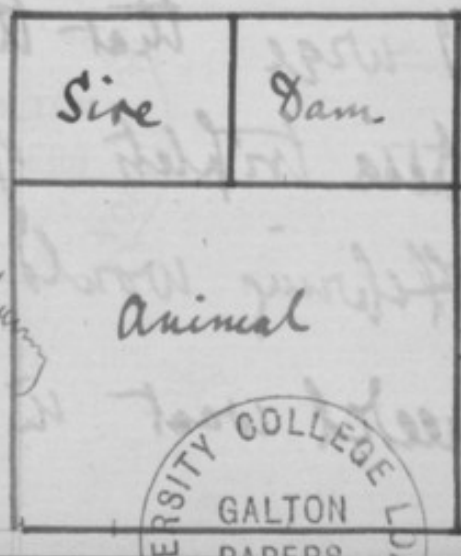
much space, and that much would ~~I~~ probably ~~much~~ suffice.

It is generally conceded now that the value of an animal for breeding will ~~never~~ be ~~inadequately~~ estimated if ~~his~~ it ~~cannot be~~ estimated by his appearance is alone ~~(taken into account)~~. There is no doubt that ~~it~~ his value will be much more rightly appraised ~~the portraits of~~ if his progenitors ~~are~~ also ~~can be seen.~~ ~~also.~~ ~~Of these,~~ Now the sire and dam have on the average as much influence on ~~their future stock as~~ ~~equal importance to~~ the whole of the remaining ~~ancestry~~ ~~progenitors~~. Therefore

I urge that the practice of issuing ~~these~~ triplets of sire, dam, and offspring would supply a large portion of a much needed want in the case of animals before offspring

whom likely to be used for breeding.

Those who scrutinized these triplets would soon appreciate how ~~great~~ large, at the same time how incomplete, are the effects purely of ~~parental~~ heredity. as detached from the ~~family~~ ancestral influences ~~when dissociated from~~

Francis Galton

(noteworthy large are the effects of the hereditary ~~parental~~ Contributions of the parents taken alone, and at the same time that ~~done~~ they are only one half of those of the complete ancestry.

Dear Sir Walter,

Lord Moreton will have prepared
you for my writing in the hope of enlisting
your sympathy & interest in ~~bringing to a
practical result~~ carrying out a scheme I have
much in heart for obtaining "regulation photo-
graphs" of pedigree stock. My own interest
in the matter ~~arises primarily~~ from the
desire of tracing hereditary influences
investigating and feeling here that
~~secondarily from a belief that~~ any advance
~~improved knowledge~~ in the knowledge of laws of
heredity will be of great value to practical
breeders. It seems to me of national importance. By
"regulation photographs" I mean such as
should be taken ~~according to a definite rule~~ and
to that be accurate portraits, and ~~not~~ as
artistic as may be under those conditions.
The details are necessarily too complex
~~too~~ to be explained briefly by letter, Proto. So I
should very much value the opportunity,
~~if you to grant it~~ one of consulting with
you as to the ~~first~~ steps on bringing the
matter before the public. I could easily
run down from town for the purpose
~~for a few~~ hours next week for the term
if it fell in with your arrangements to
allow me to call upon you.

f. 1r

42 Rutland Gate.
London. L. W,
May 12th 98

Dear Sir !

I am in receipt of your post card
from Perugia / here with I send Mr.
William Ripley's letter. from Boston
also Paper. which have been here sometime
but. I send post card at the Papers arrived
to day you was abroad, also a letter
from Mr Masterman for which I had
to pay 5ᵈ. A cheque for 13/11.ᵈ
from D. Appleton & Cⁿ 25. Bedford Street
Covent Garden. for Sales of Hereditary
Genius / 5% on hand - 87 Sold.
A letter from Mrs Vicktoria Woodhall
Martin, 17. Hyde Park Gate. S.W.
asking you. if you could oblige her
to write for her monthly magazine.
the Humanitarian some thing
I send her a card, to say that you
was abroad. /

you would be willing to do this, I will guarantee the safe re-
turn of the originals, because I am informed that even despite the
unhappy conflict with Spain just now in progress, that our mails
are perfectly safe from disturbance.

If this request seem to you impossible, would you be willing to
have a new print made from the negatives of composite Jewish types
which are in your possession, at my expense, and forward these to
me the difference, as you do in either case, bring to do justice
to those very remarkable representatives of the English Jew,
which so far as I know are not to be duplicated anywhere else.
Please be assured that in every case, complete acknowledgment of
the source of all materials thus loaned will be made. The granting
of this request will add to the obligation under which I am already
placed to you for your work in this field of common interest to
us both. I trust that my book will be worthy of any assistance
which you may render.

Yours very sincerely,

William Z. Ripley

I also beg to mention that only 6.
of your Pedigree Boards, (in particular)
have been returned up to this date
The Weather is rather dull, a good
deal of Rain. and cold Wind.
I am glad to say we are all quite
well. hoping that you. Sir. and
Mr Butler will return safe and
best of Health. by the Report
of the London Papers Italy seems
to be a hot place at present.

I am, dear Sir.
      Yours obediently Servant

          G. Gipi

TO CAMBRIDGE.

ELSENHAM, ESSEX. Station, 37 Miles From London.

STANSTEAD, ESSEX. Station, 35 Miles.

BISHOP STORTFORD, HERTS. Station, 32 Miles.

FROM LONDON.

TELEGRAMS :- ELSENHAM, ESSEX.
POST ADDRESS :- ELSENHAM HALL,
BISHOP STORTFORD.

ELSENHAM HALL
ESSEX

8 Oct 1898

Dear Sir

I am in receipt of
yours of the 6th inst & also one
from Lord Moreton which
I will lay before Sir Walter
Gilbey on his return from
abroad

Yours truly

George Pape
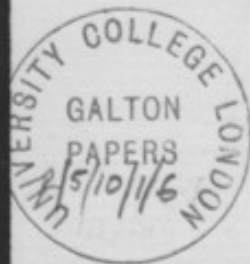
Secy

Francis Galton Esq
42 Rutland Gate
SW

W & A Gilbey
LIMITED

Pantheon. Oxford Street
LONDON W

PANTHEON. A.D. 1772.

11 Oct. 1898

Dear Sir

I expect Sir Walter
will be at Elsenham Hall
on Wednesday night, but I do
not expect him here until
Monday next.

Perhaps you would
like to write to him tomorrow
at Elsenham & I enclose
a directed envelope for your
use

Yours truly

George Pape

Francis Galton Esq
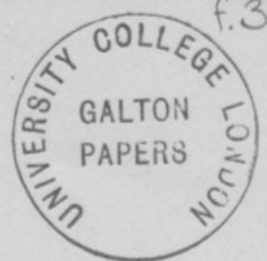
Sir Walter Gilbey, Bart.

ELSENHAM HALL

Elsenham Essex

Bishop Stortford

W & A Gilbey
LIMITED

Pantheon, Oxford Street

LONDON W

Jan. 23. 1899

Dear Sir

In reply to yours of
the 20th inst, Sir Walter has been
confined to the house for
some weeks & is leaving this
week for the Riviera where
he will stay till towards
the end of February.

He has no doubt that
your communication will
receive careful consideration
by the Hackney Society at
their meeting on the 1st Feby.
but he is sorry he will not
be present to support it

yours truly

George Pape

Fras Galton Eq

THE HACKNEY HORSE SOCIETY,

EST? TO PROMOTE THE BREEDING OF HACKNEYS, ROADSTERS, COBS, & PONIES.

HENRY F. EUREN,
SECRETARY.

12, Hanover Square,
London, W February 2nd 1899

Dear Sir,

 I yesterday submitted to the Council your letter as
to the photography of horses together with your draft ofproposed
questions etc., and I was directed to inform you that it was resolved
to ask Sir Walter Gilbey to represent this Society in any steps which
may be taken to place the details of the scheme on a permanent
basis.   Sir Walter is just now abroad but on his return I will
communicate with him and perhaps you will send him in due course
particulars of your ideas.

 Yours truly,

 Henry F. Euren

Francis Galton,Esq

 42 Rutland Gate

 S.W.

Septr 7/98.

Dear Mr. Galton –

I am pleased

to say I have arranged

for the Photos. to be

by Friday morning –

and to be delivered

at your address at

our School "D" –

so that they can

quickly be placed
in the Lantern
when required.
I also return you
the Photos you kindly
sent me - in reply
to my letter.

Believe me

Yrs truly
Alf. L. Hansen

F. Galton Esq
Clifton Street

St Marnock
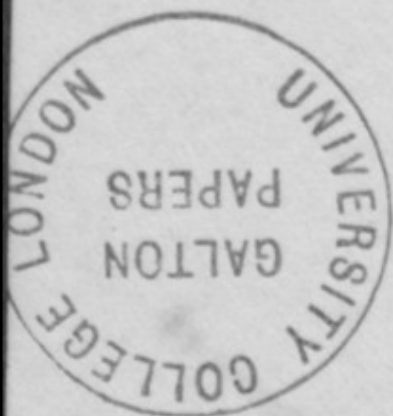
Sheedwell

Speedwell

Speedwell

E[ ]verelle

S

f.4v

Saleberia

F

9
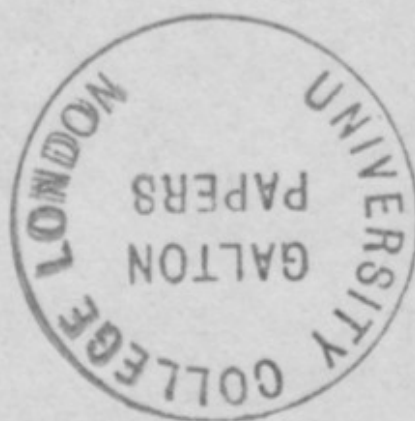
f. 5v

V. Solano

Solaro

f. 6v

B

2

Sir Visto   f. 7v

A

V

f.8
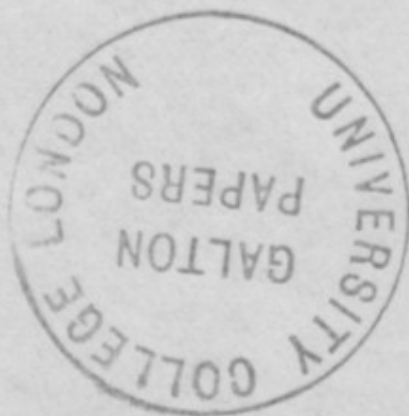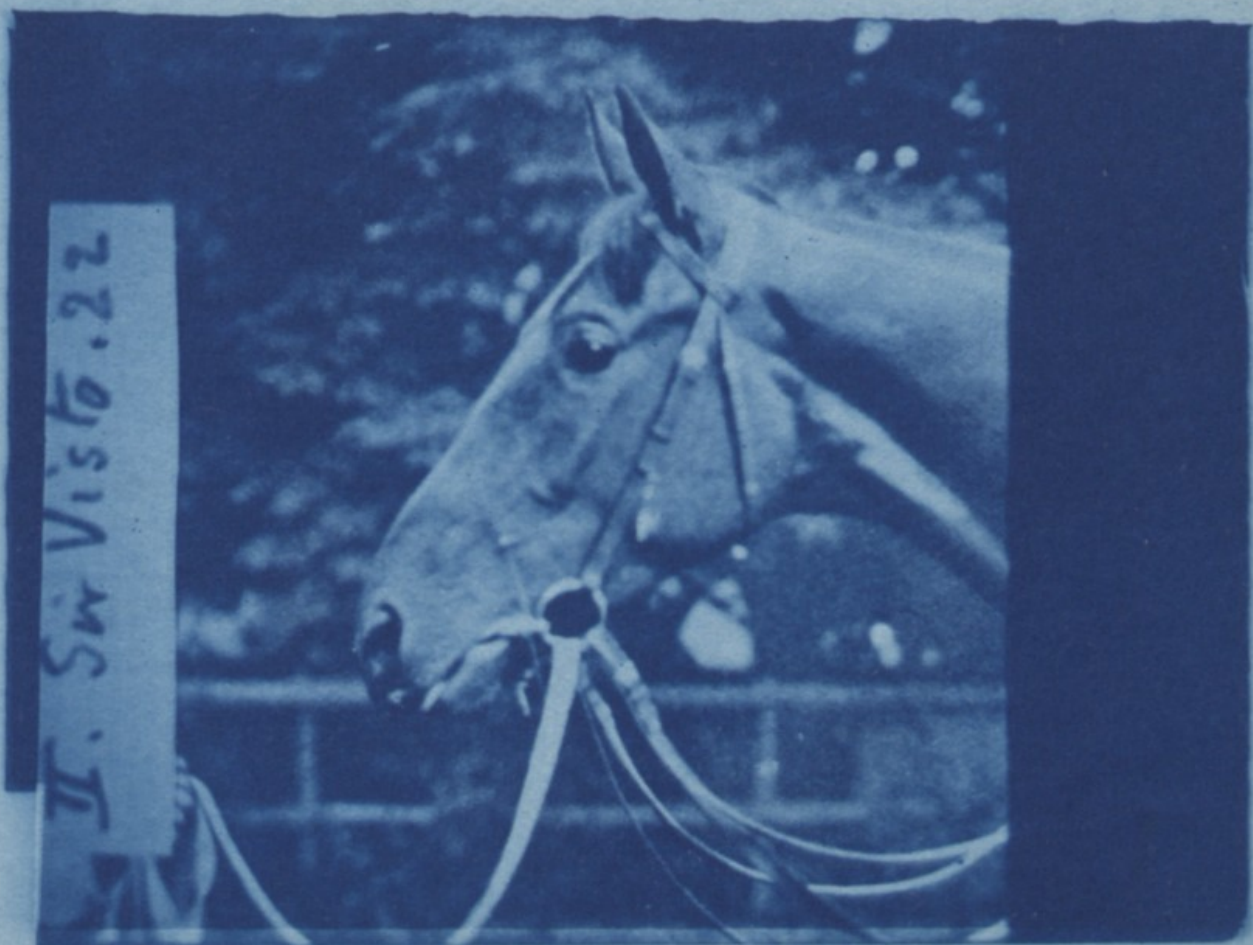
CLIFTON
9.30 PM
SP 7
98
BRISTOL
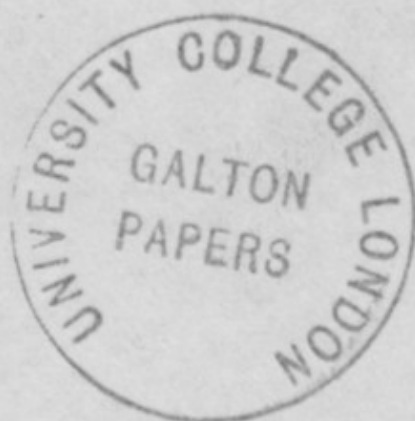
F. Galton, Esq. F.R.S.

c/o Mrs Smith.

Richmond Hsc.

Clifton Hill.
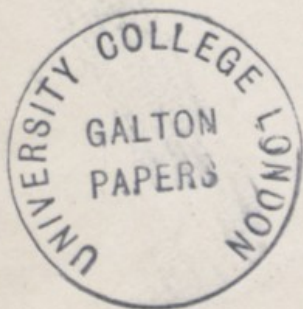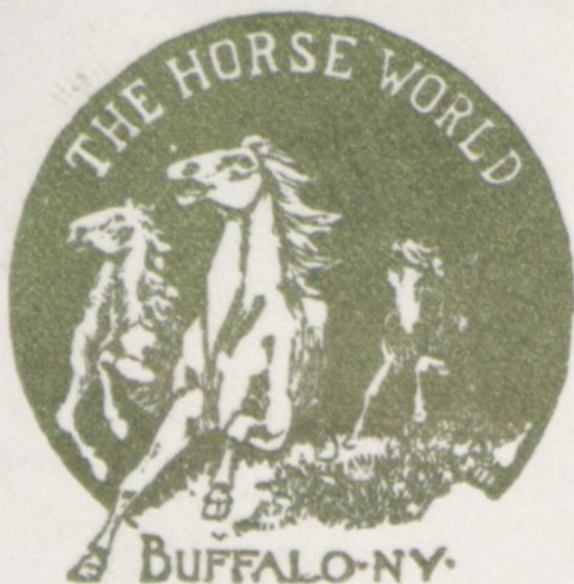
THE HORSE WORLD

BUFFALO·N·Y·

f. 1

HENRY L. ALLEN,

EDITOR.

f. 2

Mar 12 98

Francis Galton Esq.
London Eng.

Dear Sir: I have mailed to you a
copy of The Horse World in which
is an illustration of transmitted
speed in the trotting horse which
may be of interest to you. The
article was written by myself
"Raymond" being a nom
de plume.

Yours truly,

Harry L Allen

POST CARD

THE ADDRESS ONLY TO BE WRITTEN ON THIS SIDE

f.1r

LANCASTER
8PM
OC 5
98

436

Francis Galton Esq.

42 Rutland Gate

London S.W.
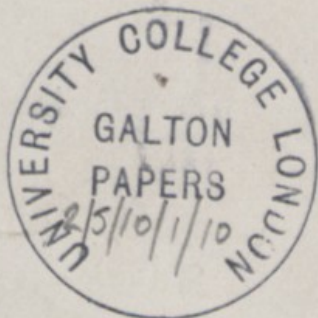
P.S. — I purpose arriving at home before the end of next week, but — am uncertain about my movements in the mean time. W.H.

Oct 5. 1898.

Letter forwarded from Live Stock Journal Office received as I was leaving home this morning for a few days. I am sorry to be unable (as a traveller today) to do more than give you my address — Prospect House, Distington, Cumberland — with assurance of my readiness and desire to cooperate very cordially so far as I can do so in the matter to which you refer. A paper sent this week addressed to me with Major Whalley, Richmond House, Lancaster, would reach me: later, to Distington.

W. Housman

Lancaster

Oct. 10. 1848.

Dear Sir,

I am much obliged
to you for your letter and
the advanced copy of your
paper which I received
yesterday.

I had seen only an
abridgement of the paper
now sent.

The subject is to me deeply
interesting. On my return
I should like to mention
to you one or two questions
which suggest themselves

to me.

I am

Yours faithfully

Wm Hosmer

_____
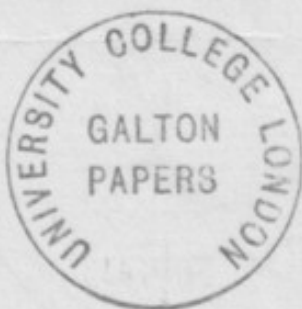
Francis Galton Esq

P.S. I am going into
Yorkshire tomorrow and
purpose returning to Distington
on Wednesday. W. H.

POST CARD

THE ADDRESS ONLY TO BE WRITTEN ON THIS SIDE.

f. 3r

DISTINGTON
6.15 PM
OC 18
98

UNIVERSITY COLLEGE LONDON
GALTON
PAPERS

Francis Galton Esq.

42 Rutland Gate

London - S.W.
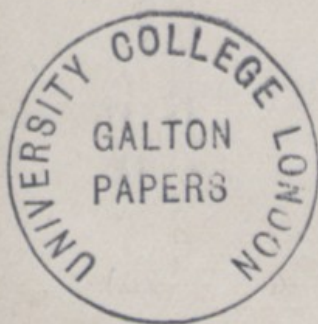
Distington Oct 18
1898.

Thanks for letter. I shall
have much pleasure in
finding and sending you
the information required.
The agent you mention by
name is likely to be helpful.
I will go into the same and other
breeds to give a choice of subjects.

W. Houseman

Prospect House, p.45
Distington, Workington,
Octr. 19. 1898.

Dear Sir,
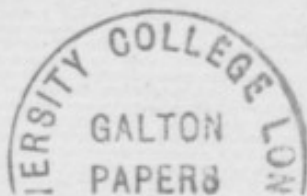
I sent you only a post
card yesterday, acknowledging
your letter, as I had
engagements through the day.

It is difficult to remember
at once and without referring
to the herd-books, &c. any living
group in any one herd or district
comprising all the relationships
you require; but I will search
the volumes and write to a
few representative breeders who
bred much within their own
herds, of the Hereford, Devon,
and Shorthorn breeds, and will
also try if I can get you any
group of horses. In sheep there

is this drawback: the Dam is
usually not to be identified
as an individual, but only as
one of, say 50, bred alike through
several generations and having
one and the same reference
number in the flock book
and one and the same ear
mark. The sire, named, is
known individually.

There is moreover such
close resemblance to one another
in carefully bred flocks of
pedigree sheep, that you would
scarcely find differences sufficiently
marked to be of service to you.

The Devon cattle breeders generally,
in like manner, work up to
similarity and to evenness of merit
in the herd; but not all to
the same type. In that area of

North Devon which is regarded as the cradle of the breed, small size, but great weight for size, fine bone, brightness of aspect, gaiety of carriage, and a corresponding vivacity, are ancient characteristics still maintained by some breeders; and I am convinced that the district (soil, pasturage, climate, &c) and management suitable to it have much to do (as well as selection) with the maintenance of those characteristics. Take the purest North Devons into Teesdale or Wharfdale (districts which have developed the massive Shorthorn) and you would have, I believe, within a few generations, the distinctive North Devon character*, size increasing, and the solid case which comes with what the Yorkshire farmers call

"a good mouth-hold" of grass
would take the place of the blithe
outlook and quickness of eye
and step. It is much so, indeed,
but partly by selection, in the
heavier grass pastures where Devons
are kept. The old "Somerset-
Devon" was large, many of the
old team oxen attaining to
great weight. Style has been
added and size reduced by crossing
with the North Devon; yet there
is still a marked difference between
the true North Devon and the
Somersetshire types. The cattle
of both are admitted to the same
Herd Book. I have seen
on an exposed sea-coast farm
in Somersetshire, Devons which
if I had seen them between
Horsham and Shoreham I should
scarcely have thought distinguishable
from the Sussex breed, and should
have supposed to be cattle bred in that county.

Oct 19/98.

Now in reference to your
second sheet. — I have
frequently gone over the
ground you indicate,
from unisexual Multiplication
onward: meanwhile
observing facts which have
come out under my
own eyes in reproduction
proper; and I am
very strongly impressed
with what — I have repeatedly
seen and take to be
evidence of exposure of
the germ to influences
acting upon the personal
parent. Such a notion

as the encasement of seminal particles, placing them out of reach of all influences but there they hold under an inviolable seal, I am hitherto unable to reconcile with these facts.

This is a subject very difficult to deal with in a paper like the Live Stock Journal. I doubt whether biologists have ever yet sounded much below the surface of a vast deep.

Yours faithfully
Wm Housman.

—

F. Galton Esq.

Houtman

f. 8r
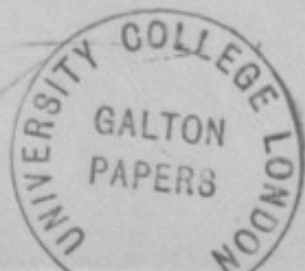
Prospect House
Distington, Workington
Nov. 21. 1898.

Dear Sir,

I have not yet succeeded
in finding what you require, but
am trying in various quarters.
The enclosed letter of Mr. Ridson,
which you need not return,
may interest you.

Your letter to the Editor
of the L. S. J. is forwarded.
I think it would be interesting
and useful to see portraits of
the parents with the portraits
of the offspring; but with this
Journal it will be a question
partly of expense and partly
of haste in getting out the
of prize-winning animals, as

f. 8v

well as a question
     a of space.

Mr Risdon has immense
knowledge of the pedigree Devon
herds, & is himself an old
breeder of Devons. To him
the breed is largely indebted
for the improvement of the
Herd Book founded by the
late Mr Davy, known in day
as "Colonel" Davy. His (Mr
Risdon's) son is Secretary to
the Devon Cattle Breeding
Herd Book Society.

      Yours faithfully
      W. Hosmer.
Francis Galton Esq.

I have not time to
go into the points in
your letter this morning,
but will attend to them.

W. H.

I never noticed any defect in the sexual organs of Count Lavender, although I
have repeatedly seen him at the shows and have a habit of looking for and noticing such
defects. I have frequently found in shorthorns instances of only one testicle in the scrotum
the other being a little higher, and not always, if ever, apparent to sight or touch; but
some shorthorn bulls have a faulty formation at the top of the scrotum which within which the
testicles actually being, although their whereabouts may not be so easily seen as in the ordinary
form, which is that of a soda-water bottle, the testicles being found at the bottom of this

according to arithmetical calculations there
would be in the last animal only 1/1024 part of
the old blood in her composition — only a few
days ago in looking through a herd of Devons
there was a heifer with a light yellow patch on her
side this the owner told me was the case with nearly
every animal of this family —

To hear some people talk of breeding one would think
it much like mixing chemicals given certain
proportions of ingredients stir them well up together
and the trick is complete —

Above and beyond all it behoves breeder to secure
stock with hardy constitutions and free from hereditary
defects — perhaps you will think it unreasonable on
my part to mention that at the last Somerset show there
were 3 or 4 bulls all 1st prize winners sired by Count Lavender
neither of whose sexual organs were perfectly developed
a defect as I was told inherited from their sire now
in my opinion instead of receiving prizes such animals
should be condemned to slaughter instead of proving
a curse to all who use them — It does seem strange
that judges exist who unduly exalt such malformed
animals — in my opinion it would be well if such
defects were a disqualification as also short ribs and an
objectionable amount of white in certain breeds —

Yours truly

John Risdon

W. Housman Esq   Risdon

HAWKES, RISDONS, & ANDREW,
AUCTIONEERS, VALUERS, &c.

OFFICES:
WILLITON AND
WIVELISCOMBE, SOMERSET.
AND ON SATURDAYS AT
CLARKE'S HOTEL TAUNTON.

Golsoncott, Washford.

Somerset.

18" Nov: 1898

Dear Sir

I am very pleased to hear from
you once more my own told me a little time
since that you had left Lune Bank should you
ever be coming in our neighborhood we will
always be pleased to see you — I fear you will
find it a somewhat difficulty thing to find
the parents and the four grandparents in existence
it would give me great pleasure to render you
assistance possibly if photos were accepted cases
may be found —

The longer I live and the more one endeavours
to unravel the mysteries of heredity the more
complex it becomes, animals frequently throw
back to some long forgotten ancestor a case
happened some years ago of a *sheeted cow being
bought into this neighbourhood which produced a ℗℗
similar marked this calf and her descendants
were generation after generation bred to Devon bulls
yet after fifty years of such breeding a ℗℗ was
produced with a perfect sheet mark now assuming
there were but ten generations from the original calf.

* Sheeted. Red at both ends (head, neck, shoulders & breast, & hind quarters), white from tips to shoulder
all round the body, as if a sheet had been thrown round a red animal. There are also black & white
sheeted animals. Formerly sheeted animals were often seen in the county of Norfolk. The Devon bulls here
mentioned were of the 2d breed of North Devon & Somerset.

Houtmay?
Prospect House
Distington
Workington
Nov. 29. 1898

Dear Sir,
                                        Tudge

Mr. William Tudge, of Leinthall. Ludlow, has a young bull whose dam and maternal grandam are both also in his possession, sire and paternal grandsire both within a few miles from Leinthall in the possession of Mr. Tudge's brother, and the remaining two grandparents although not accessible, have been photographed and the two photographs are at

Lairdhall. That of the maternal
grandsire, Mrs Judge says, is
a fair one; that of the
paternal grandsire a capital
one; and from reproductions
of it which I have seen it
evidently is very good, shewing
a Hereford of true character
and very decided individuality.

The bull (Crown Prince)
is too young to have developed
the secondary sexual characters
at all fully, but as Mrs Judge
may tell him he thinks
if you consider the 2 photos
likely to be of service and
care to photograph the
animals still accessible

you had better, perhaps, come at once, lest the opportunity should be missed. Of course Crown Prince might possibly remain in English hands and be accessible again another day, but Mr Judge is a trader whose animals are much sought for exportation. Ancient Britons went abroad and became a distinguished Champion winner at Shows across the Atlantic.

Mr Judge will be pleased to assist you, he says, in your wish to

carry out your plan, and if he hears of any groups available for your purpose will let me know at once. He is a middle-aged farmer (churchwarden, &c, & locally active man), & well known as a breeder here and in the colonies and foreign countries. His father was a very distinguished breeder who founded a herd of uniform & pronounced character from miscellaneous (pure-bred) sources, quite heedless of the fashion and the bias of opinion in his day. I knew him well, and never knew, I think, a better judge of cattle, nor one who had a clearer intuitive judgment of the fitness of animals (generally & individually) for pairing, so as to ensure satisfactory results.

Yours faithfully
Wm Housman.

J. Galton Esq.

N.B.30. If you think of going to Ludlow, 2 or 3 days' notice to Mr Inase (? Tudge) under cover to me to arrange, perhaps they a days where he of his brother would be at home. 2 appetite Thomas.

Hereford bull (Crown Prince,
calved Apl. 30. 1897; bred by
and the property of Mr. William
Tudge, Leinthall, Ludlow.

(Tudge)

Crown Prince.
(at Leinthall).

(sire)	(dam)
King Arthur	Diadem
(accessible)	(at Leinthall)
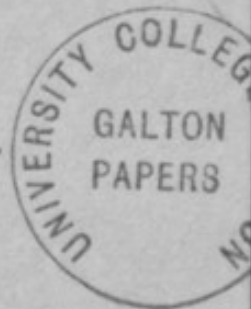
Grandsire (paternal) — Ancient Briton.
(Photograph)

— Gr. dam (paternal) — Pendridge &c. — (inaccessible)

— Grandsire (maternal) — Viscount Wilton.
(Photograph)

— Gr. dam (maternal) — Violet — at Leinthall

Mr. Judge is also looking out for groups of horses for your purpose.

I should think it would be preferable to have all 7 animals (Cattle) as nearly of one age as possible, when photographed; but this would be a work of years; and I should say the prime of maturity would be the best period of life. You know best. Cattle of the principal breeds would be in perfection at the age of about 4 years. Older animals still might have more "character", but if breeding abundantly (male or female) might be yielding (failing) a little in flesh-points. In the case of some large beef breeds it might be a question whether you wd wish to photograph the living frame, or the covering of flesh — i.e. in lean or fat state.

(Housman)

Dec 13/98

29, SUSSEX SQUARE,
13·12·98 **HYDE PARK, W.**

Dear Sir

Your letter was
duly forwarded to me,
but I dont think I have
such a group of animals
such as *Dr Galton wishes*
to photograph just at
present, — & I dont know

f. 15v
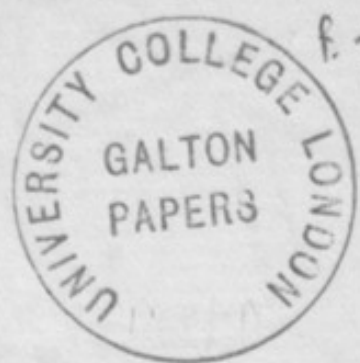
29 Sussex Square,
Hyde Park, W.

Where such an one
exists. Ld. Palwarth's
farm would be the
most likely plan. I
think to find it on.

Yours sincerely

William Graham

f. 165

Distington Dec. 14.

Dear Sir, this is from a breeder who at
Eden Grove, Kirkby thore, Penrith,
has a herd of Shorthorn cattle &
stud of Clydesdale horses, with pedigree
stock of the smaller kinds. I thought
him a likely man to have in one or another
species the animals you wish to photograph.

I scarcely think Lord Polwarth is likely
just now, as he sold a large number a few
months ago, but if you think Mertoun House,

St. Boswells, not too far. If I have not
yet got what you want, I will make
inquiry for you. I have not been at
Mertoun, if I rightly remember, since
1894.

Do not trouble to acknowledge
unless you wish me to write to Lord
Polworth. He and his younger son, the
Hon. H. Scott, both take great personal
interest in the breeding & management of
the short horns & sheep. Yours truly

J. Galton Esq.   W. Hinsman.

A. B. CHARLTON,
SECRETARY.

Dear Sir,

In reply to your note I beg to state that I cannot without

consulting my stewards give you any definite answer as to whether the

photographing of the Premium Stallions can take place on the Wednesday,

as our veterinary yard will be full of mares at various times during the

day.   I should rather be inclined to think that they will not take the

responsibility of allowing stallions to pass in and out among them.

Perhaps they would give you facilities if necessary on Thursday, after

one o'clock.

Yours faithfully,

A B Charlton

Francis Galton, Esq.

DEC 28 1898

f. 1r

Sir.

We have started
the photos of cattle.
as some of the animals
here to be sold. &
we had to take first
chance. or not at all.
We shall do nothing
further until we hear
from you;

As regards cost this
is a difficult
matter to judge.
as the greatest expense
is the time. as the

places are quite out of the way.
& as far as we can judge
the Cost complete will be
about £3 . 5 . 0   & £3 . 10 . 0

Awaiting reply
we are Sir

Respectfully
Jones Son & Harper

San Francisco, Cal.
Febr 22, 1898

Mr. Francis Galton
Proc. Royal Society
London

Dear Sir :

A few weeks ago I
received from you a circular and blank rel-
ative to pedigree records as a branch study
in your researches of heridity. This investiga-
tion as well as the books mentioned therein
are of especial interest to me, as I have long
studied the trotting horse, have myself
raised some good ones, and claim to possess
some natural talent for breeding.

I cannot perhaps judge properly of the
proposed tabulations of records before read-
ing your books, but as an ardent admirer
of the American trotter, both as a horse of
pleasure and of usefulness in carriage and
delivery wagon, I am somewhat opposed to
this inflexible classification of the trotter by
record.

Purely as an animal of sport or fast
driving the trotter can not possibly hold

his own alongside his aristocratic brother the
thoroughbred, and the love or preference of our
nation in general for the trotter is based mainly
on his usefulness as a roadster. I would always
uphold the necessity of classifying the trotter
by weight and size as well as by speed. If
speed is made the sole end this native type
will soon degenerate. I say "native" advisedly
because the trotter has been proved to be as
much the product of our soil and climate
and the characteristics of the people as he is
the outcome of mere breeding. All other famous
breeds of horses were moulded by climate and
the mental influence of the people who bred
them. What can be done by locality, careful
mating and steadfast endeavor and a
systematic education of both dam and her
product is shown in the mare called Mar-
garet North 2.15 which I raised and own.
Though eight years old she is the soundest
mare on this coast and besides a beautiful
individual. Horsemen claimed I would not
raise a colt one from her old dam, but I
knew I could and I did it and more. I en-
close a picture which I took myself, so that
you may judge yourself.

Had other business not diverted my attention
from breeding horses I felt confident I could

have repeated such results. But breeding
horses & takes one's personal unceasing care
and unflinching perseverance and patience,
it cannot be left to others. The master's eye
and personality is the chief secret of success;
and though I am deeply interested in the subject
you have treated, I have had so far no op-
portunity to fully devote myself to this bend
of my nature again.

Your circular has not appealed to me in
vain, but as the ancestors of my horses are
not all horses with record I could not furnish
you with the desired data. I beg you, however,
to give tell me in reply where your books,
specially No 2, may be had and what the
prices are.

I could give you my views still more
at length, but prefer to do so at some other
time. I have as an owner of trotters made
their gaiting, balancing or shoeing a special
study and hit upon a practical method
of ascertaining all their deficiencies by a
close examination and measuring of position
of feet and strides as marked on the ground.

But this is another subject, and I merely
mention in closing to indicate my know-

ledge of the trotter. I am one who hates
guess-work and always seek for a logical
explanation or solution of difficulties en-
countered.

By favoring me with a reply you
would greatly oblige

Yours very truly

Rudolf Jordan Jr.

2519 Washington St.
San Francisco, Cal
U. S. A.

f. 5

See letter
from Rudolph Jordan Jr Cal.
San Francisco Cal.
U.S.   2
Feb 22/98   +

FRED. JAS. LLOYD, F.C.S.
Analyst
&
Consulting Chemist.

F. J. Lloyd

Agricultural Laboratory,
4. Lombard Court.
London, E.C. 9th Oct. 1895

Francis Galton Esq
     Dear Sir.

          I have read your letter in
the L.S.J. and thought you might like
to know that at the Dairy Show, Agricultural
Hall, Oct 16 - 21 there would be an
excellent opportunity for you to study
milch Cows.   There are 94 entered for
Milking Trials. The milk will be weighed
morn + even on 19th + 20th and analysed
The camera and tape measure would
probably enable you to obtain useful
statistics in addition, if you are interested
in milking properties, and 4 days you
would have for the study.   There is not
such another opportunity in England.
                    Yours faithfully
                         F J Lloyd

FRED. JAS. LLOYD, F.C.S.
Analyst
&
Consulting Chemist.

Agricultural Laboratory,

4, Lombard Court,

London, E.C. 11ᵗʰ Oct. 1898

Dear Sir.

Re Dairy Show.

1. The animals are not all pedigree; some are. Generally these are not the best milkers.

2. Light doubtful, especially in the Hall, but with consent of Council probably some of the animals could be taken out in the open for photography. This answers your 3rd question. Photographs are taken, but scarcely snap shots.

Yours faithfully

F. J. Lloyd

Thanks for paper, which I will read.

Lowe

1898 Sept 6.

SHIRENEWTON HALL,
CHEPSTOW.

Dear Mr Galton

I have read your paper with
great interest and agree with
all that is said. I may add that
I feel certain that results, taken
where crosses are made on the female
side, differ from those on the male side
this I have been working at in cows
using ½ bred short horns short horns
½ bred Guernseys, & Guernseys with
these I have started with a black
Dexter bull, all my cows used being
light coloured some nearly white. I have as
yet five calves all black like the father
except one which is a dark mouse colour.
Mr Richard Stratton has worked in the
opposite manner he has a herd of

black Kerries & was a white short horn
bull, a specimen of each will be in
our Biological Exhibition. I have not
yet had a report of the colours but
expect more white that black, he himself
will be at the show, where we expect
other crosses from Sir Grenville Smith & also
from Mr Gibbs. Our object is to improve
quality & quantity of milk, & my view
is that I shall do this better by the introduction
of a Bull from a milk-giving breed, than
by the introduction of one where the milk
is less in quantity. Mr Stratton will beat
me in size of the animals, though I speak
without seeing his result. What we want
you to see is the commencement in calves
two or three months old. I formed my opinion
in what I had done in plants. I took
two Fuchsias one with the small ordinary
leaf & crossed it with Fuchsiafulgens (which
has a very long cup, when the seed bearer

had the large leaves the progeny had
all large leaves except one which had
medium sized leaves & this gave flowers
of the colour of pelargonium but form of the ordinary
ones, whilst of the seed bearers had
the small leaves all the progeny produced
had small leaves. I will not say more now
as I shall be able to show them to you on Thursday.
also some remarkable results of crosses with
ferns, dahlias crossed with sunflowers, Zonal
Pelargoniums crossed with the Ivy leaf Pelargonium
Zonal Pelargoniums crossed with fancy Geraniums
&c. you will see the Boa constrictor with
22 young ones a duck one of a pair hatched
from a double yolk egg (unfortunately a rat
killed) the other. also chickens from egg hatched
within an hour of being laid, this I have done
some times after isolating the hen for a month.
also chickens all hatched from one cochin &
then the cock removed. in this experiment the
eggs laid I have after coition at 1.3 4 5 8 9
days. I hope to see you at the show or at

the Brit Assoc. when I arrive . I bring my
Cows with me tomorrow morning

Believe me

Yours very sincerely

E. J. Lowe

Philadelphia, Pa,

February 5, 1898

Francis Galton Esq

42 Rutland Gate

London Eng

Dear Sir~ A friend recently brought one of your blanks to me for filling up. In the early 60's & 70's I assisted our John H. Wallace, who was the pioneer, & held to for 30 years, in the collection of trus histories of trotting bred (American) horses. In representing "Spirit of the Times, here for 16 years, & now, the Trotter and Pacer" of N.Y. city many books come to me in the exchange & for criticism & favorable notices. But I have never seen your books referred to on back of your small sheets. y.

Friendly in the Cause
Yours &c
Cyrus Lukens

f. 1r

1

Allen Farm
Pittsfield, Mass: July 21st 1897
U.S.A.

Francis Galton Esqr.

Dr. Sir,
Your esteemed favor of the 5th inst was duly recd,
two days ago. I am greatly pleased that you have written me,
because I am sure that the breed of trotters we have will furnish
you with a mass of reliable data suitable for inquiry along the lines
of your "Natural Inheritance" (which I read & re-read with a great
deal of interest) & also because I believe that if you will take the
trouble to investigate all this material, it will be of much benefit to
all students of heredity — & incidentally be of great service to all breeders.

The test of the American trotter is his ability to trot "a mile" to
"harness" at speed. "To harness" is a technical expression meaning
that the horse shall be harnessed to a two-wheeled vehicle, & be driven by
a man weighing at least 150 lbs — or if less, then enough weight shall be
added
carried to make the vehicle carry, with the driver 150 lbs. This vehicle is
known as a sulky. On Oct 13. 1845, the gr. m. Lady Suffolk trotted
to harness over the Beacon Course, Hoboken N. J. — a mile in 2.29½.
This is the first recorded instance of a horse's trotting a mile in less than
2 minutes & a half — or as we now say, the first time that "2.30 was
beaten." In 1859. Oct 15, at Kalamazoo, Mich, the bay mare Flora
Temple trotted in 2.19¾ — and this was the first time "2.20 was
beaten." Between these two dates only two trotters besides Flora
Temple had beaten Lady Suffolk's time (or "record" as we technically call
it) & many believed the limit of trotting speed had been reached.
In 1867. Dexter a brown gelding by Hambletonian trotted in 2.19, &
later in the year in 2.17¼. Then in 1871, Goldsmith Maid, a bay mare

by Alexander's Abdallah, a son of Hambletonian trotted in 2.17. & annually reduced this record until in 1874, – she brought it down to 2.14. Then Rarus in 1878 trotted in 2.13¾.   Then St Julien (by a son of Hambletonian) in 2.11¼ – in 1880, – Maud S. (by a son of Hambletonian) 10¾. 10½. 10¼, –   On Aug 1. 1884 – a black gelding named Jay Eye See also by a son of Hambletonian – a brother of Dexter 2.17¼, – trotted in 2.10, – but the day after Maud S. lowered the record to 2.09¾ – & on July 30th 1885, trotted in 2.08¾.

During these 40 years from 1845 to 1885, – while breeders were undoubtedly improving the breed by skillful selection, – there were improvements going on simultaneously (1) in the building & preparing of the tracks over which these exhibitions of speed were made (2) in the make of sulkies, – marked improvements being made in their lightness, rigidity & easy running qualities, (3) in the shoeing (4) in the harness (5) in the methods of training.   But the mile tracks or courses were all of one shape, known as a "regulation track" & shaped thus
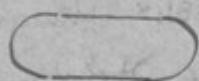
two straight sides ¼ of a mile in length placed far enough apart so that the arc of the circles connecting the two sides each measure ¼ of a mile: the whole track (or course) measuring 1 mile, – 3 feet out from the inside pole or fence. Horses cannot trot closer to the inside fence than 3 feet away from it, – & if they go further out on the turns they will necessarily trot a little over the mile.

The record of Maud S. (2.08¾) remained unbeaten for 6 years, – when in 1891 a few kite shaped tracks were built, – this shape

Finish
Start

giving two long straight stretches, - & one wide circle - starting &
finishing on different sides of the apex or point, - & over one
of these tracks, - Sunol, a bay mare by Electioneer (also a son
of Hambletonian) trotted in 2.08¾.   This style of track was
not popular, - & ~~has~~ few of them were built or are now in use.

     Previous to 1892, while the sulky had been much improved
in easy running qualities to what it was in Lady Suffolk's day -
~~its~~ its weight being reduced over one half - ^probably two-thirds, they were all made on the
same plan: viz: - two large narrow wheels about 4½ feet in diameter
or over, - connected by a stiff light axle on which was a small cane
seat for driver, - & two shafts.   In 1892, the large wheels were
superseded by small pneumatic-tired wheels similar to those used
in "safety bicycles", - & the "bicycle sulky" came into vogue - &
its use spread so rapidly that by the following year, - no one
thought of trying to compete in a race with a high wheeled sulky.
They have gone entirely out of use, - & all fast records from & including
1892 have been made to this sort of sulky.   That year Nancy
Hanks (by Happy Medium, - son of Hambletonian) lowered the
record to 2.04. & in 1893. Alix trotted in 2.03¾, - which
stands today as the world's record for trotters, (some believe the new
sulky enables a horse to
trot 5 seconds faster.)
     There are also two kinds of regulation tracks - known as
mile tracks & half mile tracks.   On half mile tracks the
horses must trot twice round to make the mile.   The straight
stretches in half mile tracks measure ⅛ of a mile: the turns also
⅛th.   Most trotters can go ^a mile from 4 to 10 seconds faster on a
mile track than on a half mile track.   There are also all
kinds of tracks, - good. bad & indifferent - of both ~~t~~ lengths -
depending on the quality of the soil, & the manner in which they

④ are kept; but in the published records of time made by the thousands of trotters, — no distinction is made on account of the quality of the track: or whether it be a mile or half mile track. The exact time the horses take to cover the mile is recorded, — there being 3 judges & at least 2 timers, — & all the necessary safeguards to insure both honesty & accuracy.

One distinction is made by breeders in records, that is as to whether they are "race-records" or "time-records" as they are technically called. A "race record" is one made in a race (or match) with other horses, — Races are with rare exception, — mile heats, — & the horse winning three heats wins the race. Only the horse which wins a heat obtains a record: & where many start, & manifestly only one can win each heat, — it is more of a feat to win a fast record under these conditions, — than where the horse is started alone with an unobstructed track
horse — & a pace maker to run or trot alongside of him for encouragement, — simply to prove in a public manner that he can trot in such a time. These latter are known as "time-records", & distinguished in the Year Books by a star (*) in front of horses name

I have probably been tedious in this long explanation but I assume that these things may be unknown to you, — & that if you proceed with your inquiry (as I earnestly hope you will) the information may be of some little value towards facilitating your investigation.

Now to answer one of your inquiries; — The trotting records & the pedigrees so far as known of every horse that has trotted a mile in 2.30 or faster are published: & can be relied upon.

All these records are contained in Volumes 8, 9. 10. 11. & 12 of Wallace's Year Book. Volume 8 - part 2 contains the complete record from 1845 to 1892 inclusive. The trotters are given alphabetically. with the color & sex. year foaled, name of sire - dam, sire of dam: & generally grandam & sire of grandam. Then there is what is named the "Great Table". where all the sires are arranged alphabetically. & their pedigrees given. year of birth, color &c. & under each sire, the name, record, & the dam of all the 2.30 trotters he has sired; also name & record of all 2.30 trotters from his daughters; also, if he has any sons what have sired speed, their names: & the progeny unto records of these sons is found under their respective names in same table. Then follows a table of horses that have not themselves sired 2.30 speed, — but whose daughters have produced a trotter. Then is a table entitled "Table of Great Brood Mares"; & this contains all mares that have produced 2 or more trotters, or that have one trotter & a son or a daughter that have got speed. — Also tables of Champion Trotters &c.

Volumes 9. 10. 11 & 12 contains the ~~so~~ similar information arranged in same manner of all the trotters for the respective years 1893, 94. 95 & 96: with ~~so~~ reports of all the races for each year.

These form a complete & reliable ~~record~~ genealogical account of all the ~~first~~ trotters down to ~~date~~ close of last year that have made records in 2.30 or better — & for the purpose of your inquiry you should have access to them.

But to get at the speed of <u>all</u> the issue of <u>all</u> the
sires & dams & grandsires & grandams of say 500 brood
mares is not so easy a matter, — & probably an impossibility.
By making a selection from breeders catalogues & from
the table of great brood mares in the Year Books this
might be done in case of the produce of the mares
themselves, — with respect to those foals that had been
trained, — and given records in public or reliable private
trials.   I have a large collection of catalogues, — &
could select 6 or 7 issued by the oldest established stock farms, & send to
you.   Those that I would send to you, — you could
depend on the information being correct.   It seldom
however happens that all the foals of any brood
mare are trained.   I can think now of only 4 or 5
such cases.   Where a mare produces a fast trotter, —
the breeder is generally anxious to put his own theories
of mating to a practical test, — & having satisfied
himself that the mare produces speed, — the sisters of
her trotter are often put to breeding as soon as they are
old enough; & the brothers are often put in the stud
without being trained & started for a record or in races.
    When it comes to stallions, — it is difficult for the
owners even to know what becomes of all their foals.
Mares are sent from a distance to be bred & taken home

(9)

after being served; they foal next year probably hundreds of miles from where the stallion is owned; the owner of the mare is even sometimes careless about reporting the foal to the owner of the stallion; altho in most cases they do this. But the foal may die at 1, 2 or 3 years of age: or grow up, be sold & lost sight of; — unless he should turn out to be very fast, when his history & identity will be traced & proved up. Still an approximation of the number of a stallions foals that lived to be 5 years of age can be made in many cases, — probably close enough for your purpose. The catalogues I could send you are issued by gentlemen, — who would doubtless be willing to further your investigations by information from their private records. & once your selection of 500 mares was made, — I should be pleased to assist you in every way, I could.

By the system you pursue in Natural Inheritance — where you have the records say from 2.07 or 8 to 2.30 of a considerable number of a horses foals, — you can determine with some approach to accuracy the probable speed of the remainder(?) Thus Electioneer (owned by the late Ex Gov. Stanford of California) has 153 trotters with records 2.07 3/4 to 2.30. The books will give you the records of each of these trotters. It is said that Electioneer had in all only some 300 to 350 foals. I believe you could thro' Professor Jordan of

⑧ the Leland Stanford University, Palo Alto. Cal.— get exact data about all of Electioneer's issue.

There is another point to which I wish to call your attention,— and that is the two harness gaits which we are now getting from the same blood, viz:- trotting and pacing. The records, in the Year Books, of both are kept entirely separate & both trotters & pacers will be found in the Year Books I have named. Pacers are separately tabulated; & when under the same sire as trotters, are printed in italics,— but only such as have records in 2.25 or faster are included in these Year Books. Probably you are acquainted with both gaits, altho I understand,— pacing is practically unknown in England & the Continent: so at the risk of being tedious I will explain. Here are the four feet of a horse:—

$$\begin{array}{ll} D1 & D3 \\ D2 & D4 \end{array} \quad \left[\begin{array}{l} 1\ \&\ 2\ \text{being the hind feet} \\ 3\ \&\ 4\ \text{"}\quad\text{"}\quad\text{fore "} \end{array} \right.$$
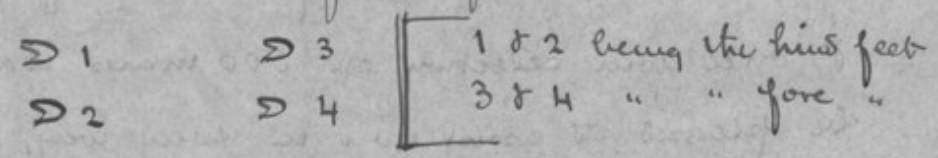
In trotting as you know a horse strides with 1 & 4 at the same instant,— & then follows with 2 & 3. This is the diagonal gait. In pacing,— the horse moves 1 & 3 at the same instant and then follows with 2 & 4. Frequently horses will trot for a while & then pace for a while,— but our trainers make them do one or the other,— & generally speaking where their pupils are thus "double gaited,"— train them to stick to the gait at which they can go the fastest & the easiest. Many pacers have lately been made to

(9) pace artificially — that is when a trainer has a horse which he cannot shoe or drive so as to be settled on one gait (trot or pace) he will strap his front & hind leg on each side to each other, — 1 to 3. and 2 to 4: & then the horse is forced to pace. This artificial making of pacers interferes with any inquiry as to hereditary influences — to a certain extent at least; & there is no means of knowing from the books what pacers have been so educated. ____ At this farm we once had twins, — one trotted, the other paced while following their dam. I have heard that ancient Egyptian sculptures or bas-relief work in the British Museum show the horse to be <u>pacing</u> & not <u>trotting</u>. Can you inform me if this is so? It is at all events a peculiar phenomenon. In my pamphlet I suggest a reason but am not very sure of it. The trotting horse breed to day is a composite breed: a mixture of different bloods: & on Mr Darwin's experiment in crossing his pure breeds of pigeons & coming back to the rock pigeon, — I am forcibly inclined to believe that the original gait of the horse was a <u>pace</u> rather than a <u>trot</u>

With reference to <u>color</u>. — the catalogues of breeders can

(10) be relied on,– & the Year Books,– for all practical purposes
The errors are not many. However with regard to
bay & brown these two colors so often shade into each
other,– that one man will say a horse is a dark
bay that another will say is brown. In a color
inquiry these two should be bracketed, I think. The
other colors can be relied on,– except sometime in the case
of very young foals. A gray is nearly always foaled
black,– & sometimes remains black when a year or two old.
Before foals have shed their primitive coats,– it is hard
sometimes to designate the right color. I have myself
recorded a newly born foal as chestnut, that shed off
into a bay: & vice versa. I have asked the
Horseman of Chicago to mail you its last Xmas number
in which they print an article of mine under a nom-
de-plume "Notes on Color Transmission." It was
thrown together hurriedly & is crude & unsatisfactory: but
the figures &c. are I think fairly reliable. At least
I intended them to be & tried to make them accurate.
I have also written the Secy of the American
Trotting Register for the price of Vols 8. 9. 10 11 & 12
if bought together & whether they can be had in
England,– & on hearing from him will send you

(11) his reply.

I am very greatly interested in your "Hereditary investigations" & have read your three best known works on the subject. Although a stranger to me except from his writings I was much grieved at the death of Dr. Romanes. Who will now take up his work?

I shall try & get copy of "Nature" containing the notice of your memoir; & I will prize very highly the copy of the memoir you are kind enough to send to me.

You are probably worn out & disgusted with this long winded dissertation; but we are a long distance apart. I hope you will look into the subject of the trotter, – & I shall only be too glad to furnish you with any information: or to aid you in any way.

I hope to hear from you soon, & remain

Yours most respectfully

A. J. Meston

ALLEN FARM,

TROTTING HORSES ✦ JERSEY CATTLE.

PITTSFIELD, MASS.

W. RUSSELL ALLEN,
PROPRIETOR.

July 22d 1894

Francis Galton Esqr.

Dr Sir. Since writing you last night, it has occurred to
me this morning that probably the following statements may serve to
throw a little more general light on the subject:

A standard trotting record is a record of 2.30 or better (faster)
A standard pacing   "   "   "   "   " 2.25 "   "

The first trotting standard was adopted by the breeders in 1879
being a set of 10 rules.   It has been modified several times, the require-
ments being each time made more rigid.

In 1891, - the pacing standard was added, - the same blood pro-
ducing so many pacers, - that it seemed a necessity to do so, - or at least-
business policy on the part of the Register Association.

I enclose blank of the Register Association, - on back of which
is a copy of both trotting & pacing standards.   This blank is used by
breeders in registering their trotters.

Since 1879, - to date 1Q Volumes of the American Trotting Register
has been issued containing the names & pedigrees of all horses (stallions & mares)
that come up to the requirements of this standard, - & whose breeders or
owners have registered them.   Nearly all that come up to these requirements
have been registered, - few owners failing to register.   These 1Q Volumes are
Numbered 4 to 12 inclusive of the American Trotting Register, - & constitute
the "stud book."   There is no record of the total number so registered, - but
at a rough guess I should say that from 90.000 to 100,000 horses are in these
books.   The stallions are numbered & indexed alphabetically: the mares
are arranged alphabetically: so that to find out the total number

ALLEN FARM,
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Wᵐ RUSSELL ALLEN,
PROPRIETOR. (2)

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of horses belonging to any one family from the Register would require an endless amount of research. The whole 10 volumes would require to be indexed under a genealogical arrangement.

Your inquiry should deal only with horses that are now say 5 years old or upwards: as at least that age should be allowed them in which to make public records: so that you would take no notice of horses born after 1892. Up to that year, — probably not to exceed 50.000 to 60.000 horses are so registered; & the number may be less.

The Year Books. Vol 8 to 12, — about which I wrote you last night concerns itself mainly with those trotters & pacers that have made exclusively standard records, — & with nothing else. (It is like a stud book confined to speed.)

Vol 8, — contains (alphabetically) the names, color, sex, & pedigrees of all standard trotters to close of 1892 (from 1845) & they number 7494. The standard pacers, from earliest to close of 1892 number 1309.

Volumes 9. 10. 11 & 12 contain the annual additions of each year & to show you the growth in volume of standard speed. I give you the total number to close of each year, viz:-

	Standard or 2.30 Trotters.	Standard or 2.25 Pacers.
Total number all told to close of 1893.	9102.	1871
" " " " " " 1894.	10.539	2606
" " " " " " 1895.	11.889	3455.
" " " " " " 1896.	12.945	4302.

The difference between each year, gives you the number of new ones for that year. Thus in 1896, there were 1056 new standard trotters & 947 new standard pacers & this year it is likely about the same number will be added.

Without an exact research of all the 10 volumes of the Trotting Register,
& noting the year of birth of each horse registered, — it is impossible to say how
many registered horses were born prior to & including 1891. Then how many
of these lived to be 5 years old or over? How many were trained? How
many could beat 2.30 in private trials, & never made any public records?
As to all this, we can get no accurate information. But say that
45.000 standard trotting & pacing horses were born up to 1891, — then by the
time that the youngest is 5 years old we know authoritatively from the
Year Books that of these 12.945 trotted to standard records & 4302 paced, —
a total of 1½.247 with standard speed. Say that 5000 of the 45000
died before taking records & that 10.000 were bred & not trained (or that 15000
never had an opportunity to make a public record) & we have 1½ 247
successful horses out of a possible total of 30.000. — The possible total
is all supposition, & from my knowledge of the number of horses without
records to those with records that are registered, — I should say that the
proportion with records cannot exceed 1 in 10. I see no way of getting
accurate figures on the whole breed.

If however you limit your inquiries to certain families or famous
progenitors, — as for instance Almont, Belmont, Hawls, Electioneer,
Woodford Mambrino, Mambrino King, Chimes & amongst stallions:
& Green Mountain Maid, Miss Russell, Emeline, Beautiful Bells &
amongst brood mares, — I think we could approach accuracy as to the
total number of all their descendants. Miss Russell for
instance, is still living, — born in 1865, — has 18 foals, — 1 died young — 7 took

records from 2.08¾ to 2.28 — & there were to close of 1895, at
least 690 of her descendants that had standard records — & by this
date — they will exceed considerably 700. All this in her own
lifetime — which is most remarkable.

If on the other hand you will narrow your inquiry
to the limits of the 2.30 list itself — that is to what extent
horses & mares with 2.30 records have succeeded in getting issue —
that were able themselves to take 2.30 records — you can get
all your facts within the Year Books — Vol 8 to 12. I have
done quite a little along this line of inquiry, thinking at first I could find
positive evidence that acquired characteristics were transmitted to
offspring — but I failed to find it.

From what I have written — you may be able to determine
just what can be done: & to define more exactly the lines along which
you wish to investigate. The field is an extensive one, & there is
much valuable material of an exact & reliable nature — which I
hope you may have time & inclination to dig into.

Pardon this second long letter. My anxiety to inform
you & get you interested may cause me to overstep the bounds of
your patience; but I will not inflict myself further upon you
until I hear from you again. Yours most respectfully

A. J. Weston

My dear Sir — My heartiest thanks for your long and valuable letters of Jul 21 and 22. They have reached me while on the Continent where undergoing a 'bath cure, and looking forward to a subsequent short tour in the mountains, during which I expect to be away from letters. What you have so kindly sent is most interesting to me, lucid, and full. I now understand the magnitude of the collection available for statistics, being both trustworthy, and exact & I also fairly understand the chief difficulties & their limits of error due to variations in the build of the sulkies, in the shape of the track, and in the quality of the ground. It is impossible to treat the subject with success on the lines I had hoped. Here, as in all statistical inquiries, the method of attack must be governed by the form of the data. I have arrived at the following provisional conclusions as to the commencement of what I might do. You wd do me a great favor by telling me what you think about their practicability & eventual use.

(1) Colour, treated as not correlated with speed, but subsequently checking that assumption & making the necessary allowances [I think I see my way pretty clearly in this, so far as is feasible without some preliminary trial]

(2) Table of frequency of the various records of trotters of 5 years old & upwards, during recent years say 1895 and 1896.] [Has this been already done? It seems of first-rate initial importance, showing

a Whether or not the data run with sufficient smoothness to lend themselves easily and trustworthily to statistical treatment, and b how to graduate the records].

(3) Supposing a satisfactory & collate the pedigrees of not less than 3 contrasted groups of trotters as in table the limits of each group to be fixed after the table of frequency has been obtained (Comparing to be

Table 1 Frequency Racing records of trotters of 5 yrs old & upwards	
under 2.08	No of cases
2.08 & under 2.09	
2.09 " 2.10	
2.10 " 2.11	back
2.2 " 2.22	

Table 2 Contrasted groups of trotters			
I	203 204	205	210
II	217 218	219	220
III	228 229	230	

* I accidentally began the table too low down. It ought to begin with 2.03

made

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Table I   Frequency of the various records
of Trotters and Pacers aged 5 years & upward (in 1895, 1896.)

Minutes and Seconds occupied in running one mile	Stallions				Mares				Geldings			
	Trotter		Pacers		Trotters		Pacers		Trotters Pacers		Trotters Pacers	
	Racing	Time	Racing	Time	Racing	Time	Racing	Time	Racing	Time	Racing	Time
2,03 and under 2,04												
2,04 " " 2,05												
2,05 " " 2,06												
&c &c ∴												
2.29 " " 2.30												

Table II   Contracted groups (of record horses, (not less than 5 years old
... limits ... are tentative - Table I will give data for fixing them.)
(The results of Table I will show whether Stallions Mares & Geldings may be treated separately)

Group	Limits of Groups *	Names of Trotters 5y upwards					
		Stallions		Mares		Geldings	
		Racing	Time	Racing	Time	Racing	Time
I	all under trotter 2,10						
II	2,18; 2,19 is under 2,20						
III	2,28; 2,29 all under 2,30						

* These limits are provisional, table 1 will give the data for determining them

† It seems better to concentrate work on Trotters, & leave Pacers aside at first
Probably also, the Editorial work of drawing out the collating their pedigrees would be confined
to a single column of the above table, say Stallions & racing records, or the three
columns of racing records, Stallion Mares & Geldings.

made the relative richness of the pedigrees, up to the 16 great grand parents, inclusive, in respect to speed and to each other, preliminary inquiry may suggest

If the inquiry should stop here, much ought to be gained, but it is not likely to do so, as new statistical work generally reveals unsuspected side issues. I purposely pass over, thinking it better to concentrate on trotters at first.

Supposing that you see no difficulty in the above and approve generally of it, subject to such corrections & suggestions, I am prepared to take it in hand. For these purposes I should want the previous catalogues, which might otherwise be very valuable, perhaps these would in a compact form much of what I should want at the outset otherwise be tedious to find. Please do as you think best about these, being assured that I am very grateful for the offer. There is one point in your communication that I cannot interpret, namely, in the printed form for Registration, what is meant by First dam, Second dam &c.

What are the relative numbers of those stallions, mares, and geldings from which the record is made?

What are the estimated relative speed of Stallions, mares & geldings.

Are there any careful experiments been made as to speed of old fashioned & of bicycle sulkies, or of any other change of speed that would justify a small time correction being made, depending on the year of each record. (Of course the uncorrected data will be given, but more consistent results might be expected if a judicious time correction were applied, & the results given in another table)

I gather that the records of the years 1892-6 are comparable in equal terms.

(Reply about anything)

P. Allen Farm
Pittsfield. Mass: Aug 28th 97

Francis Galton Esq[r]

    Dear Sir,

        Your two highly esteemed
letters of Aug 8th & 9th came duly to hand, —
& about a week ago I also received the
copy of your recent memoir on the "average
contribution &c" for which I am very
greatly indebted to you. I thank you
for your kindness in sending it to me.

      I have given the subject matter of
your letter of the 8th careful consideration,
& that is why I have not answered sooner.

(1) <u>Color</u>. A copy of the last Xmas number
of the "<u>Horseman</u>" has been forwarded to
your London address, & I wish to call
your attention to my article entitled
"Notes on Color Transmission". I hope
the tables may be intelligible to you — &
I believe them to be on the whole correct,

The reading matter is mainly padding, —
worden off in a hurry to string the
tables together into an article that
might be read by the average horseman, —
& combating some widely spread belief
which I consider popular fallacies. ~~My~~
Your work on Natural Inheritance
suggested the formation of these tables.
It is only at odd hours of an evening
that I have any time to devote to
such work as this, — & hence while I
believe my figures to be in the main
correct, — I was not able to go over all
the detail carefully & check off the
results. So that there may be errors.
Your inquiry into color will I think
be facilitated by using breeder's catalogues.
In the broodmares catalogues — their
produce is given under each one, — &
you have at once the color of all the

foals from each mare. I think from
this source you could make some very useful
tables, without excessive labor, bearing on the
color question. — I will send you two or
three old catalogues from well known
breeding farms, — & if you find them useful
& want more, let me know.

I hardly think color can be correlated
with speed, — except indirectly; it will be
found that bay & browns largely pre-
dominate in numbers, because bay is the
most fashionable color, — & has been much
more sought for than the other colors.
Most of the stallions & brood mares are
bays, — a few chestnuts, — & a few gray
mares, — but only on very rare occasions
will a gray stallion be found. Pilot
Medium is the only gray stallion of any
note that has been in demand for the
past 10 or 15 years, & he is dead. I

I tried to get from his owner a summary
of the number of mares of different colors
bred to him during his stud career, with
the color of the foals, — but failed.
Stallion owners are not fond of giving
much information of that sort, — as a
rule.

2. <u>Table</u> of <u>Frequency</u> of the various records
of Stallions, mares, & Geldings that
have trotted or paced a mile in 2.30 or
faster, — (Horses not less than 5 years old)
<u>With</u> the <u>pacers</u>, — there are so few
(comparatively speaking) <u>time</u> records, —
that a separate column for them
would hardly be necessary. The fastest
pacing record is 2.00½ against time, &
in a race it is 2.01½. In starting
in with miles between 2.03 & 2.04, — the
distinction between time & race records
so far as the pacer is concerned may be
disregarded without affecting the general

result.   This would eliminate three
columns from your table.

✗   I have a chronological list of
all mares & stallions (listed under the
years in which they were born) that
had made trotting records in 2.30 to close of 1892,
There are 2814 mares, 2552 stallions
& this leaves 2128 geldings.   The
proportion then was - Mares   37 %.
                                    Stallions 33 %.
                                    Geldings 30 %.
I assume that this is about the
present proportion.   This table was made
out in order to determine what
proportion of such mares & stallions had
produced trotters, — in quest of evidence
as to the transmissibility of acquired
speed.   Stallions, mares & geldings all
compete in trotting & pacing races on
the same terms.   The only handicap
is the time ~~hands~~ classification.   In

a purse offered for say 2.15 horses, — any
Stallion, mare or gelding whose record is
not *faster* than 2.14¼ may compete.
A record of 2.14 (flat) will keep a horse
out of the 2.15 class.   The fraction of
a second admits it to the even second class
next above.   Thus horses with records 2.19¼,
2.19½ & 2.19¾ & ~~2.20~~ are ~~all~~ eligible to
^all slower than that.
the 2.20 class.   For this reason in
listing them by fractions of seconds you
will find a ~~much~~ larger number of
horses with a record of — say 2.19¼ than
say 2.19. or even 2.19½ or 2.19¾.
The relative proportion of horses trotting
miles in 2.19. 2.19¼. 2.19½ & 2.19¾ is
probably the same, — but quite a few
that actually trot in 2.19 will be given
records of 2.19¼ so as to still save
them for the 2.20 class.   This is not
right, & is frowned upon by the authorities

but ~~get~~ judges are occasionally good natured, -
& watches apt to vary a quarter of a
second.   These small perturbations
would not ~~include~~ disturb your table
which will be graded by seconds, &
not by fractions of seconds.

This is a digression from the answer
to your 3d question as to relative speed of
stallions, mares & geldings.   Judged by
the fastest records, the relative speed is

Trotters.		Pacers
<u>Mare</u> — Alix — 2:03¾.		Lottie Lorraine. 2:06½
<u>Gelding</u>. Azote — 2:04¾		Robert J. — 2:01½
<u>Stallion</u> Directum 2:05¼		John R. Gentry — 2:00½
		Star Pointer — 1:59¼

Since this was written

In actual races — no distinction is made. With
trotters the mare appears the faster of the two
sexes, - & with pacers the stallion appears to be
considerably the faster of the two.   In
each case the gelding is intermediate.

Directum the fastest stallion, is a 4 year
old, - so that in your table if limited to 5 year

olds, he would be left out. You might change this table to include 4 year olds & over.

Or make additional tables on same plan for trotters only, without regard to sex — but with regard to age, viz:-

	Yearling Trotters.	Two Year Trotters.	Three Year Trotters.	Four Year Trotters.
~~2.10¾~~ —				
Fastest Present records }	2.23.	2.10¾	2.08¼	2.05¼

The figures show the time grade at which each of these columns would commence. These tables would be useful to show the range of the capacity for speed before maturity, — at 1. 2. 3 & 4 years of age, — & the main table would be confined to matured capacity — 5 years old & over.

(4) Two public attempts have been made to beat the best high wheel sulky records since the introduction of the bicycle sulky. Directum 2.05¼ tried to beat

the 2.08 3/4 of Maud S, - & trotted I think in
2.10 1/4, to high wheel.   This year, John
R. Gentry 2.00 1/2 tried to beat Johnston's
2.06 1/4 pacing record to high wheel & made it
in 2.04 1/4.   The difficulty in the way
of these experiments is that the horse
should
~~must~~ be trained & driven in all his
preparatory miles to the high wheeled
sulky, - & few owners are willing to do
this, - because the old sulky is so much
of a drag on a fast horse in comparison
with the bicycle sulky - & all the rage
is for speed & more speed.   Trainers have
told me that when they first used the
new sulky on horses that had been up
to that time trained to the high wheels -
the horses trotted & paced from 3 to 4
seconds faster than they had ever
done before.   Some are not willing to

4 concede that the new sulky is much of
a help, - others say 3 seconds, - but the
general consensus of opinion would likely
make it 5 seconds; & with most horses I
believe the bicycle is equal to 5 seconds
in the mile.   An investigation by you
of all the records made in 1891, 1892, &
1893, would settle the question.   1891
was the last year of the high wheels; & '92
saw the introduction of the bicycle, - &
before the end of the season almost its
complete adoption.   93 is entirely a bicycle-
sulky year, - & each season since then -
some minor improvements coming on
each year in sulky & harness - but these
not enough to count. [for much]   The records 93-96
are comparable on even terms, - & in all
probability those of 92 also, - altho' high wheels
were used that year to a certain extent.

I doubt the feasibility of applying a time
correction to the records 93-96, - to bring
these records into more harmony with
the time made prior to 92.   The
difficulty is in deciding on what this
time correction should be.   Besides ever
since the first mile was trotted in 2.20
(Flora Temple 2.19 1/4 in 1859) there have
been continual improvements in sulkies,
harness, tracks, & training methods, - &
I daresay the same thing has been
going on before that date.   The bicycle
sulky seems to be the most radical &
far reaching of all the many improvements,
Still the fact remains that the speed
as recorded has been shown by these
horses, - & that there has been a gradual
& continuous advancement in the speed

Capacity of the light harness horse. If
you make a time correction for the bicycle
sulky, a score of minor improvements might
by some be pointed out, - all of which
may have been instrumental in helping
along the increase of speed, - & the question
will be raised, - why not make time corrections
for them also?

Since beginning this letter the
news has come that at last the
2 minute harness horse is here.   On
Saturday. Aug 28th - at Readville, near
Boston, Star Pointer, a pacer, covered the
mile in 1.59¼, -   He is a bay stallion.
The first quarter was in   30 seconds
"   2d   "   "   ..   29¼ ..
"   3d   "   "   ..   29¾ .
"   4th   "   "   ..   30¼ ..
The whole mile being in   119¼ "
Or 1 minute 59¼ sec.   This was a mile

against time to beat the worlds record
of 2.00½ seconds.   It is a most
remarkable performance.

I had almost omitted to ~~mean~~
answer your first question.. "First dam"
is a redundant expression & means
simply the dam. (or mother). "Second
dam" always means the "dam's dam"
or the maternal grandmother.

———

When you come to your second table
of contrasted groups, — my familiarity with
the pedigrees of the breed may be of-
service to you in making out the
separate forms you refer to, — & if so
I shall be glad to help the thing
along as far as I can, — & put in
all the spare time at my disposal
towards helping you.

With regard to Pacers;

I have talked with several breeders & ~~pacers~~ trainers on this subject since receiving your letter, — with results as follows;

A trainer tells me he has seen a few natural pacers amongst the droves of wild mustangs on the South Western plains, — in Texas. As the herd would gallop off, — these few would be seen keeping up with the herd at a pace: & he added the pacers were generally dun colored; altho not always. He has seen piebald pacers.

It is not uncommon among the trotters, — if one be trotted off to halter (a groom running alongside holding the halter strap) for the horse to amble for a few strides & then shift into a

trot. We have a gray 3 year old filly
trained for first time this summer, - (can
show about 2.30 speed) & I have noticed
when being urged to trot a little
faster than she was able, - she would
shift into a pace; instead of as is the
usual custom of breaking from the trot
into a gallop. Another 3 year old, - a
gelding we sold last fall. - when turned out
in a paddock, - & stirred up, - would
trot beautifully round the lot, - but
in harness he did nothing but pace;
& if a groom put a halter on him, - &
lead him away faster than a walk, -
he at once paced. Free in a paddock
this gelding was a trotter; with as little
harness as a halter, - he was a pacer.
Another example of - dual gaits, is that of a

gray mare, — a "combined saddler & buggy horse."
Under saddle she "racked," — a gait which
many pacers are made to acquire, — for ease to
the rider.   (It is a 1–2–3–4 gait, — each
foot striking the ground at a different time.)
To harness this mare could pull 2 men in
a buggy (a 4 wheeled light carriage) in about
2.50 to 2.55 to the mile.   While going at
this rate of speed, — her owner has ~~climbed~~
climbed out over the dash board, — & sat on
her back; & as soon as she felt the weight
of the rider, — the mare would shift from
the trot to the "rack" (a special
refinement of the pace.) She could not be made
to rack unless a rider was on her back.
    Many, if not most, of our present pacers
when going at an ordinary road gait of say
8 to 12 miles an hour, — will trot steadily
all the time.   When urged to their speed, —
they shift from the trot to the pace.

1½ One breeder of long &ltho' limited experience had this to say: The mechanical form for extreme speed at the trot, - requires a horse whose body is shorter in comparison to his height than the normal horse. We are tending towards a tall, short horse. (He has a notion that the higher the centre of gravity is, - i.e. the longer the legs, within certain limits, the faster that horse will trot, other things being equal). The difficulty, then is in the management by the horse of his legs, - when trotting very fast. He will brush one leg against the other, - cut, bruise, or hurt himself, - & being kept from running (or galloping), - he finds that he is much less apt to "interfere" (as it is technically called) in pacing, than in trotting. So shifts into a pace & becomes a pacer.

Amongst trainers, — it is their common experience, — that a trotter which becomes sore from training & racing, — will adopt the pacing gait in his exercise, — evidently as a relief.

Hence it would seem that a great deal of pacing comes from over driving trotters, — & preventing them from seeking the usual relief in a run or gallop. But still there are natural born pacers, — & I cannot well believe that the pace is ~~is~~ ⌃almost entirely a matter of acquirement, — This summer, ~~I~~ saw a foal, not over a week old, — come along a smooth barn floor alongside of its dam — with a well articulated trotting & pacing gait: trotting a few yards, then pacing a few yards. We had twin foals, a few years ago, — & as sucklings — one trotted the other paced.

About the Average Contribution

P: to Total Heritage.

If I properly grasp the theory of your recent memoir, – the contributions from each generation as set forth $(\frac{1}{2} + \frac{1}{4} + \frac{1}{8}$ en$)$ hold good only in a large number of cases. There may be individual deviations to almost any extent in isolated cases. But in a large number of cases these deviations will resolve themselves into a regular grade.

How are these deviations calculated? Is Table 8 of "Natural Inheritance" page 205, – the table for calculating all such deviations? If not where can I find the proper tables? or further information?

Is the enclosed diagram a fair

method of illustrating your theory, —
(diagrammatically I mean)? The black
portion in the 4th & 5th generations
is the extent of the chestnut influence, —
as shown in the second example
tabulated in the "Notes on Color Transmission."
In decimal fractions, — the influence of
the 5 generations is expressed thus, —

1st generation — (Sire & dam) = $\cdot 50$

2 "   "   (4 g. parents) = $\cdot 25$

3 "   "   (8 g.g. parents) = $\cdot 1250$

4 "   "   (16 g.g.g. parents) = $\cdot 0625$

5 "   "   (32 g.g.gg parents) = $\underline{\cdot 03125}$

Influence of 1st 5 generations = $\cdot 96875$

Influence of all the more
     remote generations   = $\underline{\cdot 03125}$

Whole Heritage   = 1.00000 or 1

If this be correct, — then in the 2d example
of Horseman article, — the chestnut
influence from chestnut ancestors is

In 4th generation. $2/16 = 1/8$ or $\cdot 0625 = \cdot 0078125$

" 5th " $3/32 = \cdot 094$ or $\cdot 03125 = \cdot 0029375$

Unknown in 5th generation say is chestnut.

$= 7/32$ or $\cdot 2156$ or $\cdot 03125 = - - - \cdot 0067187$

Concede that everything
beyond 5th generation is
chestnut. (which is not at all probable)

Then that influence is $= \cdot 03125$

Largest possible chestnut influence. $= \cdot 0487187$

Say chestnut influence $= \cdot 0488$
Influence against chestnut $= \cdot 9512$.

And yet the resulting foal is a chestnut.

This example will present no difficulty to you — for explanation under your theory: but I am sorry to confess that I do not grasp your theory sufficiently to be able to explain such a great apparent deviation.

I should like to help in popularizing your theory for the benefit of horse

2/

breeders,- in our horse papers,- sometime during this winter,- & if you can without too much bother explain this apparent contradiction,- or refer me to some books or tables that will help me out,- I shall be under many obligations.

If enclosed diagram is a fair representation of the theory. I should like to make use of it,-

Apart from your demonstration with the Bassett hounds,- many general considerations lead me to believe there is a great deal of truth in the theory: but it is the law or rule of the deviations that staggers me.

22/

Tables of Frequency of Records.

If you disregard the separation of the sexes – Mares. Stallions & Geldings; & also that of "race-records," & "time-records" but simply treat the subject in two columns, viz:– <u>Trotting Records</u> & <u>Pacing Records</u>" it would be much simplified & a vast amount of time & labor saved.

I hope you will not consider it presumption on my part to suggest:–

1. I do not think you will find enough difference in the time made by **mares** Stallions & geldings when a large number of cases are dealt with, to warrant you in going to the labor of tabulating the results separately.

2. Excepting at the fast end of the

table, I do not believe you will find enough difference in the race-records & time records to warrant you in separating them.

3. — A treatment of the subject by years, — keeping the trotters & pacers separately — would I think give some very useful results.   In Vol 8 of the Year Book. Vol 2d, — under the alphabetical list of all 2.30 trotters — & also in similar list of pacers, — the year in which each record is made is given.   Making tables for each year, or for a certain series of years, — say 1880 to 1896 incl: or say every 5th year from 1865 to 1890, — & then from 1891 to 1896, — for each year, — would show the general advance of the whole breed in point of speed.

All trotters 4 years old & over & all the pacers could be treated in this way.

Then separate tables for the 2 & 3 year olds, - treated in same way: with a yearling table if you like, - which would be a small affair.

The questions of practical interest to breeders are:

(1) The limit of trotting & pacing speed.

(2) The best lines of blood.

(3) The value of developed ancestry vs. undeveloped ancestry. (By developed ancestry I mean sires & dams with 2.30 records. This is the old question of the transmission of acquired characteristics)

I have written at much greater length

than I expected to, — & in a rambling &
tedious matter.   But I have been
subject to interruptions, — & have not
the time now to re-write this long
letter; — & you will likely expect
to hear something from me on
your return from the continent.

I shall be pleased to hear from
you at your convenience; & do not
hesitate to call on me, if I can be of
any service whatever.

The catalogues will go forward
in a day or two.

If you can spare me another
copy of the memoir on the "Average Contribution"
I should like to send it to a friend of
mine in Boston who is interested in horses &
has for years been interested in your works,

I am, Yours respectfully A. J. Meston

P.S. ②⑥ (45—

If you conclude to treat the records
chronologically. by years: you will have to
sift out the different years up to & in-
cluding 1892 from Vol 8 ^2d part^ of- the Year Book
Trotters pp 1 to 214. Pacers pp 215 to 248.
The year when the horse is "foaled" or born
is given in these alphabetical ~~works~~ lists.
The final date ~~in~~ under each name is the
date when record is made. A comparison of-
both dates gives age of- horse at time such
record is made. If you wish to distinguish
race records from time records, — then you must
refer to each horse under his sire, — as.
entered in the Great Table pp. 256 to 460.
In this division an asterisk (*) is placed in
front of- all horses with time records.
Any careful clerk can do this work for you.
For the years 1893-1896, — the trotters & pacers
for each year are in the respective Year Books.
Vol 9 to 12; each Year Book being confined

to the records of that year, – as far as the
Alphabetical Lists, Great Table, & Tables of
Great Brood Mares are concerned.

At page 249. Vol 8, 2nd part, you will find
a list of 2.20 trotters, – arranged according to
their records; & at p. 254 a similar arrangement
of 2.15 pacers.   Similar tables are in Vols
9 & 10, – & include ALL 2.20 trotters & 2.15
pacers; being the 1892 lists corrected up to
end of each year. 1893 & 1894.   In Vol 11 & 12,
the trotter is limited to 2.15 list, – as the 2.20
list was taking up too much room for a con-
tinuation of the same classification.

In the catalogues I will send you, under each
brood mare, – giving her Produce, – the abbreviations
used are:

b. c. = bay colt (colt always means male foal)
br. c. = brown "
bk c = black "   (if a black colt is noted
   under a gray mare, – the chances are 500 to 1
   the colt is or will be at or before maturity
   a gray.   Gray horses are generally foaled black)
ch. c. = chestnut colt } These colors are the same
s. c = sorrel   " }   sorrel is old-fashioned

gr c. = gray colt
ro. c = roan "
dn c. = dun colt.

———————

Where b. f = br. y. f. is used, — colors are
as explained above & f. = filly (a female
foal)

———————

Bay & brown shade into each other in
many cases & especially with young foals
that it may be necessary to treat both
colors under one heading.

———————

Some very dark browns are blacks in the
winter time.

———————

I have seen some "straw berry roans" that
were bays with their long winter coat on.

Roans & duns are not common,
amongst the trotters.

Two Minutes.

Klondike and Star Pointer, the pacer, are the two sensations of the year. Star Pointer's mile in 1:59¼ makes him Klondike's companion. In the light of evolution the harness horse is still so young and so imperfect a creature that science scouts the idea of his being near the limit of his speed, as the running horse may be supposed to be near his, so we may expect that the once impassable two-minute mark will be left still further in the rear. Who knows how long it will be before the "Two-minute class" will be called as the alternate of the "Free for all"?

In all performances that have broken the harness track records, a study of the circumstances invariably reveals some point where improvement is possible, and tells us that, given that improvement, we may hope for a result still better. In Star Pointer's case this possibility of improvement is in the horse himself. The day of the trial was beautiful and the track was perfect, but the horse was very far short of the ideal. He is a big, coarse brute, weighing 1,200 pounds, mounted upon a set of extremely poor feet. On the day of this great mile his feet were so sore that it was with difficulty that he could be urged to a 2:20 gait without breaking into a run. Put the qualities that drive Star Pointer forward into a frame that includes no fault to keep him back, and the record of 1:59¼ will go the way of all its predecessors.

The trotter will follow in time. A few more generations and a few more mechanical improvements in track and sulky, perhaps, and the trotter will cross the two-minute divide, to continue the old contest with the pacer in the valley beyond.

1.59¼ is now the fastest pacing record.

(49

Diagram of the Total Heritage

Influence of the
2 Parents
1st Generation

Influence of
4
Grand
parents
2nd Generation

3d Generation

4th

5

6

7

All beyond
the 7th Generation

Black spot in 4th Generation
"   "   " 5th "   "
represent the Chestnut colored
ancestors.

F.43r 50

Allen Farm
Pittsfield. Mass: October 25th 1897.
U.S.A.

Dr. Francis Galton

Dear Sir,

Your favor of 2d inst was duly recd, — & I am grieved to hear of your domestic affliction. Apart from this great grief I have often been amazed, at one of your age, continuing your scientific pursuits with such ardor, I hope you will permit me to extend to you my sympathy. I have a young wife, & a little girl nearly five years old. But we are all youngsters, — at least we would appear so to you, — for I, the oldest, was born in 1859, — at Macduff, Scotland, — coming in the same year with the public birth of "Natural Selection," — & my wife is more than eight years my junior. We have all been blessed with good health, so far, I am glad to say.

The copies of the memoir were safely received. I was pleased to see the correction: as my inquiries into "Color Trans-mission" seem to prove beyond a question, that in a large number of instances, the prepotence is relatively on the sire's side. There are of course, many instances of color prepotence on the maternal side. The families of two gray brood mares — Miss Russell & Madam Dudley — furnish excellent examples of the persistence of their gray color: & I think I can find several lines where their gray color has persisted even as far as the 5th generation; in spite of every male cross being bay.

I have never heard of any analysis of any sort
having ever been made of the pigments, - red & black, - in
horses' hair.   - I have written to Dr. R. P. Bigelow, Editor,
of the American Naturalist & a Professor at the Massachusetts
Institute of Technology. Boston. Mass. & also to Pres. D. S.
Jordan. of the Leland Stanford Jr. University. Menlo Park.
California, - quoting your question, - & asking them to write
either you or me as to any information they may have.
I also took the liberty of suggesting to Pres. Jordan, that if
no such analyses had been made, - ~~that~~ his university had
exceptional advantages for doing the work, - from hair taken
from well known pedigreed animals, - both trotting bred &
thoroughbred: as the University is part of the late Gov.
Stanford's estate: & adjoining it is the extensive farm of
Palo Alto, - probably the largest in this country - which was
the special pride of Gov. Stanford: & which is still being
kept up.   I also asked Prof Jordan to mail you some
copies of the Palo Alto catalogues, - (of the horses) - which he
will undoubtedly do.   If not, & you are pursuing the subject, -
I can mail you two of my copies.

In connection with this subject of color, - there is
a very excellent classification & description of the various
colors & markings of horses ~~published~~ written by two French
writers, - which, if you have not seen, might be of interest —

to you.   The English translation is published by The
J. B. Lippincott Co. 10 Henrietta St. Covent Garden. 1892.
The title is "Exterior of the Horse" By Armand Goubaux
Hon Director of Veterinary School of Alfort in France &
Gustave Barrier, Prof of Anatomy & Exterior,—same school.
Translated by Simon J. J. Harger.   You may prefer
the original.   The portion on Color is Section b. Chap 1.
page 771. 2d edition of the translation above referred to.

Do you know of any analysis of the pigments
in horses hair having been made?   I should be
much interested in seeing the report: if there is any
in English,— will you kindly refer me to it?

I have just finished compiling the "Allen Farm
Catalog",— the first one published since Jany 1896,— & will
mail you a copy in the course of the week. Our stud
is too young a breeding enterprise for many results yet.

I have been digging away, more or less, at the
trotting horse pedigrees for 14 years,— & I can readily
understand the many difficulties you will encounter. I
hope they may not altogether discourage you. I only wish
I were within reach of you, as I might be of some service
as a "time-saver." & might also save you some tedious re-search.
It will always be a pleasure for me to hear from you & to do what little
I can that may serve you in any way. I am, with much respect
Yours very truly A.J. Weston

INSTRUCTIONS

About Names, Preparing Pedigrees for Registration, the Standard, etc.

BLANK FORMS will be furnished gratuitously to all applicants. The requirements of the blanks must be complied with. If carelessly filled out they will be rejected. Nothing will be required that is not essential, and all "little things" must be in their place.

Go no further in filling the blank than you can substantiate by competent evidence. All crosses must be clearly established. Any attempt at fraud in the near or remote crosses will be *promptly exposed* when detected.

When a pedigree is forwarded that runs into that of an animal already registered, don't fail to refer to that animal and show the relationship. When an animal has a record, don't fail to give that record, with the time and place where made.

Select three or four good and new names for each animal in the order preferred, and the first one not taken will be accepted. The name of an owner as a prefix will not be accepted. We will accept no more "Hambletonians" nor "Mambrinos" nor "Wilkes' " nor "Pilots," etc., in any form.

The American Trotting Register Association adopted the following rule : " That every stallion and colt will be registered under a name distinctively his own, and that the name of a distinguished ancestor or sire will not be repeated in any form when naming animals further removed than the immediate progeny of such ancestor or sire; that no stallion or colt will be registered by a name already recorded for another animal, or by a prohibited name, unless he has started in a public race under said name prior to January 1, 1892, and that no mare foaled after January 1, 1890, will be registered under a name by which another animal has been registered, except as above provided in cases of stallions and colts."

Fill the blanks carefully, and then compare them, to see that nothing is omitted.

At the annual meeting of the American Trotting Register Association, April 3, 1895, the following rule was adopted : "That the instructions to the registrar in regard to the registration of non-standard animals are hereby modified so that any horse, mare or gelding may be registered in said non-standard department, provided its pedigree is established under the rules of the association and the registration fee is paid."

All animals upon which rank depends must first be registered at the expense of the applicant. If a performer makes its sire or dam standard it must first be registered.

Let it be observed that the standard itself makes registration a condition and requisite to standard rank.

						TO STOCKHOLDERS.
REGISTRATION FEE, whether Standard or Non-Standard,	-			-	$2.00	$1.00
Official Certificate of Registration,	-	-	-	-	.50	.50
Transfers of Ownership,	-	-	-	-	.25	.25

THE TROTTING STANDARD.

In order to define what constitutes a standard bred trotting horse, and to establish a BREED of trotters on a more intelligent basis, the following rules are adopted to control admission to registration. When an animal meets the requirements of admission and is duly registered, it shall be accepted as a standard-bred trotting animal.

FIRST. Any trotting stallion that has a record of two minutes and thirty seconds (2:30), or better; provided any of his get has a record of 2:35 trotting, or better; or provided his sire or dam is already a standard trotting animal.

SECOND. Any mare or gelding that has a trotting record of 2:30, or better, whose sire or dam is standard.

THIRD. Any horse that is the sire of two trotters with records of 2:30, or better.

FOURTH. Any horse that is the sire of one trotter with a record of 2:30, or better; provided he has either of the following additional qualifications : 1. A trotting record of 2:35, or better. 2. Is the sire of two other animals with trotting records of 2:35. 3. Has a sire or dam that is already a standard trotting animal.

FIFTH. Any mare that has produced a trotter with a record of 2:30.

SIXTH.—The progeny of a standard trotting horse when out of a standard trotting mare.

SEVENTH. Any mare whose sire is a standard trotting horse, and whose dam and second dam are by a standard trotting horse.

THE PACING STANDARD.

In order to define what constitutes a standard-bred pacing horse, and to establish a BREED of pacers on a more intelligent basis, the following rules are adopted to control admission to registration. When an animal meets the requirements of admission and is duly registered, it shall be accepted as a standard-bred pacing animal.

FIRST. Any pacing stallion that has a record of two minutes and twenty-five seconds (2:25), or better; provided any of his get has a record of 2:30 pacing, or better; or provided his sire or dam is already a standard pacing animal.

SECOND. Any mare or gelding that has a pacing record of 2:25, or better, whose sire or dam is standard.

THIRD. Any horse that is the sire of two pacers with records of 2:25, or better.

FOURTH. Any horse that is the sire of one pacer with a record of 2:25, or better; provided he has either of the following additional qualifications : 1. A pacing record of 2:30, or better. 2. Is the sire of two other animals with pacing records of 2:30. 3. Has a sire or dam that is already a standard pacing animal.

FIFTH. Any mare that has produced a pacer with a record of 2:25, or better.

SIXTH. The progeny of a standard pacing horse when out of a standard pacing mare.

SEVENTH. Any mare whose sire is a standard pacing horse, and whose dam and second dam are by a standard pacing horse.

EIGHTH. The progeny of a standard trotting horse, out of a standard pacing mare, or of a standard pacing horse, out of a standard trotting mare.

Address,

J. H. STEINER, Registrar,

LOCK BOX 4, CHICAGO, ILL.

STATE IF APPLICATION IS MADE UNDER TROTTING OR PACING STANDARD.

Form L.

OFFICE OF THE

AMERICAN TROTTING REGISTER ASSOCIATION,

1700 Old Colony Building, Chicago, Ill.

APPLICATION FOR REGISTRATION.

Sex_____ Under what Rule eligible_____

Name_____ Color_____foaled_____day of_____18

Record, if any_____ Where and when made_____

*Marks_____

Bred by_____ P. O. and State_____
(Do not be afraid of giving too much information.)

Name of sire_____ Reg. No._____ Son of_____
(Certificate of owner of sire at time dam was bred must be furnished.)

Name of Dam_____ Reg. vol._____ Page_____
(When registered dam is reached give page and volume.)

Bred by_____ P. O. and State_____

Got by_____ Reg. No._____ Son of_____

Name of second dam_____ Reg. vol._____ Page_____
(Information about names of dams must be positive.)

Bred by_____ P. O. and State_____
(Furnish a certificate from breeder of each dam, or give reason for not doing so.)

Got by_____ Reg. No._____ Son of_____

Name of third dam_____ Reg. vol._____ Page_____
(Attach list of produce of all mares sent for entry, if possible, on separate sheet.)

Bred by_____ P. O. and State_____

Got by_____ Reg. No._____ Son of_____

Name of fourth dam_____ Reg. vol._____ Page_____
(If any dam is thoroughbred, give vol. and page in Bruce's American Stud Book where recorded.)

Bred by_____ P. O. and State_____

Got by_____

Succeeding dams and sires_____

Give address of all successive owners_____

Present owner_____ P. O. address_____

I HEREBY CERTIFY THAT THE FORE-GOING PEDIGREE IS CORRECT.

Signature of breeder or legal representatives, or reason for not giving it,_____

Signature of applicant,_____

P. O. Address,_____

Dated_____

Instructions (see other side) should be carefully read before filling out this blank.

* If there are no white marks, write "SOLID COLOR."

[OVER.]

Allen Farm.
Pittsfield. Mass: Nov 5/97

Dr Francis Galton
   Dear Sir,
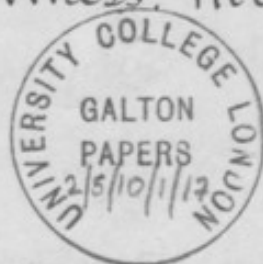
         Many thanks for your favor
of 23d ult, - enclosing article on "Hereditary
Colour in Horses", - which I have read with a
very great deal of interest.   I had no idea
you would take up the figures in my table -
t subject them to such a searching analysis, -
Neither did I think that they would in
any way help out the "average contribution
theory".   I quite believe all you have to
say about the figures running wild wildly -
for scientific purposes.   My object in first
making a tabulation of color transmission was
to compare our stallions in this respect, -
with other well known stallions, - t getting
started, I pursued the inquiry a little
further, - t then gave the tables to the

Horseman, — in hopes that others might take
up the subject, — which so far as I know, has
not been done.   My figures being taken off
at odd times, — by myself. without verification —
& without any <u>exact</u> view in end, — are very
liable to error, — but I thought that such
errors might balance each other; & ~~this~~ hence I wrote you the
table as a whole ~~is~~ was substantially correct, —
but I have no way now of verifying the
statements.   I wrote you that many
breeders seemed to confound Bay & Brown —
& these colors often shade into each other,
so that it is a matter of opinion — & two
horsemen looking at the same animal will
~~some~~ differ as to the color being designated
Bay or Brown.   Breeders (or at least some)
have such a preference for Bay — that they
will hardly ever catalogue a horse as
Brown.   This may partly account for
the sequence 30. 40. 0. 30, — which you
pronounce a statistical impossibility, — altho'

I should like to know why it is an impossibility.
If you can advise me as to what books to study
so as to inform myself on this subject, I will
be very much obliged to you.

The ideal data you speak of can I am
sure be got from the Register, – & probably
from the Year Books even. on all except
gray, – that color being doubtful, – (as to whether there are enough stallions) but it wd
take a lot of time to dig it out.   I may
find time this winter to make up the data –
& if so. I will mail it to you.

There are so many different shades of
bay, brown, chestnut, & gray – What a series of
chemical analyses would have to be undertaken –
As individual results might mislead.   And there
are several degrees of black.   Shades of color
vary at different seasons, – coats being visibly
darker in mid winter than in mid-summer.
I refer to breeding stock – grazing in summer – & not blanketed & housed up.
   am I prepared to believe that the ordinary
chestnut (or sorrel) is devoid of black, – & as you
say more or less imperfectly supplied with
red.   But there is a shade of chestnut.
(so named by some "burned chestnut".) Which is
almost if not quite a chocolate color – a very
rich color – & seldom seen, – but which must be

colored with black pigment. If ~~there~~ this
shade of chestnut were mated, — there might be
a departure from chestnut in the offspring.
As the stud books never, & few catalogs ever,
give the shade of a color, — there is a disturbing
element here for exact data.

I am satisfied that "Grey" ranks with
black, — rather than white: that is it is more
or less absence of black (& an entire absence of
red by itself) that constitutes the true gray.
These shade into roans, (where I fancy red
comes in) blue grays. iron grays &c &c. My
reasons for thinking that Grey ranks with
black are (1) A Grey is always born black —
& sometimes appears black except under close
inspection until 1. 2. or even 3 years of age —
after which they grow lighter & lighter in color
until they look white — (if they live long enough)
(2) Grey horses are peculiarly susceptible (or at least
much more so than other colors) to melanotic tumors —
"Melanosis" — from the black pigment; see any work
on Veterinary ~~Medicine~~ Diseases.
A remarkable thing about Hambletonian 10 is the
claim, which I believe to be a fact, that amongst his
1287 foals, & bred to all sorts of mares, he never got
a chestnut. I am, with great respect.
Very truly yours A.J. Meston

To A. S. Weston Go Esq. U. S. Nov. 27/97

My dear Sir,

After several days work I have got a pretty just idea of the serviceability of the trotting Records, and have written a short memoir of the results (probably to be published by the Royal Society), with diagrams for the years 1892-6 respectively. It would take long to summarise the results but the nett out-come is a conviction of their great importance, if what seems to me the chief desideratum could be obtained, namely a collection of those (let us call them) "pedigree horses" the records of whose ancestry are known with completeness to the second ascending generation inclusive. It would be waste of time to trouble about other horses. Even when the self, the 2 parents & the 4 grand parents are all fully known, there remains (according to my theory at least) 25% of unknown influence. I find it a hopeless task to extract such horses' names from the Register; there is also a very small proportion of them to be found there. After much time in search, I have not found one. The fact of the Register only containing Records of 2:30 or better, greatly limits the possibilities of success. Of course for the present purpose, it does not matter whether the record was a good or a moderate one, so long as it is authentic.

On the other hand, the breeders and owners of such "pedigree-horses" are sure to know all the required facts in each case, & would be only too pleased that they shd be published. So it strikes me as a likely means of getting what I want and what others would want, is to apply to them to fill up yellow circulars such as the one I enclose, and simultaneously to apply to the Trotting Associations and to the Editor of Wallace's Year Book to insert a table of such horses. Before taking any such steps, I shd be exceedingly obliged to you for your advice as to the appropriateness of the form enclosed. Explanations wd be printed on the back & copies of my as yet unprinted

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paper w.ᵈ be sent. The heading of one
of the first columns viz "Nᵒ in Register" is
I hope right? It supposes ~~that~~ the existence
of a Register in which every horse that we have
to do with, is numbered. I infer that it is
so, from the frequent appearances of Nᵒˢ in
the entries in the Year Book. All I want
is to identify the horse beyond doubt, and
to have means for verifying the assertions
as to his speed. It is to save a post that
I send herewith only one proof of the yellow
circular, which is all that I can spare at
the moment, but to-morrow the printer
shall be instructed to print off others, & I
will send you a small batch of a dozen or so
by book post. Possibly you may have an
opportunity of conferring about it with
some friends who like yourself, are experts.
            I am sorry to send you so bald an
account of what I have done, but it is
hard to compress it in a way that would be
wholly clear.
            What I want is to launch this effort
with some completeness, and thereupon as
from a basis to work upon our own stud-
book arrangements in this country.
            I have a good deal to say about useful
data that might be obtained, if the interest
of breeders & horse owners were first awakened,
as I think it might be by ~~asking~~ using your
trotting records as a text to preach from.
            W.ᵈ you kindly tell me how to address
the Trotting Associations? You have kindly
sent me several catalogues & I would write
to the gentlemen who issued them. Is it
probable that a letter to the "Horseman"
w.ᵈ be of much use? I sh.ᵈ be greatly
obliged by your ~~&~~ guidance in all this
as to what I ought to do.
                                    F. G.

Office of the President
Leland Stanford Junior University
Palo Alto, California

Post Office: "Stanford University"

Nov. 29, 1897.

Mr. A. J. Meston,

Allen Farm, Pittsfield, Mass.

Dear Sir:

Referring to your letter of October 20th, I am informed that no experiments of the kind suggested have ever been undertaken here, nor, so far as I know, any where else.   If it is really worthwhile, I think that some member of our Department of Chemistry would take pleasure in doing the work.   Our Catalogues have been sent to Dr. Galton, as suggested.

Very truly yours,

Am sorry.

David S. Jordan
Co.

David S. Jordan is President of above University. You probably know all about him, - & very likely if you will write him, he will have the Color analysis made. Of course the suggestion coming from me would have no weight.

Pres Jordan was in Washington D.C. at the Alaskan Seal International Investigation - when my letter was rec'd, - as his Secy wrote me.

Allen Farm
Pittsfield. Mass: Dec'r 10th 1897

Francis Galton Esq
     42 Rutland Gate
          London. S.W.
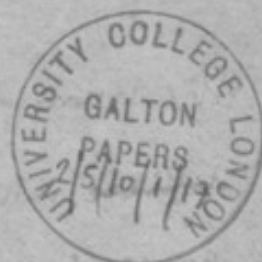
Dear Sir,
          Your favor of Nov 27th postmarked
"Chelsea Nov. 29th 12.15 a.m." was rec'd y'day.

          I hope that the memoir on the trotting
records will soon be printed, — as I should
like very much to have the pleasure of
reading it.   May I ask you to mail me
a copy as soon as it is printed?

          The Yellow blank for Pedigree records
is a capital idea.   The only suggestions I
can offer are these, viz:-

(1) It is only stallions that are "standard
bred" that are numbered.   Mares or geldings
are not numbered.   This is a small matter.
If the heading of column stands as it is, — then it will
be only in the lines following the names
of standard bred sires, — that their numbers

can be inserted.   The heading might be
changed to "Number of Stallion"   in which case
           or Vol. of Register "

the number can follow the sire's names – &
~~where~~ the number of volume of the Register
could be inserted after the dam's names.
If the "Subject" is registered, – then the
Volume of Register & page, – or simply the
"Volume No" would be sufficient to identify
the correctness of all the ~~other~~ rest of the
pedigree.   Many owners & small breeders
do not have access to the Trotting Register
(there are 13 volumes, – published at $5 per
volume), & while they might be able to
give the volume in which the "Subject"
was registered, – it would stump them to
add the other references.

The last column "Where record was
published" is probably unnecessary.   I think
"place where record was made" might be better.

The official published ~~record~~ authority for records is now the "Year Book", - & all the records for the year are now published in this book. Records slower than 2.30 are in a place by themselves.   Year Books have been published since 1885.   Prior to that, - the recognized authority is "Wallace's Monthly" - from 1875 to 1891, - & bound & indexed volumes are accessible. Then for the earlier records, - there are tables in Volumes 1. 2. 3 of Wallace's American Trotting Register. - & 2 Volumes of Chester's Complete Trotting & Pacing Record.

With the year when, & place where record was made, - the record can be verified from some of these authorities.   The date is the most important for purposes of verification, - that is the "Year."

- The greatest obstacle to the success of your inquiry will be the scarcity of the "subjects," - which you have found to be the

case with 2.30 records, It widens the
field very materially to take in <u>all</u>
records, - slower or faster than 2.30, as the
case may be, - & even with this latitude
I question if you will be able to find
enough "subjects" to be of practical
value. Many of our most popular
stallions have no records: & nearly all of
our ~~most~~ best mares, - (those that have
produced the most speed) have no records.
Training & racing is expensive business,
both in time & money. Then again
many mares have been trained a little
by their owners, - enough to satisfy them
of their speed & of their desirability
for brood mares, - & have been put to breeding
without ever having been raced. Many
have been trained, & have trotted or paced
fast trials (or moderate ones) & have either

gone lame before being started in a race,
or become flighty, unreliable &c., — or they
have failed to show fast enough to
warrant their owners starting them, —
+ so have never been given a record.
Some have been raced, — but failing to win
a heat in any race, — have retired to the
breeding stud without a "record."

For instance there are three mares
on this farm, sisters, — (Allene, Almera,
& Amorita) that Mr Allen before buying
saw trot quarters when 3. 4 + 5 years old
in from 33 to 34 seconds = 2.12 to 2.16
to . the mile.   He expected to give all three
records in one year.   All three went lame, —
one after the other, — nothing serious, — but
enough to spoil their chances for that
year. They were brought home to the
farm & bred. Amorita the first year she

missed, was again put in training & in
her work had ~~she~~ trotted 4 successive
mile heats in from 2.22 to 2.25.   In
the second heat of her first race, which
I saw,- she was leading her field at the
3/4 pole,- when she broke into a run, &
fell behind.   She had sprained a muscle
of her hip,- & so was "drawn" from the
race, & had to come home.   Next year,
fully recovered, she was again put in training
& was able to trot a mile in about 2.20,-
when by some carelessness or mischance
she sprained a hind ankle, - & so was
again out of it.   She is now with foal.
This mare has no "record",- still we know
she has trotted a mile in 2.22 (or thereabouts
I ~~speak~~ write from memory) & our office
records show exactly what & when she
did this.   A moderate record is the outcome

of favorable circumstances, — t to obtain a fast record, — all the circumstances must be peculiarly favorable, — even where you have a horse with speed.

Now we say that Amonta has shown a "private trial of 2.22," — but this is not a record. For your purpose, — if you are _sure_ _of_ _the_ _truth_ _of_ _the_ _statement_, — such a "trial" has as much value as a "record," — has it not?

If in your blanks, — you will allow owners statements as to actual trials — with date, place, (t probably name of driver) — where, some of-parents, grandparents or g.g.p. have no "technical records", I think you might be able to collect enough data to be of ~~some use~~ value. But if you confine the inquiry to a "technical record" for both parents, t the four grandparents, — I fear that the harvest will be disappointing. In a few years more, we may have quite a number bred in this way, — but to the close of 1896, — I

67) think there are very few, – if any. This year's trotting & pacing may bring out a few, – & as soon as the Year Book is out, – I will look through it for such.

In either case, however, I hope you will prosecute your inquiry, & see what comes of it. I should think the best way to wake up the owners & breeders & get them interested in the subject, would be through the columns of one or more of the "Horse papers." If you confine it to one paper, – that paper would make a feature of the inquiry, – & would, I shd say. be glad to open a column on the subject, – asking their readers to send them particulars of any horses bred as you require. An article from you setting out the scope of the inquiry – & stating what information you want, would start the ball rolling. The memoir you have written would be a good thing to publish, but & should stir up plenty of interest. If

you think it best to use one paper, (instead
of all the horse papers) I believe the best
one to be The Horseman, 323 Dearborn St.
Chicago. Ills.   The editor & proprietor is
Daniel J. Campau.   He is a lawyer. & a
wealthy property owner of Detroit. Michigan,—
& & is one of the officers of the American
Trotting Association, & is also president of the
Detroit Driving Park, (a trotting course) He manages his
paper through subordinates, — but lives in
Detroit. Michigan.   It might be well to
address him personally: either address will reach him.

        There is no use in asking information
from the Trotting Associations, — that is, the
different track owners throughout the
country.   Their "personnel" changes frequently
& the officers (or the most of them) could
give you little or no information.

        W. H. Gocher, Secretary of the National

69) Trotting Association, Hartford, Connecticut
might be of some assistance. (It would be
well to write him, I think)

Amongst a few of the prominent
breeders, that it might be well to write
to on the subject, — I will mention

Gen'l Benj. F. Tracy

Gen'l B. F. Tracy
Ex. Secretary of the Navy
Brooklyn. N.Y.

J. Malcolm Forbes
30 Sears Building
Boston Mass.

John E. Thayer
Lancaster
Mass.

L. Brodhead
Woodburn Farm Spring Station
Kentucky.

C. J. Hamlin
Buffalo New York

C. W. Williams
        Galesburg Illinois

May Overton
        Hermitage Stud
                Nashville Tenn.

These are all representative men in their
different sections.   Genl Tracy's knowledge &
advice would be of special value.   He
owns Kentucky Wilkes 2.21 1/4 - & is one of
the leading public men of his state.

J. Malcolm Forbes is a wealthy Bostonian -
paid $125.000 for Arion 2.07 3/4, bought from
the late Gov. Stanford of Palo Alto, Cal. (This
is the highest price ever paid for a trotting horse =
£ 25.000⁰⁰.)   Col John E. Thayer owns Baron
Wilkes 2.18, & is the President of the New England
Breeders Assn.   Mr Brodhead is now in
Europe.   I do not know his European address, - but a
letter will be forwarded, & if you can meet
him, he can give you more information & can do

you more service than any other one man.
He represents the oldest breeding farm in
the U.S. You have Mr Hamlins
catalogues. He is the largest breeder, &
his stable of trotters has been the most
successful for some years. C. W. Williams
owns Allerton 2.09¼, & some years ago
sold Axtell 2.12 for $105.000.⁰⁰. Not a wealthy
nor an educated man, - but a worker, - & is
well posted. Mr. Overton is the leading
breeder in Tennessee, owner of Bow Bells 2.19¼.
H. D. McKinney, of Janesville, Wisconsin
is a small breeder, - but very well informed, - &
would be a good man to have interested.

I can name others, - but these are
probably enough to begin on, - & you are
bored sufficiently with this letter.

I have shown your letter & blank to Mr. W.
R. Allen, the owner of this farm & my employer,
& he advises working the information up through
the "Horseman" without any personal inquiries.
He is the only one within my reach. I can advise with
verbally. Yours respectfully A.J. Weston

Allen Farm
Pittsfield, Mass: Dec 11th 1897

Francis Galton Esq.

Dear Sir,

Since writing you last night, I
find that we have a trotter whose ~~record~~ pedigree fills the
requirements of your yellow blank, — so I have filled
it out, — & enclose it. — I had Mr Allen sign it
as the mare Brown is his property, — & hence he is
the proper sender.

You will see that even in this record there is
some lack of completeness. I cannot find the
year in which Belle Patchen's (No 5) record of
2.30¾ was made. — It was prior to 1883, — because
in Chester's Trotting & Pacing Record Vol 1, — which
brings down <u>all</u> records from earliest times to
end of that year. In 1876, she won a 2 year old
race & took a record of 2.42¼, — so that it is subse-
quent to that. In 1882, she foaled Baron Wilkes, —
hence it was prior to that year. I have looked
through Wallace's Monthlys for the intervening
years, — but they are poorly indexed, & I fail to

find it. Her record is perfectly well known & is correct beyond a doubt.

Volunteer's record of 2.37 was to wagon, which is rated as 5 seconds slower than the high wheeled & sulky. This latter Vehicle is considered 5 seconds slower than the present bicycle sulky which came into use in 1892, — so that as compared with present records, it equals 2.27 at the slowest. This 2.37 is the record given in the Year Book. Vol 8. p.447

The Monthly refers to his wagon record of 2.36 at Goshen N.Y. (1/2 mile track) in 1862; & his trial of 2.31 1/4 in 1861 to wagon is doubtless authentic. I insert all 3 in blank.

— Peggy Slender is registered in Vol 2. Trotting Register & all that is known of her history is given. The facts were furnished to the Compiler of the Register (John H. Wallace) by Col. John W. Conley. & we have a letter from him stating that the record printed as 2.55 is a typographical error for 2.35. I explain this in a marginal note.

The 2.30 records as they conferred standard rank, have been more jealously guarded, & are easy

of verification, - compared with many of the slower
records.   This will give you an idea of the
field you are seeking to explore.

The 2.48 of Hambletonian 10 is not a technical
record, but was a public performance at a Horse
Show, - & is authentic.   His owner never trained
or raced him.

The enclosed example might be incorporated in
your printed explanation on the back of these
blanks - as a sample of how you wish others
filled out.

Mr. Allen is the President of the American Trotting
Register Assn, - the publishers of the Year Book &
the Register; & the fact of having made a beginning
& having him on your list of "information contributors"
would have a tendency to stimulate other breeders
to supply you with similar information.

The clerical force of the Register Assn is con-
fined solely to compiling the Year Books & Registers -
& they would not likely be of any assistance to you, -
unless interested as individuals.   I mean that
officially they could not be of any service.

If however you conclude to write to the

75)

gentlemen whose names I gave you last night
I think it well to add these two, viz:-

(1) Maj. P. P. Johnston
                    Lexington
                                Kentucky.

He is President of the National Trotting Assn_
the governing body for most of the Trotting
Courses in the U.S: & is President of the
Ky Trotting Horse Breeders Assn: & is also a
breeder of trotters.   By profession a lawyer.

(2)   John H. Steiner
                    Secy. American Trotting assn
                                Ellsworth Bldg
                                    Chicago. Ills.

The American Trotting Assn is the governing body for
nearly all the Western tracks.   These two assns
are the custodians of all trotting & pacing records,-
W. J. Ijams, Terre Haute, Ind. is president of the
"American."   I gave you Gocher's address y'day- the
Secy of the "National."
            When you get the thing started, I will do all
that I can to help you,- in the way of distributing
blanks, writing to the "Horseman" or other papers, &c &c
            Yours respectfully   A. J. Weston

Allen Farm
Pittsfield. Mass: Dec 22/97

Francis Galton Esqr.

Dear Sir,
I am greatly indebted to you
for mailing me proof of your memoir on Trotting
Horses, — & I note the proviso that the information
is <u>not</u> for publication.

I have read the article with a great deal
of interest, & let Mr. Allen. (who is president of
the Register Association) read it. He called
my attention to the fact that your explanation
of the "pinnacle" is ~~probably~~ certainly an erroneous
inference, & after discussing the matter briefly
I am inclined to agree with him, in his
explanation, viz:-

A record of 2.30 <u>trotting</u> and since & including
1895,- a record of 2.25 <u>pacing</u> confers standard
rank on the animals themselves & many of
their relations, which without such a record
are non-standard.   These records admit

77) the horses & many of their kindred to standard rank, to the privilege of registration & thus confers a value upon in some cases a whole family, - which (in the absence of one of the members obtaining such a record) they did not previously possess, ∧ Hence there has been
a great struggle to obtain records of 2.30 trotting & 2.25 pacing by many horses whose extreme efforts under favorable circumstances enabled them just to make these records or a fraction of a second inside of it. It is a goal towards which many have been struggling & just reached, or got a fraction of a second inside of. Then again as it is manifestly easier to trot in 2.30 or a fraction under, than it is to trot in 2.29 or a fraction below: & as 2.30 or under confers standard trotting rank for purposes of registration just as thoroughly as a faster record, - many breeders have given

their horses just the necessary 2.30 record, - & as
near the 2.30 limit as practicable. & then
retired their horses to the breeding stud, -
instead of racing them to faster records.
The same remark applies in to 2.25 pacing record, -
tho' the relative number of these will be smaller.
In other words the 2.30 trotting point, & the
2.25 pacing point (since 1895) are in actually
"pinnacles" towards which many horses are
Striving - the object being to reach it. & not
go far below it. The object is to attain
Standard rank, - & that honor being obtained
the owners strive no further.

From the standpoint of registration - a
2.30 trotting & 2.25 pacing record is an honor, -
for which hundreds struggle. From a
racing standpoint, - all records are penalties, -
being the method of handicapping the horses, -
& serving the same purpose as additional weight
does with the running horses. After a trotter

or pacer once attains standard rank, — & enters
the field as a "racer" to win as many races
as he can, — & is gradually forced to a faster
& faster record, — when the law of chance comes
in, — & your curve of normal frequency is
well followed.   But the struggle for standard
honors is a seriously disturbing factor, & it is
this which causes your "pinnacle" at the 2.36
border.   In 1895 when the 2.25 limit is
first introduced for "pacers," — your 1895 table
shows this disturbing element at the 2.25
line.   This disturbance (at 2.25 line) is more pronounced
in the 1896 table, — & is entirely absent from
the 1892, 1893, & 1894 tables, — when in fact
the rule had not been formulated & did not
exist.   It gives me a still greater respect for
your methods, — & for the accuracy of your
tables, — that they show these disturbances, or
departures, — from causes which exist, but are not apprehended by you. —
If I have succeeded in making the explanation

2/   f. 60r

intelligible, I hope you will now perceive
that your inference of its being due to
a "tolerance" of 2 or more seconds is
an error; & if so, before the paper is
published in the _Proceedings_ of the
Royal Society. I trust that this portion
of the memoir will be changed.

My explanation will I hope convince you
quite apart from the further fact, that
these records for standard rank & registration
are &
purposes, have been safe-guarded specially so
as to exclude fraud.   In addition to the
judges. there must be _three timers_; the mile
must be trotted or paced, at a regular
meeting. advertised one week in advance, –
        days
the program must contain the name &c of
the horse – & what time or record he is
to start against.   If the horse is started
to _beat_ _2.30_, – he must make a record of

2.29 3/4, or faster. A record of 2.30
equals, but does not beat what the horse
started out to do, — & would not be accepted.
If the horse starts to beat 2.30 1/4, — then
a 2.30 record will constitute a record.
Records every year are rejected, — many
of them simply because some technicality
was not observed; & in such cases, they
constitute bars or records from the
trotting association's standpoint, but are
not records for registration purposes, or
admitted as "records" in the Year Book.
They appear in the Year Books as "rejected
records" in a place by themselves.
There is no "habitual tolerance" permitted;
& as the breeders know this, — your remark
would seem to them as throwing a slur
on their methods; & such laxity would

never be allowed.

Am I right in understanding your base line to be from 30 to 10 seconds in the several tables?

The figures are $\overline{30 \text{ sec.} \qquad 20 \qquad 0}$ but as 20 is the centre, I infer that instead of running to zero, - or the 2 minute mark, - the line runs to 10, & the tables show no records lower or faster than 2.10.

If I have failed to make myself plain, - please ask questions, & I shall be glad to answer them.   In the 1896 table I don't quite understand why the point which indicates about 17½ seconds should be so far above the normal line? The departure lower down, which I take to be the equal of. 2.12: I can account for

by there being many classes for 2.12
trotters & pacers, – & ~~many horses would~~ owners might try
to stay in the 2.12 class, – that is they
would probably rather suffer defeat than
force their horses to trot or pace to a
faster record than 2.11 1/4: & then again
this is about the extreme limit of
a great many horses.

I wrote the <u>Horseman</u> about your
Law of Heredity. If they print it, will mail
you a copy, – & I hope it may not be with you
another case of – "Save me from my friends."
In quoting from your explanation of Particulate
Inheritance, – I was struck with the sentence
(not before realizes) in which you anticipate
what Weissman has since elaborated into
"Germinal Selection", – a doctrine which I am
prepared to fully believe in.

Yours respectfully

A. J. Weston

Would suggest that you mail a
copy of your blanks to every breeder
whose name & address is given after each trotter & pacer in 96
Year Book. Unsealed the postage is 1/2 d. only.

f. 625

ALLEN FARM,

TROTTING HORSES ✳ JERSEY CATTLE.

PITTSFIELD, MASS.

W^M RUSSELL ALLEN,
PROPRIETOR.

Decr 26th 1897

Francis Galton Esqr.

Dear Sir,

I am not sure that I made myself entirely clear in my last letter with reference to the cause of the "pinnacle."

In these tables from the Year Book, — you are dealing with two classes of records: 1st. Records against time, — the great bulk of which (probably 90 per cent) are simply inside the 2.30 limit, — & since 1895, with pacers, just inside the 2.25 limit. 2nd. Race-records, — won in actual competition for stakes & purses, — horses trotting (or pacing) against horses in a race, — where the winners get the prizes & the losers get nothing. These latter will follow the normal curve of frequency. The former compose the "pinnacle," — both classes being (as I take it) included in your tables.

You can readily prove whether this explanation is the correct one. In each Year Book, — there is a list headed

"The Great Table" (in Vol 12 it is at page 461) of trotters & pacers under their sires.   In this table, — all horses with records made against time are, (or chosen to) marked with an asterisk. (*) — as for instance on page 463 Vol 12, under Advertiser is *Nordica .. 2.19½ ", — signifying it to be a record against time.   If by making cross references to these "Great Tables" you exclude all those so, marked from your observations, — you will, I feel sure, get rid of the "pinnacle" because you will then be dealing exclusively with race records — made in actual contests for money prizes.

The "time record" is nearly always made under the most favorable circumstances, — & unless it be a very fast time (as for instance a world's record) it is not considered as severe a test of a horses speed & temperament as a race-record; hence it does work ~~to~~ (compared with race-records) as if there might have been "habitual tolerance" extended: & I can see how your inference would appear to be the correct one from your standpoint

Wishing you all the compliments of the season, I am
Yours respectfully A J Mestor

Allen Farm
Pittsfield. Mass: Jany 10/98
U.S.A.

Dear Sir,

I clip the above from y'days "N.Y. Sun." Daily newspapers are so notoriously unreliable concerning reports of this sort,— that I take the liberty of calling your attention to this "discovery" of Dr. Schenck.

If there is any foundation for such a report,— and you should see an account of it in any scientific paper, magazine or pamphlet,— will you be good enough to let me know,— so I can procure it,— & get all the available reliable information on the subject.

I am also interested in learning what progress you have made towards collecting your special "Pedigree-records" data. I have had no time lately to give to it,— but hope to be able to occupy the most of my evenings during the rest of the winter in going through the Year Books for special data— & will keep an eye open for what you

want, & as Captain Cuttle said "When found. make a note of."

I hope you will make use of the <u>Horseman's</u> Columns in furthering your inquiry.

J. H. L. Johnstone, the actual Editor, is anxious to have a copy of your "memoir" for publication. He has written you sometime ago, – & I wrote him that he had better communicate with you ~~as to~~ about the publication of the "Average contribution" memoir.

May I hope to have a copy of your last paper, – after it is published in the Royal Society's proceedings?

Yours respectfully

A. J. Weston

Allen Farm.
Pittsfield Mass: Jany 20/98

Francis Galton Esq

Dr Sir. Your last favor of the
1st inst, - mailed same date, - did not reach
N York city until 15th. according to post
Mark & was rec'd by me next day the
16th, - an unusual time in transit. from London to New York

The six blanks (3 yellow & 3 white) rec'd
Y'day: & I have mailed 2 of each to
2 breeders. with the hope of securing
a "subject" & getting them interested.
I have suggested to them that if they
can aid you in this, to write you
for what blanks they need, or to
let me know,

If you will send me in a tube
by book post, - Say 50 blanks (white &

yellow) I shall try to place them
in hands where they will be of-
Some use.

I hope you will succeed in
getting many responses: but knowing
the difficulty in having all breeders
report their foals, in which they are
directly interested, — I hope you will
not be discouraged if the responses
are slow in coming back to you.

Many breeders are very poor correspondents,
dislike to write, dont know how to
fill out a plain blank, — & are
generally slow & lazy about such
things. Then London is a long
way off, — foreign postage (5cts) is
required for the return letter — &
amongst these rural breeders, there

may be a narrow prejudice against
sending information to foreign shores;
all of which may militate against
your getting returns. With the
addresses I gave you, there sh'd be
nothing of this sort, — nor likely will
be, — & if they would only 'take
hold & give you a helping hand
then all will be well. I forget
whether I gave you this name, viz:—

Major H. C. McDowell
Ashland
Lexington Kentucky

If not, do not fail to communicate with
him. He can be of much assistance if not growing too old.
I should despair of ever getting
the Allen Farm Stud records completed
if it were not for the fact that in
writing for information, I can enclose

a stamped & addressed envelope: &
it is a "mighty mean man" that
won't answer your questions when
you do this.

With
~~In~~ the blanks that you may
send me — in mailing them, I can
do this, & by this means may procure
information, which they would not
mail to you.

I am looking forward with interest
to the receipt of the paper in Nature —
& also your latest memoir on American
Trotting Horses.   Can these memoirs
of yours numbered "(2)" & "(3)" in the note on
back of blanks be purchased, — & if so,
where, & at what price?

You give the date of publication of
Natural Inheritance as 1889.   My
copy bears the date of 1894, — & I was
under the impression it was a first edition
                    Yours respectfully   A. J. Weston

P.S. I mailed your note &
blanks to Mr. Allen who is temporarily at St. Louis, Mo:

Allen Farm.
Pittsfield, Mass: Jany 24/98

Francis Galton Esq

Dr Sir.

Many thanks for your article
in Nature of Jany 6th. Your
suggestions appear so simple & practical.
that the wonder is they have not been
acted on before. But I for one would
never have thought of it. As soon
as the cold weather moderates, & the
opportunity offers, — I will try the
plan on some of the horses here, — &
if I succeed in having the photographer
follow your directions, — will mail you
the results. I have written The
Macmillan Co, — for 3 copies of Nature

I will try & place them in
hands of people, when your
suggestions may I hope bear
fruit:

Since May 1st 1893, on the
farm here we have weighed every
horse old & young on the first
of every month: & have a record
of these weights.   We do this
as a guide to growth (in the young
things) & condition.   It is the
only exact data extending over
a continuous period we have —
& probably the only record of the
kind in the country.   Would
this data be of any use to you?

It also includes the weights of all foals at birth, & their dams after foaling — for several years past.

I am a little afraid I may miss some of the good things you are sending me, — because in one case you have addressed me to

Pittsburgh Pa:

& in another to Pittsburgh. Mass.

Please note that the address is Allen Farm.

Pittsfield Massachusetts

In future, if any of your articles appear in Nature or other current periodicals, I do not wish to tax your good nature for the article itself, — but I will be greatly obliged to you, if you will send

me a memo: of the paper in which the
article appears, & I can get it
myself.

But I have no means of getting
the memoirs you read to the Royal
Society, - unless you are good enough to
mail me a copy; & I very much want
a copy of the Memoir on the "Speeds
of American Trotting Horses", as it finally
appeared.   I suppose you will vote
me a "great nuisance."

I hope to see soon in the "Horseman"
Some communication from you about
the "Yellow beauks". It may need
considerable "hammering" by or through the papers,
to get you the desired information, -
but I mean that you shall get all there
is in time, - if it can be got at.

Yours respectfully

A.J. Meston

If I can do anything to facilitate
the thing, please command me.

Allen Farm.
Pittsfield, Massachusetts.
Feby 27/98. U.S.a

Francis Galton Esqr.
Dr Sir,
            I am now your debtor in a
great many ways, — & more specifically must
acknowledge receipt of your favors of Jan 14,
and Feby 4th, the bundle of blanks with
copy of Nature of Jany 29th, & your postal
card of Feby 17th, — which reached me today.
Please accept my thanks for your great
courtesy & kindness.
            I saw at once the beauty of your
method of numbering the squares in the
diagram, — altho' it never would have
occurred to me.   The diagram as numbered
by you will in time be of great service to
us, in discussing individual ancestral
influences, —   Should I, for instance, ever
resume & complete my inquiry into the

"Common Sources of. 2.10 Speed," I should recast the whole plan, & by the aid of your diagram & its notations, the references would be greatly simplified. The ease with which the line, (of ancestor) may be traced to the subject, if the number of the ancestral place is known, & working more-makes it I believe of great value to students of breeding, - & I hope, should I have occasion to make use of it, that you do not object to my doing so - on proper credit being given.

I am much pleased to know you are convalescing from the influenza attack; & hope you will soon be fully recovered. As a boy I spent 3 months in London visiting relatives (from Sept to Xmas) & know something of the London fogs, which it seems to me now, must be very trying. We have had an old fashioned

winter up here in the Berkshire Hills, —
lots of snow, — but no dangerous storms, —
some zero weather, — but only one day of
very cold temperature. (On my porch thermo
was — 18° Fah, — & lower down in the valley ½
mile off it was reported — 28°).   We are
about 1200 feet above sea level. 150 miles west
of Boston & the same distance north of
New York City; & this county (of Berkshire)
is a popular summer & fall resort for
wealthy city people.   The severe winters
add much to the cost of horse raising —
but the climate is a healthy one —   We
have 2, 3 & 4 year olds that run out the
whole winter with an open shed for
shelter. that they go under at will, &
they thrive wintered that way.   Horses
can stand great extremes of cold or heat
as long as it is dry — Cold rains or damp

snows are the most injurious.

The error in the address was natural
enough. There are so many names nearly
similar, & many duplications of same
name in these United States: — probably
20 or more Pittsfields in as many
different States. For that reason the
State name, Mass. is the most important
part of an address, to this post office.

It was entirely too kind of you
to bother write me when you were sick, —
& while I appreciate your kindness
more than I can express, — please do
not inconvenience yourself again by
writing. Your letters are a great
pleasure to me, — but I can wait, — this
business of breeding learns one patience.

Until the snow goes, I cannot
try any experiments in photographing
horses according to your plan. I do

not however think you made any mistake
in not dividing your article into two
parts, & dealing with one as a hippometric
laboratory. Perfectly trained horses might
do all right in such a place; but such
we
you do not often find. Viewing the plan
from a practical standpoint, I am inclined
to think, that if the plan can be made
to work, it must be by bringing the
camera to the horse's accustomed place, —
at least with breeding stock. We have
in the trotter, the best tempered horses
in the world, I think; & a child would
be safe to go near almost any of our
horses, in the stables or paddocks or
fields. But I do not believe more than
one or two could be made to stand still
in a strange "hippometric laboratory" long
enough to be photographed. In large cities

probably it will answer well enough. For
breeders, the "makeshift kind" will have
to do it properly – or it will never be done
with us.

Many thanks for your suggestions as
to hair specimens, of horses. In this country
there is no leisure class, that such a thing
would appeal to: & if there was any chance
for such a thing becoming a "fad" it
would be taken hold of by unscrupulous
people – & the purchasers would be hopelessly
swindled, – Hair from any old hide would
be labelled as they saw fit. But as a
means of making a private collection for
purposes of analysis ^{etc} – your suggestion
is a most excellent one.

I feel sure that after your Cambridge
experiments in the analysis of hair color,
should they lead to useful results, – a
line from you to President Jordan. of

The Leland Stanford Jr. University, California,
would get him to make similar experiments
there.   The University is part of the
Palo Alto Estate, - & the Palo alto Stock
Farm is still a big affair.   Pres. Jordan
can get all the samples he needs close at
hand; & ~~I think~~ ^{It is quite possible} the Palo alto farm ~~will~~ ^{could}
furnish him with specimens of pedigreed
hair, - including the subjects, their sire &
dam, & their grandsires & grandams,
If Senator Stanford were alive. I would not
hesitate to write him, - with the ~~assurance~~ ^{assured hope}
that such an analysis would be carried out.
He was the first to photograph animals in
motion - the Muybridge photographs being
taken on his farm & at his instance, & expense,
A request from you to President Jordan
would have all the weight necessary.

When you have the time, I shd like
to know whether you have received answers

in the way of properly filled out blanks,
& how many, that you can use. I
enclose a blank mailed to Mr. Allen; but
it will not answer.   Three of the requisite
six ancestors are blanks, — & one of these
is the <u>dam</u>, — about which the breeder
who signs it should know, if any one does.
I am trying to stir up a little interest
in the inquiry thro' the <u>Horseman</u>, —
with the co-operation of Mr. Johnstone, the
<u>actual</u> editor, who is a Scot, like myself
Sometime ago he wrote me that he & an
assistant, a capable man, spent a day
looking for "subjects" but found none,
I fear I may have been the means of
getting you to take up a hopeless hunt, —
& yet if these breeders can only be
stirred up & interested, I believe some
hundreds of examples should be

forthcoming.   There are practical reasons
for their scarcity.   Training is necessary
to get an approximately correct record of
speed: & training is expensive, & unless the
horse showed early signs of being very fast, -
the animal would not be trained.   The
standard limit of 2.30 was, looked on as the
minimum goal.   Unless a breeder was sure
of equalling or beating 2.30 time, he
would not start his horse for a record;
feeling that a record slower than 2.30
would be a public confession of failure.
Then a record for parents, - or even a speed-
measurement approximately near the limits
of the parents capacity has not been
considered a sine-qua-non.   There have
been many disappointments from mating
a fast trotting horse with a fast trotting
mare (with fast records I mean): & not one
signal success has ever been yet reached from

such matings. With mares particularly, years of training & hard racing seem in some way to injuriously affect their reproductive organization. They are often "shy" breeders, & poor milkers. With stallions also, there is evidence tending to show they get better foals after resting for one or more years from the time they have been trained & raced. Opinion has been divided. Older breeders are generally a unit in the belief that training tends, for a time at least to sap the reproductive vitality. Hence many of them, - if not all - prefer not to train their most valuable brood mares, - will select the fillies ~~from~~ on account of their gait & natural speed, & their form & breeding - & purposely put them in the stud without being trained at all. The less experienced breeder is almost sure to select

a high value on a record for the parents
& most of them believe that "training
intensifies the trotting instinct," as they
phrase it.   This I believe to be wholly a
fallacy, & a pernicious one, — altho' I am
aware of the different steps by which it
has been worked up almost into a dogma —
Starting as I believe in part at least from one
of Darwins very cautious remarks that
"long continued habits are often not to be dis-
tinguished from instincts".   Some years ago
I published (under signature of Iron Kirk) a
lot of evidence that negatived the theory of
"training intensifying trotting instinct," — & in
hopes of bringing out some counter evidence.
carried the argument too far, by claiming
that "if the 2.30 list were forced to depend on
itself for its annual supply of new recruits
the fast trotter would disappear from the
face of the earth."   It is precisely this sort of
evidence that you now want. I have sent the
Horseman an article trying to stir up some interest

in your inquiry, in which this controversy
is referred to; & if published, will ask them to
mail you a copy.   I was annoyed that I
did not bring out any responses on the other
side, of the questions but beyond a few growls
my opponents gave it up in silence. (For
business reasons, I do not wish to be
publicly known for the present at least,
in these Iron Kirk articles.)

The 1894 Natural Inheritance I have is a
regular edition published by & bought from The
Macmillan Co.   You say you know only of the 1889
edition. I want to have Prof Pearson's article
or paper, & have written The Macmillan Co. If
they can supply me with the No of the Proceedings
Containing the paper.   The 2/- price looks reasonable
enough, but it will probably be higher here.   I
should not complain when I asked that price
for my little pamphlet (of which I sent you a
copy): altho' I did not sell enough to pay the
printer's bill. Have you ever been able to find out
for certain if there are any ancient Sculptures in
British Museum with pacing horses? I sent copies of
Nature to Horseman & another paper, & called their attention to
your photographic suggestions.   Yours respectfully A J Weston

Allen Farm
Pittsfield. Mass: May 29th 1898.
U.S.A.

Francis Galton Esq
Dr Sir.
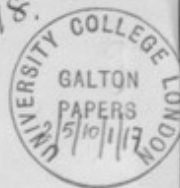
It was very kind of you to write me at such length from Sicily: & I hope by the time this reaches you, ~~will~~ you will be again settled in London, — & much refreshed in mind & body by your sojourn in Southern Europe: & that you suffered no inconvenience from the rioting which has apparently been going on in Italy.

As the outcome of the blanks you mailed has been so disappointing I feared that you might feel that I had mislead you into sending them out. I knew that you could not get technical records for the ancestry complete for 2 generations, — but I was greatly in hopes that you would be able to get enough special information about trials from breeders, — to be of some use. The more the ~~inquiry~~ is pushed, however, — the more certain I am that the necessary information does not now exist, — in sufficient volume, or with sufficient accuracy to be of any value; & had I known this last fall, as I know it now, I might have saved you a lot of work & expense; so that I naturally feel guilty of helping to send you on a bootless errand, — & I am very sorry that it should have turned out so.

I enclose a clipping from the "Horseman" of an article they finally published a month ago, — but it has resulted in nothing. In that article I summarize the results of an inquiry made two years ago, — in which I showed how few mares with 2.30 records had succeeded in begetting 2.30 trotters.

Since the Year Book of 1897. was issued some six weeks ago, — I went over the records, — & made up some tables such as I fancy you made, — as preliminary tables for preparing your speed diagrams

on a curve of frequency. From these tables (a copy of which I also enclose clipped from a "horse paper" that printed them) I can make the "observation" columns on the diagram - which you represent by the small dots, - but I am not able to draw the curve of normal frequency - & be satisfied of its accuracy - nor am I entirely sure that my mean averages of speed are correct. I worked one or two of the divisions (by ages) out by the usual arithmetical process, - a tedious business with so many figures & fractions, - & I found the mean average about 3/4 of a second slower for the 5 year old & over division than the percentage columns make it. My figures in these tables which I enclose are correct, - I believe, - so that I did not bother going all over the calculations to find out where this discrepancy came in. If you are not already tired of these 2.30 records, - I would like very much to see these tables for the 4 different ages reduced to diagram form, - with the normal curve of frequency drawn on each. From your tables in the appendix of "Natural Inheritance" I ought to be able to do it myself, - Can you suggest any text book or set of tables that would be any additional help to me?

I sent for a copy of Prof Pearson's paper, - & some day hope to be able to understand how his formulas are worked out - but as you have very properly perceived, - it is beyond my present reach. Its general conclusions, however, I read with interest.

From a 3d clipping enclosed, I see that the Revue Scientifique has had something to say: & as usual the paper copying wholly misunderstands & mis-states your conclusions. There is a lot of human stupidity I can see, - & you are capable of seeing a vast deal more. The "leaven" however is working. With best wishes for your health. I am yours respectfully A.S. Mark

STUDY OF HEREDITY ON THE TROTTING HORSE RECORD BASIS.

The English statistician and biologist, Francis Galton, contributes to the Revue Scientifique (Paris, March 5,) a preliminary study of the speed-records of American trotting horses, which he thinks offer a particularly attractive and promising field for students of heredity. A translation from the French appears in the Literary Digest, May number. Prof. Galton claims there is nowhere in the world such a collection of valuable facts bearing on the subject of heridity of such force and value as that made by the trotting horse in the United States. First, let us quote a paragraph from Prof. Galton's valuable opinions:

"It is strange that, notwithstanding the large sums spent on the training of horses, cattle and other animals, there has never been made systematic publication of authentic facts on this subject, so arranged as to allow of a scientific investigation into their bearings on the laws of heredity. Almost the sole exception to this indifference on the part of breeders and owners to the importance of exact measurements exists in the United States, where the speed of trotters and pacers has long been under definite conditions."

From the recorded race records of trotting horses in the United States, running through a period of twenty-five years, Prof. Galton proceeds to estimate the force and value of inherited speed, and also to measure the velocity of inherited speed upon the offspring. For instance, suppose that one ancestor of a certain horse had a record of 2:30, and that another ancestor of the same degree had one of 2:10, how shall we estimate their respective influences? Should their combined influence be the same on the average as that of two horses having each a record of 2:20, or should it be different?

Prof. Galton's conclusion is that it is a safe rule to take the average. Before writing his essay, Prof. Galton took up the records and speed inheritance of 5,705 horses with fast records, all made from 1892 to 1896. He finds that these records prove that speed is a true inheritance that in a great majority of cases can be depended upon with reasonable certainty to reproduce itself, and make speed breeding a thoroughly scientific achievement.

price of 750 guineas, which was given by Lord Kensington for Sailor at Messrs. E. D. and G. A. Miller's sale of made polo ponies at Spring Hill, Rugby, on Monday, April 4. There were in all thirty-one ponies sold, averaging £281. The first sixteen on the catalogue made an average of close on £400, which, in the history of sales of polo ponies, is quite unprecedented. Up to this date the purchaser of Sailor held the highest record for the amount given for a polo pony, which was for Fizzer, bought at Tattersall's by him in 1897 at 510 guineas.—Baily's Magazine, England.

A trotting meeting was given at Pleasanton, Cal., on April 30, at which the California horses which will be raced in the east were prominent. Dione 2:14, which Tom Keating will bring east, won the free-for-all in 2:16½ and 2:20, beating Andy McDowell's gray gelding Carlyle Carne, which is extensively entered in Grand Circuit 2:12 classes. McDowell's mare Lena N. by Sidney won the free-for-all pace in 2:12½ and 2:15, beating Andaconda 2:08. McDowell will bring this mare east. Last year in Montana she paced a quarter in 29 seconds and a half in 59 seconds. On the same afternoon Searchlight paced in 2:12¼ and Azote showed a quarter in 32 seconds.

THE JOHNSTOWN ENTRIES.

The following entries have been received to the $400 stakes offered for the meeting at Johnstown, Pa., June 1 to 3:

2:40 class, trotting; purse $400:

John Johnson, Buffalo, N. Y.—Altie R., b m by Patchen Wilkes—Hattie W.

A. M. Masters, Johnstown, Pa.—Lizzie S., b m by Black Bishop—Daisy by Joe Downing.

Frank Deitz, Johnstown, Pa.—Maggie D., b m by Col. Bruce.

A. W. Lickert, Butler, Pa.—Flight, br g.

Bancroft Farm, McKeesport, Pa.—Barry B., b g by Townsend Chief—Lottie by Notable.

E. D. Pendleton, East St. Louis, Ill.—May Blossom, b m by Abdallah Mambrino, dam by Messenger Chief.

S. A. Way, Macon, Ga.—Frank Way, b c by Aberdeen.

A. J. Haws, Johnstown, Pa.—Aunt Augusta, b f by Sphinx—Belle Noble by Masterlode.

2:45 class, pacing; purse $400:

W. H. Booth, Salem, O.—Bessie Q., b m by Brown Wilkes, dam by Nugget.

J. W. Weatherspoon, Minerva, O.—Jackmont, br s by Egmont, dam by Forrest Hal.

William Burns, Blairsville, Pa.—Monon, blk g.

John Frank, Johnstown, Pa.—John F., b g by Earnest, dam by Elgin Boy.

Frank O'Connor, Johnstown, Pa.—Easter E., b f.

Dr. C. E. Hannan, Johnstown, Pa.—Calhoun Boy, ch g by Calhoun Bullett.

J. M. Cunningham, Butler, Pa.—Black Bess, blk m.

A. M. Smith, Bradley, Pa.—Fox, blk g.

W. H. Haws, Johnstown, Pa.—Little Jask, br g by Oculist, dam by Bay Tom.

2:28 class, trotting; purse $400:

J. E. Chafer, Cleveland, O.—Marquette, b m by son of Jay Gould, dam by George Wilkes.

John Johnson, Buffalo, N. Y.—Altie R., b m by Patchen Wilkes—Hattie W.

E. D. Pendleton, St. Louis, Ill.—Wilkesbarre, b g by Egotist, dam by Harry Wilkes.

W. M. Toomer, Way Cross, Ga.—Royal Baron, b s by Baron Wilkes—Daisy Blackwood.

THEY SAY.

THE ORDER.
PALO ALTO, OAKWOOD PARK, LOMO ALTO.

WHAT THE EXECUTORS SAY.

SPEED FROM SPEED.

THE HORSEMAN.

Allen Farm.

Pittsfield. Mass: Oct 4th /98

Francis Galton Esq

Dr Sir.

       I have been waiting
with great expectancy for a copy
of your summing up memoir
which, as advised, you were to
read at the September meeting of
the Royal Society, & which I
am very anxious to read,

       Many thanks for last copy
of "Nature" which was duly rec'd
during the summer.

       If not asking too much,

Will you be good enough to
see that a copy of the
Sept Memoir is mailed to
me, when issued, –

 and, I shall be under
renewed obligations to you
for your kindness.

 Yours respectfully
 A.J. Meston

THE GALTON LAW OF HEREDITY,

AND HOW BREEDERS MAY APPLY IT.

(Copyrighted 1898, by A. J. MESTON, Pittsfield, Mass.)

A new law of heredity has recently been announced by Francis Galton, the distinguished English scientist, who has been known for many years as an able investigator and talented writer in this special field. His investigations have mostly been directed towards classifying and analyzing large numbers of observed facts, for which he has a peculiar genius, hence his conclusions, based as they always are on known and measurable results, have the distinct merit of being useful and practical. He happily avoids the speculations in which so many writers on heredity are prone to indulge. So that his announcement of a general law applicable to bi-sexual descent should command the attention of all who are interested in the workings of heredity.

The law referred to is set forth by Mr. Galton in a memoir read before the Royal Society, in London, on June 3d, 1897, and entitled "The Average Contribution of Each Several Ancestor to the Total Heritage of the Offspring." The law governing the average ancestral contributions is as simple as it is comprehensive, and appears destined to be as far reaching, in its practical application, to races, breeds and varieties, as the law of gravitation has been towards explaining the movements of the planets. The Newtonian law deals with the movements of masses of ponderable matter infinitely extended in space. The Galton law of heredity deals with the transmission of imponderable units of particulate inheritance infinitely extended in time, back through successive generations of ancestors.

The Galton law is in brief this:—The whole of the heritage being equal to 1,— the parents contribute between them $\frac{1}{2}$, the grand-parents together contribute $\frac{1}{4}$, the great grand-parents $\frac{1}{8}$, the next generation $\frac{1}{16}$, and so on *ad infinitum*, the whole forming a diminishing geometrical scale, which may be ~~infinitely~~ indefinitely extended, but the sum of which can never exceed 1. The series may be variously expressed thus:—

$$\frac{1}{2} + \frac{1}{2}^2 + \frac{1}{2}^3 + \frac{1}{2}^4 + \frac{1}{2}^5 + \frac{1}{2}^6 \text{ etc.} = 1 =$$
$$.5 + .5^2 + .5^3 + .5^4 + .5^5 + .5^6 \text{ etc.} = 1 =$$
$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{64} \text{ etc.} = 1 =$$

The Whole Heritage.

Each term of this infinite series is equal to all that follows it; and, each succeeding term is one-half the term that immediately precedes it. Each term states the *average* contribution of each successive generation. The average contribution of each separate ancestor is obtained by dividing the amount of the particular term by the number of ancestors belonging to that generation, as more clearly set forth in the following example, expressed in decimals, viz:—

	Average Contribution.	No. of Ancestors.	Average Contribution of the Individual Ancestor.
First generation	.5	2	.25 by each parent.
Second generation	.25	4	.0625 by each grand parent.
Third generation	.125	8	.015625 by each great g. parent.
Fourth generation	.0623	16	.00384375 by each g. g. g. parent.
Total for 4 generations	.9375	30	

The remainder .0625 = Total average influence beyond 4th generation.

Total 1.0000 = The whole heritage.

The following diagram has been approved by Mr. Galton as a useful illustration of the chief features of his law, (see *Nature*, January 27th, 1898, p. 293), viz:—
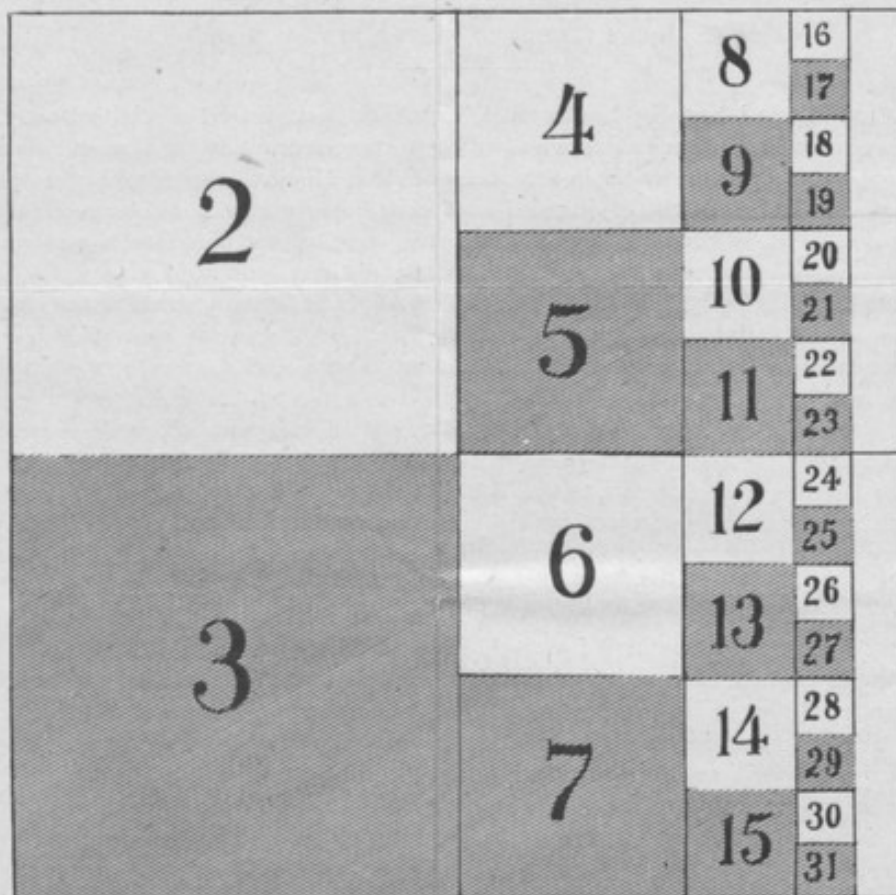
(The white squares represent male ancestry, and the shaded squares represent female ancestors for four generations. The upper half of the diagram represents the entire average individual and ancestral influence of the male parent; the lower half of the diagram represents the entire average individual and ancestral influence of the female parent.)

"The area of the square diagram" writes Mr. Galton, "represents the total heritage of any particular form or faculty that is bequeathed to any particular individual. It is divided into subsidiary squares, each bearing distinctive numbers, which severally refer to different ancestors. The size of these subsidiary squares shows the average proportion of the total heritage derived from the corresponding ancestors. These numbered squares may be indefinitely continued. Here, they end at the fourth generation, which contributes one-sixteenth, hence the whole of the more distant ancestry comprised in the blank column contributes one-sixteenth part."

The "distinctive numbers" are those employed by Mr. Galton in his "Family Records" and deserve special mention, because of a pretty property which they possess. It must be borne in mind that the subject of any pedigree (repre-

sented above by the entire diagram), is numbered 1. Thenceforward, whatever the *number* of the ancestral place, the sire is double that number, and the dam is double that number plus one. Let *a* be the number of any ancestor, the sire of that ancestor is 2*a*, and the dam is 2*a*+1. Hence all male ancestors are even numbers, and all females are odd numbers. This holds good no matter how far a pedigree may be extended. The convenience of this system of numbering, in discussing lines of descent or relationship, is at once apparent. Given the number of any ancestor, the sex is known, and the line of descent or ascent can be worked out with ease. Take 13 in the diagram ; 13 is a female, whose sire is 26 and whose dam is 27. The sire of 26 is 52, the dam is 53; the sire of 27 is 54, the dam 55. The sire of 52 is 104, the dam 105, and so on. Now for the line of descent from 13:— 13 is mated with 12, and the offspring is 6, a male; 6 mated with 7 produces 3, a female ; 3 mated with 2 produces 1, the subject. Any remote ancestor whose number is known can be dealt with in like manner. For instance 1000 is a male mated with 1001—offspring 500 a male, mated with 501,—offspring 250, a male, mated with 251,—offspring 125, a female, mated with 124,—offspring 62, a male, mated with 63,—offspring 31, a female, as shown in diagram, whence its further course to the subject 1 may be traced.

SCOPE OF THE GALTON LAW.

It applies to all cases of bi-sexual descent, in which the individuals, being the offspring of parents of the same *variety*, differ in having a greater or less amount of such characteristics as any individual of that variety may normally possess. It has nothing to do with hybrids. It deals with races, breeds, varieties and families in the aggregate, concerns itself wholly with observed results, and it is a necessary pre-requisite for the application of the law, that the faculties, qualities or capacities it may pass judgment on, must be susceptible of measurement. With a sufficient number of such measurements, average results and their deviations can be determined with great accuracy. Prepotencies and subpotencies of individual ancestors are eliminated by a law that deals with average contributions and the varying prepotencies of sex in respect to different qualities are also presumably eliminated. Corrections for these can be made in any particular pedigree, but care must be taken that the corrected series still amounts to 1 exactly. "The word ' Heritage ' " Mr. Galton explains, " has a more limited meaning than ' Nature ' or the sum of the inborn qualities. Heritage is confined to that which is inherited, while Nature also includes those individual variations that are due to other causes than heredity, and which act before birth. Now, individual variation in a race that is stable, must have a destructive as often as a constructive effect, consequently its effects balance one another in average results, and disappear from a law which deals only with these."

PRESENT STATUS OF THE GALTON LAW.

The existence of this law to the third ascending generation was discovered from an interesting and exhaustive analysis of a large collection of special data obtained from family records, fully discussed in Galton's " Natural Inheritance " (Macmillans 1889 and 1894.). The law has been verified to the fourth ascending generation in the case of color transmission, in a stud of Bassett Hounds, bred by Sir Edward Millais from 1874-1896 (see Royal Society's Proceedings, Vol. 61, page 401). A further corroboration of the truth of this law was obtained from the

consideration of a collection of statistics on the color of trotting bred horses, although the data were too inexact for verification. (See Nature, Oct. 21, 1897, page 598.) Of more importance is the fact that an independent investigation by Prof. Karl Pearson, of the London University College, certifies to the correctness of the law. Prof. Pearson is considered the greatest English mathematical authority, and his paper on this subject read before the Royal Society on January 27 last, will carry much weight. (See proceedings Royal Society, Vol. 62, pp. 386.)

The law is in strict consonance with all the latest knowledge of physiological and biological phenomena. It also coincides with the observations of practical breeders, who know in a general way, that the near crosses have the most influence, and who also know that a peculiarity or characteristic may be transmitted from any ancestor, even a very remote one. The Galton law forms a common platform on which for the first time, the scientist and practical breeder can meet. It reigns supreme amidst the diverging or conflicting theories of heredity. No matter what the ultimate units of life may finally be named, how classified, or what composed of; no matter what the ultimate carriers of heredity are discovered to be ; no matter what new light may be shed on the processes of generation, the law of average contribution must still be reckoned with ; and for this reason, it deals solely with observed and tangible results after they have been reduced to some form of accurate measurement. It reigns equally serene over the pangenes of Darwin, the physiological units of Spencer, the stirp of Galton, or the germ plasm, determinants and ids of Weissmann, and is not disturbed over the uncertain question as to whether acquired characteristics are or are not transmitted.

ILLUSTRATION OF ITS PRACTICAL APPLICATION.

The application of the law to life insurance and sociology will be obvious to those competent to discuss the heredity problems these subjects involve. What follows is a brief explanation of how it may be usefully applied by breeders as a powerful search-light and guide.

Exact measurement is the basis of all science, and breeding cannot become a science until it conforms to this requirement. Fortunately our one distinctive American breed of fast horses and pacers, offers an almost solitary exception in this respect, that it furnishes annual publications of authentic records, which are measurements, in a form suitable for scientific inquiry into the laws of heredity. This publication is known as "Wallace's Year Book," issued by the American Trotting Register Association, and well known to every horseman and breeder. To the casual reader or investigator, nothing would appear more disorderly or heterogeneous than these bulky tables of records of standard trotters and pacers ; and yet under the magic of Mr. Galton's statistical methods, they yield, in the aggregate, surprisingly orderly results. The records, trotting and pacing, for each of the five years, 1892-96, made by aged horses, which fill many closely printed pages of the Year Books, are boiled down and intelligibly represented by the following five diagrams, which show the aggregate relative proportions and rates of speed for each of the years named (See Proceedings, Royal Society, Vol. 62, page 311), viz:

f. 82r
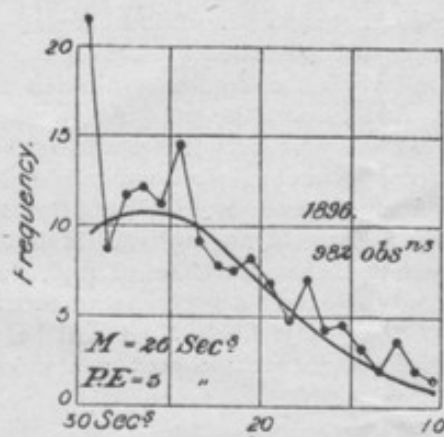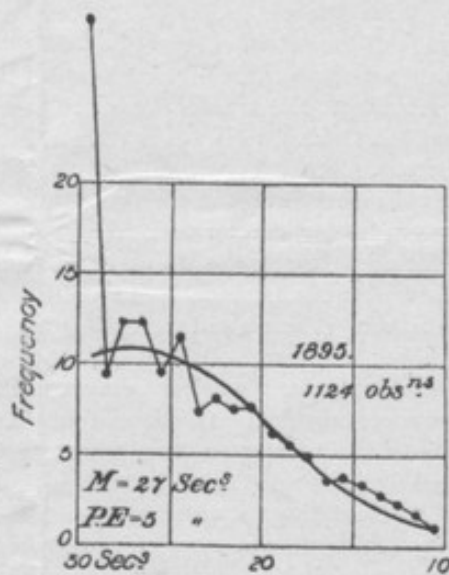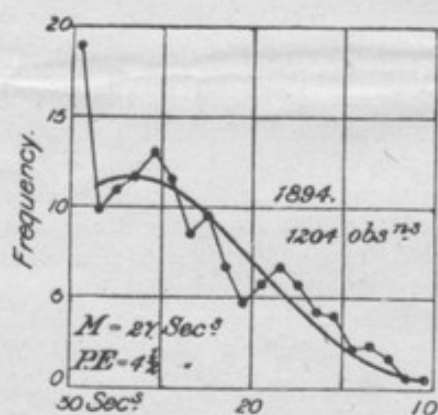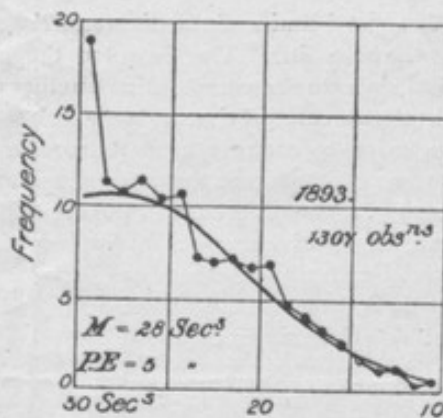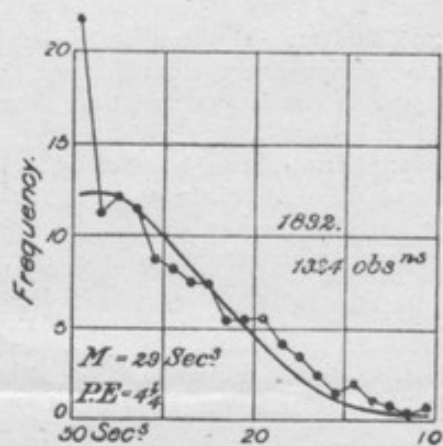
The speed limits of the diagrams are 2:29¾ and 2:10, the time scale running along the base line. The dots are the heads of imaginary columns, and their heights indicate the comparative number of trotters and pacers that have records within that second of time above which the dot is placed. For instance, the dot in the lower corner represents all records in 2:10, 2:10¼, 2:10½ and 2:10¾. The dot running away up at the other side represents all records in 2:29, 2:29¼, 2:29½ and 2:29¾. The difference in the relative height of these two dots is the difference in the relative number of trotters and pacers with records in 2:10, etc., as compared with those having records in 2:29, etc. The intervening dots are similar proportions for each second and its fractions, between the two extremes, 2:29¾ and 2:10. The thin lines show the trace or curve of these actual observations. The smooth curved line is known by mathematicians as the curve of normal frequency, calculated from the normal value of the mean (or average) and of the probable error (or normal deviation), which are given in each diagram as M. and P. E. With the exception of the 2:29 column, and some minor perturbations, the range of the actual observations follows the calculated curve closely enough for purposes of scientific inquiry, and it is very remarkable that there should be such an amount of correspondence. The extreme divergence of the 2:29 column puzzled Mr. Galton, who was not then aware that he was dealing with a mixed set of records acted on by two diverging influences. On the one hand, there are the actual race records and time records made by horses well able to compete in the faster classes; and on the other hand, there is a large number of ~~time~~ records made for the sole purpose of obtaining standard rank, by horses which, under the most favorable circumstances, are just able to reach the desired goal, and not able to go further. These swell the ranks of the 2:29 column, and cause its extreme divergence; and traces of the same influence at the 2:24-2:24¾ column is caused by a similar though smaller army of 2:25 pacers also struggling for standard recognition,—2:30 being the time standard for trotters, and 2:25 for pacers. It is a striking tribute to the searching powers of Mr. Galton's methods that his system detected these two diverging influences; and while the divergence perplexed him, he had no hesitation in rejecting the "strange pinnacle" (of ~~time~~ Standard records) as a "false maximum," when he calculated the smooth curve. Had these disturbing elements been eliminated in the first place the observations would follow much more closely the line of the calculated curves, although the diagrams as they stand, when all the circumstances are known, are better proofs of their own analytical power and accuracy.

The connection between these diagrams and the Galton law of heredity is this: That, if the records of a fair proportion of the ancestors for *two* generations of these trotters and pacers were also known, then by the application of this law, it can be determined accurately in what respect the transmission of speed from generation to generation conforms to this law or deviates from it, as the case may be. Breeders could then be put in possession of valuable and reliable knowledge, which is now entirely lacking, and which previous to Mr. Galton's important investigations, there was absolutely no way of finding out. Singular as it appears, it still remains apparently a fact, that, to the close of 1896, no trotter or pacer of standard record rank is from two generations of ancestors that are also of standard speed rank. In the course of time it is likely there will be many such instances, but the published Year Books do not seem to contain a single example

I find the same pinnacle in the 1897 records, where the time records cut no figure—there being less than 3 per cent of them last year & the mean average about the same. It is the great rush to get inside the standard & no further that makes it—& like you I

so far. A 2:30 record for ancestry is not an essential, but for reasons which it would be tedious to give here, it is essential to the pursuit of the investigation, that a correct record or speed measurement of the two parents, and the four grandparents be known; and in a sufficient number of cases to insure the correctness of average results. With the hope of getting this information Mr. Galton has mailed blanks to some two thousand breeders, and the inquiry into the transmission of speed rests in abeyance until such time as this information is forthcoming.

PHOTOGRAPHY AS AN AID TO MEASUREMENT.

Valuable suggestions have been put forward by Mr. Galton as to how breeders by means of photographs, may form a useful collection of the physical measurements of their breeding animals, which in course of time, would include each ancestor for several generations, of their pedigree stock. These suggestions open up a new field of inquiry, and it is needless to say that the essential measurements for any breed have never yet been determined, and that breeders, either individually or collectively, would have in the first place to decide what physical measurements are of value to them in the improvement of their respective breeds. These difficulties once satisfactorily settled, the conditions under which the photographs may be taken *must* be *strictly* complied with, but these conditions are in themselves simple and do not seem to present inherent obstacles.

Some experiments have been successfully made with horses,—from which it appears that the conditions to be observed are these (See *Nature*, January 6th, 1898, page 231), viz:—

1. Select a piece of hard, level ground, preferably close to a house, barn or shed, on which mark off a rectangle 100 inches long and 20 inches wide, with a 20 inch line across the centre. Marks on the ground that will show as straight lines in the photograph are all that is necessary.

2. Place the horse so that all his feet are within the rectangle and so that the centre cross line is between his front and hind legs.

3. Place the camera exactly at right angles to the rectangle, 20 feet away, and 5 feet from the ground. If the camera occupies a place in line with a point about 20 inches forward of the centre cross line of the rectangle, it has been found that this throws the horse well within its field.

4 The horse *must* stand so that the toes of all four feet will show in the picture, and it is better if all the four hoofs are visible.

5. The back of the camera and the plate *must* be *strictly vertical*, and if the feet and rectangle do not then show, the bottom must be tilted downward so as to bring these well within the field of the camera.

If the background of the picture does not give vertical and horizontal lines sufficient to show that these conditions have been complied with, then two nails can be driven at the same height above the level base, (in the parallel wall behind it), and a string with weights on each end stretched across the nails and allowed to hang plumb on both sides. These nails should be placed so that the string will photograph as a narrow line across the top and down the sides of the

begin to believe there must also be "tolerance."
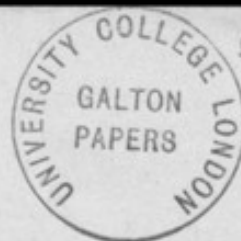
plate. If the top line in the finished photograph is straight and level and the
lines on the sides are vertical and at right angles to the top line and the long sides
of the rectangle, then the picture bears in itself evidence that the necessary con-
ditions have been complied with.

From such photographs Mr. Galton has figured out a formula by which abso-
lute measurements of height, length of limb and body, depth of chest, etc., can be
made with exactness. He has also calculated a table of the proper corrections to
be added to fore-shortened measurements where different degrees of obliquity
occur. Some minor modifications are necessary in the case of fat cattle, sheep,
etc., but it is hoped that the rules above laid down may be explicit enough to enable
any one so desirous of giving this method of photography a fair trial. In New
York and other large cities a hippometric studio might be fitted up for the
special purpose of photographing show horses in this manner. It would be an
excellent help towards educating breeders and buyers and furnishing them
with exact information as to the physical requirements of the premium winners,—
from year to year. The National Horse Show Association is well fitted to take
the lead in this. The use of such photographs might also be extended, under the
auspices of the National and American Trotting Associations and the Jockey Clubs,
so as to include all trotters, pacers and runners that start in public races. Properly
systematized, it would put an effectual stop to "ringing," and as a means to this
end, is worth while considering.

The application of the Galton law along the lines mapped out cannot fail to
shed light on many complicated problems of heredity, by giving exact knowledge
in place of the conflicting opinions which now prevail

Francis Galton Esqr.

Dear Sir, I am stealing your thunder, but it is only in
an effort to spread the "new gospel,"— & try & get the breeders
interested.   I thought I might be able to enlist a few
of the leading dailies,— but this senseless war occupies their
exclusive attention.   The Horseman has not been the help I
expected.   It has been busy with some squabbles of its own
stirring up.   These horse papers are simply miserable trade
advertising sheets,— & nothing appeals to them but a dollar.
I am sending this round to the various editors.   Two papers
promise to print it next week.— & I will have asked them to
mail you copies.   My tables on last years trotting— Year Book just
published, I have sent to several of the papers: & you will have a copy
of them if it is in MSS.   You can calculate the curve from my
figures I think, & it will be a saving of labor to you.
      I hope your health keeps up   Yours respectfully A.J. Weston

Allen Farm
Pittsfield. Mass: Novr 3d 1898

Francis Galton Esq
        Dear Sir,
            Your recent favor & the
three copies of the Memoir on Photographic
Measurements have been received & read
with much interest.   The publication
of your Memoir in several of the
leading papers, devoted to Live Stock
interests in this country would be of-
service to the cause: & with your
permission, I should like to give it to
them,— the papers printing it to make
special mention of the fact, that it
is published by your permission.   I
will, of course, do nothing until I hear

from you as to whether such a
publication would be agreeable to you.
& if not perfectly agreeable I should
not think of doing it.   The papers
I have in view as the best mediums
for bringing it before the right people
are: The Country Gentleman. (Albany N.Y)
            The Breeders Gazette (Chicago, Ills)
            The Horseman   "   "
& probably the Turf. Field & Farm of N.Y.
City.   If you approve of this, & can
furnish me 3 more copies, — then I can
prepare the matter (printed on one side
only, — for three of the papers, — &
arrange for simultaneous publication
in three papers.

        I made some preparations for
photographing several horses here, but

I regret to say, that the summer has passed without anything having been done. not I fear another example of the "better waiting on the good."

I am preparing an article on the "Relative Potency of Ancestors (to the 3d generation) of all the 2.10 Trotters, — measured according to the Galton Ancestral Law of Heredity" & if it amounts to anything, will publish it in "The Horseman" Xmas number & mail you a copy.

I should like to see a photograph or sketch of the instrument for measuring heights of animals without touching them. If not too intricate & expensive, there should be some Sale for such a contrivance, — as

its convenience would commend it
to many.

Thanking you for all the
favors you have done me, – & with
best wishes for the success of your
new line of investigation

I am.
Yours respectfully
A. J. Meston

Lord Moreton
  Sarsden House
    Chipping Norton
      Oxon

Sept. 25. 1898

Dear Sir

    I have read with much interest a short account of your paper on
photographic records of pedigree stock. I have been a breeder of stock
for 23 years and a photographer for nearly half that time and have given
a good deal of thought to the subject of your paper. The great difficulty
is that it is so easy to produce an absolutely untrue likeness of an
animal. I once had a bull whose head was larger than it ought to be. I
did two photos of him. One an honest one with the camera opposite the
middle of the body, the other with the camera shifted so as to bring his
head to proper proportions. To get absolutely reliable portraits I fear
that it would be necessary for them to be all done by the same man.
Personally I would not trust one professional photographer in a hundred.
The natural wish to make a 'picture' would be almost too strong in them.
When the Royal Agricultural Society was bringing out its Text Book in
1891 it was determined that the illustrations of stock should be taken
from photos of prize winners at the Show at Warwick. Knowing that if a
photographer was turned loose in the yard to do what he thought best
we should get most unsatisfactory results I undertook to see every photo
taken. I insisted on the camera being placed opposite the middle of the
animal and being at exactly the same distance from cattle and also at
same distance from all the sheep. This gives a sort of scale, as anybody
who is familiar with one sort of cow or sheep and can form a fair idea

Continued

of the size of the others. Once or twicw it has been suggested that

the Herd Book of the Shorthorn Society should be illustrated with

photographs. This I have fought hard against as I feel certain that

in most cases they would be even more unlike the animal than the mar-

vellous productions that aior the pages of the earlier volumes. The only

satisfactory way, I think, would be to appoint an official photogrpher

This would make the illustrations very costy I fear. To get photos

that would be scientific records for breeders to work from in the

future I think it would be necessary to have them done of the different

animals when they were at the same age. For instance a photo of a heifer

would not much resemble the same animal six or seven years after.

I must apologise for troubling you with this letter and can only say

that if I can be of any use to you in this matter I should be only

too proud.

I enclose two photos of my bull. not the one mentioned above. You will

notice the difference in size of head from a shift of position.

I remain

Yours truly

Moreton

F.3

Sarsden House
Chipping Norton
Oxon   Sept 28.   /98

Dear Mr Galton

        I am exceedingly obliged to you for your letter. I will

shortly return the two photos with the measurements for which you ask.

The account of your paper I read was in the Live Stock Journal and I

think not a good one. If you wish to experiment on cattle, mine are

at your disposal also a dark room and if you were to come down my

wife and myself would be delighted to welcome you. We are only two

hours from London. Long ago I had the idea of taking photos of all

my breeding stock but laziness I fear prevented my doing so. I have one

great difficulty in photoing my cows in the field viz, that they know

me so well that they come to lick me when my head is under the focussing

cloth. I doubt if you could ever get proper photos of pigs, unless you

could hypnotise them. Their snouts are always at work and they are queer

tempered things. I think it would be far better to get a few breeders

to meet together to explain your plan to. than to apply direct to the

breed societies. You must be careful who you invite. Some will try to

turn the whole thing into an advertisement. I have a very large acquain-

tance among breeders and know their weak as well as their strong points.

                I remain

                Yours truly

                Moreton

PRIVATE

Sarsden House
Chipping Norton
Oxon   Oct. 2.   /98

Dear Mr Galton

I have gone through the list of members of council of the following societies, viz. Royal Agricultural, Shire Horse & Shorthorn. On these councils are many men who would take an interest in your scheme and who would possibly help with money when it was really working, but who I fear would not take much trouble to help initiate it. Nine out of ten would say that in their opinion they had never seen a satisfactory photograph of an animal and would not have the technical knowledge to understand that if certain definite rules are followed the sun is not necessarily a liar. Unless a man had some slight experience of photography he would be rather a mill stone round the neck of any committee. I ought to except from this rather strong statement men, who have had a training in any science, men who are able to realise that scientific theories may be facts without their being able to thoroughly understand them.

I confess that I do not think there is any prominent breeder on the councils of the above named societis who would be of any use to you at first. I am almost inclined to think that the best plan would be to get together a very small committee to start the scheme, of people not of necessity breeders, but who would take a great interest in the work and whose names would carry scientific or other weight with the world. Sir Walter Gilbey would enter heartily into the matter, I feel certain.

2.

Sir Jacob Wilson and Sir W. Gilbey, to use a vulgar expression, run in
couples. I have heard remarks made about this and the idea expressed
that the object of this is in the end the furtherance of their own
interests. I mention this as I think it would be unwise to ask both
to act. Sir Jacob could give his name but not his time. Sir W. if he
got bitten with the idea, would give name, time, and money. Moreover
he is the largest proprietor of the Live Stock Journal. A most important
matter. Housman is a dreamy man with a rather philosophic mind. He has
given more attention to the scientific side of stock breeding than most
men, and has been a prolific writer on the subject. I do not know where
he lives. If far from London, I fear that possibly railway expenses
might be a difficulty. There is another well known writer and authority
on some matters , Tegetmeyer. I do not know him personally and can only
say that he has a great reputation. The Duchess of Bedford has gone in
for experiments in hybridysing animals, I am told. I do not feel at all
sure that the Duke might not be worth thinking of. He is not a stock
breeder in the strict sense of the word. But in your scheme there is
just enough science to interest a Russell. I think with the exception of
the two names mentioned above press representation would be dangerous.
I would also shun any connection with the British Dairy Farmers Assoc.
I say this although I am a V. President. It is too much run by the
London trade. The Lincoln Red Shorthorn Society is also to be avoided.
This may sound like professional jealousy. This Society was founded to
register the pedigrees of the so called Lincoln Red Shorthorns. It was
done to catch the unwary foreigner who would not export unregistered ani
mals.

3.

Have you thought of enlisting the sympathies of any of the leading men at the Royal College of Veterinary Surgeons? The head men there are at the head of their profession not only as ~~th~~ regards ~~their profession in~~ England but as regards the world.

To sum up these rather disjointed notes I, so far, think that the plan most likely to gain success for your scheme in the long run would be get a small committee to start it and when it was started to get the press and the breed societies interested in it. As regards the R.A.S.E. No doubt a room would be put at your disposal for a preliminary meeting or meetings. Beyond this I do not think the Society would go, at all events at present. It would be felt that if any steps are taken, that those steps ought to be taken by what I may call specialist socities. One curious fact is that, as far as I can see, your scheme would not come within the scope of work of any of our Royal A. committees.

I hope to send up the photos tomorrow. Some I think will do. At the same time I do not think that any of them, with perhaps the exception of the donkey, are what I should, as a breeder, care for.

I rather fancy that placing the animal in mathematically correte positions seems to take the life out him. If I had had a cow walked past the bull you would have seen a transformation. His head would have been half a foot higher and every muscle would have been brought out.

Yours very truly

Moreton

42, RUTLAND GATE, S.W.

Dear Lord Moreton

Thank you exceedingly for your valuable (& private)
advice & ~~and~~ for the negatives
which I will follow; also
~~Which I have received this~~
morning ~~of which excellent the best~~ will follow
~~negatives of~~ bull & donkey
~~the advice~~ & have already been
printed. ~~the bull which~~ in
the 2 negatives ^they^ thus ~~for tried~~
came out exceedingly well and ~~seem are~~
quite suitable to serve as illustration
accompany
to private letters, & for are
at ~~office~~ & the like, to which

purpose I will apply them
(unless you object).

(I have been unable to
touch photography till to-day
& my own negatives are at this
moment undeveloped — I shall
know more later on   Also I
will see the effects of moderate
2 or 3 fold   enlargements.

As Mr. Houtman raised
some objection to the theory of my
plan in the last live Stock Journal
(which I have written a short
letter to prove to be quite untenable)
it might be better for me not to

approach Sir W. Gilberg till
the next No contain my reply, shall
have appeared. Moreover the
finally ~~touched~~ paper (of which you
saw the proof) has not yet reached me
I expect it daily and it would
be well to send it to Sir W Gilberg
when I write to ~~Eulitll~~ if I can,
his interest who would be most
serviceable. As I have not
the honor of his acquaintance
would it be too much to ask you
to kindly send him a line to
serve to introduce me & to prepare
him for the letter I should be
truly grateful if you would.

In the mean time, or independently,
I propose writing for photographic
suggestion to Sir David Salomons
I know well of him & of his numerous
inventions, papers, presidencies &c
though I do not know himself; if it is however
likely that he ~~also~~ know about me. So
I should not hesitate writing without
an introduction – I know & have
occasionally corresponded with & seen
Mr. Tegetmeier. I should
certainly greatly value the aid
of the Duke of Bedford who has,
indeed ~~given~~ apparently to carry on
~~at least my the member~~ some of the work of
his Royal Society "Evolution ettc."

49

Sarsden House

Chipping Norton

Oxon   Oct. 5.   /98

Dear Mr Galton

    I enclose a letter I have written to Sir Walter Gilbey.
Would you kindly read it and if you think that it will do will
you have it put into the post. Walter Rothschild is, as you know,
a naturalist. His father breeds stock of all kinds. Walter is likely
to take an interest in your scheme from a purely scientific point of
view. He would be of use in any preliminary movement. I think if you
were to write to him and say I had suggested your doing so it would
be all right. His address is

        Hon.
        Walter Rothschild

          Tring

At present I am unable to think of any other names.

      Yours very truly

        Moreton

Sarsden House
Chipping Norton
Oxon

Sunday. Oct.16. /98

Dear Mr Galton

John Thornton, the shorthorn auctioneer, has been staying
with me here and I had a long talk with him about your scheme.
I succeeded in interesting him in it and as far as I could,
explained it to him. He entirely agrees with me that it would be
useless to try and get breeders to initiate it but thinks that if
some start could be made and evidences of its utility placed before
them that they would probably take to it. One point he suggested
was that it would add immensely to the value of the photos if the
girth of the animal could be given. This is taken round the heart.
Of course this measurement depends greatly on the condition of the
animal. A little practice would enable the person measuring to
grade the animal as thin, medium or fat. Girth is a point shorthorn
breeders lay great stress on. I asked him to consider all my talk
with him as of a private nature. If a wafer was placed on both the
hip bones and that portion of the back measured across another useful
record might be obtained.

Yours sincerely

Moreton

Sarsden House

Chipping Norton

Oct. 19./98

Dear Mr Galton

You will find it difficult to get from one herd photos
of sire, dam, and adult progeny. A cow could hardly be called an
adult before the age of four years. If her father is in the same
herd this means that he has been there for not less than five years.
In many if not in most herds a bull is got rid of when his daughters
become old enough to breed. Of course in very large herds where
many stud bulls are kept this is not so much the case. Again
some like myself prefer to buy old bulls that have proved them-
selves good sires and in this case also the difficulty of finding
the different generations would be considerable. I should not be
surprised if the Alnwick herd gave you what you seek. You will
find it easier to get photos of female produce than of male.
Nearly every shorthorn bull is parted with before he is 18 months
old. It used to be 12 months but the Argentina buyers have raised
the age. They find the younger bulls are too keen when turned out
and work themselves to death. Whereas the older bulls take life
more seriously

Yours very truly

Moreton

Sarsden House
    Chipping Norton
        Oxon

Nov. 8. 1898

Dear Mr Galton
        I am sorry to hear that Sir Walter Gilbey will be unable
to give you active assistance, still his sympathy is worth a
good deal. What he says about the best sires not being seen at
shows is no doubt true. The same applies to shorthorns. Though
more perhaps in the past than in the present. When cattle were
worth more than they are now it would have been utter madness to
have fatted a valuable sire up for show purposes. Now times are
altered. The foreign trade is what we have to depend on. The
foreign buyers are fond of buying show cattle and therefore bulls
that would probably turn into valuable sires, are I think, more
shown. Certainly it is not always the animal that takes a high
place in the show yard that turns out the most valuable for
stud purposes. Many of the great sires that I can remember would
have had no chance of gaining a prize. Something more than mere
outward looks are wanted to make an impressive sire. Unseen
qualities inherited from ancestors can hardly be awarded prizes.
Hubback, the father of shorthorns by all accounts was a rather
mean looking little bull. Every now and then a bull crosses the
shorthorn firmament that seems to have the power of getting
good stock all alike from any sort of dam. Such a one was Duke
of Connaught sold for over £4000. He however, good as his
daughters were, hardly got one really good bull. He was a rather
cowy looking bull about the head, and had only one testicle down.
The great fat brutes one sees in the shows are very often the
very bulls a breeder would not care to use, and are often under-
bred into the bargain. New Years Gift, a bull never beaten,
and sold by the Queen for £1000 was not a success as a sire,
grand bull though he was to look at. I was talking to a brother
in law of mine who is a master of hounds and he agreed that it
would not be difficult to photo hounds as they can be made to
stand still. If ever you want to have photos done he would I
know do all he could to assist.
                I remain
                Yours truly

                Moreton

Sarsden House
Chipping Norton

Nov. 10. 1898

Dear Mr Galton

As regards prepotency, I doubt if any animal lends itself more
to the study of this point than the shorthorn. For nearly a hundred
years they have been bred with extreme care, and for a long time the
pedigrees have been attended to and kept properly. There may be said
to be a really trustworthy written record of the breed for a very
long time. Even if one rejects many of the pedigrees, as one ought,
in the first volume of the Herd Book. For many years the Shorthorn
breed consisted of the two geat lines of Bates and Booth, kept sep-
arate with the greatest jealousy by their breeders, and what were
called mixed bred cattle. i.e. cattle that did not come under either
the B tes or Booth banner. Of late years another line must be added
viz. the Aberdeenshire shorthorn. When a shorthorn breeder speaks of
taking an outcross he means using a bull of one of these great divisions
on cows of another. For many years I doubt if there were any animals
alive with greate prepotential powers than Bates terribly closely
bred Dukes. Doubtless a good deal of this power remains, though I am
inclined to think that the necessity of putting slightly different
blood into their veins has impaired it. At the time they were most
closely bred they were said to have restored fertility to several
herds. Now they do not excel in this point. In cattle as in men
families seem to come to their prime and then th go downhill and in the
end disappear. I could name several tribes of shorthorns, numerous a
few years ago, that are almost extinct now. Theoretically one would
expect to produce a prepotent bull by carefully concentrating the
good qualities of his ancestors by close line breeding, in practice
one runs the great risk of also concentrating unseen physical weakness
I doubt if many loosely bred bulls have excelled in prepotency. Of
one thing I feel certain- that no one can possibly tell what bull will
be prepotent till the animal has been used and tried. I am inclined
to think that bulls with this gift or power are really very rare.
In three and twenty years I do not think I have come across a dozen.
                    Yours truly

                              Moreton

Garsden House
    Chipping Norton   Nov. 15.   1898

Dear Mr Galton
        Since I wrote to you the other day I have been thinking a
good deal about prepotency and in-breeding.One result is that I set
to work and did out the full pedigree of Duke of Connaught to the
tenth generation. Human life would hardly be long enough to work it
out to the very end.Thinking ,if you have a spare moment you might
like to see it, I am sending you the papers. You will see that I have
done D of C as far as I can on one paper and that the figures in RED
ink refer to the continuations of the pedigree on other forms. It
seems to me that in-breeding can hardly go further than it does in
this instance.
Duke of Connaught was bred by Lord Dunmore and purchased from him by
the late Lord Fitzhardinge for 4500 guineas. Large as this sum may
appear the bull was a good investment. Besides the good he did in
the Berkeley herd, he is credited with having/ earned 7000 pounds
in service fees.Probably no bull of modern times produced so many
good heifers, many of them almost invincible in the show yard. I
do not think that he was a good sire as regards his male progeny.
If you have the patience to look through the papers you will notice
that Bates used these bulls as crosses for his terribly in bred stock.
Norfolk. ½ cross. His father was bred by Bates
The Oxford blood. There is little doubt that Bates could have made
                out a longer pedigree for this line. If he had he
                would have had to own that Matchem cow was full of
                Masons blood. Bates had always run this line down,
                as was his way with other peoples animals, and
                therefore is supposed, on good evidence, to have kept
                the matter dark.
Belvedere An incestuously bred bull of the Princess tribe. A tribe
                older—probably than the Duchesses, and one that
                beginning as far as we know, in 1770 had been
                jealously and carefully bred.
Usurer. This cross was put on my grandfather, the late Lord Ducie.
                He was of Mason blood that Bates objected to and yet
                used.
Please do not trouble to return the papers
                    I remain
                        Yours truly

                        Moreton

Sarsden House
Chipping Norton
Oxon

Dec. 4. /98

Dear Mr Galton
        I do not know much about the Horse Breeding Com. in Ireland.
From what I see in the papers they seem to quarrel a good deal over
there as to whether they ought to encourage hackney stallions or not.
I do not know, but I think it may be quite possible that they would
not be allowed, by their charter or whatever it is, to go into the
business of publishing illustrations of their stallions and their
immediate ancestry. Probably you would find that the English Com.
had a freeer hand.
I am glad to hear that the Editor of the Live Stock Journal will print
photos of animals and their two parents. This seems like the thin end
of the wedge. As I think I said before the one thing you cannot put
into a photo is quality. That immensely important and immensely dif-
ficult thing to define on paper. Last Friday I was looking over a bull
that had taken a champion prize, with a view to seeing if he would do
to send a particular cow to. In outward form they ought to between
them produce something extra good. The moment I put my hand on him,
I knew, or thought I did, that his meat was of a most inferior quality.
        I wonder if you would mind telling me if your Natural Inheritance
is published in book form, or in the proceedings of some Society. I
have, I am ashamed to say, never read it and should much like to.
Although being abnormally stupid at mathematics, I can hardly hope to
understand it.
If any more full pedigrees of shorthorns would be of any interest to you
I could easily send you some. Now they have stopped me using the micro-
scope I have time on my hands at night.
Have you any idea through how many generations a peculiarity of one
ancestor can be handed down, or how many generations it will skip to
reappear again. The Hebrew nose and the Gipsey eye would be good
points to trace.
                    I remain
                    Yours very truly
                                    Moreton

I have lately been trying to get facts about cows holding to the bull
while suckling their calves. It is an interesting question, and I have
obtained a certain amount of information. I fear that I have impressed
some of my correspondents with the idea that my reason for enquiring is
that my cows are not breeding well. This is luckily not the case. In
Scotch herds it seems that cows while nursing come to calf all right.
This is rare in England. Why????

Sarsden House,
Chipping Norton.

Dec 10/98
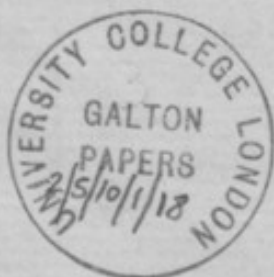
Dear Mr Galton

I returned home this
afternoon and found your
two books awaiting me. Please
accept my thanks for your
very kind present. Some day
I hope to trespass on your
kindness by asking you
to put your name in them

Yours very truly

Moreton

Sarsden House
   Chipping Norton
    Oxon

Dec. 15.   1898

Dear Mr Galton
       There is a point about shorthorn breeding that has been
a puzzle to me for a long time. I wonder if you can throw any light
on it.
If a cow is put, say two years running to the same bull, one would
expect the progeny in the two years to be of the same colour. The
colour of the parents and ancestors being, of course the same.
As a matter of fact the progeny do not always resemble each other
in colour.
This evening I took 100 cases of births in two successive years
by the same bull out of the same dam, out of the herd book. I
took them as they came, not counting twins. Out of this number
there are 50 cases of the same colour and 50 cases of different
colour.
I counted red and red and little white as different colours. I do
not think I ought to have done so. The rule is that white hair
that one can see is red and white, but that white along the belly
where it is not seen is still red. A calf therefore one year might
have a little white on the belly and the calf the next year might
have no white on the belly but the same number of white hairs on
the head. These two animals would really have the same amount of white
white but the one would be entered as red and the other as red &
white.
The only recognised colours for shorthorns are, and have been for
a very long time, red, red & white, roan, & white. In four cases
in my experience cream colour has appeared. Two of these cream
coloured cases traced to the herd of a man who was a confirmed
drunkard and I have always had a suspicion about the purity of their
breeding.
If by any unlikely chance the question, of why two parents should
                                has escaped your notice
have different coloured progeny, different coloured to such an
extent as they are in shorthorns, the problem may interest you.
If on the other hand you have thought at all about it, doubtless
you can enlighten me.
          I remain
          Yours very truly

             Moreton

Sarsden House
   Chipping Norton   Dec. 18.   1898
   Oxon

Dear Mr Galton
       On another sheet of paper I send you some more figures
relating to the colour of calves. As you will see I have taken
the colour of 1000 calves from the same volume as I have taken the
other figures from.

I should estimate the average relation of red to white a little
differently from your estimate. You hardly ever see an animal
in which the red and white are equal. (I mean in an animal classed
as red and white) Red almost always predominates.

Mr Galtons estimate		Ld Moretons estimate	
Red 1.0	0.0	Red 1.0	0.0
R & W. 0.5	0.5	R & W 0.7	0.3
Roan 0.5	0.5	Roan 0.5	0.5
White 0.1	0.9	White 0.1	0.9

Nearly every white animal, for some inscrutable reason, has some
red hairs in the ears.
           Yours sincerely

             Moreton

Dec 18ᵗʰ

COLOUR OF 1000 SHORTHORN CALVES TAKEN FROM VOL XXXV
OF THE HERD BOOK.

ROAN ~~446~~ 444
WHITE 82
RED 219
RED & WHITE 255

Note. Breeders have a strong prejudice against white cattle. This
will go far to explain the small number of them. Few ever
dare to use a white bull.
At present roan is the popular colour. Red-and-whites are
disliked by the buyers from Argentina. They say that the
red-and-whites get progeny too much like Herefords in their
colour.
Vol XXXV was published in 1888, before this latter feeling
had come into force.

From the same volume I took 100 calves, not counting the reds &
whites, born in two consecutive years by the same bull from the
same cow. The result is that I find that 72 calves are of the
same colour and that 28 are of different colour.
From the same volume and from the same part of it, (covering ½ (about?)
the same ground) I took 200 calves counting in the reds & whites.
The result is colours alike 108. Clours unlike 92.

Moreton
Dec. 18. /98

Sarsden House
Chipping Norton

Jan. 21. /99

Dear Mr Galton
        The only suggestion I can make is that something might be
said about shoes. Also particular attention should be drawn to the
importance of really correct measurement of height. This is most
important, as hackneys are taught to stand in an unatural position
with both hind and fore feet as far from each other as possible.
Also because men who have to do with horses are usually untrustworthy.
I should like to add that I am not a horse man. Apropos of this
C.Sutherland, the donkey expert, told me a few days ago that Americans
measure a donkey thus. They take hight at withers , say 14 hands.
Then as they say a donkey has no true withers they add one inch
for the withers that they say do not exist and call the animal 14.1
This odd system he says is thoroughly well recognised.
I do not know whether you have ever paid any attention to the ques-
tion of the possibility of controlling sex. A man is offering £500
if anybody can prove his system to be wrong. I bought his pamphlet
at the price of 2/6. I wrote a review, very short, of it yesterday
which I hope the Live Stock Journal will venture to publish. If
they do I may save people sending money to either a knave or a fool.
If you care to see the pamphlet I would lend it to you.
To go to quite another subject, but one which may interest you,as
so much attention is being drawn to it now. I tested 31 cattle with
tuberculin. For years I have been most careful about tuberculosis,
far more so I think I may say, than most people. Yet with all my
care ten have to be buried. If my herd has 30 per cent wrong Goodness
only knows what it must be in ordinary dairy herds. One curious
point is that my four most highly bred cattle came out of the ordeal
best. So much for high bred cattle being more delicate than mongrels.
I have to now alter my whole system of calf rearing. I intend that no
calf shall suck the mother and all be fed on boiled milk. All milk
used in the house will be sterilised. I must own I thought that the
cry against tuberculosis was a little overdone, that things were
not as bad quite as they were painted. Now I give in. For 24 years
I have tried for constitution and yet I must confess myself beat.
This latter clause please consider of a private nature, or rather
please do not mention my name.Now my life will be a fight against
this terrible curse and if I live long enough I hope to overcome it.
As a beginning I have ordered 5 gallons of carbolic acid!!
        Yours very truly

                    Morton

Farsden House
Chipping Norton   Feb. 14.   1899

Dear Mr Galton

        I am delighted to hear of your success about the photographs.

Now you have got the socities interested the scheme ought to go ahead.

                                    it
Directly people understand about ʌ which they will hardly do until they

have something to look at, they will I think take it up.

We have had nothing but gales of wind and torrents of rain last night

the wind smashed a thick pane of glass in a window as if it had been

tissue paper.

        Yours very truly

                    Moreton

Duke of Connaught 33604 Roan, 1874	Duchess 108					
		Duchess 101	Duke of York 8. 28480	Duchess 84	Duchess 72	Duchess 67 (1)
						Duke of Oxford 4. 11387 (2)
					Archduke 14099	Duchess 69 (3)
						Duke of Cambridge 12742 (4)
				Duke of Thorndale 4 17750	Duchess 66	Duchess 55 (5)
						Duke of York 4. 10167 (6)
					Duke of Glo'ster 11382	Duchess 59 (7)
						Grand Duke 10284 (8)
				Duchess 86	Duchess 70	Duchess 66 (9)
						Duke of Gloster 11382 (10)
					Grand Duke of Wetherby 17997	Duchess 67 (1)
						Duke of Oxford 6. 12765 (12)
				Duke of Thorndale 4 17750	Duchess 66	Duchess 55 (5)
						Duke of York 4. 10167 (6)
					Duke of Glo'ster 11382	Duchess 59 (7)
						Grand Duke 10284 (8)
		Duke of Hillhurst 28401	Duke of Thorndale 10 28454	Duchess 92	Duchess 84	Duchess 72 (11)
						Archduke 14099 (13)
					Duke of Oxford 4. 11387	Oxford 6 (14)
						Grand Duke 10284 (8)
				Duke of Wharfdale 3. 21819	Duchess 86	Duchess 70 (15)
						Grand Duke of Wetherby 17997 (16)
					Duke of Wharfdale 2 19649	Duchess 73 (17)
						Duke of York 7. 17754 (18)
				Duchess 97	Duchess of Thorndale 3	Duchess 66 (9)
						Duke of Gloucester (10) 11382
					Grand Duke 2. 12961	Duchess 64 (19)
						Duke of York 4. 10167 (6)
				Duke of Thorndale 10 28454	Duchess of Thorndale 4	Fordham Duchess (20)
						Grand Duke 2. 12961 (21)
					Baron of Oxford 23371	Oxford 13. (22)
						Duke of Gloster 11382 (10)

Duchess 67. (1)

Duchess 59	Duchess 51	Duke of Northumberland 2. 3646	Duchess 41
			Cleveland Lad 3407
		Oxford 2	Duchess 34
			Belvedere 1706
Duchess 56	2nd Duke of Oxford 9046	Duke of Northumberland 2. 3646	Matchem Cow
			Short Tail 2621
			Duchess 34
			Belvedere 1706
	Cassandra mason blood	Gold mason blood	No 25 mason blood
			William 2840 mason blood
		Oronles 4623 mason blood	Welcome mason blood
			William 2840 mason blood
	Usurer 9763	Lord Warden 717 mason blood	———
			Jop 3820
		Duke of Cornwall 5947	Lily
			Duke of Northumberland 4 3649

Right-hand ancestor column (F.24):

- Duchess 32 — Duchess Tribe
- Belvedere 1706 — Princess Tribe
- Matchem Cow — Oxford Tribe
- Short Tail 2621 — Duchess Tribe
- Duchess 24 — Ditto
- Belvedere 1706 — Princess Tribe
- Angelina 2 — Ditto
- Waterloo 2816 — Ditto
- ——— — Oxford Tribe
- Matchem 2281 — mason blood
- Duchess 32 — Duchess Tribe
- Belvedere 1706 — Princess Tribe
- Duchess 24 — Duchess Tribe
- Belvedere 1706 — Princess Tribe
- Angelina 2 — Ditto
- Waterloo 2816 — Ditto
- ——— — mason blood
- Richard 1376 — mason blood
- No 19 — mason blood
- Magog 2246 — mason blood
- No 19 — mason blood
- Firly 1040
- No 19 — mason blood
- Magog 2246 — mason blood
- ———
- Rufus 2576
- Gaudy
- Woodford 2854
- Sally
- Young St Leger 2585
- Duchess 34 — Duchess Tribe
- Short Tail 2621 — Duchess Tribe

Pedigree (horizontal, read left → right)

Duke of Oxford 4. 11387 (2)	Oxford 6	Oxford 2.	Matchem Cow.	Matchem 2281
				—
				Young Wynyard 2859
			Short Tail 2621	—
				Duchess 32
				Bonny Face 807 or St. Albans 1412
				Duchess 29
				Hubback 2nd 1423
				Belvedere 1706
				Angelina 2
				Waterloo 2816
		Duke of Northumberland 2nd 3646	Duchess 34	Duchess 29
				Duchess 20
				Hubback 2. 1423
				Belvedere 1706
				Angelina 2
				Waterloo 2816
			Belvedere 1706	Angelina
				Young Wynyard 2859
				Angelina
				Young Wynyard 2859
			Waterloo 2816	Duchess 19
				Belvedere 1706
	Grand Duke 10284	Duchess 55	Duchess 38	Duchess 33
				Nonpareil
				Hubback 2nd 1423
			Norfolk 2377	Duchess 29
				Belvedere 1706
			Duchess 34	Duchess 32
				Belvedere 1706
			Short Tail 2621	—
				Young Wynyard 2859
		Cleveland Lad 2nd 3408	Matchem Cow	Matchem 2281
				—
				Bonny Face 807 or St. Albans 1412
			Short Tail 2621	Duchess 29
				Hubback 2nd 1423
				Duchess 32
				Angelina 2
			Belvedere 1706	Waterloo 2816

Pedigree chart (Shorthorn "Duchess" line)

Generation 1
- Duchess 69 (3)

Generation 2
- Duchess 59
- Duke of York 4. 10167

Generation 3
- Duchess 56
- Duke of Oxford 9046
- Duchess 51
- Duke of Northumberland 1940

Generation 4
- Duchess 51
- Duke of Northumberland 3646
- Oxford 2
- Duke of Northumberland 1940
- Duchess 41
- Cleveland Lad 3407
- Oxford 2
- Duke of Northumberland 3646

Generation 5
- Duchess 41
- Cleveland Lad 3407
- Duchess 34
- Belvedere 1706
- Matchem Cow
- Short Tail 2621
- Duchess 34
- Belvedere 1706
- Duchess 32
- Belvedere 1706
- Matchem Cow
- Short Tail 2621
- Matchem Cow
- Short Tail 2621
- Duchess 34
- Belvedere 1706

Generation 6 (ancestry notes)

Group 1
- Duchess 32
- Belvedere 1706
- Matchem Cow
- Short Tail 2621
- Duchess 29
- Belvedere 1706
- Angelina 2
- Waterloo 2816

Group 2
- Matchem 2281
- Duchess 32
- Belvedere 1706
- Duchess 29
- Belvedere 1706
- Angelina 2
- Waterloo 2816
- Duchess 19
- Hubback 2. 1423
- Angelina 2
- Waterloo 2816

Group 3
- Matchem 2281
- Duchess 32
- Belvedere 1706

Group 4
- Matchem 2281
- Duchess 32
- Belvedere 1706
- Duchess 29
- Belvedere 1706
- Angelina 2
- Waterloo 2816

			Cambridge Premium Rose	Red Rose 9
				Belvedere 1706
		Cambridge Rose 2	Belvedere 1706	Angelina 2
				Waterloo 2816
				—
		Cleveland Lad 2 3408	Matchem Cow	Matchem 2281
				Duchess 32
	Cambridge Rose 5		Short Tail 2621	Belvedere 1706
				Duchess 32
			Duchess 41	Belvedere 1706
		Duchess 51		Matchem Cow
			Cleveland Lad 3407	Short Tail 2621
				Duchess 29
	Duke of York 3 10166		Duchess 34	Belvedere 1706
		Duke of Northumberland 4. 3649		Duchess 32
			Short Tail 2621	Belvedere 1706
Cambridge Rose 7			Duchess 33	Duchess 19
				Belvedere 1706
		Duchess 38	Norfolk 2377	Nonpareil
				Hubback 2. 1423
			Duchess 34	Duchess 29
	Grand Duke 10284			Belvedere 1706
		Duke of Northumberland 4. 3649	Short Tail 2621	Duchess 32
Duke of Cambridge 1274				Belvedere 1706
(4)			—	—
		Duchess 55		Young Wynyard 2859
			Matchem 2281	—
		Matchem Cow		Bossy Face 807 or St Albans 1412
			Duchess 32	Duchess 19
		Cleveland Lad 2. 3408		Hubback 2. 1423
		Short Tail 2621	Belvedere	Angelina 2
				Waterloo 2816

Duchess 55. (5)	Duchess 38	Duchess 33	Duchess 19	Duchess 12	Duchess 4
					The Earl 646
				Hubback 2. 1423	Red Rose 1
					The Earl 646
			Belvedere 1706	Angelina 2	Angelina
					Young Wynyard 2859
				Waterloo 2816	Angelina
					Young Wynyard 2859
		Norfolk 2377	Nonpareil	—	—
					North Star 459
				Magnet 2240	Young Sally
					North Star 459
			Hubback 2. 1423	Red Rose 1	American Cow
					Yarborough 705
				The Earl 646	Duchess 3
					Duke 226
	Duke of Northumberland 4 3649	Duchess 34	Duchess 29	Duchess 20	Duchess 8
					The 2nd Earl 1511
				Hubback 2. 1423	Red Rose 1
					The Earl 646
			Belvedere 1706	Angelina 2	Angelina
					Young Wynyard 2859
				Waterloo 2816	Angelina
					Young Wynyard 2859
		Short Tail 2621	Duchess 32	Duchess 29	Duchess 12
					Hubback 2. 1423
				Hubback 2. 1423	Red Rose 1
					The Earl 646
			Belvedere 1706	Angelina 2	Angelina
					Young Wynyard 2859
				Waterloo 2816	Angelina
					Young Wynyard 2859

Duke of York 5. 10167 (6)

- **Duchess 56**
  - **Duchess 57**
    - **Duchess 41**
      - Duchess 32
        - Duchess 19
        - Hubback 2 – 1423
      - Belvedere 1706
        - Angelina 2
        - Waterloo 2816
    - **Cleveland Lad 3407**
      - Matchem cow
        - Matchem 2281
      - Short Tail 2621
        - Duchess 32
        - Belvedere 1706
  - **Duke of Northumberland 2c 3646**
    - **Duchess 34**
      - Duchess 29
        - Duchess 20
        - Hubback 2. 1423
      - Belvedere 1706
        - Angelina 2
        - Waterloo 2816
    - **Belvedere 1706**
      - Angelina 2
        - Angelina
        - Young Wynyard 2859
      - Waterloo 2816
        - Angelina
        - Young Wynyard 2859

- **Duke of York 3. 10166**
  - **Duchess 57**
    - **Duchess 41**
      - Duchess 32
        - Duchess 19
        - Hubback 2 1423
      - Belvedere 1706
        - Angelina
        - Waterloo 2816
    - **Cleveland Lad 3407**
      - Matchem Cow
        - Matchem 2281
      - Short Tail 2621
        - Duchess 32
        - Belvedere 1706
  - **Duke of Northumberland 4**
    - **Duchess 34**
      - Duchess 29
        - Duchess 20
        - Hubback 2. 1423
      - Belvedere 1706
        - Angelina 2
        - Waterloo 2816
    - **Short Tail 2621**
      - Duchess 32
        - Duchess 19
        - Hubback 2. 1423
      - Belvedere 1706
        - Angelina 2
        - Waterloo 2816

			Duchess 32	Duchess 19	
				Hubback 2. 1423	
			Belvedere 1706	Angelina 2	
				Waterloo 2816	
		Duchess 41	Matchem Cow	————	
				Matchem 2281	
			Short Tail 2621	Duchess 32	
		Cleveland Lad 3407		Belvedere 1706	
			Duchess 24	Duchess 6	
	Duchess 57			Hubback 2. 1423	
		Duchess 34	Belvedere 1706	Angelina 2	
				Waterloo 2816	
			Angelina 2	Angelina	
				Young Wynyard 2859	
		Belvedere 1706	Waterloo 2816	Angelina	
Duchess 59 (7)		Duke of Northumberland 2 3646		Young Wynyard 2859	
	Duchess 56		————	Young Wynyard 2859	
				————	
			Matchems 2281	Bonny Face 807 or St Alban 1412	
		Oxford 2		Duchess 19	
			Duchess 32	Hubback 2. 1423	
				Angelina 2	
		Short Tail 2621	Belvedere 1706	Waterloo 2816	
				Duchess 6	
		Duke of Oxford 2. 9046	Duchess 24	Hubback 2. 1423	
				Angelina 2	
		Duchess 34	Belvedere 1706	Waterloo 2816	
				Angelina	
		Duke of Northumberland 1940	Angelina 2	Young Wynyard 2859	
		Belvedere 1706		Angelina	
			Waterloo 2816	Young Wynyard 2859	

f. 31

Grand Duke 10284 (8)

Duchess 55

Duchess 38 — Duke of Northumberland 4. 3649

Cleveland Lad 2. 3608

Duchess 33

Norfolk 2377

Duchess 34

Short Tail 2621

Matchem Cow — Matchem 2281

Duchess 32

Belvedere 1706

Duchess 19

Belvedere 1706

Nonpareil

Hubback 2. 1423

Duchess 29

Belvedere 1706

Duchess 32

Belvedere 1706

———

Young Wynyard 2859

———

Bonny Face 807 or St. Albans 1412

Duchess 19

Hubback 2. 1423

Angelina 2.

Waterloo 2816

Duchess 1? — Hubback 2. 1423
Angelina 2 — Waterloo 2816
———
Magnet 2240
Red Rose 1. — The Earl 646
Duchess 20 — Hubback 2. 1423
Angelina 2 — Waterloo 2816
Duchess 19 — Hubback 2. 1423
Angelina 2 — Waterloo 2816
——— ———
Princess — Wellington 680
——— Farmer 251
Duchess 12 — Hubback 2. 1423
Red Rose 1 — The Earl 646
Angelina — Young Wynyard 2859
Angelina — Young Wynyard 2859

Duchess 66. (9)

			Duchess 33	Duchess 19	Duchess 12
					Hubback 2. 1423
				Belvedere 1706	Angelina
					Waterloo 2816
		Duchess 38	Norfolk 2377	Nonpareil	——
					Magnet 2240
				Hubback 2. 1423	Red Rose 1
					The Earl 646
	Duchess 55	Duke of Northumberland 4 3649	Duchess 34	Duchess 29	Duchess 20
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
			Short Tail 2621	Duchess 32	Duchess 19
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
			Duchess 41	Duchess 32	Duchess 19
					Hubback 2. 1423
				Belvedere 1706	Angelina 2.
					Waterloo 2816
			Cleveland Lad 3407	Matchem Cow	——
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
	Duke of York 4 - 10167	Duke of Oxford 2 9046	Oxford 2	Matchem cow	——
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
			Duke of Northumberland 1940	Duchess 34	Duchess 29
					Belvedere 1706
				Belvedere 1706	Angelina 2
					Waterloo 2816

				Duchess 41	Duchess 32
					Belvedere 1706
		Duchess 51	Duke of Northumberland 2. 3646	Cleveland Lad 3407	Matchem cow
					Short Tail 2621
	Duchess 56			Duchess 34	Duchess 29
					Belvedere 1706
				Belvedere 1706	Angelina 2
					Waterloo 2816
					————
		Duke of Oxford 2 9046	Duke of Oxford 2	Matchem cow	Matchem 2281
					Duchess 32
			Duke of Northumberland 1949	Short Tail 2621	Belvedere 1706
					Duchess 29
				Duchess 34	Belvedere 1706
Duchess 59					Angelina 2
				Belvedere 1706	Waterloo 2816
					Duchess 19
				Duchess 33	Belvedere 1706
Duke of Gloucester 11382 (10)		Duchess 38	Duke of Northumberland 2. 3649	Norfolk 2377	Nonpareil
					Hubback 2, 1423
				Duchess 34	Duchess 29
					Belvedere 1706
	Grand Duke 10284			Short Tail 2621	Duchess 32
					Belvedere 1706
				————	————
		Duchess 55	Matchem cow		Young Wynyard 2859
					————
				Matchem 2281	Bonny Face 807 or St. Albans 1412
			Cleveland Lad 2 3408		Duchess 29
				Duchess 32	Hubback 2. 1423
			Short Tail 2621		Angelina 2.
				Belvedere 1706	Waterloo 2816

Leftmost:
- Duchess 67
- Duchess 72. (11)

Next column:
- Duchess 59
- Warrior 9763
- Oxford 6
- Duke of Oxford 4. 11387
- Grand Duke 10284

Next column:
- Duchess 56
- Duke of Oxford 2. 9046
- Gold
- Lord Warden 7167
- Oxford 2
- Duke of Northumberland 2. 3646
- Duchess 55
- Cleveland Lad 3408

Next column:
- Duchess 51
- Duke of Northumberland 2 3649
- Oxford 2
- Duke of Northumberland 1940
- Cassandra
- Orontes 4623
- ——
- Duke of Cornwall 5947
- Matchem cow
- Short Tail 2621
- Duchess 34
- Belvedere 1706
- Duchess 38
- Duke of Northumberland 4 3649
- Matchem cow
- Short Tail 2621

Rightmost column:
- Duchess 41
- Cleveland Lad 3407
- Duchess 34
- Short Tail 2621
- Matchem cow
- Short Tail 2621
- Duchess 34
- Belvedere 1706
- No 25
- William 2840
- Welcome
- William 2840
- ——
- Fop 3820
- Lily
- Duke of Northumberland 4 3649
- ——
- Matchem 2281
- Duchess 32
- Belvedere 1706
- Duchess 24
- Belvedere 1706
- Angelina 2
- Waterloo 2816
- Duchess 33
- Norfolk 2377
- Duchess 34
- Short Tail 2621
- ——
- Matchem 2281
- Duchess 32
- Belvedere 1706

Duke of Oxford 6. 12,765 (12)	Oxford 11.				
		Oxford 6	Oxford 2	Matchem cow	___
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
			Duke of Northumberland 2 - 3646	Duchess 41	Duchess 32
					Belvedere 1706
				Cleveland Lad 3407	Matchem cow
					Short Tail 2621
			Duchess 51	Duchess 41	Duchess 32
					Belvedere 1706
				Cleveland Lad 3407	Matchem cow
					Short Tail 2621
		Duke of York 10167	Duke of Oxford 2 - 9046	Matchem cow	___
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
			Duchess 56	Duchess 51	Duchess 41
					Cleveland Lad 3407
				Duke of Northumberland 2 - 3646	Duchess 34
					Belvedere 1706
		Duchess 59	Duke of Oxford 2. 9046	Matchem cow	___
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
			Duchess 55	Duchess 38	Duchess 33
					Norfolk 2377
				Duke of Northumberland 2. 3649	Duchess 34
					Short Tail 2621
		Duke of Gloster 11382	Grand Duke 10284	Matchem cow	___
					Matchem 2281
				Short Tail 2621	Duchess 32
			Cleveland Lad Short Tail 2. 3408		Belvedere 1706

Pedigree chart (read left to right):

Archduke 14099 (13)

Duchess 69	Duchess 59	Duchess 56	Duchess 57	Duchess 41
				Cleveland Lad 3407
		Duke of Oxford 2. 9046	Duke of Northumberland 2 3646	Duchess 41
				Cleveland Lad 3407
			Matchem cow	———
				Matchem 2281
			Short Tail 2621	Duchess 32
				Belvedere 1706
	Duke of York 4 10167	Duchess 57	Duchess 41	Duchess 32
				Belvedere 1706
			Cleveland Lad 3407	Matchem cow
				Short Tail 2621
		Duke of Oxford 2 9046	Matchem cow	———
				Matchem 2281
			Short Tail 2621	Duchess 32
				Belvedere 1706
Duke of Cambridge 12742	Cambridge Rose 7	Cambridge Rose 5	Cambridge Rose 2	Cambridge Premium Rose
				Belvedere 1706
			Cleveland Lad 2. 3408	Matchem cow
				Short Tail 2621
		Duke of York 3. 10166	Duchess 57	Duchess 41
				Cleveland Lad 3407
			Duke of Northumberland 4 - 3649	Duchess 34
				Short Tail 2621
	Grand Duke 10234	Duchess 55	Duchess 38	Duchess 33
				Norfolk 2377
			Duke of Northumberland 4 - 3649	Duchess 34
				Short Tail 2621
		Cleveland Lad 2. 3408	Matchem cow	———
				Matchem 2281
			Short Tail 2621	Duchess 32
				Belvedere 1706

Matchem cow

Matchem 2281

Young Wynyard 2859

Princes
Wellington 680

Farmer 291

Bonny Face or St Albans 807 ... 1412

Oxford 2

Duchess 32

Duchess 19

Duchess 12
Hubback 2 . 1423

Hubback 2. 1423

Red Rose 1
The Earl 646 *Duchess Tribe*

Short Tail 2621

Belvedere 1706

Angelina 2

Angelina
Young Wynyard 2859

Waterloo 2816

Angelina
Young Wynyard 2859

Oxford 6 (14)

Duchess 34

Duchess 29

Duchess 20

Duchess 8
The Earl 2. 1511 *Duchess Tribe*

Hubback 2. 1423

Red Rose 1
The Earl 646

Belvedere 1706

Angelina 2

Angelina
Young Wynyard 2859

Waterloo 2816

Angelina
Young Wynyard 2859

Duke of Northumberland 2. 3646

Belvedere 1706

Angelina 2

Angelina

Anna Boleyne
Phenomenon 491

Young Wynyard 2859

Princes
Wellington 680

Waterloo 2816

Angelina

Anna Boleyne
Phenomenon 491

Young Wynyard 2859

Princes
Wellington 680

Duchess 70 (15)					
Duchess 66	Duchess 55	Duchess 38	Duchess 33	Duchess 33	Duchess 19
					Belvedere 1706
			Norfolk 2377	Nonpareil	
				Hubback 2. 1423	
		Duke of Northumberland 4. 3649	Duchess 34	Duchess 29	
				Belvedere 1706	
			Short Tail 2621	Duchess 32	
				Belvedere 1706	
	Duke of York 4. 10167	Duchess 51	Duchess 41	Duchess 32	
				Belvedere 1706	
			Cleveland Lad 3407	Matchem cow	
				Short Tail 2621	
		Duke of Oxford 2 9046	Matchem cow	—	
				Matchem 2281	
			Short Tail 2621	Duchess 32	
				Belvedere 1706	
Duke of Gloster 11382	Duchess 59	Duchess 56	Duchess 57	Duchess 41	
				Cleveland Lad 3407	
			Duke of Northumberland 2 3646	Duchess 34	
				Belvedere 1706	
		Duke of Oxford 2 9046	Oxford 2	Matchem cow	
				Short Tail 2621	
			Duke of Northumberland 1940	Duchess 34	
				Belvedere 1706	
	Grand Duke 10284	Duchess 55	Duchess 38	Duchess 33	
				Norfolk 2377	
			Duke of Northumberland 2 3649	Duchess 34	
				Short Tail 2621	
		Cleveland Lad 2 3408	Matchem cow	—	
				Matchem 2281	
			Short Tail 2621	Duchess 32	
				Belvedere 1706	

			Duchess 51	Duchess 41
				Cleveland Lad 3607
	Duchess 56	Duke of Northumberland 2 3646	Duchess 34
				Belvedere 1706
			Matchem cow	———
	Duke of Oxford 2. 9046			Matchem 2281
			Short Tail 2621	Duchess 32
Duchess 67				Belvedere 1706
		gold	Canandra	No 25
				William 2840
	Absener 9763		Oronta 4623	Welcome
				William 2840
		Lord Warden 7167	———	———
			Duke of Cornwall 5947	Fop 3820
				Lily
Grand Duke of Betherby 1754				Duke of Northumberland 4 3649
(6) (16)		Oxford 6	Oxford 2	Matchem Cow
				Short Tail 2621
	Oxford 11		Duke of Northumberland 2 3646	Duchess 34
				Belvedere 1706
		Duke of York 4. 10167	Duchess 51	Duchess 41
				Cleveland Lad 3407
			Duke of Oxford 2. 9046	Matchem cow
Duke of Oxford 6. 12765				Short Tail 2621
		Duchess 59	Duchess 56	Duchess 51
				Duke of Northumberland 2 3646
	Duchess 59		Duke of Oxford 2. 9046	Oxford 2.
				Duke of Northumberland 1940
		Grand Duke 10264	Duchess 55	Duchess 38
				Duke of Northumberland 2 3645
			Cleveland Lad 2. 3408	Matchem Cow
				Short Tail 2621

Duchess 38

Duke of Northumberland 4 3649

Duchess 51

Duke of Oxford 2. 9046

Duchess 56

Duke of Oxford 2. 9046

Duchess 55

Cleveland Lad 2 3408

Oxford 2

Duke of Northumberland 2 - 3646

Duchess 51

Duke of Oxford 2 9046

Duchess 56

Duke of Oxford 2 9046

Duchess 55

Cleveland Lad 2. 3408

Duchess 55
Duke of York 4 - 10167

Duchess 66

Duchess 59
Duke of Gloster 11382

Oxford 6
Duke of York 4 10167

Duchess 59
Grand Duke 10284

Duchess 70

Oxford 11

Duke of Oxford 6 - 12765

Duke of Gloster 11382
Grand Duke 10284

Duchess 73 (17)

Duchess 33

Norfolk 2377

Duchess 34

Short Tail 2621

Duchess 41

Cleveland Lad 3607

Matchem Cow

Short Tail 2621

Duchess 51

Duke of Northumberland 2 3646

Matchem cow

Short Tail 2621

Duchess 38

Duke of Northumberland 2 3646

Matchem cow

Short Tail 2621

Matchem cow

Short Tail 2621

Duchess 34

Belvedere 5706

Duchess 41

Cleveland Lad 3607

Matchem cow

Short Tail 2621

Duchess 51

Duke of Northumberland 2 3646 7940

Oxford 2

Duke of Northumberland 1940

Duchess 38

Duke of Northumberland 2 3646

Matchem cow

Short Tail 2621

(18)

Duke of York 17754					
Duchess 69	Duchess 59	Duchess 56	Duchess 57		Duchess 41
				Duke of Northumberland 2 3646	Cleveland Lad 3407
					Duchess 34
					Belvedere 1706
		Duke of Oxford 2 9046	Oxford 2		Matchem cow
					Short Tail 2621
			Duke of Northumberland 1940		Duchess 34
					Belvedere 1706
	Duke of York 4 10167	Duchess 57	Duchess 41		Duchess 32
					Belvedere 1706
			Cleveland Lad 3607		Matchem cow
					Short Tail 2621
		Duke of Oxford 2 9046	Oxford 2		Matchem cow
					Short Tail 2621
			Duke of Northumberland 1940		Duchess 34
					Belvedere 1706
Duke of Oxford 6 11765	Oxford 11	Oxford 6	Oxford 2		Matchem cow
					Short Tail 2621
			Duke of Northumberland 2 3646		Duchess 34
					Belvedere 1706
		Duke of York 4 10167	Duchess 57		Duchess 41
					Cleveland Lad 3607
			Duke of Oxford 2 9046		Oxford 2
					Duke of Northumberland 1940
	Duke of Gloster 11382	Duchess 59	Duchess 56		Duchess 57
					Duke of Northumberland 2 3646 +440
			Duke of Oxford 2 - 9046		Oxford 2
					Duke of Northumberland 1940
		Grand Duke 10284	Duchess 55		Duchess 38
					Duke of Northumberland 2 3464
			Cleveland Lad 2 3408		Matchem cow
					Short Tail 2621

Duchess 64 (19)	Duchess 55	Duchess 38	Duchess 33	Duchess 19	Duchess 12
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
			Norfolk 2377	Nonpareil	———
					Magnet 2240
				Hubback 2. 1423	Red Rose 1.
					The Earl 646 [Duchess Tribe]
		Duke of Northumberland 4 3649	Duchess 34	Duchess 29	Duchess 20
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
			Short Tail 2621	Duchess 32	Duchess 19
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
	Duke of Oxford 2. 9046	Oxford 2.	Matchem Cow	———	———
					Young Wynyard 2859
				Matchem 2281	———
					Bonny Face 807 or St Albans 1412
			Short Tail 2621	Duchess 32	Duchess 19
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
		Duke of Northumberland 1940	Duchess 34	Duchess 29	Duchess 20
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
			Belvedere 1706	Angelina 2	Angelina
					Young Wynyard 2854
				Waterloo 2816	Angelina
					Young Wynyard 2859

Fordham Duchess (20)					
Fordham Duchess (20)	Duchess 66	Duchess 55	Duchess 38	Duchess 33	Duchess 19
					Belvedere 1706
				Norfolk 2377	Nonpareil
					Hubback 2. 1423
			Duke of Northumberland 4 3649	Duchess 34	Duchess 24
					Belvedere 1706
				Short Tail 2621	Duchess 32
					Belvedere 1706
		Duke of York 4 10167	Duchess 51	Duchess 41	Duchess 32
					Belvedere 1706
				Cleveland Lad 3607	Matchem cow
					Short Tail 2621
			Duke of Oxford 2 9046	Oxford 2	Matchem cow
					Short Tail 2621
				Duke of Northumberland 1940	Duchess 34
					Belvedere 1706
	Grand Duke 2. 12901	Duchess 64	Duchess 55	Duchess 38	Duchess 33
					Norfolk 2377
				Duke of Northumberland 4 3649	Duchess 34
					Short Tail 2621
			Duke of Oxford 2. 9046	Oxford 2	Matchem cow
					Short Tail 2621
				Duke of Northumberland 1940	Duchess 34
					Belvedere 1706
		Duke of York 4. 10167	Duchess 51	Duchess 41	Duchess 32
					Belvedere 1706
				Cleveland Lad 3607	Matchem cow
					Short Tail 2621
			Duke of Oxford 2. 9046	Oxford 2	Matchem cow
					Short Tail 2621
				Duke of Northumberland 1940	Duchess 34
					Belvedere 1706

Grand Duke 2 ·12961 (21)	Duchess 64	Duchess 55	Duchess 38	Duchess 33	Duchess 19
					Belvedere 1706
				Norfolk 2377	Nonpareil
					Hubback 2. 1423
			Duke of Northumberland 4 3649	Duchess 34	Duchess 24
					Belvedere 1706
				Short Tail 2621	Duchess 32
					Belvedere 1706
		Duke of Oxford 2. 9046	Oxford 2	Matchem cow	——
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
			Duke of Northumberland 1940	Duchess 34	Duchess 29
					Belvedere 1706
				Belvedere 1706	Angelina 2
					Waterloo 2816
	Duke of York 4. 10167	Duchess 51	Duchess 41	Duchess 32	Duchess 19
					Hubback 2. 1423
				Belvedere 1706	Angelina 2
					Waterloo 2816
			Cleveland Lad 3607	Matchem cow	——
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
		Duke of Oxford 2. 9046	Oxford 2	Matchem cow	——
					Matchem 2281
				Short Tail 2621	Duchess 32
					Belvedere 1706
			Duke of Northumberland 1940	Duchess 34	Duchess 29
					Belvedere 1706
				Belvedere 1706	Angelina 2
					Waterloo 2816

Oxford 13. (22)

Oxford 5

Oxford 2

Matchem Cow
- Matchem 2281
  - Young Wynyard 2859
  - Bonny Face 807 or St. Albans 1412
- Duchess 32
  - Duchess 19
  - Hubback 2. 1423

Short Tail 2621
- Belvedere 1706
  - Angelina 2
  - Waterloo 2816
- Duchess 24
  - Duchess 6
  - Hubback 2. 1423

Duchess 34
- Belvedere 1706
  - Angelina 2
  - Waterloo 2816
- Angelina 2
  - Angelina
  - Young Wynyard 2859

Belvedere 1706
- Waterloo 2816
  - Angelina
  - Young Wynyard 2859
- Duchess 32
  - Duchess 19
  - Hubback 2. 1423

Duke of Northumberland 1940
- Belvedere 1706
  - Angelina 2
  - Waterloo 2816

Duchess 41
- Matchem Cow
  - Matchem 2281
  - Duchess 32
  - Belvedere 1706
- Short Tail 2621

Duchess 57
- Cleveland Lad 3407
- Duchess 29
  - Duchess 20
  - Hubback 2. 1423

Duke of York 3. 10166
- Belvedere 1706
  - Angelina 2
  - Waterloo 2816
- Duchess 32
  - Duchess 19
  - Hubback 2. 1423

Duke of Northumberland 4 3649
- Short Tail 2621
- Belvedere 1706
  - Angelina 2
  - Young Wynyard 2859

f. 15

29 Oct. 1897.

Magdalene College.
Cambridge.

My dear Galton

Memory is seldom accurate & that which bears reference upon is, I am sorry to say, no exception. No doubt it originated in the fact that I have long used the Canary-bird as one of the few cases ^of^ domesticated animals with whose history we are thoroughly acquainted, so that it can be regarded as a "known quantity" in a certain mathematical illustration of the evolution of species — Beyond this I have never

force, and though I think it likely
enough that in the case of
pigeons birds there may be some
scrupulously kept pedigrees, I
can not say whether it is so. It
might not be too difficult to find
out, through some of the officials
of the many pigeon-bird Shows.
The amount of variation shewn
by the different breeds is notoriously
Great; and, in your hands, I think
it might be capable of numerical
expression — at any rate it would
be worth Trying — If I could keep

Ten further I would gladly do it,
but at present I do not see that
I can, for I have no acquaintance
among breeders of Canary-birds,
and it is many years since I
went to a Bird-show, meanwhile
I remain

Yours very truly
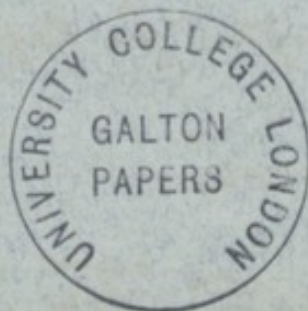
Alfred Newton

SPRINGFIELDS,
ALSAGER.
CHESHIRE.

Oct 10th 1898

Dear Sir

I have read with much "intrest" your letter in the "Live Stock Journal" And I should bee glad to know if I can help you In any way I am nearly 15 yrs and have been collecting Portraits, plates, etc of Pedigree (not photograph' but from papers) Stock for about 4 years. I have now about 2000 (different) portraits as well as many of the same animal at different ages - and fои different possisitions I have many old portraits of Stock and I have portraits

If I can help you in any
way, I shall be only toglad
If you like I will send you
a list of photographs taken
by C Reid price 1/ size cabinet
who I think Is one of the
very best stock photographers
Kindly reply

I remain
yours Very truly
G.H.Parsons

F Galton Esq

42 Rutland Gate

I have portraits of
        Shorthorn bull Comet
        and the first Smithfield
        Champion (hundred yrs ago)
            (ox

of all the noted Races
Horses I have been most-
careful as to accurated ped
-igree, age, name and weight etc and
have spent a large amount
of time and money in getting
a nearly compleat collection
and I have had some portraits
speicaly reprinted

Why I took to this form of
a hobby Is that I am interested
In pedigree stock and I think
that a collection of this
kind will be of great intrest
in them time, I have spent
a lot in oblaining old papers
and If you have any portraits
or old (before or 1889) L S Journals for
Sale I should be glad to
buy

G.H. Parsons

SPRINGFIELDS,
ALSAGER,
CHESHIRE.
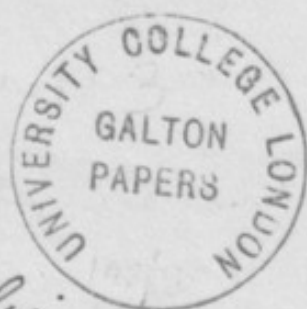
Dear Sir

Thank you very much
for the most interesting book
you sent me.

The reason I took to collecting
Portraits of Pedigree Stock
was that- I am very fond of
Cattle Horses ate and I though
It would be an interesting
hobby I only have Cattle
Horses Sheep & Pigs. in
my Collection.

.How I get the portraits, is
by getting the illustrated
papers likely to contain
portraits Stock papers

etc I have had the vols
of the L.S. Journal since
1886 given to me and I now
have the portraits from it
every week, I have had
all or nearly all the "Racing
Illus" &c besides many others
others papers, My collection
shows the rise in the reproduction
of portraits of Animals
Firstly & the rude sketchs mostly
escagerated then a gradual
improvment in. drawings
and then Drawings of Photos
(I some cases I have a reproduction
of photo and a drawing of it)
and lastly the escelent
reproduction which is now
used I think the L. S Journal
Pictures as good as any

published and I have nearly
all their "Summer Number"
Coloured plates.

Do you think the collection
of any use?

And you will do me a great-
if you can inform me of any
one who has a copy of Vol 1 (1874
~~first half~~) Illus sporting & dramatic
newse fore Sale? I have been
trying to get a copy for a long
time

Have you any old Illus Stock
Papers for Sale? Kindly say

I have not been at a bording
School, but go to a school
about 2 miles away

I remain

Yours very truly

G H Warson

I have had no one to help
me

P.S.

I have to be most particular
a mistakes in papers.
often occur

I do not keep my collection
in albums but in a large
oak chest specialy made.

I have never lost any without
being able to obtain them
again

Another thing I think ~~which~~
is most confusing and
that is so many animals
of the same name without
even 2ⁿᵈ or 3ʳᵈ behind

Park Farm. Alnwick
Sep. 22. 1898
—

Patton (see also Ed Wheler)
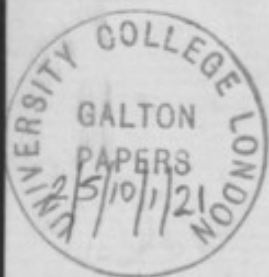
E. G. Wheler Esq

Sir. I beg to return "Photographic
records of pedigree Stock" by
Sir Francis Galton, which
I have read with much
interest.

For some years past as
a fancy & sort of memento,
photographs of a few of our
best animals have been taken,
and though now & again I
have shown them to buyers of

animals revert very much to
their grandsires & grandams,
both in form & colours, as if (for
I must not be heterodox) they con-
contributed even more than 16 each
to the "total heritage of the offspring",
striking instances having come
under my notice of the close likeness
of a heifer to the sires' dam.
Prepotency, to which Sir Francis
refers is also a most powerful
factor to be accounted for, an
inbred sire getting very much

of his own way.

Referring again to photography there
is certainly some difficulty in
obtaining a fair mental picture
of the united characteristics of

their descendants or relatives,
I can now see if this was
done systematically, it might
be more fully utilized in
the sale of animals.

Without the aid of photography
a purchaser as a rule only
sees the sire & dam of
the animal he may wish to
buy, & if he recognises, as a
breeder ought to do, the laws of
heredity, how very instructive
& assuring it would be to
see the photographs of at least
another generation or two.

The late Mr. Torr of Aylesby Manor
one of the best judges & successful
breeders of shorthorns used to say
"public sales of bulls are the bane
& curse of shorthorn breeding". By
this he meant a breeder who
purchased there, even a good
looking animal (which might only be
a "happy fluck") as a stock bull,
without seeing for himself the
sire or dam or any of the relations
of his purchase ran a great risk
of ruining his herd. Thus he
recognised the necessity of more
information than a printed cat-
-alogue affords, but which phot-
-ography might supply.
From experience I find

three or four generations by the
study of a number of photographs,
& if Composite photography can
be of and here something will
have been gained. But for all
practical purposes I think
a general survey of the phot.
-ographs would Enable a buyer
to form an approximately correct
judgment of the tribe he is buying
from. I may here take the
liberty of saying that while
photography shows the general
Contour of the animal, it
does not in any conclusive
degree determine the handling

under discussion,

I am, Sir

Your Obed Servt

John Patten

P.S.

I should be very glad if
I could have one of
these papers by Sir Francis Galton.

J.P.

or quality. The only index as to
this important point to be gathered
from a photograph would be
the appearance of hair, ^
if taken in summer there would
be little or none ~~to be~~ seen.
Neither could levelness of
flesh or otherwise be very
well determined by a photograph.
I just mention these points
as they occur to my mind.
Measurements will also be
of service, not so much per-
-haps in informing us as to
the actual size of the animal
as of its proportions. I

will just add that whether
or not Agricultural or other
societies heartily fall in with
the proposals of this paper,
it will have answered a good
purpose if it convinces breeders
generally that it be to their
interest to preserve both
by photography & measurements
more careful records of their
stock. Apologising for this
long letter, & fearing withal
it does not add much
information to the subject

Park Farm. Alnwick

Oct. 4. 1898

E. G. Wheler Esq

Sir,

I beg herewith to send you a copy of "The Live Stock Journal" which contains a criticism by Mr Housman on Sir Francis Galton's papers.

You may remember it was Mr. Housman, whom I mentioned to you as the sort of man to whom Sir Francis might write when he was working

out his idea in its Earlier
Stages.

Mr. Stranman is sceptical as
to the utility of composite
photographs, but is in
favour of it in its more
simple form, & thinks that
steps should be taken to
carry it into practice.

I am, Sir,
Your Obdt. Servt.

John Patten.

[J. Patten]

Park Farm. Alvinton

Oct. 19th 1898

Francis Galton Esq

Dear Sir.

In reply to your
letter of the 15th inst. I am
sorry I do not know of
any case of adult stock-
-horses, or even of colours
where the two parents and
four grandparents are
all alive. Such I fear
could not Easily be
found. The chief

difficulty would be to find
the grandsires both living,
bulls as a rule ceasing
to be useful at a much
Earlier age than cows give
up breeding.

In looking up the pedigrees
here, I find we have
2 bull calves 8 & 9.
months old, whose sire
& sires dam, dam and
grandam are living.

There are others some-
what similar, but they
show a break somewhere,

The subject you are
dealing with is a very
interesting one, and if
there is any practical
point on which I can
throw light, I shall
only be too happy to do
so.

Yours faithfully

John Patters.

adds my notes
on back

Park Farm. Alnwick
Nov. 4. 1898
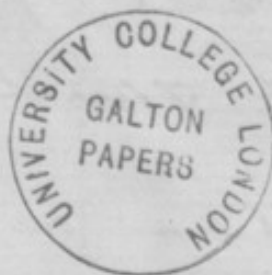
Francis Galton Esq

Dear Sir.

I beg to acknowledge the receipt of your letter of yesterday, & look forward to making your acquaintance on the 12th inst. & to hav- -ing a quiet look round with you the following week.

My boy has done a little in photography, but-

chiefly landscape. I
send however, as request-
ed, two or three of his
attempts at cattle.

He seems quite willing
to assist you the matter
you refer to, though I
believe his spare time
is greatly taken up with
preparation for some
examinations which take
place in the early part

of next year. If you
consider his work good
enough, I feel sure
there will be no difficulty
in coming to an arrangement
with him.

I am, dear Sir
Yours faithfully

John Watson.

1 & 2 Seem ... are ... quite as good as I can
reasonably expect. & will suffice
I must forego ... mathematical precision
at first.

No. 3 is quite good in proportion but being a dark
animal should have been taken in sunshine
otherwise no shadow can be seen

4 is slightly diagonal
5 much too diagonal

It wd be well if the plot where they stand
could be mown (of grass) or otherwise flattened
so as to show hoofs — { Attend to background being
suitable to colour of animal

Wanted (height at withers, to give a scale to the photo,
also   also girth round heart)

? as to scale — distance greater consequently scale smaller
Lord moreton is a minimum.

4 Negative & 2 prints f each; bearing private
Register No.

2. A book or sheet containing opposite each
register No. date of photographing
name & sex of animal
his or her no in the herd book
date of his or her birth
height at withers (? term)
girth round heart
Remarks

Those first needed are such as wd form family
groups — viz fairly adult offspring, its Sire & its dam
also the one case mentioned by mr Potter in which
parents & grand parents are all alive

The negatives are to belong to me ...

Arrangement to be made on foregoing basis.
photograph at leisure, ... want perhaps 100 in all

Patten

Park Farm. Almindly
Nov. 30. 1898.

Francis Galton Esq
Dear Sir:

My boy is anxious
I should write & tell
You that the exceedingly
dull weather we have
had of late, indeed Ever
since you left, has pre-
-vented him making any
headway with the Photo.
-ography. You may

ly on time embracing every
opportunity. I think those
he took where you were here
are fairly successful.

We are having a taste of
winter now, & hope for brighter
days. Hoping you are
quite well.

I am, dear Sir

Yours faithfully

John Pattison

f. 1

Park Farm,
Alnwick -
Dec. 16th 1898

Francis Galton, Esq.,

Dear Sir /

I am sorry I
have been so long in sending
you the first set of photos, here-
with enclosed; but as you are
aware the weather has been much
against photography and Sat-
urday afternoons have hitherto
been my only opportunities.

I trust the particulars
are all that you require, and
that you will detect the needle
pricks on the prints.

Father has told me to enclose

the photos. of two excellent sires, used here. but sold some time ago; they would complete (especially the white one) several sets. and our best heifer is by the roan from St. Ursula.

They were taken by a Swedish gentleman two years ago, & I fear there would be some difficulty in getting the negatives.

Father has also a photo. of the sire of Norse King, taken by an Alnwick photographer, (who will most likely have the negative) & as I have taken his (Norse King) dam, (the red cow you saw,) I hope it can be utilized.

Yours faithfully.

John Patten, Jun

f.3

Park Farm.
Alnwick.
Feb. 3rd 1899

Francis Galton Esq./

Dear Sir/

I am afraid you will
think I have quite forgotten the
Photography I undertook for you, but
now that the Exam. I was going in for
is over, I hope to be able to devote more
time to them. The weather also has
been against me, but that too will
doubtless soon improve :-

I have one or two prints which I
hope will be ready to send the end
of next week, including that of
St. Ursula 4.13, which I have taken
over again.

With kind regards.

I am.

Dear Sir.

Yours faithfully.

John Patten. Ju.

Francis Galton, Esq.

F.4

Park Farm.
Alnwick.
February 14th 1899.

Francis Galton, Esq./

Dear Sir,/

I am sending the photo. of St. Ursula
A13, as promised. It is not a very good
print, but is the best I can get from
the negative, which is rather "thin";
but I hope it will do.

I took 3 animals on Saturday, &
they have all turned out well. I hope
to let you have them, as well as the
other of St. Ursula in about a week's
time.

I am keeping all the negatives care-
fully, and think it will be better to
send them to you altogether, but if
you wish to have them at the same
time as the prints, I could do so.

The weather is much brighter, and
hoping it will remain so.

I am,
Yours faithfully,
John Patten, Jr.

42, Rutland Gate.
S.W.

f.6

Park Farm,
Alnwick.
Feb. 25th. 1899

Francis Galton. Esq./

Dear Sir,

I am forwarding you the photos. which I hope will suit you. You will notice in A 23 that the measuring staff is <u>just</u> seen and the number is not visible at all. Will this make any difference.? The reason is that the animal moved slightly from the centre of the camera, which I did not notice until I had developed the negative.

I am writing to the Swedish Gentleman to ask him for the negative of Highland Snowstorm. who is the sire of A 22 (Daisy's Perfection) & also of A 21 (Maréchal Niel). I hope to receive a reply from him soon.

Thanking you very much as regards money on a/c.: but I am not requiring any at present.

Yours faithfully.

John Patten. Jr.

42. Rutland Gate.
London. S.W.

Hulne Park.
Alnwick.
May 20th 1899

Francis Galton. Esq/

Dear Sir/

I beg herewith to send you
eleven 'sets' of photos.

I am sorry the particulars in
some cases are not quite so com-
plete as they ought to be, as, in
the pressure of work at the time
of the Sale two or three of the
measurements were neglected to be
taken. I hope, however, to obtain
most of those wanting in a short
time and also to forward you
more sets.

Yours faithfully,
John Pattern, Jr

42, Rutland Gate,
London. S.W.

Hulne Park.
Alnwick.
Northumberland.
July 5th 1899

Francis Galton. Esq.

Dear Sir/

I am sending on the remainder of the
photos. which I hope you will find all
right. You will notice that the numbers
on two or three of the prints have been
scratched out and another number put
in the place of the original one, — this is
due to the fact that, by mistake, I took
one or two animals which did _not_ make
up a set, and in order to keep up the
rotation, I had to resort to this method.

I am sorry there are still a few
measurements. which I am unable to get.
but hope you will be able to manage
without them.

I will send on the negatives in about
a weeks time, as I would like to take
some prints from them for myself before
they go. I will label them with their
numbers as requested.

Sorry to have kept you waiting so
long:
I am.
yours faithfully,
John Patten. Jr

Hulne Park.
Alnwick.
Northumberland,
July 8th 1899.

Francis Galton. Esq;
                 Dear Sir,

I am sending on my account together
with the negatives as requested. Should
there be any mistake of course you
will let me know.

                                and B35
   You will notice A 66, have accid-
entally not been taken, but I think
all the others, viz. from A 11 to B 42
are in rotation, and there are a few
I have sent which have been taken
several years ago and are not num-
bered.

   I am also enclosing photo. of
Fairy King which I forgot to
send with the last batch:-

                 I am,
                    Yours faithfully,

                 John Patten, Junr.

CHARLES REID,
PHOTOGRAPHER.

The Studio.

WISHAW, 6th Feby 1899
N. B.

Dear Sir,

I am in receipt of
your letter of the 5th inst for which
I thank you.

I have gone over the contents with
care & also read the accompanying
paper in both of which I feel quite
interested. The taking of the portraits
would be quite in my way, and as far
as I know there would be no great
difficulty in securing the results
you specially desire. There is however
one important factor which must not
be overlooked, viz; the granting of
the necessary facilities for doing
the work. I once had a most dis-
-agreeable experience at a 'Royal'
show taking a series of photos for
book illustration. From your letter
I infer that there will be no such
difficulty as that to which I allude,
but this point should be made clear.

CHARLES REID,
PHOTOGRAPHER.

The Studio.

WISHAW, Feb 6 189
N.B.

I have not been to Islington. During
the years I photographed the Champion
Shires, Hackneys, & Hunters, they were
taken at their homes after the shows.
By this arrangement better results were
obtained for the Stud books.

I understand there is plenty of room at
the showground, but you could make sure
of that on Wed. next. With my whole plate
apparatus I would require to be over 40'
distant to obtain such small images as
you mention. Could you not do with the
figures considerably larger than one inch?
There would be no distortion with my lens
of some 13" focus at 30 feet. However this
and other points could be discussed later
if it is decided that I do the work.

I have not considered the question
of charge, but will let you know about
this later on.

yours truly

Charles Reid

CHARLES REID,
PHOTOGRAPHER.

✻ The Studio. ✻

WISHAW. 9th Feby 1899
N. B.

Dear Sir,

I am in receipt of your letter of the 7th with further particulars, for which I thank you.

Taking into account the time that I would be from home, the fare for 400 miles by rail, and Hotel & other expenses, I think twelve guineas would be a moderate estimate for doing the work. ✝

I would require to leave home on Monday m'g, so as to get to the Showyard on Tuesday to see the ground, get the no.s of the winners, and arrange with the grooms to have the horses taken. & could begin as early on Wed. as possible.

A space of say 40' would be enough, but the exact locality could only be settled on the spot, so much depends on surroundings, the light, & the ground.

over

✝ The negatives would be sent you when anything.

I have slides for 36 plates &
would use 2 at least on each animal.
Should they be all used on Wed. I wd.
have to got outside to change. Would
a pass be granted for admission?
There are other points to be considered
provided you desire my services.
Hunting to hear from you
I am
yours tul
Charles Reid

The Studio.
WISHAW. 11th Feby 1899
N.B.

Dear Sir,

The intimation that
my terms are accepted increases
the interest I feel in your efforts
towards obtaining portraits of
more than passing interest.

The pass business being settled,
the points for future consideration
are the notifying of the grooms,
the position of the animals heads,
& legs, the obtaining of assistance,
& the procuring of a dark room—in
the yard if possible. The first point
is the only one requiring attention,
before we meet, as far as I know.
After your meeting with Mr Herbert
Taylor perhaps you will have
something to say about this matter,
and you will be able to tell me
as to the available open air space

2

❀ The Studio. *❀*

❀WISHAW.❀
N. B.

189

I was taking a lad on horseback to-day, and after doing so, I measured 30' and took a portrait at this distance, a copy of which I will send you when printed. The animal is only 13 ¾ hands, and the height at the withers is 1 ⅞.

It is easy to calculate the size of the figure of a horse 15 hands. I have a letter from Lord Arthur Cecil who is evidently interested in your efforts. He says he may want some types of Ponies done

yours truly

Charles Reid

13   2

F

$$54'' : 360'' :: k : 13$$

$$\frac{13}{162}$$

$$360 \,\overline{\big)\, 702} \,(1.9 \quad \text{th}^{\circ}6u$$
$$\,\frac{54}{360}$$
$$\,3420$$
$$\,3260$$
$$\,160$$

$$\frac{5}{8} = \frac{k}{10}$$

$$k = 8\big)\overline{50}\,(6.2$$
$$\frac{48}{20}$$

CHARLES REID,
PHOTOGRAPHER.

✳The Studio.✳

WISHAW. 16th Feby 1895
N.B.

Dear Sir,

I beg to thank you for your long & explicit letter, with drawing of the ground. If it is equally suitable the screen might be better at the north end, so as not to have to work against the light.

The additional number of horses increases the difficulty. I was to allow 4½ hours for the 29 but I might manage to do them all in that time, at least I hope so. I have decided to take one of my sons as an experienced assistant, and speaking of Lord Arthur Cecil, perhaps I might get one of his men to take up the attention of the horses at a time. I must write his lordship.

The presence of my son will make the work more easy & certain, and I do not think you need trouble the Secty about further assistance in the meantime. I intend to take non-actinic calico to secure a safe place for changing plates but if the yard fails, my son will have to go outside. Perhaps you may obtain a pass for him too. My pass would require the one to allow me into the yard before 8 a.m.

I note what you say about the negatives. They will be your property and copyright. I never had any orders for portraits of Horses taken for the Societies, by the owners, as far as I remember. As you say some of the

2

the illustrated papers might accept them
on the usual terms. They would form a very
interesting display if they could all be
published together, the more so if accompanied
by such a paper as you suggest.

about the extra negatives, and prints.
My minimum charge for taking animals
is 5/- and cabinet size portraits
mounted or unmounted 1/- each.

The greater part of my work is done on
albumen paper, but for scientific
purposes collodion paper would be
preferable, as it does not expand
or contract in the printing or subsequent
operations.

Enclosed please find print of Pony
I wrote about.

yours truly

Charles Reid

P. S. In the event of Tuesday being an
unfavourable day, could the horses
be taken on the subsequent days?

C R

f. 8v

Pony 13.2
Lens ~~camera~~ 4' 7" high

The Studio.

WISHAW. 22nd Feby 1899
N.B.

Dear Sir,

I have your favour about
the passes &c.

I will go to London on Saturday, and
after making a call in the City on Monday
morning will go to the Agricultural
Hall & arrange about dark-Room &c., so
as to leave nothing till Tuesday but the
actual taking of the animals.

Lord Arthur Cecil has kindly replied
that he will send one of his men. His
coachman would be most useful to me.
I cannot let myself think of Tuesday
as a bad day.

Re. prices. I quoted for Collodion
pictures, which would have to be done
specially for you, as I do not use it in
my ordinary business. The ordinary
albumen prints could be supplied
at 8/- p. doz. I note that you will advise
me about this later on.

yours truly
Charles Reid

Royal Agricultural Society of England.

13, Hanover Square.

London. w. 4th Feby 1899

SIR,

I beg leave to inform you of your election as a MEMBER of the ROYAL AGRICULTURAL SOCIETY of ENGLAND, at a Monthly Council held on Wednesday, the *1st* instant, on the nomination of *Lord Moreton* and of the Registration of your name under the official designation *Ga : 527*, which appended to your name will at once form the key for immediate reference and identification, whether in your correspondence with the Society or on the payment of your Subscription through the Bankers. You are therefore requested to favour the Society by adding it to your signature in all official communications.

On the remittance of your Annual Subscription of £1, or (at your option) a Life Composition of £15, you will become entitled to the privileges of a Member of the Society, as established under the authority of the Charter and Bye-laws, of which a copy is enclosed herewith.

By the Rules of the Society the Annual Subscription for the current year is payable on election, and afterwards becomes due in advance on the 1st of January in each succeeding year, until formal notice of your resignation shall have been given to me in writing, and all payments due from you at that time shall have been made.

In connection with the payment of your Annual Subscription, I am instructed by the Council to draw your attention to the advantages of the system—extensively adopted by Members of the Society—of giving an order upon your Bankers for the payment of each year's subscription as it falls due. By this method you would be saved the trouble of drawing an annual cheque for the subscription, and you would be assured of receiving the Journals and all other publications of the Society immediately on their issue.

I enclose herewith two forms of Order on your Bankers: **A** for the payment of an Annual Subscription of £1, and **B** for the payment of a Life Composition of £15; and I shall feel obliged if you will kindly fill up and return to me an Order for the particular method of payment which you may decide to adopt.

Should any correction be required in your own designation, or in the address of this present letter, you will much oblige the Society by pointing it out.

I am, SIR,
Your obedient Servant,

Ernest Clarke

Secretary.

Francis Galton Esq FRS

f.1

Jan 30th 1899.

Dear Sir,

I beg to acknowledge the receipt of your letter of the 28th inst, with enclosure to the Duke of Portland, which I have forwarded to His Grace.

I remain,
Yours faithfully,

J. Herbert Taylor

Secretary.

Francis Galton Esq.
42 Rutland Gate.
S.W.

Feb 2nd 1899.

Sir,

With further reference to your letter of the 28th ulto, requesting the Commissioners would cause the 29 Queens Premium Stallions at their next Show to be severally photographed, measured described &c & which was read before a meeting of this Commission held on Wednesday the 1st inst.

I am desired to say that the Commissioners feel favorably disposed to the cause, & in the event of your Committee defraying the cost &c would, subject to the direction of the Royal Commission Stewards, & provided the owners of Stallions were willing, do their best to render any assistance in their power.

Should you care to talk the matter over

I shall be very pleased if you would make an appointment for me to call upon you.

I am, Sir,
Your obedient servant.

J. Herbert Taylor

Secretary.

Francis Galton Esq.

42 Rutland Gate.

S.W.

Feb 9th 1899.

Dear Sir.

I was sorry I missed you when you called at the office on the 7th inst.

With regard to the Photographers access to the Hall on the 8th prox'o. I shall be pleased to send you a ticket for yourself as well as one for him.

I do not know of anything else at the present time that we can do to facilitate matters, but perhaps if there is anything else that occurs to you that I am able to do, you will let me know.

Yours faithfully.

J. Herbert Taylor

Secretary.

Francis Galton Esq.
42 Rutland Gate.
S.W.

12, *Hanover Square, London, W.*
~~39, Victoria Street~~
~~Westminster, S.W.~~

Oct 24th 1899.

Dear Sir,

I beg to acknowledge the receipt of your letter of the 20th inst. & your enclosure shall receive the attention of the Royal Commission on Horse Breeding at their meeting on the 30th inst.

Yours faithfully,

J. Herbert Taylor

Secretary.

Francis Galton Esq.
42 Rutland Gate.
S.W.

12, Hanover Square, London, W.
~~39 Victoria Street~~
~~Westminster, S.W.~~

Oct 31st 1899.

Sir.

In further reference to your letters of 6th July & 25th October last which were duly read at a meeting of this Commission held yesterday. I was instructed to write stating that subject to the direction of the Stewards, the Commissioners would be willing to do their best to render any assistance in their power at the forthcoming Show to be held at the Royal Agricultural Hall Islington on March 13th, 14th & 15th 1900.

I am. Sir.

Your obedient servant.

J. Herbert Taylor

Secretary.

Francis Galton Esq.
42 Rutland Gate.
S.W.

Gordon House. Windsor.

Feby 25th 1899

Dear Sir

I am in receipt
of your letter relative to
the photographing and
measuring certain of the
Stallions at the Agricultural
Hall Islington, during the
Competition for the Queen's
Premiums. I assured Sir
Jacob Wilson that personally
I would willingly aid you
in any way I could

ring and the telemining
examination, aggravate his
general unrulyness.

For your purpose, you
want to see the Stallion at
home. If you could obtain
the Consent, of the Duke of
Portland to photograph and
measure at Welbeck, that
might be successful. There
is a stud about 20 miles
from London where I am pro-
fessionally engaged containing
at least 6 Thorobred
Stallions, where if you wish I
will try & get sanction for your
operations, + would help you there.
Francis Galton Esq   Yours in faith
42 Rutland Gate S.W.   Henry Simpson

I have two Colleagues who
are associated with me
in the work of professionally
examining these horses as to
freedom from Hereditary
Disease, & altho I have not
Consulted them, I feel they
would be as willing to aid
your efforts as I can be.

It is however im-
- plicit that before we can
do anything in the direction
you indicate, you must first
obtain & deliver to us

(1) the written Consent and
authority from the Royal
Commission to your request.

(2) the written Consent of
the Owner of each stallion
who is to receive any
treatment from the Veterinary
Surgeons, outside the
professional examination
laid down by the Royal
Commission

I have carefully
read your letter & feel bound
to tell you the yard at
Islington is a very bad place
for your purpose. The Thorobred
Stallion is always an
unruly member & the trying
incidents of the show

Gordon House. Windsor.

f.3

Mar. 10 1899

Dear Mr Galton

I have the
pleasure to forward
the record compiled by
my young friends which
they completed last
Evening & forwarded to
me by post—

Any measurements

which appeared to be
doubtful I requested
them to take again &
this has been done.

Sir Jacob Wilson
thought these young
fellows should have
a couple of guineas
a piece for their trouble
& if you like to send
it to me, I shall be
very pleased to transmit
it to them Yours very faithfully

Francis Galton Esq
42 Rutland Gate

Henry Simpson

Write me at: Fort Hamilton, New York, 99th Street

Telegraph me at: _____

My Express Office is: _____

2—547

U. S. COAST AND GEODETIC SURVEY, Tide Station

Fort Hamilton N.Y.

Sept. 5, 1898

Francis Galton Esq.
42 Rutland Gate,
London, England

Dear Sir:

Enclosed find one of your pedigree blanks filled out. Numbers 3, 7, 14 and 15 were bred by myself. Any additional information will be gladly furnished. Please acknowledge receipt and forward me an additional blank and I will fill out a pedigree of Cashier 2:25½ (pacer) Duad and Cashier have both beaten 2:20 in losing heats in races &

Respectfully yours
James G. Spaulding

f. 1r

Aug 25th 1878

SWANSFIELD HOUSE,
ALNWICK.

Dear Uncle Frank

I put my few notes
on a separate sheet of
paper. If you have copies
to spare of your paper when
finally printed — could
you spare me a couple?

The ticks have done
nothing very startling since
you left. I find I can do
little as regards comparing

All - other than make preparations - till next Spring.

I have received a long letter from Miss Ormerod, but am still as far as ever from being able to classify my ticks, & hence never know of which variety I may be reading for certain.

I found two new species, a I thought, on bracken, & then

discovered they were male &
female. The male organ being
the Rostrum! This was a
surprise, as I did not know
that such was ever the case
in insects. Impregnation
continued for some 12 hours,
& I made a careful examin-
ation under the microscope of
the parts.

The old "hen" is still alive
with her eggs, which have I
think increased in number,
but she looks very dry &
will not live long, I expect.

Edith Drysdale is all
right again. I am glad to
say. I fear poor brother
has suffered sadly with her
face.

I have been staying for
some grouse shooting with
your Wm Clayton, & have
heard much of the "freak"
now re-christened "the missing
duck". Some 12 sorts of wild
flowers sent him from the Moss
were at once recognised & named.
Ever yrs affecly
E. C. Wheler

Ed. Wheeler

Alnwick

Aug 26. 1898

I regret much that
I have had no opportunity
of shewing this to W. Patten
whose practical knowledge of breeding
is far greater than my own.

Edn Wheeler

Dear Uncle Frank,

      I have been away shooting on the Moors, or would have
returned your very interesting paper sooner, with the very few & I
fear very valueless remarks I have to make upon it.

    It appears to me very clear on practically all points, & my sugges-
tions are on merey matters of detail.

(a) Would not the word "speaking" be better omitted ?

(b) Perhaps this would be clearer if an example or illustration were
    given.

(c) As this is a most important point to be impressed on the minds
    of readers, should not it be more insisted upon ?

(d) Am I right in supposing that such a pamphlet would contain a
    composite photograph of the animals' ancestors, as nearly resem-
    bling him as could be arrived at, together with a statement of
    the proportion of exposure given to each ancestor, whereby it
    would be apparent how far he had bred true to his ancestry, &
    the prepotency of any one ancestor would be obvious. It seems
    clear that such would be invaluable as showing how far <u>his</u> pre-
    potency would be probably transmitted to his offspring, & in
    what proportions from the various ancestors.

(e) It does not appear to be stated, which of these are horses, &
    which mares, though it is implied.
    The photographs are not a very good selection, & certainly
    not typical of thoroughbreds, but I understand that there is
    no time to get better ones.

(f) No photograph should be accepted except of adult animals, say
    of 5 years old in the case of horses. Many horses that have not
    been well done by as youngsters, grow considerably even after
    they are 5.

      Yours affecty,

        E.G. Wheeler

P S Of course the photograph suggested under "d" would be supplemen-
    tary to one of the ancestors in their proper proportion, a for
    comparison with it.

f.45.
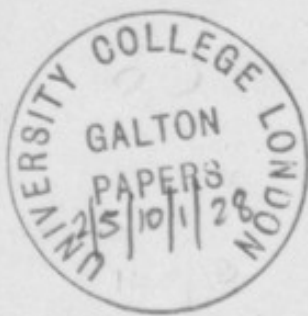
Sep 23ᵈ 1898
SWANSFIELD HOUSE,
ALNWICK.

Dear Uncle Frank,

You will think I
was never going to answer
your letter, & to thank you
for the pamphlets, but I
was waiting till I got an
opinion from W. Patten, our
Farm Bailiff, who is A 1 as
a practical breeder, & well
known to all the Repⁿ. Agricᵘ.

Soc}. people.

I was sent a very good
letters from him, written
from a Shorthorn Breeder's
point of view, which you can
make any use of you like.

They families of ticks
(was somewhat numerous)
thrive happily, but won't grow
in the absence of a "host".

I propose starting white mice
(nasty little brutes!) as being
the easiest for Examination.

The Eggs seem alive, but
have not hatched yet.

I go to London about the
15th or 16th for these "Arbitrations"
& I had thought of asking
whether you would be at
home & could take me in
for 2 or 3 days quite conveniently.
If not, I should go, as usual

to any Club. I would
promise not to introduce
live ticks into the house!

Ever me affec[?]

L. G. Wheler

Private.

Board of Agriculture,
3, St James' Square. S.W.

Nov. 4th 1899.

Dear Mr Galton

R¹. C. on Horse Breeding.

I am duly in
receipt of your letter of the
1st inst. to which I regret that
I have been unable to
reply ere this.

I am indeed disappointed
to observe the tone in which
you have received the

reply of the Royal Commission
to your letter to them, as
I can assure you they
were most appreciative
of all that you had done
during the past year, and
I was of opinion that they
had practically agreed to
all that you asked for.
next year

As one who has had
a large experience in

such matters, it must be
obvious to you that the
Commissions have not the
power — as regulated by
Parliament — to make
any arrangements or to
enter into any undertaking
or engagement beyond
the current year, and
therefore no promise could
be given by them will

reference to the future.
Personally, however I have
no reason to suppose that
- if again successful this
year - similar sanction
for Photography would not be
given in future years.

As yours is somewhat of an
official letter I will forward it
to Mr. Herbert Taylor - the Secretary.
I remain dear Sir
yours

Jacob Wilson.

Francis Galton

Nov 1/99.

42 Rutland Gate S W

KNOLE LODGE,
KNYVETON ROAD,
BOURNEMOUTH.

Dear Sir Jacob,

Mr Herbert has communicated to me the resolution of the R. Com? on Horse Breeding in reply to the letter I addressed to them, and I have since seen him to guard myself against possible misunderstanding

The resolution does not convey the assurance for which I specially asked, namely – in the event of the photographer seeing

his way, after the experience of
1900, to take the photographs in
subsequent years at his own
cost, whether the R. Comm^{rs} would
be disposed to make photography
(under standard conditions) a
regular feature of their show?

  Without this assurance I am
not prepared to defray the expenses
for 1900, because my object is
not to obtain the photographs,

but to establish a self working
scheme, as was fully explained
in my Report.

Mr Herbert informs me that
the next meeting of the R. Commrs
will be held early in December.

At that date I shall be
preparing to leave England for
the winter, so even if the R. Commrs
should be then willing to give
the assistance I sought, it would
be too late for me to make the
necessary arrangements.

Therefore with much regret
I must forego my project of

photographing the premium stallions
of 1900. —— Thanking you much
for the interest you have shown in
my scheme and for the considerable
help given this year Believe me
very faithfully yours

F G

P. S. Perhaps you will kindly
convey the sense of this letter to
the Royal Commissioners at their
next meeting – It seems hardly
necessary that I should address
them directly.
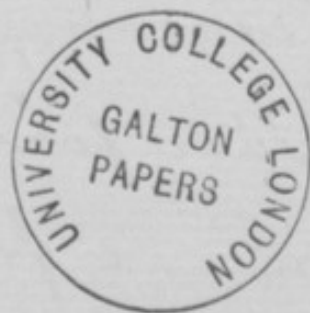
My Lords, ~~Dukes~~ & Gentlemen

Permit me to ~~call the attention~~ subject to your notice
~~Grace~~ ~~to the passage~~ concluding paragraph of my
report this year to the R. Comm on Horse breeding
It is at p 13 ~~above as follows~~ which is herewith
enclosed.

~~A remarks in that~~ paragraph

In continuation ~~of this~~ ~~remark~~
~~beg to~~ ~~say~~ that it will give me pleasure to
defray the cost of the photography for the year 1900
of the R. Commissioners ~~and disposed~~ still disposed
to encourage ~~in attempts~~ the project therefore I desire to
ask it whether ~~they would feel disposed~~ of carrying
photography "under standard conditions as permanent
feature of their annual Shows, in the event of
the photographer expressing his readiness to undertake
the work, ~~is f~~ years at his sole charge ?
If they ~~should be so~~ disposed, ~~there would I think~~
be little difficulty in arranging ~~details~~ conditions
~~& other necessary~~ details.

I expect to be away from England in [a few weeks time and not]
to return until after the [end] of the next Show, but should [arrange to the following] provide
a scientific assistant to see that the standard
conditions were scrupulously observed. by the photographer

It may be mentioned that the photographs ^ ^ Champion
dogs at the great Show, a week ago (held) by the
Kennel Club at the X tal Palace, was successfully
carried on under standard conditions

SOCIETY OF ARTS,
JOHN ST. ADELPHI,
LONDON.W.C.

September 21st, 1898.

Dear Mr.Galton,

     I am much obliged to you for the copy of your B.A. paper on Pedigree Stock.   I think when you have developed the subject a little further, it certainly will be quite suitable for a paper before the Society.   Perhaps you will keep the matter in your mind.

     Would it not be interesting if you could test one of your composites by comparing it with the actual natural result?   I mean, if you could compare a composite photograph, made up of the ancestors of a horse or a man, with an actual photograph from the horse or the man himself.   I should think it ought not to be difficult to obtain materials for making such an experiment.

          Yours faithfully,

          H. T. Wood

              Secretary.

Francis Galton, Esq., D.C.L., F.R.S.

After making the entries, please return this Form by post, addressed to Francis Galton, 42 Rutland Gate, London, England.

PEDIGREE RECORDS.

Form for use <u>only when</u> the speeds (standard or not) of the subject, of its two parents, and of its four grand parents are all known.

		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Stallion of the Pedigree / ~~Stallion, Gelding,~~ or Mare	Antonina.	Vol. 8,	Bay, 4 white feet.	1888.	Trot.	Record 2.18¼	1896.	Record in a race - and can trot faster.
PARENTS.	2 Sire	Antonio.	2823.	Bay,	1880.	Trot.	2.28¾	1886.	Race Record.
	3 Dam	Kitty Morgan.	Vol 13. f.491.	Bay.	1882.	Trot.	—	—	Could trot a mile in 3 minutes - Never trained.
GRAND PARENTS.	4 Sire of the Sire	Messenger Duroc.	106.	Bay.	1865.	Trot.	—	—	
	5 Dam of the Sire	Green Mountain Maid.	Vol. 4.	Br.	1862.	Trot.	—	—	Reputed trial in 2.28.
	6 Sire of the Dam	Sam Purdy.	918.	Bay.	1866.	Trot.	2.20½	1876.	Race Record 2.20½ - Two mile Heats 4.49½ 4.45 Thirty heats better than 2.30
	7 Dam of the Dam	Andrew's Mare	—	Bay.	—	Trot.	—	—	Good driving Mare.
Great Grand Parents	8 Sire of 4	Hambletonian.	10.	Bay	1849	Trot	—	1852.	Reputed trial 2.40
	9 Dam of 4	Satinette.	—	—	—	—	—	—	
	10 Sire of 5	Harry Clay	45.	Black.	1853.	Trot.	2.29	1864.	Race to wagon.
	11 Dam of 5	Shanghai Mary	—	Sorrel.	—	—	—	—	
	12 Sire of 6	George M. Patchen Jr.	31.	Bay.	185—	Trot.	2.27	1867.	
	13 Dam of 6	Whisky Jane	—	Bay.	—	Trot.	2.40		In a race in California.
	14 Sire of 7	Jesse Morgan	—	Bay.	—	Trot.	2.48		In a race at Staunton, Va.
	15 Dam of 7	Mare by Red Lion Morgan	—	Bay.	—	Trot.	—		Plain driving Mare.

Signature and full address of the sender } Dr. Wilbur P. Morgan
315 West Monument St.
Baltimore Maryland U.S.A

Breeder and owner of Antonina.

PEDIGREE RECORDS.

All students of Heredity feel acutely the absence of any large collection of Pedigree Records in which exact measurements are given. It matters little for their purposes what Dimension or Faculty is measured, because the same laws of Heredity appear to apply to every dimension and faculty in every kind of animal and plant. All that is necessary is that the measures should refer throughout to the same particular and be numerically recorded for every member of the ancestry at least up to the grand parents inclusive. That is to say each Pedigree Record should include the measurements of the Subject, of its two Parents, and of its four Grand Parents. It would be a distinct gain if the measurements of its eight Great-Grand-Parents could also be given.

I may refer to some of my own writings to show how this kind of information would be utilised. No. 2 of the following brief list is the most important for the present purpose.

(1) Natural Inheritance (Macmillan & Co.) 1889.

(2) Average Contribution of each several Ancestor to the total heritage of the offspring. Proc. Royal Society, June, 1897.

(3) Examination of the registered speeds of American Trotting Horses with remarks on their value as hereditary data. Proc. Royal Society, 1897.

The well-authenticated speeds of American Trotters and Pacers are peculiarly suitable measures to deal with, and, out of the many thousands of horses whose speeds have been authentically determined there will be many whose Pedigree Records also are known with the necessary completeness. The breeders and owners of these notably bred animals must be well acquainted with all the facts, and would presumably be pleased to have them published. Without their aid it is scarcely possible to discover from the published records in Wallace's Year Books, which those horses are.

American breeders and owners are honourably known for their interest in scientific breeding. I therefore issue these circulars with reasonable hopes that they will kindly aid me by supplying the desired information, for which I shall be truly grateful.

Mr. Russell Allen, of Allen Farm, Pittsfield, Mass. has kindly filled up a draft form, a copy of which I enclose as an example, after having slightly recast it to suit the amended arrangement of the Table.

FRANCIS GALTON.

LAW OFFICE OF
E. E. MELLON,
SCHERMERHORN BLOCK.

CORTLAND, N. Y., 1 — 30 — 189 8

Mr Francis Galton Dear Sir I inclose
one horse Breading fro whitch you sent mr P.D. megrigor and
I will all so inclose a Cercular of Breading and if this
Copy is not filed out proper you can ~~fix~~ Change it
I will all so say if I can be of anny service to you
in the futcher I will be glad doe anny thing for
the Troting horse Breading

      yous Truly

     mr Charles A Blanchard

      Cortland

      Cortland Co

       N Y

BARON ALMATER, _____

Black horse, bred by Eliza Smith, Highlawn stock farm, Lee, Mass., foaled the property of L. J. Fitzgerald, Cortland, N. Y., June 12, 1891, standing 15 hands 2½ inches high, weight now 1050 pounds, will weigh 1150 when fully matured. He is a well built colt, short back, well coupled with deep chest and sloping shoulders, well muscled with the best of feet and legs. He has a star in forehead, snip on nose, left hind pastern white, and a trial mile as 4-year-old in 2:23, and I think he will beat 2:20 this summer. With his breeding my judgment is good for saying so. He has a double cross to that great brood mare Alma Mater, and one to Sally Chorister and Belle Patchen, and a double cross to George Wilkes. The progeny of Baron Wilkes 218, his grandsire on sire's side, won, in 1895, $51,475.50, and Alcantara 2:23, his grandsire on dam's side, is a great sire of race horses, as you can see if you look them up in the year book. When they started they were well up in the money, and I think that in this horse I have as good a young one as stands at any stock farm in the country. I will stand him for service at my farm between Cortland and Homer, on the back road, at $25.00 to insure a foal (with return privilege) or money refunded at owner's option if mares prove not in foal. Season to close the first of July, 1896, when we will put him in training. He has a few colts foaled this spring and those who have seen them say they are as good as they ever saw. For further information address

Cordly L. J. FITZGERALD,
Cortland, N. Y.

_____, Manager.

P. D. megregor

BARON AL MATER.—Trial in 2:23 as a four-year-old colt.

BARON ALEXANDER 26393.

Sold for $15,000 at 2 years of age to G. G. Davis and if Mr. Davis had lived he would have been trained, but Mr. Davis died and he was sold in the spring of 1895 and was turned up in his new home. He leaves some very speedy colts which will, with the other brothers and sisters of this noted race-horse, finally give him fame.

BARON WILKES, 4785.

Record 2:18. Sire of
P Rachel, 4 years 2:09¼
P Balsanders 2:09¼
P Bumps, 4 years 2:09¼
P Baronet, 4 years 2:12¼
T Baron Rogers, 4 years .. 2:13¾
T Baron Dillon, 4 years .. 2:12
T Oakland Baron, 2 yrs .. 2:12½
T Margrave, 3 years 2:16¼
T Baronmore, 3 years 2:17¼
T Beava, 6 years 2:16¼
Oakland Baron, 2:12½, won the $40,000 Futurity stake, $11,- 675. Baron Dillon, 2:12, won the Stallion $5,000 stake in Kentucky.
Bumps won $7,050
Rachel won 6,350
Baron Wilkes, 2:18, is the champion winning sire of '95 and sold for $95,000 last fall. He is as game a horse as George Wilkes ever sired. Baron Wilkes sired 26 others from 2:10¼ to 2:30.

ALMA MATER.

Dam of
Alcantara 2:23
Alcyone 2:27
Arbiter 2:32¼
Altondorf 2:25½
Alfonso 2:26¾
Almater 2:36¼
Aldis 2:30
Amanti 2:08¾
Alnota 2:32
Aldebaran 2:24
Grand dam of 154 in 2:06 to 2:30.

GEORGE WILKES, 519.

Record 2:22. Sire of 73 trotters and 211 pacers in the list. He is the grand sire of
Bonnetta, 4 years 2:06¼
T Maxine Wilkes 2:08½
T Stella T. 2:10
P Joe Patchen 2:04
P Guenn 2:04½
P Col. Thornton 2:03½
T David B. 2:05½
T Dandy Jim 2:08½
T Trevilian, 4 years 2:05½
T Allerton 2:09¼
T Early Bird 2:10
T Yers (Angel 2½C¾
T Moquette, 4 years 2:10
T Lena Wilkes 2:19
P Seymour Wilkes 2:09¼
P Baron 2:10
P Directum 2:05¼
and 1,204 others in 2:30 or better.

BELLE PATCHEN.

Record 2:30¼. Dam of
Baron Wilkes 2:18
Grandam of
Neptunad 2:24¼
Balsanders 2:09¼
Rachel 2:09¼
Bumps 2:09¼

MAMBRINO PATCHEN, 58.

Sire of the Dams of
Ralph Wilkes 2:06½
Bourbon Patchen 2:19
Crawford 2:07¾
Oakman 2:09½
and 128 others in 2:30 or better, and he is the sire of 25 in 2:30 or better. His sons have sired 124 in 2:10 or better.

ESTELLA.

Grand Dam of
Alcantara 2:23
Alcyone 2:27
Arbiter 2:32¼
Altondorf 2:25½
and 6 others in 2:30.

ALCANTARA, 223.

Sire of
Baron 2:10
Alare 2:11
Lightnine 2:11¼
Balsamned Wilkes 2:11½
Areca 2:13½
Alta-clive 2:13½
*Glen Lewis 2:17½
Bernard Wilkes 2:17¾
Miss Alice 2:17¾
Mahstone 2:14¼
Albachler 2:14½
Alclois 2:14¼
Allegro 2:14½
Georgia M. 2:14½
Clara 2:17½
Annophele 2:19½
and 17 others in the 2:30 list. He is son, Alcanter, 2:09¾, sired Winger, 2:09¾, and 9 others in 2:30 or better. Daniels has produced Dibole, 4 years old, 2:09.

RACHEL B.

2:09¼. Dam of
Baron 2:10
Rachel, trial in 2:23
Will go in 2:20 or better this summer. Quarters 34 seconds.

GEORGE WILKES, 519.

Record 2:22. Sire of
Harry Wilkes 2:13½
Brignoli Wilkes 2:14¾
Guy Wilkes 2:15¼
and 40 others in 2:30, also sire of the dams of
Berlesque 2:09¾
Rachel 2:09¼
Delmarch 2:11½
Silverton 2:09¾
and 1,204 others in 2:30. His sons have produced
Joe Patchen 2:04
Bonnetta 2:06½
Nokita 2:04
Ralph Wilkes 2:06½
Trevilian 2:05½
Seymour Wilkes 2:09¼

ALMA MATER.

Dam of 4 in 2:30.
Arbiter, sire of 1 .... 2:32¼
Alcantara, 4 years 2:23
Sire of 60 in 2:30
Alcyone 2:27
2 in the 2:10 list and 50 others in 2:30
Altendorf 2:25½
sire of Strongboy 2:11½
and 13 others in 2:30
Almater 2:36¼
Amanti 2:08¾
Alfonso 2:26¾
sire of
Freeland, 3 years 2:17½
Alnis 2:32
Aldebaran 2:24

AL WEST, 6457.

2:25. Sire of
Laura T. 2:09½
Charlie Ford 2:10½
Fanny West 2:17
Frank Champ 2:14
Jewett 2:14
His daughters have produced
Allie Wilkes 2:11
Herbbert 2:17
Raven 2:10
Hosalice 2:15
Mary West 2:16½

MOLLIE.

Grandam of
Raven 2:10
winner of 16 races in '94 and '95, out of 20 starts and 40 beats from 2:10 to 2:30.

HAMBLETONIAN 10.

The sire of 40 in 2:30 or better. 148 sons have sired 1304 in 2:30 or better. Of his daughters, 79 have produced 130 in 2:30. He is the grandsire of
Sunol 2:08¼
Palo Alto 2:08¾
Arion, 2 years old 2:10¾
" 3 " .. 2:10¾
" 4 " .. 2:07¾
Belle Bird, 1 year old . 2:26¼
Nancy Hanks 2:04
Kitty Medium 2:19
Maud S. 2:08¾
Jay-Eye-See, P. 2:06¼ and 2:10

DOLLY SPANKER.

Dam of
George Wilkes 2:22
Sire of
Harry Wilkes 2:13
Brignoli Wilkes 2:14
and 74 others in 2:30 or better.

MAMBRINO PATCHEN, 58.

Grandsire of
Nightingale 2:08
Moncelese 2:09½
Heir-at-Law 2:12
Prince August 2:19½
Princess Royal, 2 years . 2:20
Ralph Wilkes 2:06½
Island Wilkes 2:22
Abbott Wilkes 2:12
Nat Forster 2:16¾
Booster 2:15¾
Oscar Wilkes 2:19¾
Sunland Clay 2:15¼

SALLY CHORISTER.

Prolins 2:18
Belle Broadhd 2:20
and the dam of Homer, sire of May Homer, 4 years old, ... 2:25½
1 other in 2:30
and dam of Baron Wilkes 2:18
sire of 29 in 2:30 or better.

MAMBRINO CHIEF, 11.

Sire of 6 from 2:16¼ to 2:30. Sire of 22 sires of 95 in 2:30. Sire of 12 dams of 34 in 2:30.

RODES MARE.

Dam of
Lady Thorne 2:18
Mambrino Patchen, 58, sire of 25 in .... 2:30 or better.

IMP. AUSTRALIAN.

FANNY G.

HAMBLETONIAN 10.

The sire of 40 in 2:30 or better. 148 sons have sired 1304 in 2:30 or better. Of his daughters, 79 have produced 130 in 2:30. He is the grand sire of
Sunol 2:08¼
Palo Alto 2:08¾
Arion, 2 years old 2:10¾
" 3 " .. 2:10¾
" 4 " .. 2:07¾
Belle Bird, 1 year old . 2:26¼
Nancy Hanks 2:04
Kitty Medium 2:19
Maud S. 2:08¾
Jay-Eye-See, P. 2:06¼ and 2:10

DOLLY SPANKER.

Dam of
George Wilkes 2:22
Sire of 80 in 2:30.

MAMBRINO PATCHEN, 58.

Sire of
London 2:30
and 17 others in 2:30, also sire of the dams of
Crawford 2:07¾
Ralph Wilkes 2:06½
Bourbon Patchen 2:19
and 125 others in 2:30
47 sons have sired 130 in 2:30
30 grandsons have sired 40 in 2:30

ESTELLA.

Grandam of
Alcantara 2:23
his son
Alcanter 2:09¾
has sired 7 with records of 2 over, so
and his daughters have produced 17 with records of 2:30 to 2:09¾

ALMONT, 33.

Record 2:09½. Sire of 35 trotters and 2 pacers. 80 sons have sired 262 trotters and 6 pacers. 65 daughters have produced 90 trotters and 11 pacers.

Dam by WALLACE MEDIUS.

Dam of
Al West 2:25
Sire of
Laura T. 2:09½
and 5 others in 2:30

WILLIAM MAMBRINO.

Sire of the Dam of
Rachel B. 2:09¼

MARY.

ABDALLAH, 1.

Sire of Hambletonian 10, sire of 40 in 2:30.
Frank Forrester 2:30
Mr. Walker 2:27
Colthare 2:30
and the Dam of 7 in 2:30.

CHARLES KENT MARE.

Dam of Hambletonian 10, sire of
Dexter 2:17¼
and 39 others in 2:30.

MAMBRINO CHIEF 11.

Sire of
Lady Thorne 2:18
and five others in 2:30

Dam of LADY THORNE.

Record, 218.

MAMBRINO CHORISTER.

Sire of
Onedish 2:16¼
and dam of 6 others.

Dam by BLOOD BLACK HAWK.

MAMBRINO PAYMASTER.

ELDRIDGE MARE.

Grandam of
Lady Thorne 2:18½

MAMBRINO CHIEF, 11.

Sire of Mambrino Patchen 58, sire 25 in 2:30.

ABDALLAH 1.

CHARLES KENT MARE.

MAMBRINO CHIEF, 11.

Sire of
Lady Thorne 2:18

RODES MARE.

Dam of
Lady Thorne 2:18

IMP. AUSTRALIAN.

Sire of the dam of Alma Mater, dam of 8 in 2:30.

FANNY G.

Grandam of
Palo Alto 2:08½

ABDALLAH 15.

Sire of Belmont 64, the sire of
Nutwood 2:08½
Elfo Belmont 2:12½
34 others in 2:30. 38 sons have sired 450 2:30 performers. 48 have produced 65 2:30 performers.

SALLY ANDERSON.

Dam of Almont, 33, one of the greatest brood mare sires there was.

By Sire of WALLACE BOHEMIAN.

MAMBRINO BELLE.

ERICSSON, 130.

Sire of dam of Shadeland Belmonta . 2:13¼ Sire of 14 in 2:30.

COL. LEWIS.

A Copperbottom Horse.

HAMBLETONIAN 10.

MAMBRINO CHIEF, 11.

GRANDAM KATE.

Grandam of Clay Pilot 91.

MAMBRINO CHIEF 11.

PILOT JR., 12.

Sire of the Water Witch dam of
Viking 2:19½
Waterloo 2:16½
Mambrino Gift 2:20
and 5 others in 2:30

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PEDIGREE RECORDS.

Form for use **only when** the speeds (standard or not) of the subject, of its two parents, and of its four grand parents are all known.

		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	~~Record~~ or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree / Stallion, ~~Gelding or Mare~~	Barron Alsater	—	Black	1891	Trotter	Trial 2.23	1895	This horse trotted a mile in a race in his 4 year old form in 2.21½ timed syderly at syracuse ny, a state fair in 895 though he got no part of money
PARENTS.	2 Sire	Barron Alexander	~~28393~~	Brown	1887	Trotter	—	—	he started in this race under the name of Alma mater wilkes but we have changed its
	3 Dam	Rachel	—	Black	1886	Trotter	Trial 2.25	1895	name so that we can have him Register
GRAND PARENTS.	4 Sire of the Sire	Barron wilkes	4758	Brown	1882	Trotter	2.18 rec	1888	
	5 Dam of the Sire	Alma mater	—	Chest	1872	Trot. trotting	—	—	
	6 Sire of the Dam	Alcantara	729	Brown	1876	Trot	2.23 rec	1880	
	7 Dam of the Dam	Rachel. B.	—	Black	—	Trot	2.28½ rec	—	
Great Grand Parents.	8 Sire of 4	George wilkes	519	Brown	1856	Trot	2.22 rec	1848	
	9 Dam of 4	Belle patchen	—	Bay	1854	Trot	2.30¼ rec		
	10 Sire of 5	Mambrino patchen	58	Black	1852	Trot	—	—	
	11 Dam of 5	Estella	—	—	—	trotting	—	—	
	12 Sire of 6	George wilkes	519	Brown	1856	Trot	2.22 rec	1868	
	13 Dam of 6	Alma mater	—	Chest	1872	Trott	—	—	
	14 Sire of 7	Al west	14071	~~Bay Black~~	1870	Trotter	2.25 rec	—	
	15 Dam of 7	Mollie	—	—	—	—	—	—	

Signature and full address of the sender: Mr Charles H. Blanchord Cortland Cortland Co. N.Y.

PEDIGREE RECORDS.

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I may refer to some of my own writings to show how this kind of information would be utilised. No. 2 of the following brief list is the most important for the present purpose.

(1) Natural Inheritance (Macmillan & Co.) 1889.

(2) Average Contribution of each several Ancestor to the total heritage of the offspring. Proc. Royal Society, June, 1897.

(3) Examination of the registered speeds of American Trotting Horses with remarks on their value as hereditary data. Proc. Royal Society, 1897.

The well-authenticated speeds of American Trotters and Pacers are peculiarly suitable measures to deal with, and, out of the many thousands of horses whose speeds have been authentically determined there will be many whose Pedigree Records also are known with the necessary completeness. The breeders and owners of these notably bred animals must be well acquainted with all the facts, and would presumably be pleased to have them published. Without their aid it is scarcely possible to discover from the published records in Wallace's Year Books, which those horses are.

American breeders and owners are honourably known for their interest in scientific breeding. I therefore issue these circulars with reasonable hopes that they will kindly aid me by supplying the desired information, for which I shall be truly grateful.

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SUBJECT.	1 Subject of the Pedigree	Bonnie Meleager Stallion, Gelding, or Mare		Brown	1891	trot	2.30	1896	Bonnie Meleager trial is 2.22½ half in 1.09 quarter 32½ to made in 1897
PARENTS.	2 Sire	Atlanta Meleager	7490	Bay	1887	trot	2.24½	1895	Trial of Atlanta Meleager is 2.17 at Mckus Rock Pa in 96.
	3 Dam	Rosa Day	Vol 4	Bay	1887	trot			
GRAND PARENTS.	4 Sire of the Sire	Atlantic	1003	Black	1879	trot	2.21	1887	
	5 Dam of the Sire	Ubsica	Vol 7	Sorrel	1872	trot	2.32	1885	
	6 Sire of the Dam	Abbott	1239	Sorrel	1870	trot	2.22	1874	
	7 Dam of the Dam	Bonnie Bessie	dam of 2.24½ bespokan	Bay	not known.				
GREAT GRAND PARENTS.	8 Sire of 4	Almont	33	Black	—	trot	2.39		Bonnie Meleager and Atlanta Meleager sold at New York only to be sold at Sale at Madison Square Garden H
	9 Dam of 4	Unknown	—	—	—	—	—	—	
	10 Sire of 5	Captain	805	Bay		trot	2.28	—	
	11 Dam of 5	Flora	Unknown	Bay	—	trot	—	—	
	12 Sire of 6	Belmont	—	—	—	—	—	—	
	13 Dam of 6	Unknown	—	—	—	—	—	—	
	14 Sire of 7	Abdallah Star	—	—	—	—	—	—	
	15 Dam of 7	Bonnie Lassie	—	—	—	—	—	—	

Signature and full address of the sender M. A. Arnold North East Pa U.S.A.

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 SUBJECT of the Pedigree	Boodle Stallion, Gelding, or Mare	5829	brown	1886	Trotter	Record 2.12½	1896	Race Record at Los Angeles California
PARENTS.	2 SIRE	Stranger	3030			Trotter			
	3 DAM	Bride				Trotter			
GRAND PARENTS.	4 Sire of the Sire	Gen'l Washington	114			Trotter	2-20		Trial
	5 Dam of the Sire	Goldsmith Maid				Trotter	2-14		Race Record.
	6 Sire of the Dam	Jay Gould	197			Trotter	2-20½		
	7 Dam of the Dam	Ida				Trotter	2.38½		
Great Grand Parents.	8 Sire of 4	Gen'l Knox	140			Trotter	2.31½		
	9 Dam of 4	Lady Thorn				Trotter	2-18½		
	10 Sire of 5	Abdallah	15			Trotter	2.42		
	11 Dam of 5	Old Ab.				Trotter	—		
	12 Sire of 6	Hambletonia 10.	10			Trotter	—		
	13 Dam of 6	Lady Sanford.				Trotter	—		
	14 Sire of 7	Ethan Allen	43			Trotter	2.25½		2-15 with mate.
	15 Dam of 7	Daughter of Abdallah	1			Trotter			
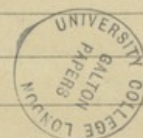
Signature and full address of the sender { Geo. K. Hostetter & Co. San Jose, California

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FRANCIS GALTON.

THE HORSE WITHOUT A "BUT."

—o—

Boodle 5829, Rec. 2:12½

—— SIRE OF ——

ETHEL DOWNS, ~~2:13~~ 2√0; THOMPSON, 2:15; MERLE M, 2:25.
Nad W. 2.29. Valentine (2) 2 30

 Two prominent horsemen were discussing the relative merits of notable stallions. They agreed that a certain stallion was well bred and a good producer, "*but*" he had no record. Another had a fast record, was well bred, and a good producer, "*but*" he was too small. Another had nearly all the necessary qualifications, "*but*" he had curbs and bad feet. Another possessed many rare qualifications, "*but*" he was vicious, as well as a "quitter." Finally one asked the other, "What's the matter with Boodle?" They both concluded that no stallion, living or dead, possessed *all* the qualifications desired in a more marked degree than BOODLE

—o—

QUALIFICATIONS

BREEDING unexcelled. Send for extended tabulated pedigree and history of BOODLE.

COLOR, beautiful seal brown, black points, no white.

SIZE, sixteen hands high, weight 1,150 pounds.

DISPOSITION, gentle as a lamb. A child can handle him.

STYLE. A real handsome horse—"a thing of beauty."

CONDITION. Sound as he was the day he was foaled.

SPEED. Race record 2:12½, in a hard-fought battle, which he won.

GAMENESS. A veritable bull dog. A gamer horse never lived.

PRODUCE. While he has only ~~three~~ *five* in the list, no horse living or dead can make a better showing, considering the number of his progeny that have been trained. He transmits all his perfect qualifications to his progeny. His ancestors are noted for their iron constitutions; many of them, notably Goldsmith Maid, 2:14, were obtaining world's records at a time in life when ordinary horses are thinking of dying of old age.

SEASON, ONE HUNDRED DOLLARS
(Usual Return Privileges)

G. K. HOSTETTER & CO., Owners, San Jose.

C. F. BUNCH, Manager, San Jose Race Track.

BOODLE 5829

RECORD, 2:12¼
Sire of ETHEL DOWNS, 2 years old, 2:10
Sire of THOMPSON, 5 years old, 2:15
Son of Valentine, 2 years old, 2:20 and others

BRIDE
Dam of Trenton, 2:40½
Dam of Boodle, 2:12¼
Dam of Begum, 2:27½

STRANGER 3030
Sire of Buttons, 2:13½; Col. Kuser, 2:13½; Boodle, 2:12¼, 2:17½, and 22 others better than 2:30.

GEN. WASHINGTON 116
Trial.....................................2:20
Sire of 8, also Loto, dam of
Pixley 2:08¼

GOLDSMITH MAID
Record..................................2:14
World's Record 1874-1878.
114 heats in 2:20 and better
332 heats won
Has won more money than any other horse

JAY GOULD 197
World's champion stallion, 1871-74
Record..............................2:20½
Sire of 26 trotters and 1 pacer, including Pixley, 2:08½; also, sire of the dam of Robert J, 2:01½.

TIDA
Record..............................2:38½
Sister to Blondie, 2:24.

GEN. KNOX 140 .... 2:31½
Sire of 16 in 2.18½ to 2:30

LADY THORN 2:18½
Full sister to Mambrino Patchen.

ABDALLAH 15 .... 2:42
Sire of 9 in 2:30
Sire of 13 with 126
Sire of 27 Dams with 35

OLD AB ....

HAMBLETONIAN 10
The greatest sire of trotters
Sire of Electioneer, Dexter, etc.

LADY SANFORD ....

ETHAN ALLEN 43. ..... 2:25½
With mate 2:15
Sire of Daniel Lambert

Daughter of

VERMONT HERO 141 .... 2:35

Dam by SEARCHER ....

MAMBRINO CHIEF, No. 11 .....

RHODES MARE ....

HAMBLETONIAN 10

KATIE DARLING

ABDALLAH 1 ....

ABDALLAH 1 ....

CHAS KENT MARE ....

AMERICAN STAR, 14 ....

OLD SORREL ....

BLACK HAWK 2:25½
Also called Vermont Black Hawk
Dam by Freeman's Messenger.

ABDALLAH 1 ....

SHERMAN'S BLACK HAWK 142
Dam by Liberty

BARNEY HENRY

MAMBRINO PAYMASTER
by Mambrino
ELDRIDGE MARE
by American Eclipse

GANO

ABDALLAH, 1
CHAS. KENT MARE

MAMBRINO by Imp. Messenger
AMAZONIA by Imp. Sour Krout

MAMBRINO
AMAZONIA

IMP. BELLFOUNDER
ONE EYE

AMERICAN STAR
SALLY SLOUCH

EXTON ECLIPSE
Dam by Messenger Duroc

SHERMAN MORGAN
by Justin Morgan
NARAGANSET PACER

MAMBRINO Son of Messenger
AMAZONIA by a Son of Messenger

Breed to the Developed Trotter

BOODLE

...No. 5829...

RACE RECORD, 2:12½

Made at Los Angeles, October 31, 1895

Boodle is Standard by all rules—Standard Bred, Standard by Performance, Standard by Produce.

BOODLE will make an early spring season, limited to twenty selected mares, at Agricultural Park, San Jose, Cal.

TERMS: By the Season, One Hundred Dollars ($100.00), with return privilege, or money refunded at our option, payable on or before June 1st, when season ends.

G. K. HOSTETTER & CO.

SAN JOSE, CAL. ...Proprietors.

Boodle's History

As a race horse, Boodle is known to all California. Each year he has shown himself to be a consistent race horse, always ready, and never suffering defeat unless his competitor trotted in faster time than his record at that particular time. He obtained his present record of 2:12½ in a hotly contested race, and at the same time gained the distinction of having trotted the fastest mile trotted by a stallion in California during the season 1895. In dissecting his pedigree you will find the blood of the gamest performers and that of the most prolific producers of speed this country has ever known. The beau-ideal of a stallion that the successful and educated student of the breeding problem can breed to with confidence and safety, should possess these qualifications: Proper size, staple color, recognized speed and endurance, and lastly, yet above all, to be bred in the speed-producing lines that have been tried, tested and proven successful.

BOODLE possesses all these many qualifications, and besides has proven himself a producer, as the only two colts ever worked for speed and raced have shown themselves to be consistent race horses. At nine years Boodle is the sire of "Thompson," ch. s., 5 years, record, 2:15, made in a winning race; also, "Ethel Downs," bl. mare, 5 years, record 2:13, in the fourth heat of winning race. This race is the fastest five-heat race ever trotted in California, Ethel Downs being the contesting horse in each heat, and winning the third, fourth and fifth heats. A number of his colts will be worked the coming season, and, from the promise they have already shown, will enter the list before the end of 1896. All of his get are uniformly handsome, of good size and substance, good disposition and speedy. Examine the within tabulated pedigree, and see who has a better bred animal than Boodle, then examine the horse and see who has a better individual.

The AMERICAN SPORTSMAN says: The get of Stranger made as strong a showing on the turf this year as the produce of any other sire. Col. Kuser, Cebolla and Beyreuth in the east, while Boodle was the best stallion seen on the California turf since the day of Palo Alto, while his get made a strong showing, Ethel Downs earning a record of 2:13, and Thompson a mark of 2:15. With these performances still in mind, there was an active demand for the produce of the son of Goldsmith Maid when they were led into the sale ring at Parkville Farm last week.

Boodle's dam, "Bride," is by Jay Gould, one of the most successful sires of brood mares, also the sire of Pixley, 2.08¼ trotting, and of the dam of Robert J, 2.01½, pacing.

Boodle started in thirteen races during 1895, reducing his record in nearly every race he won, and never being defeated in slower time than his record at that time. He won seven first moneys, two second moneys and two third moneys.

Boodle's first foal, Ethel Downs, 2:13, known as "the handsome and game black daughter of Boodle," has started in twelve races during her turf career. She was first nine times, second twice, and third once. She won the race of two-mile heats at the State Fair with the greatest ease. She also won the fastest five-heat race ever trotted in California (the 2:20 trot at Santa Ana) in 2:12½, 2:13½, 2:13½, 2:13 and 2:15.

Boodle's second foal, Thompson, has also a very creditable record, 2:15.

As a game and consistent race horse, Boodle has no superior. Boodle's record, 2:12½ (Coast stallion race record for 1895), is not a kite-shaped-prepared-track-tin-cup affair, but was made in a hotly contested race, which he won.

Col. Kuser, 2:11½, the game eastern campaigner and crackerjack, is bred the same as Boodle, being by Stranger, dam by Jay Gould.

CLARK'S HORSE REVIEW says: "Amongst the notable performances of the season of 1895 is that of the California stallion, Boodle, 2:12½, and his son, Thompson, 2:15, and daughter, Ethel Downs, 2:13, all having obtained these records in races during this season. This is the only instance on record where a stallion and two of his get have entered the 2:15 list in races which they have won all in one season."

The WESTERN BREEDER says: "Henry Pierce, the millionaire manufacturer, capitalist and horsebreeder, of California, arrived in New York from San Francisco to attend the Parkville sale of trotting stock last week. He says one of the best horses out on the California Circuit this year is the stallion Boodle, 2:12½, by Stranger, which he says is so game a race horse, besides having got two in the 2:15 list from his first crop of foals, as to convince Californians that Stranger blood is a great trotting element. As all horsemen know, Stranger is a son of the famous trotting queen, Goldsmith Maid, 2:14."

As a three-year-old, Boodle was mated with six mares, the result of which was five foals, the first two being Ethel Downs, 2:13, and Thompson, 2:15; one of the others can show a 2:40 gait on the road, and will be trained this spring; the other two have never been harnessed. As a four-year-old, he sired two colts, neither of which were ever trained. As a five-year-old, he sired but three colts, one of which will be in the 2:20 list in 1896. The other two have never been trained. Up to December 1st, 1895, there have been but four of Boodle's produce trained, viz: Ethel Downs, 5 years, 2:13; Thompson, 5 years, 2:15; Merle M, 3 years, a very promising filly; and Spry Ruth, yearling, (owned by Hon. J. D. Carr), very promising. The above statements show the limited opportunities Boodle has had.

Breed to a game stallion. Do not be misled by the fast quarter-horse, that can do that distance in 31 seconds. There is no money at the quarter for trotters. It requires the ability to go mile heats, three in five. Boodle seldom loses a race in which he gets a heat. It very often becomes necessary to postpone races to the next day in order to defeat him.

Breed to a horse with a good disposition—"like begets like." A child can go into Boodle's stall, or can drive him, with perfect safety.

Breed to a sound horse. Boodle has not a single blemish.

Breed to the best bred horse you can find. Examine within pedigree.

Breed to a horse with a fast race record:

❖ BOODLE, 2:12½ ❖

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PEDIGREE RECORDS.

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree — Stallion, Gelding, or Mare	Captain Cook	8083	Bay	1883	Trot	231	1893	Sire of Sir Edwin Arnold 2.09½ Van Dean 2.10½ pt cyr 2.20 Alf Taylor 2.24½ Brookdale Girl trial (2) 2.16½
PARENTS.	2 Sire	Favorite Wilkes	3257	Bay	1877	Trot	2.24½	1886	
	3 Dam	Belle		Cht		Trot			
GRAND PARENTS.	4 Sire of the Sire	George Wilkes	519	Brown	1856	Trot	222	1868	
	5 Dam of the Sire	Favorite Miller's		Brown		Trot			
	6 Sire of the Dam	Bell Morgan							
	7 Dam of the Dam	Daughter of Old Tom Crowder	—	—	—	—	—	—	
Great Grand Parents.	8 Sire of 4	Hambletonian	10	Bay	1849	Trot	248	1852	
	9 Dam of 4	Dolly Spanker	—	—	—	—	—	—	
	10 Sire of 5	Aly. Abdallah	15	Brown		Trot			
	11 Dam of 5	Lizzie Peeples	—	—	—	—	—	—	
	12 Sire of 6	Cottrell Morgan	—	—	—	—	—	—	
	13 Dam of 6	Canadian Mare							
	14 Sire of 7	Tom Crowder							
	15 Dam of 7	Snowstorm							

Signature and full address of the sender { H. H. Lovelace, Brookdale Stock Farm Como Tenn U S A

PEDIGREE RECORDS.

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree Stallion, Gelding, or Mare	Charity Lockwood	vol 14	chestnut Sorrel	1893	Pacer	rec 2.21¼ Trial 2.13½	1996	Trial over mile track at Davenport as a 3 year old quarters in 32 seconds
PARENTS.	2 Sire	Hastrange	5214	Bay		Trotter		2.23	2.23
	3 Dam	Belva Lockwood	Vol 14	Chestnut	1887	Trotter	2.36½	2.27	would have had rec of 2.25 or better but for an accident trial 2.25
GRAND PARENTS.	4 Sire of the Sire	Nutwood	600	Ch.		Trotter	2.18¾		dam of Harger Cylee coast 2.16½ Harpeth 2.21½
	5 Dam of the Sire	Hilda				Trotter			dam of Hargus 2.25 Cylee coast 2.16½ Harpeth 2.21½
	6 Sire of the Dam	Abdallah Sargent	4791	Bay	1881	Trotter			Trials 2.25
	7 Dam of the Dam	Lady Shelby 2nd		ch	1982	"	3.00		Trial 3 minutes 2.26 never trained
GREAT GRAND PARENTS.	8 Sire of 4	Belmont	64 by Abdallah 15 by Hamb 10						
	9 Dam of 4	Miss Russell dam of Maud S 28¾							
	10 Sire of 5	Cooper	100 by Hambletonian 10						
	11 Dam of 5	Hilda Nora Norman by Blackwood 74 by Norman 25							
	12 Sire of 6	Sargent	600 brown 1866 Trot					2.8.7	
	13 Dam of 6	by Hickory 2.27½							
	14 Sire of 7	Sterling	461 bay 1869 Trot				Trials better than 2.31		
	15 Dam of 7	by Shelby by Richelieu by Membrino chief 11							

Signature and full address of the sender

Hilton Engle Massillen Downs Cedar co

f. 9v

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree	Christmas Gift Stallion, ~~Gelding, or Mare~~	O 339	Black	1889	Pacer	2:15 ¾ Race Record	1896	
PARENTS.	2 Sire	Santa Claus 2.17½	2000	Bay	1874	Trot	2:17½	1881	
	3 Dam	Emma T.	Vol. 11	Bay	1879	Trot	(1) 2:32 ¼	1886	(1) Trial Harrisburg Penna
GRAND PARENTS.	4 Sire of the Sire	Hambletonian	#10	Bay	1849	Trot	(2) 2.48	1852	(2) Trial Recorded in Wallace Monthly
	5 Dam of the Sire	Lady Thorne Jr	Vols 4 & 6	Black	1870	Trot	—	—	
	6 Sire of the Dam	Sir John Franklin	—	Soml	1877	Trot	2:50	—	
	7 Dam of the Dam	Dolly	—	Black	1868	Trot	2:55	—	
GREAT GRAND PARENTS.	8 Sire of 4	Abdallah	Vol. 4	Bay	1823	Trot	—	—	
	9 Dam of 4	Charles Kent Mare	Vol. 4	Bay	—	Trot	—	—	
	10 Sire of 5	"William's" Mambrino sire by Ericson 2.30 ¾ to wagon	—	Bay	—	Trot	—	—	
	11 Dam of 5	Kate sire by Highland chief, he by Mambrino Chief &c out of daughter of McLenan & Holcom & C							
	12 Sire of 6	Young Moscow	—	Soml	1864	Trot	2:30 (1)	1870	(1) Trial Figure 8 Track West Chester Pa
	13 Dam of 6	— By Hickory Marcus Thoroughbred	—	Bay	—	Trot	—	—	
	14 Sire of 7	Bashaw "Harry's"	—	Black		Trot	—	—	
	15 Dam of 7	unhaced							

Signature and full address of the sender
Edward Twaddell
1823 Arch St
Philadelphia Penna U.S.A.

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SUBJECT.	1 Subject of the Pedigree	Clonmore	52.88	bay	1885	trot	2.21	1892	
		Stallion, Gelding, or Mare							
PARENTS.	2 Sire	Connaught	2432	bay	1879	trot	2.24		
	3 Dam	Hopeless	Vol 6 P 262	bay	1880	trot			
GRAND PARENTS.	4 Sire of the Sire	Wedgewood	692	brown	1871	trot	2.19		
	5 Dam of the Sire	Consuela	Vol. 4 p. 179	bay	1872	trot			
	6 Sire of the Dam	Hermes	548	brown	1871	trot	2.27½	1881	
	7 Dam of the Dam	Evadne		brown					
Great Grand Parents.	8 Sire of 4	Belmont	64	bay	1864	trot	2.42 (3) 2.28 (2)		
	9 Dam of 4	Woodbine	Vol. 4 P. 292	brown	1855	trot			
	10 Sire of 5	Harold	413	bay	1864	trot			
	11 Dam of 5	Young Portia				trot			
	12 Sire of 6	Harold	413	bay	1864	trot			
	13 Dam of 6	Hermosa		bay		trot	2.33½		
	14 Sire of 7	Ericsson	130	brown	1856	trot	2.30½		
	15 Dam of 7	Mrs. Candle							

Signature and full address of the sender J. R. Foster, Rock Farm, Danville, P. Q. Canada

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SUBJECT.	1	SUBJECT of the Pedigree **Dorrance** Stallion, Gelding, or Mare	Vol.8 P.504	Bay	1889	Pacer	2.13½	1894	
PARENTS.	2	SIRE **El Capitan**	9950	Bay	1884	Pacer	2.20½	1891	
	3	DAM **Dolpha**	Vol.8 P.303	Brown	1883	Trot	—	—	
GRAND PARENTS.	4	Sire of the Sire **Alcantara**	729	Bay	1876	Trot	2.23	1880	
	5	Dam of the Sire **Piedmont Maid**	—	Bay	1877	Trot	—	—	
	6	Sire of the Dam **Dresden**	4618	Brown	1879	Trot	—	—	
	7	Dam of the Dam **Pinnie Pepper**		Brown	1875	Trot	—		
GREAT GRAND PARENTS.	8	Sire of 4 **George Wilkes**	519	Brown	1856	Trot	2.22	1868	
	9	Dam of 4 **Alma Mater**		Chesnut	1872				
	10	Sire of 5 **Piedmont**	904	Chesnut	1871	Trot	2.17¼	1881	We have letter from Mr C.C.Brown
	11	Dam of 5 **Minnie Haha**		Bay	—	Trot	2.36		who bred Minnie Haha that says Minnie Haha has record of 2.32 at Prospect Park
	12	Sire of 6 **Administrator**	357	Bay	1863	Trot	2.29½	1877	
	13	Dam of 6 **Pareppa**		Bay	1868	Trot			
	14	Sire of 7 **Challenger**		Bay	1874	Trot	—		
	15	Dam of 7 **Bounty**		Black	1874				

Signature and full address of the sender { John Colvin & Sons, Alta Plane Farm, Rensselaer, Md. U.S.A.

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FRANCIS GALTON.

Watertown Feb 14th 88.

Mrs. Francis Galton

Dear Sir

I have

waited some time too find
out about all of the Relations
of my horse but have faild
too doe so and I supose you
can pick them out better
than I can so I will send
it along   what is a horse
worth like this with you
he could trot in 2.20 last fall
the first reason of training

Yours

T. D. Harris

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree	Dyer-H ___ Stallion, Gelding, or Mare		Red Bay	1892	Pacer	2.28¾	1897	
PARENTS.	2 Sire	Wayford	vol. V. page 416 5376 vol. 21 page 162	Red Brown	1878	Trotter	2.16½ hic 2.20¼	1888	
	3 Dam	Lucy	—	Bay	1888	trot pace	300.2	1891	
GRAND PARENTS.	4 Sire of the Sire	Hemlock formerly call'd Midland	1229						
	5 Dam of the Sire	Julia See A	A T R vol V page 416			trot	2.50		
	6 Sire of the Dam	Major Benton							own bro Jefferson Bronce & General Benton but never been handled for speed
	7 Dam of the Dam	Sally untraced							
GREAT GRAND PARENTS.	8 Sire of 4	Belmont	64						the sire of 24 below 30 g. 15 other in list 30
	9 Dam of 4	Missouri							sister in blood to woodford Mambrino
	10 Sire of 5	Woodford							
	11 Dam of 5								
	12 Sire of 6	Jim Scott							
	13 Dam of 6								
	14 Sire of 7								
	15 Dam of 7								

Signature and full address {
of the sender {

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For Sale.

FLAMINGO C. 2.25¼

ST VINCENT. 5443
2.13½

    3803
    WILKES BOY
    2.24½
        GEO WILKES 519
        2.22
            HAMBLETONIAN. 10. RYSDYKS.
            DOLLY SPANKER
        BETTY BROWN
        Dam of two in the list
            MAMBRINO PATCHEN 58
            PICKLES

    AILEN
    DAM OF
    ST. VINCENT 2.13½
    ELLERSLIE WILKES
        MAMBRINO BOY 844
        2.26½
            MAMBRINO PATCHEN
            ROVING NELLY
        BETTY BROWN
        DAM OF TWO IN THE LIST
            MAMBRINO PATCHEN
            PICKLES

GOLDEN GIRL
~DAM OF~
AITIC, PACING 2.19¼
FLOSSIE ~ ~ ~2.18¼

    BLUE BULL 75
    WILSON'S
        PRUDEN'S BLUE BULL
        DAM UNTRACED

    DAM BY
        MANCHESTER TUCKAHOE

FLAMINGO C. 2.25¼. BAY MARE, 16 HANDS HIGH, TWO HIND ANKLES WHITE,
GOOD MANE AND TAIL, WEIGHS 1165 POUNDS
FOALED MAY 1892. STANDARD UNDER RULE 6.

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		NAME.	Register No. 2.2264 or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1	Subject of the Pedigree	Flamingo C	Rule 6 Vol XIII	Bay	1892	Trotter	2.25¼		Trotted in 2.19 half mile track – Trial.
		Stallion, Gelding, or Mare								
PARENTS.	2	Sire	St Vincent							Never Trained only 1897
	3	Dam	Golden Girl							& raced 3 times,
GRAND PARENTS.	4	Sire of the Sire	Wilkes Boy							She is registered in the
	5	Dam of the Sire	Aileen							American Trotting Register
	6	Sire of the Dam	Blue Bull, Wilsons							full 16 high
	7	Dam of the Dam	Manchester Tuckahoe							
Great Grand Parents.	8	Sire of 4	Geo Wilkes							
	9	Dam of 4	Betty Brown							
	10	Sire of 5	Mambrino Boy							
	11	Dam of 5	Betty Brown							
	12	Sire of 6	Pruden's Blue Bull							
	13	Dam of 6	Untraced							
	14	Sire of 7								
	15	Dam of 7								

Signature and full address of the sender: Charles Castle. Titusville, Penn.

PEDIGREE RECORDS.

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FRANCIS GALTON.

"GUY D."

DESCRIPTION:

GUY D. 2.2¼ Pacing Stallion is a beautiful bay with black points excepting white legs behind and strip in face, is a very rapid mover and one of the speediest in the country.

Sired by Monte W. No. 10901, 2.34; dam by Tremont, sire of Junemont 2.14.

Monte W. sired by Olmedo Wilkes 2.26 sired by Onward 2.25.

GUY D's. dam was by General Cobham his dam Messenger and Durock. Second dam Marshall Chief is a Morgan and is registered in Wallace's trotting register as producer of speed. It is claimed Morgan and Wilkes are the best of combinations of blood for speed and endurance.

This is of 1896

f. 17v

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PEDIGREE RECORDS.

Form for use only when the speeds (standard or not) of the subject, of its two parents, and of its four grand parents are all known.

		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree	Guy L — Stallion, ~~Gelding, or Mare~~	Performance	Bay	1890	P	2.21¼	1897	Three miles in 2.16 beets horses with marks of 2.13 to 2.17
PARENTS.	2 Sire	Monte W	V.6. 10 & 01	golden Chesnut	1887	Patter 2.34¼	1894	Started in eight races & won 5, first monies 2 sec & one 3rd money all in free fors
	3 Dam	Nellie		Bl Brown Hair	1881	Mix	—	—	alls except once
GRAND PARENTS.	4 Sire of the Sire	Almedo Wilks	3770	B	1882	Mix	2.26½		Rec in Trot
	5 Dam of the Sire	Idlewild		ches	1884	T			wasent trained
	6 Sire of the Dam	General Cobham		Bay Brok Hair		T			Wasent trained good actor
	7 Dam of the Dam	Kitt		Bl		T			wasent trained
GREAT GRAND PARENTS.	8 Sire of 4	Onward				T	2.25¼		
	9 Dam of 4	Alma							
	10 Sire of 5	Tremont	1565	B		T	2.28½		
	11 Dam of 5	Mag Strater				T			
	12 Sire of 6	Old Cobham							
	13 Dam of 6	Black Hawk Messenger							
	14 Sire of 7	Marshall Chief							Standard producer & troger beet
	15 Dam of 7								

Signature and full address of the sender: W. E. Dunham
Bangor Lacey Mich

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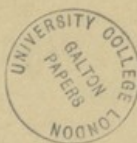
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SUBJECT.	1 Subject of the Pedigree	Henry Barrett Stallion, Gelding, or Mare	—	bay	93	Trot	Rec 2.10½	191	
PARENTS.	2 Sire	Baron De Aton	21.714						
	3 Dam	Ellen Tree	vol 13	chst	1856	Trot	—	—	Dam of Rachel 3 y. rec 2.25
GRAND PARENTS.	4 Sire of the Sire	Baron Wilkes	4758	Brown	1882	Trot	2.18	1888	Lola Montes 2.34 & L. Henry Barrett 4 y. rec. 2.10½
	5 Dam of the Sire	Stinette		Bay	1886	Trot	—	—	
	6 Sire of the Dam	Mambrino Russell	2008	chst	1878	Trot	—	—	
	7 Dam of the Dam	Omega		chst	1882	Trot	—	—	
GREAT GRAND PARENTS.	8 Sire of 4	George Wilkes	519	Brown	1856	Trot	2.22	1868	
	9 Dam of 4	Belle Patchen	—	Bay	1874	Trot	2.30¾	—	
	10 Sire of 5	Steinway	1808	Bay	—	Trot	2.25¾		
	11 Dam of 5	Ola Nd	—	Bay	—	Trot	dam of 5 better than 2.30		
	12 Sire of 6	Woodford Mambrino	345	chst	—	Trot	Rec 2.21¼		
	13 Dam of 6	Miss Russell	—	brag	—	Trot	—	dam of Maud S (2.08¾)	
	14 Sire of 7	Dr Spaulding son of Lodi & he by W. M. Clay Jr.							
	15 Dam of 7	Hattie Fuller	vol XI	Bay	1878	Trot	dam of Col Mc rec 2.27¾		

Signature and full address of the sender   J R Rogers   Cane Ridge Bourbon Co Ky.

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FRANCIS GALTON.

ALADDIN, 2235

RECORD 2:41, Trial 2:29.

SIRE OF

ADAM (p) 3.. ....2:15½	ALSO SIRE OF DAMS OF		
JNO. KENNEY 2:16			
HAMDEN, (p) 2:23	MARY 2:20½		
BROWN AL, (p).. .....2:24½	ROBERT RYAN... .2:21½		
PEARL P., (3) 2:29¼	LADY PICO.... . ..2:30		
HYPOLITE............2:30			

By Hambletonian, 10.

Sire of DEXTER, 2:17¼ and 40 others in the 2:30 list.

1st Dam, MISS MONROE,
Full sister to Monroe 2:27¼ and dam of Fergus Mc-Gregor, sire of 11 in the 2:30 list; also Pansy McGregor, (1) 2:23¾ - By IRON DUKE, 181
Sire of Kelsie, 2:23¾; Monroe, 2:27¼; Silver Duke, 2:28¾; Coriander, 2:29¼, by Hambletonian, 10.

2nd Dam, YOUNG SALINA,
Dam of Monroe, 2:27½; St. Patrick, 2:14¼ - By GUY MILLER,
g s. of Darby, 2:16; also sire of Whipple's Hambletonian, sire of fifteen with records of 2:20; by Hambletonian, 10.

3rd Dam, SALINA.
Dam of J. H. Coleman, 2:31¼ - - - - By PAMUKY,
Son of American Eclipse.

ALADDIN is a very dark brown, 15 hands high and weighs 1000 pounds.

TERMS—$25 cash or approved note, with return privilege until you get a colt, if horse is living.

ABDALLAH BRUCE,

SIRE OF

GRANT'S ABDALLAH, 2:10 1-2,

And the dams of WHIRLIGIG, 2:10¼; PEARL P., 2:11⅜.

By Bruceton,

1st Dam, TROTTING SISTER,
Full sister of Pacing Abdallah and dam of Nephew, 2:36, sire of 17 with records 2:30; Hamdallah, sire of seven with records of 2:30; Downing's Abdallah, sire of 2 with records better than 2:30 By ALEXANDER'S ABDALLAH, 15 Sire of Goldsmith Maid, 2:14; Belmont, 64, sire of Nutwood, 2:18¾; and sire of 51 with records of 2:30.

2nd Dam, LYDIA TALBOT,
Dam of Pacing Abdallah, 6038, sire of Bay Mate, 2:30; also sire of the dam of King William, 2:20½; Cad Wade, 2:22¾; Hilcrest, 2:29 and Calett, 2:29½ - By TAYLOR MESSENGER, son of General Taylor, sire of the dam of Wells Fargo, 2:18¾ and 5 others with records of 2:30.

BRUCETON.

1st Dam, BELL GODDARD,
By Mambrino Chief, 11; 2nd Dam, Woodford Bell, by Mirbeau, son of Medoc - - By BEN BRUCE, Son of Corbeau, sire of Billy Boyce, 2:14½; Billy S , 2:14½; Dora, 2:26¼ and Rose Standish, 2:29.

Abdallah Bruce, black, no white, 16¾ hands high, weighs 1400 pounds.

TERMS—$10 cash or approved note, with return privilege until you get a colt, if horse is living.

TO BREEDERS.

Mares sent from a distance will receive such care and attention as we are able to give our own, and will be kept on good pasture at $1.00 per month, while breeding, or fed grain at $1.00 per week.

All possible care will be taken to prevent accidents, but will not be responsible should any occur.

☞ We have a few choice, well-bred colts for sale, and invite all lovers of good horses to call and see our stock.

Breed while service is cheap, you will have horses to sell when they are higher. There is always a demand for the good ones

J. M. GRANT.

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SUBJECT.	1	Subject of the Pedigree	no. 1. Hipolite		Dk Bay	1892	Trot	2 20½	1897	Trial 2 14
		Stallion, Gelding, or Mare							
PARENTS.	2	Sire	Halladin	2 35	Dk Brown	1876	Trot	2 4		Trial 2 29
		Hipoliton (Mare)			Dark Bay	1894	Trot	2 20½	1897	Trial 2 14
	3	Dam	Lulu Knox by Genl Garfield (by Genl Knox)		Brown	1884	Trot	3 00	1888	As a two year old
GRAND PARENTS.	4	Sire of the Sire	Hambletonian	# 10	Bay		Trot	2 48	1852	
	5	Dam of the Sire	Miss Monroe		—	—	—	—	—	
	6	Sire of the Dam	Iron Duke	181	—	—	—	—	—	
	7	Dam of the Dam	no. 2 Lady Sprague		Blk	1893	Trot	2 23½	1897	
GREAT GRAND PARENTS.	8	Sire of 4	Rounds Sprague	4194	Brown		Trot	2 24½		
	9	Dam of 4	Lulu Knox							
	10	Sire of 5	no. 3 Rex. Abdallah		Bay	1894	Pacer	2 25¾		
	11	Dam of 5	Maggie Bettis		Bay	—	Trot	—		By Oswego Chief Record 2 32
	12	Sire of 6								
	13	Dam of 6	You will please observe that I have used this one sheet for Three animals							
	14	Sire of 7	as indicated by Numbers 1 - 2 + 3. Should you need more information							
	15	Dam of 7	write and I will comply. Yours Truly William Goodman							

Signature and full address of the sender

Parsons Kansas

January 26th 1898. Breeder of above mentioned animals

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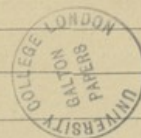
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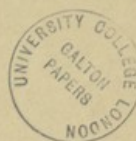
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SUBJECT.	1	Subject of the Pedigree Jim Doran Gelding. Stallion, Gelding, or Mare		Bay	94	Pacer	heri in race Trial ½ 1.08	46	Sher in Race worked down nicely broke
PARENTS.	2	Sire Western Light 13476		Chestnut	90	Trot Trial		95	heri in but on race two record lapsed out in 24
	3	Dam Elizabeth R. Tilden		Bay	73	Trot			Never Trained
GRAND PARENTS.	4	Sire of the Sire Ambassador 1496		Black		Trot	32 14		Trial 2.18
	5	Dam of the Sire Puss							
	6	Sire of the Dam Magna Charta Reg 105							Jim Doran was sired
	7	Dam of the Dam By Vernon Heron							by Western Light 13476
GREAT GRAND PARENTS.	8	Sire of 4 George Wilkes Reg No 519							he by Ambassador 1496 he by
	9	Dam of 4 Dolly Spanker							George Wilkes 519 he by Hamblehonian
	10	Sire of 5 Hambleton 10							10. Western Light dam Puss
	11	Dam of 5 Telegraph Charles Kent M							by Magna Charta 105. Jim
	12	Sire of 6 Morgans Eagle							Dorans day by Elizabeth R Tilden
	13	Dam of 6 By Imp Granby not Trained							by Wilkes Champion. by Kelloggs Champion
	14	Sire of 7		Bay					Bay Horse 15¾ high has stown 1⁄8 fast
	15	Dam of 7							

Signature and full address of the sender ⟩ Almon Castle Richland Mich Kalamazoo Co

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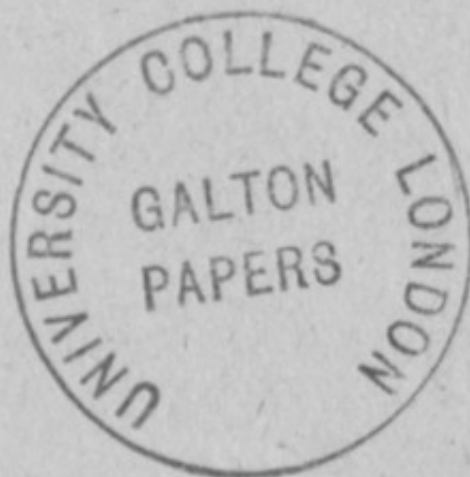
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SUBJECT.	1	Subject of the Pedigree	Brava	Vol. 7, p. 336	Bay	1885	Trot.	2.14½	1892	
			~~Stallion, Gelding, or Mare~~							
PARENTS.	2	Sire	Baron Wilkes	4758	Brown	1882	Trot.	2.18	1888	
	3	Dam	Mary A. Whitney	Vol. 4	Bay	1867	Trot.	2.28	1874	
GRAND PARENTS.	4	Sire of the Sire	George Wilkes	519	Brown	1856	Trot.	2.22	1868	
	5	Dam of the Sire	Belle Patchen	—	Bay	1874	Trot.	2.30¾	—	
	6	Sire of the Dam	Volunteer	55	Bay	1854	Trot.	2.36 (1) 2.31¼ (2)	1862 1861	(1) To wagon. (2) Trial : to wagon.
	7	Dam of the Dam	Peggy Slender	Vol. 2, p. 269	Bay	1850	Trot.	2.55 (3)	1859	(3) Won at Burton, Ohio, 7th heat of race, and the time trotted is given by John W. Conley as 2.35. He says 2.55 in Wallace's Register is a typographical error for 2.35, and that he furnished Mr. Wallace with the information there published.
GREAT GRAND PARENTS.	8	Sire of 4	Hambletonian	10	Bay	1849	Trot.	2.48 (4)	1852	(4) Trial. Recorded in Wallace's Monthly.
	9	Dam of 4	Dolly Spanker	—	—	—	—	—	—	
	10	Sire of 5	Mambrino Patchen	58	Black	1862	Trot.	—	—	
	11	Dam of 5	Sally Chorister	—	Brown	186--		—	—	
	12	Sire of 6	Hambletonian	10	Bay	1849	Trot.	2.48 (4)	1852	
	13	Dam of 6	Lady Patriot	—	Bay	1850	Trot. (5)	—	—	(5) Also a fast runner.
	14	Sire of 7	Unknown	—	—	—	—	—	—	
	15	Dam of 7	Unknown	—	—	—	—	—	—	

Signature and full address of the sender {
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Allen Farm, Pittsfield, Mass. U.S.A.

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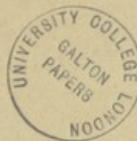
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f. 24r

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree	Brava	Vol. 7, p. 336	Bay	1885	Trot.	2.14½	1892	
		Stallion, Gelding, or Mare?							
PARENTS.	2 Sire	Baron Wilkes	4758	Brown	1882	Trot.	2.18	1888	
	3 Dam	Mary A. Whitney	Vol. 4	Bay	1867	Trot.	2.28	1874	
GRAND PARENTS.	4 Sire of the Sire	George Wilkes	519	Brown	1856	Trot.	2.22	1868	
	5 Dam of the Sire	Belle Patchen	—	Bay	1874	Trot.	2.30¾		To Wagon allows 10 secs: off the pace.
	6 Sire of the Dam	Volunteer	55	Bay	1854	Trot.	2.36 (1) / 2.31½ (2)	1862 / 1861	(1) To wagon. (2) Trial: to wagon.
	7 Dam of the Dam	Peggy Slender	Vol. 2, p. 269	Bay	1850	Trot.	2.55 (3)	1859	(3) Won at Burton, Ohio, 7th heat of race, and the time trotted is given by John W. Conley as 2.35. He says 2.55 in Wallace's Register is a typographical error for 2.35, and that he furnished Mr. Wallace with the information there published.
GREAT GRAND PARENTS.	8 Sire of 4	Hambletonian	10	Bay	1849	Trot.	2.48 (4)	1852	(4) Trial. Recorded in Wallace's Monthly.
	9 Dam of 4	Dolly Spanker	—	—	—	—	—	—	
	10 Sire of 5	Mambrino Patchen	58	Black	1862	Trot.	—	—	
	11 Dam of 5	Sally Chorister	—	Brown	186--	—	—	—	
	12 Sire of 6	Hambletonian	10	Bay	1849	Trot.	2.48 (4)	1852	
	13 Dam of 6	Lady Patriot	—	Bay	1850	Trot. (5)	—	—	(5) Also a fast runner.
	14 Sire of 7	Unknown	—	—	—	—	—	—	
	15 Dam of 7	Unknown	—	—	—	—	—	—	

Signature and full address of the sender Wm. Russell Allen,
Allen Farm, Pittsfield, Mass. U.S.A.

F. 24 v

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SUBJECT.	1 Subject of the Pedigree	Duad Stallion, Gelding, or Mare	No. 22937 Vol. XII	Chesnut	1891	Pacer	2:23¼	Aug. 14 1896	A close second at Pittsfield Me. Sept. 15 1897 in 2:21¼, 2:21¾ & 2:17¼. His race record of 2:23¼ made at Pittsfield Me. Aug. 14, 1896 ½ mile track
PARENTS.	2 Sire	Edgemark	No. 7432	Bay	1885	Trotter	2:16	1889	
	3 Dam	Coral	Vol. VII	Bay	1887	Trotter			
GRAND PARENTS.	4 Sire of the Sire	Victor Von Bismarck	No. 326 Vol. IV	Bay	1867	Trotter			
	5 Dam of the Sire	Edgewater Belle		Bay	1879	Trotter			
	6 Sire of the Dam	Nelson	No. 4209	Bay	1882	Trotter	2:09		
	7 Dam of the Dam	Belle Heaven		Black	1883	Trotter			
GREAT GRAND PARENTS.	8 Sire of 4	Hambletonian	No. 10	Bay	1849	Trotter			
	9 Dam of 4	Hattie Wood		Bay	1860	Trotter			Dam of Gazelle 2:21 & 3 producing sires
	10 Sire of 5	Edgewater	No. 12730	Bay	1872	Trotter			
	11 Dam of 5	Easter	Vol. VII	Bay	1869	Trotter			
	12 Sire of 6	Young Rolfe	No. 3517 Vol. V	Bay	1876	Trotter	2:21¼		
	13 Dam of 6	Gretchen		Bay	1867	Trotter			Dam of 5 in 2:30 list
	14 Sire of 7	Aral	No. 2247 Vol. III	Glay	1877	Pacer	2:25½		
	15 Dam of 7	Kate		Bay	1879	Trotter			

Signature and full address of the sender James G. Spaulding
99th Street (between 3ᵈ & 4th Avenue) Fort Hamilton. New York City. U. S. A.

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SUBJECT.	1 Subject of the Pedigree	Lola Montus Stallion, Gelding, or Mare	—	Chst	1892	Trot	Rec 2.30	1896	now owned by Emperor of Austria — won as many starts with race rec. in Austria of 2.16
PARENTS.	2 Sire	Warlock	—	Bay	—	Trot	—		Reimported from England
	3 Dam	Ellen Tree	Vol 13	Chst	1884	Trot	—	—	
GRAND PARENTS.	4 Sire of the Sire	Belmont	No 64	Bay	—	Trot	—	—	
	5 Dam of the Sire	Waterwitch	—	—		Trot	—		Great Brood Mare
	6 Sire of the Dam	Mambrino Russell 2008		—		Trot	—	—	Out of dam of Maud S. 6 in list
	7 Dam of the Dam	Omega	—	Chst	1872	Trot	—	—	
GREAT GRAND PARENTS.	8 Sire of 4	Alexanders Aballah	15	Bay	—	Trot	—	—	
	9 Dam of 4	Mambrino Chief	—	—	—	Tr	—	—	
	10 Sire of 5	Pilot Jr.	B	—	—	Tr	—	—	
	11 Dam of 5	Fancy		—					by St. Lawrence
	12 Sire of 6	Woodford Mambrino 345	Chst	—	Trot	2.21½	—		
	13 Dam of 6	Miss Russell	—	Bay	—	Trot		Great Brood Mare dam of Maud S.
	14 Sire of 7	Dr Spaulding	son of Lodi, son of Cassius M. Clay Jr.						& others
	15 Dam of 7	Hattie Fuller	Vol XI	Bay	1878	Trot		dam of Col. Mess rec 2.27½ by Strathmore 408

Signature and full address of the sender

J R Rogers
Cane Ridge Bourbon Co.
Ky.

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SUBJECT.	1 Subject of the Pedigree Stallion, Gelding or Mare	McGreggor Wilkes		Bay	1894	pacer	½ mile 1.15	1897	
PARENTS.	2 Sire	George Black	15345	Blk	1890	pacer	2.22½	1896	
	3 Dam	Miss Souchard	Vol 13	Ch	1887	Trot			Dam of Dick Wilkes 2.09¾
GRAND PARENTS.	4 Sire of the Sire	Blooming	15344						
	5 Dam of the Sire	Belva Lockwood							
	6 Sire of the Dam	Robert Mack		Chestnut					by Robert McGreggor 647 – 2.17¼
	7 Dam of the Dam	Bell Jones							
GREAT GRAND PARENTS.	8 Sire of 4	St Jerome	VII 6430						
	9 Dam of 4	Flora Diamond	Registered						
	10 Sire of 5	Hambletonia Wilkes	1679						Geo Wilkes 2.22
	11 Dam of 5	Hester							Belmont 4468
	12 Sire of 6	Robert McGreggor	647	Chestnut	1871	Trot	2.17¼		
	13 Dam of 6	Name unknown	by Hicks Black Hawk Son of Singletons Silver Heels by Hills Black Hawk #5						
	14 Sire of 7	VanHagener	Bruce Stud Book						Thorough bred
	15 Dam of 7	Grace Town							

Signature and full address of the sender { Wm M English
Elmwood Peoria County Illinois U.S.A

f. 27v

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This Horse is for Sale

MELROSE ✳ WILKES.

STANDARD.

MELROSE WILKES—Sire, Guythurton, 11,014, bred at San Mates Farm, California. First dam, Florence Jones by Melrose, 2,819; second dam, by Florence by Duroc, 1,099; third dam, by the Skinner horse by young Columbus; fourth dam, by the Morse Horse.

Guythurton, by Guy Wilkes, 519. First dam, Huntress by Arthurton, 365; second dam, Old Huntress Skenandoah, 926; third dam, Susette by David Hill Imported; fourth dam, Thoroughbred.

Terms—$20. Accident and escapes at owner's risk. Bills payable March 1, 1895.

RICHARD JONES,
Schaghticoke Hill, N. Y.

ᚷMELROSE ✳ WILKESᚧ

Was foaled April 9, 1891. Bay, small star, both hind ankles white. Stands 15 hands 2½ inches high; will make a horse 15:3. ½ weighs 1125

Guythurton died when 4 years old, but his record showed his ability, as a trotter. His dam, Huntress, trial 2.24, and is the dam of Hidalgo, 2.27 trial 2.20, and one 2-year-old entered the 2.30 list last season.

Arthurton, the sire of Huntress, is the sire of Arab, 2.15, etc

Guy Wlikes's record, 2.15¼, now has to his credit six with records below 2.12, surpassing in this respect all other sires; namely, Hulda, 2.8¼ in the third heat of a race; Rupee, 2.11; Hazel Wilkes, 2.11¼; Muta Wilkes, 2.11¾. He also has to his credit, Sira, 4 years, 2.13¾; Chris. Smith, 2.14½ and Una Wilkes, 2.15,—and a number of others in the 2.30 list.

Guy Wilkes is a brother to William L., the sire of Axtell 2.12; Mel-

rose, record 2.29¼; at 18 yeary of age and the sire of T. T. S., 2.19½: and ten others in the 2.30 list. Also sired Florence Jones, record 2.37¼; this mare was very fast; second time she was hooked to a sulky she trotted a half over the Schaghticoke track in 1.14¼; then sold her to Messrs. Haner & Cody, and was soon started in the 2.50 class at Binghamton, which she won in three straight heats, and could have taken a mark below 2.30; Meeting with an accident, she was bred, and now in foal. She has recovered from her injury and will be heard of later on. Second dam, by Hill's Duroc, the sire of Ripple, 2.17¼; and Frank T.; 2.19½; and a number of others in the 2.30 list. Thus it will be seen that MELROSE WILKES combines the blood of the great trotting family and traces back four times to Hambletonian 10, which cannot fail to produce the best trotting stock.
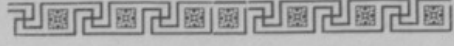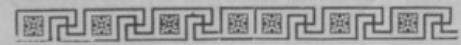
March 20, 1894.

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SUBJECT.	1 Subject of the Pedigree	Melrose Wilkes	not Registered	Bay	1891	Trot	Trial 2.28½	1896	he has been driven 3 heats over ½ mile track faster than 2.30 the last heat in 2.28 he showed a 2.20 clip anytime last year
		Stallion, Gelding, or Mare							
PARENTS.	2 Sire	Guy Thurston	11014	Brown		Trot	—	—	
	3 Dam	Florence Jones	Vol 10	Bay	1888	Trot	2.30½ Trial 2.20	1892	
GRAND PARENTS.	4 Sire of the Sire	Guy Wilkes	519	Bay					
	5 Dam of the Sire	Florence		Brown					
	6 Sire of the Dam	Duroc	1.088						
	7 Dam of the Dam								
Great Grand Parents.	8 Sire of 4								
	9 Dam of 4								
	10 Sire of 5								
	11 Dam of 5								
	12 Sire of 6								
	13 Dam of 6								
	14 Sire of 7								
	15 Dam of 7								

Signature and full address of the sender

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SUBJECT.	1 Subject of the Pedigree	Miss Mayms Stallion, Gelding, or Mare *Mare*	Vol. XIV	Black	1892	Pacer	2:12½	1897	
PARENTS.	2 Sire	Kervs Baly 11834	IX	Brown	1887	Pacer	2:14	1894	Pacing record 2:14 Trotting record 2:25½
	3 Dam	Black Baly	XIV	Black	1876	Pacer	—	—	
GRAND PARENTS.	4 Sire of the Sire	Kervs Reference 1466	IV	Brown	1837	Trot	2:25¼	1884	
	5 Dam of the Sire	Suey G	IX	Bay	1875	Pacer	—	—	
	6 Sire of the Dam	Nigger Baly	—	Black	1854	Pacer	—	—	
	7 Dam of the Dam	Fidgett	—	Brown	1867	Pacer	—	—	
GREAT GRAND PARENTS.	8 Sire of 4	Louis Napoleon 261	IV	Bay	1846	Pacer	—	—	
	9 Dam of 4	Mambrino Princess	IV	—	—	—	—	—	
	10 Sire of 5	McKinney Harte	—	Bay	—	Pacer	—	—	
	11 Dam of 5	Flora	—	Bay	—	Pacer	—	—	
	12 Sire of 6	Black Jeff	—	Black	—	Trot	—	—	
	13 Dam of 6	—	—	—	—	—	—	—	
	14 Sire of 7								
	15 Dam of 7								

Signature and full address of the sender

Wm Whitten M.B.
Pilot Point
Texas. U.S.A.

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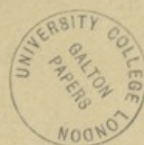
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SUBJECT.	1 Subject of the Pedigree. Stallion, ~~Gelding, or Mare~~	Moquette 2.10	Vol XI	Bay	1888	Trot.	2.10	1892	Sire of Bowman (3) 2.17¼ " " Midway p (3) 2.19¼ (4) 2.17½ " " Mole (3) 2.29¼
PARENTS.	2 Sire	Wilton	5982	Brown	—	Trot	2.19¼	—	Sire of 74 in the 2.30 list.
	3 Dam	Betsey & I	—	—	—	—	—	—	
GRAND PARENTS.	4 Sire of the Sire	George Wilkes	—	—	—	Trot	2.22	—	Sire of 77 in 2.30 list
	5 Dam of the Sire	Alley	—	—	—	—	—	—	
	6 Sire of the Dam	Ericsson	—	—	—	Trot	2.30½	—	Sire of Bell 2.28¼, Doble 2.28, Eric (4) 2.28½ Della R 2.29, Nightingale 2.28½, Rarely 2.24½
	7 Dam of the Dam	Molly Lincoln	—	—	—	—	—	—	A First class race mare.
GREAT GRAND PARENTS.	8 Sire of 4	Hambletonian	10	—	—	—	—	—	Sire of 188 sires with 1192 in 2.30 list
	9 Dam of 4	Dolly Spanker	—	—	—	—	—	—	
	10 Sire of 5	Hambletonian	10	—	—	—	—	—	
	11 Dam of 5	Lady Griswold	—	—	—	—	—	—	
	12 Sire of 6	Mambrino Chief	11	—	—	—	—	—	Sire of 23 sires with 92 in 2.30 list " " 17 dams " 24 " " "
	13 Dam of 6	Miss Caudle	—	—	—	—	—	—	
	14 Sire of 7	Imp Australian	—	—	—	—	—	—	Sire of granddams of Alcantara 2.23 Alcyone 2.27 Allendorf 2.19½ & others
	15 Dam of 7	Laura Bruce	—	—	—	—	—	—	A great race mare and stakes winner.

Signature and full address of the sender { Frank & T.E. Drake Lebanon Ohio

PEDIGREE RECORDS.

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree	Monocacy	9893	Brown	1887	Trot.	2:15¾	1896	Has shown 2:04 gait for ¼ mile.
		Stallion, Gelding, or Mare.							
PARENTS.	2 Sire	King Wilkes	1867	Brown	1876	Trot	2:22¼		Trial 2:17
	3 Dam	Vivandiere	Vol. 6⁵	Bay	1866	Trot.			Trial ¼ mile 2:40 gait
GRAND PARENTS.	4 Sire of the Sire	George Wilkes	519	Brown	1856	Trot.	2:22	1868	
	5 Dam of the Sire	Missie	—	—	—	—	—	—	
	6 Sire of the Dam	Volunteer	55	Bay	1854	Trot.	2:37	1862	Trial to wagon 2:31¼
	7 Dam of the Dam	Martha	Vol 4.	Bay					
GREAT GRAND PARENTS.	8 Sire of 4	Hambletonian	10	Bay	1849	Trot.	2:48	1852	Trial 2:48
	9 Dam of 4	Dolly Spanker	—	—	—	—	—	—	
	10 Sire of 5	Brignoli	77	Brown		Trot.	2:29¾	1867	
	11 Dam of 5	Geo Brand Mare	—	—	—	Trot	3:06		Trial 3:06
	12 Sire of 6	Hambletonian	10	Bay	1849	Trot.	2:48	1852	
	13 Dam of 6	Lady Patriot	Vol 4.	Bay	1850	—	—	—	Running mare.
	14 Sire of 7	Abdallah	1	Bay	1823	Trot			According to history could trot 2:49 gait
	15 Dam of 7	Lady of the Lake							

Signature and full address of the sender { Carlos M. deGhermundia
Tuscarora, Maryland
U.S.A.

(over)

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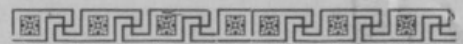
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SUBJECT.	1 Subject of the Pedigree	Piletta Stallion, Gelding, or Mare	—	Grey	1889	Trotter	2.11½	1896	
PARENTS.	2 Sire	Pilot Medium	1597	Grey	1879	Trotter		—	
	3 Dam	Maggie	Vol 7	Chestnut	1882	Trotter		—	
GRAND PARENTS.	4 Sire of the Sire	Happy Medium	400	Bay		Trotter	2.32½	—	
	5 Dam of the Sire	Hambletonian Tackey	3728	Grey	1859	Trotter	2.28¼	—	
	6 Sire of the Dam	Hambletonian Chosta	3728	Roan	1876	Trot		—	
	7 Dam of the Dam	Lady Markham	—	Bay	—	Trot		—	
GREAT GRAND PARENTS.	8 Sire of 4	Hambletonian 1	10	Bay	1849				
	9 Dam of 4	Princess	—		Trot	Trot	2.30		
	10 Sire of 5	Pilot Jr.	12	—		—			
	11 Dam of 5	Jenny Lind	—	—		—			
	12 Sire of 6	Master Lode	595	Bay		Trot			
	13 Dam of 6	Nellie	—	Bay		Trot			
	14 Sire of 7	Masterlode	595	Bay		Trot			
	15 Dam of 7	Markham Mare	—	Bay		Trot			

Signature and full address of the sender   H.J. Smith   Batavia. Mich. U.S.A.

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			Name.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	Remarks. Full particulars of Trials to be given here.
Subject.	1	Subject of the Pedigree	Pilot Boy ~~Stallion,~~ Gelding, ~~or Mare~~		gray	1890	trot	rec 2.09¼	1897	
Parents.	2	Sire	Pilot Medium	1597	gray	1879	trot			
	3	Dam	Nettie Cardinal		bay	1886	trot			trot at 3 yr old and never fast one old could trot a full mile in three minutes with any preparation
Grand Parents.	4	Sire of the Sire	Happy Medium	400	bay	1863	trot	2.32½		
	5	Dam of the Sire	Tackey	vol. 4	gray	1859	trot	2.26	1867	
	6	Sire of the Dam	Cardinal	1059	bay		trot			a very fast road mare which
	7	Dam of the Dam	Nellie K.		bay		trot			I still own
Great Grand Parents.	8	Sire of 4	Hambletonian	10	bay	1849	trot	2.48	1852	
	9	Dam of 4	Princess	vol.5 b 140	bay	1846	trot	2.30	1858	
	10	Sire of 5	Pilot Jr.	12	gray	1844				
	11	Dam of 5	Jenny Lind							
	12	Sire of 6	Almont	33	bay	1864	trot	2.39¾		
	13	Dam of 6	Cut	by Brignoli son of Mambrino Chief no. 11						
	14	Sire of 7	Danville	son of Provincial Chief no. 634						
	15	Dam of 7	Nell	by son of Sadi Hamet (Thoroughbred)						

Signature and full address of the sender: Lloyd F. Kline Berlin Center Ohio, U.S.A.

Subject bred by me and owned until 4 years old

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SUBJECT.	1	SUBJECT of the Pedigree	Queen Wilkes		Brown	1889	Trot	2.36 / 2.21	1895 / 1896	Made a Rigby Park, Portland Me. in third of race.
		Stallion, Gelding, or Mare								
PARENTS.	2	SIRE	Messenger Wilkes		Brn	Trot	2.23		
	3	DAM	Offa		Bay	Trot	2.35		
GRAND PARENTS.	4	Sire of the Sire	George Wilkes						
	5	Dam of the Sire							
	6	Sire of the Dam	Silver Boy		Gray	Trot			
	7	Dam of the Dam	Nellie Patch			Trot	2.40		
GREAT GRAND PARENTS.	8	Sire of 4							
	9	Dam of 4							
	10	Sire of 5							
	11	Dam of 5							
	12	Sire of 6	Emperor		Blk	Trot	2.29¼		
	13	Dam of 6	Blister		White	Trot	2.40		
	14	Sire of 7	Unknown / Godfrey Patch						
	15	Dam of 7	Unknown						

Signature and full address of the sender Fred E. Dwinal

Mechanic Falls Maine N. S. A.

f. 35r

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SUBJECT.	1 Stallion, Gelding, or Mare Subject of the Pedigree	Redfield	6248	Bay	1884	P.	R. 2.19¾	1891	High Wheel sulky Cambridge City Track U.S.A.
PARENTS.	2 SIRE	Red Wilkes	1749	Bay	1874	T.	2.40		
	3 DAM	Lorretta	Reg.	Grey		T.			Dam of Pooton 2.24½ Better Irwin 2.16¼ Redfield 2.19¾
GRAND PARENTS.	4 Sire of the Sire	George Wilkes	519	Brown	1856	T.	2.22	1868	
	5 Dam of the Sire	Queen Dido							
	6 Sire of the Dam	Enfield	128	Bay	1868	T.	2.29	1876	
	7 Dam of the Dam	Juanita	Reg.	Grey					
GREAT GRAND PARENTS.	8 Sire of 4	Hambletonian	10	Bay	1849	T.			
	9 Dam of 4	Dolly Spanker							
	10 Sire of 5	Mambrino Chief	11	Bay	1844	T.			
	11 Dam of 5	—	—	—	—	—	—	—	By Red Jacket son of Comet
	12 Sire of 6	Hambletonian	10	Bay	1849	T.			
	13 Dam of 6	Julia Machree				T.			Dam of Chester 2.37
	14 Sire of 7	Pilot Jr	12	Grey	1844				
	15 Dam of 7	Fanny Dawson							

Signature and full address of the sender S. M. Pooton
Rushville Indiana U.S.A.

f. 36v

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FRANCIS GALTON.

Redfield 6248.

Record 2:19¾.

Sire of 17 from 2:14¼ to 2:30.

Indiana's Leading Living Sire for 1897.

One of the best bred and most successful sires of speed standing for service in the State, and one that has already taken a prominent position among the leading sires of ——— the country. ———

One of Red Wilke's greatest speed producing sons, and one of the best bred ones.

TERMS, $25,

Cash or Note, payable Dec. 25, 1897, with return privilege.

Will make the Season of 1897 at my barn.

J. J. RIFE,

BOSTON, Wayne Co., Ind.

Send with a letter of form

Redfield 2:19¾.

HIS breeding is unsurpassed. Sired by the great Red Wilkes, the greatest living sire, sire of 127 from 2:06¾ to 2:30.

1st dam, Loretta, dam of Betty Irvin 2:16¼, Redfield 2:19¾, by Enfield 2:29, the great brood mare. Sire a son of Hambletonian 10 and Julia Machree, dam of Chester 2:27, Enfield 2:29, Harlequin, sire of Joe L. 2:15, Mercury, sire of Mamie 2:28¼, and 4 others better than 2:30. Enfield is the sire of the dams of Laurel 2:09¼, Clayburn 2:11¼, Gambrel 2:10½, and 38 others in 2:30.

2d dam, Juanita, dam of Eula Lee 2:29½, and grandam of 3 better than 2:21, by Pilot Jr., sire of the dam of Maud S. 2:08¾, Jay Eye See 2:06¼, (T) 2:10, Nutwood 2:18¾, sire of Manager 2:06¾, Lockhart 2:08½, and 134 others in 2:30.

3d dam, Fanny Dawson, by Stump the Dealer.

4th dam by Altorf.

REDFIELD is splendidly bred in strong and extreme speed producing lines, and is a great individual, possessing all the qualifications of a great sire, and is proving a wonderful success and deserving of the title, "Indiana's Greatest Living Sire."

Redfield's sire, first and second dams being producers, yet he does not depend upon his ancestors, but is a performer himself, and a sire of early and extreme speed. He is the sire of Red Leaf 2:14¼, Red Elgin 2:15½, Woodford C. 2:17, Red 2:17½, Charley Wilkes 2:18, Red Bird 2:18¼, Elberfield (3) 2:19¼, Brookfield 2:19¼, Mary Shawhan 2:22½, Redbrook 2:23½, Red Vein 2:25¼, Red Bee 2:24½, Cardinal 2:27, Goldwinner 2:27¼, Red Rover 2:29¼, Red Clover 2:29½. All made in contested races, while there are many more youngsters by him that can take low marks when called on to do so. *Keysoerway 226½*

Cummey A. 220

Walter R 226½

⊕ H. P. Wade, Jefferson, Ohio might know something about the speed of Maple Leaf & I would write him, were she the sire only.

After making the entries, please return this Form by post, addressed to Francis Galton, 42 Rutland Gate, London, England. blank. But nos 3
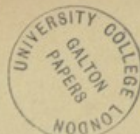
PEDIGREE RECORDS.

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SUBJECT.	1 Subject of the Pedigree / Stallion, Gelding, or Mare	Rose Leaf Mair Gold Pebble Hort No By Gold Stallion #	XIII 24014 XIV 7662	Black Brown "	1890 1892 1895	Trott " "	214¼ 229¼	1894 1894	She Made Record at 3 year old by 22½ way one of the Pair that Beat the worlds Record for 1894 at Columbus Ohio 215¼ Gold Pebble Mad 3 heats in 2:18 in 1897
PARENTS.	2 Sire	Gold Leaf	6070	Brown		"	216½		Gold Leaf by Nugget by Wedgwood
	3 Dam	Florence B	XIII	"	1884	"	—		
GRAND PARENTS.	4 Sire of the Sire	Nugget	1398				2:19		her Dam I Cannot
	5 Dam of the Sire	Maple Leaf (See Vol 8 Year Book Part III page 508 ⊕		Part III page 508			No record		give the Records back
	6 Sire of the Dam	Atlantic	1003				221½		the three names
	7 Dam of the Dam	North Starr	This mare is unknown as to speed or pedigree						I give are all the
GREAT GRAND PARENTS.	8 Sire of 4	Rose Leaf & Dolly							Same breeding the
	9 Dam of 4	Among Mak the							two year old has
	10 Sire of 5	Worlds Record for Double							Not been Broken
	11 Dam of 5	Team at Columbus Oh							but promis eagual
	12 Sire of 6	I think in 1896 Gold							to each of the other
	13 Dam of 6	Pebble Would have been							
	14 Sire of 7	full as fast Rose Leaf							
	15 Dam of 7	but for an accident							

Signature and full address of the sender   Jacob Boland   Cambridge Springs Pa USA

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The well-authenticated speeds of American Trotters and Pacers are peculiarly suitable measures to deal with, and, out of the many thousands of horses whose speeds have been authentically determined there will be many whose Pedigree Records also are known with the necessary completeness. The breeders and owners of these notably bred animals must be well acquainted with all the facts, and would presumably be pleased to have them published. Without their aid it is scarcely possible to discover from the published records in Wallace's Year Books, which those horses are.

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Mr. Russell Allen, of Allen Farm, Pittsfield, Mass. has kindly filled up a draft form, a copy of which I enclose as an example, after having slightly recast it to suit the amended arrangement of the Table.

FRANCIS GALTON.

After making the entries, please return this Form by post, addressed to   Francis Galton, 42 Rutland Gate, London, England.

PEDIGREE RECORDS.

Form for use **only when** the speeds (standard or not) of the subject, of its two parents, and of its four grand parents are all known.

		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT	1 Subject of the Pedigree	Sibyl *Stallion, Gelding or Mare*		bay	1897	Pacer	—	—	This mare is Eligible to Registration
PARENTS	2 Sire	Stoneway	0340	bay	1890	Pacer	2:22¾	1893	record at 3 years
	3 Dam	Clematis Basler	Vol. 12	bay	1893	Trot			Trotted ¼ in 40 seconds at one year old
GRAND PARENTS	4 Sire of the Sire	Strathway	13,214	Chest	1885	Trot	2:19	1891	
	5 Dam of the Sire	Elizabeth Basler	Vol. 12. No. 0180	Brown	1874	Pace	—	—	Dam of two in the list This mare was very fast no record
	6 Sire of the Dam	Robert Basler	Vol. 12 Page 597	Brown	1888	Pace	2:20	1893	Trials miles 2:14, halves in 1:03
	7 Dam of the Dam	Ida May	Vol. 8	bay	1886	Trot	—	—	Trial ¼ in 45 seconds in 1889
GREAT GRAND PARENTS	8 Sire of 4	Stienway	Vol. 4 No 1808	bay	1876	Trot	2:25¾	1879	at record at 3 years
	9 Dam of 4	Countess	—	Chest		Trot	2:25	—	it is authentic I dont know the year of trial but I know
	10 Sire of 5	Bill Arp	—	bay		Pace	—	—	very fast no record
	11 Dam of 5	Mary	—	bay	1862	Pace	—	—	
	12 Sire of 6	Antevolo	Vol. 7. No 7648	Brown	1881	Trot	2:19½	1885	
	13 Dam of 6	Elizabeth Basler	Vol. 12	Brown	1874	Pace	—	—	very fast no record Dam of 2 in list
	14 Sire of 7	Grosvenor	Vol. 4	Brown	1878	Trot	2:28	—	trial at San Jose California
	15 Dam of 7	Susie K.	—	bay	1878	Trot	—	—	Dam of two Producing Daughters

Signature and full address of the sender   R. O. Newman Visalia, California, (Tulare County) U. S. A,

PEDIGREE RECORDS.

All students of Heredity feel acutely the absence of any large collection of Pedigree Records in which exact measurements are given. It matters little for their purposes what Dimension or Faculty is measured, because the same laws of Heredity appear to apply to every dimension and faculty in every kind of animal and plant. All that is necessary is that the measures should refer throughout to the same particular and be numerically recorded for every member of the ancestry at least up to the grand parents inclusive. That is to say each Pedigree Record should include the measurements of the Subject, of its two Parents, and of its four Grand Parents. It would be a distinct gain if the measurements of its eight Great-Grand-Parents could also be given.

I may refer to some of my own writings to show how this kind of information would be utilised. No. 2 of the following brief list is the most important for the present purpose.

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		NAME.	Register No. or Vol. of Register	Color	Year when foaled	Trotter or Pacer?	Record or Trial	Year of Record or Trial	REMARKS. Full particulars of Trials to be given here.
SUBJECT.	1 Subject of the Pedigree	Woodstock 19899 Stallion, Gelding, or Mare	vol 12, p 6	ch S	1889	Trotter	2.17½	1895	At Terre Haute Ind
PARENTS.	2 Sire	Robt McGregor	647	Chestnut	1871	trotter	2:14½	1883	Woodstock has several
	3 Dam	Kitty Golden	vol 13	Brown	1883				colts all of which are
GRAND PARENTS.	4 Sire of the Sire	Major Edsall	211	bay	1859	trotter	2:29	1873	of good size, fine style
	5 Dam of the Sire	Nancy Whitman	vol 7	bay	1860				and action.
	6 Sire of the Dam	Onward	1411	bay	1875	trotter	2:25¼	1881	I have a two year old
	7 Dam of the Dam	Kitty Goldsmith	vol 5	black	1872				filly by him that is entered
GREAT GRAND PARENTS.	8 Sire of 4	Abdallah 15	15	bay	1852				in three futurity stakes
	9 Dam of 4	by daughter of Harris' Hamiltonian							amounting to 56 000.00 and
	10 Sire of 5	American Star	14	ch.	1837				she is to start in these
	11 Dam of 5	Nance by Young Mckinny or Lance							in 98 + 99. She is certainly
	12 Sire of 6	George Wilkes	519	brown	1856	trotter	2:22	1868	speedy — and as pretty
	13 Dam of 6	Dolly by Mambrino chief 11	vol 4	bay	1861				as a picture — I also
	14 Sire of 7	Goldsmith by Am of Hamb 10							own her mother Roxane
	15 Dam of 7	Miss Kitty by Eldorado 124							2.12¾ by Robt McGregor

Signature and full address of the sender { W. M. Akin
Evansville Ind

PEDIGREE RECORDS.

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FRANCIS GALTON.

WOODSTOCK, 19899. (Rule 1 & 6.)

2:17½

RECORD IN RACE, LAST HALF IN 1:07½.

Rob't McGregor, 647
Record 2:17½
Sire of
Woodstock...........2:17½
Bonnie McGregor.2:13½
Nyanza................2:12¾
Count Robert 2:13½
Nellie McGregor...2:14
Corinne 2:14½
Silver Bow 2:16
Roxane...............2:16¾
With a total of 63 in the list.

Major Edsall, 211
Record 2:29
Sire of
Rob't McGregor ...2:17½
Lillie Banks.........2:22
Major A 2:30
Clayton Edsall 2:22¾
Kitty Edsall 2:28½
Lady Douglas.......2:29½

Abdallah, 15
Sire of
Goldsmith Maid ...2:14
Rosalind 2:21½
Thorndale............2:22½
Dam of
Favonia 2:15
Jerome Eddy 2:16½
Convoy................2:22½

Daughter of
Dam of
Major Edsall.........2:22

Hambletonian, 10
Sire and Grandsire of over 1000 in list.
{ Abdallah, 1
{ Kent Mare

Katie Darling
{ Andrew Jackson, Jr.
{ Sir Henry Mare

Harris' Hambletonian,
Sire of 6 producing dams.
{ Bishop's Hambletonian
{ Munson Mare

Untraced
{ Untraced
{ Untraced

Nancy Whitman
Dam of
Madaline 2:23½
McLeod, Sire of
Jim Sneaks..........2:23½

American Star, 14
Sire of Dam of
Rob't McGregor ...2:17½
Dexter 2:17
Nettie 2:18
Joe Bunker 2:19½
Driver 2:19½
39 others in 2:30 list.

Nance
Dam of
Lady Whitman 2:30

American Star
(Stockholm's.)
{ Duroc
{ Untraced

Sally Slouch
{ Henry
{ Dt. Imp. Messenger

Young Messenger Duroc
{ Messenger Duroc, 106
{ Untraced

Untraced
{
{

Onward, 1411
Record 2:25½
Sire of
Buretta, 3 ....2:12¾
With a total of 100 in the 30 list and better.

George Wilkes, 222
Over 2,000 descendants from 2:06¾ to 2:30.

Dolly
Dam of
Director 2:17
Sire of
Direct 2:05½
Directum.............2:05½

Hambletonian, 10
{ Abdallah, 1
{ Kent Mare

Dolly Spanker
{ Henry Clay, 8
{ Baker's Highlander

Mambrino Chief, 11
Sire of
Lady Thorne 2:18¼
{ Membrino Paymaster
{ Untraced

Fannie
By Ben Franklin.
{ Hazarack, Pacer
{

Kitty Golden
Dam of
Woodstock............2:17½

Goldsmith, Son of

Hambletonian, 10
{ Abdallah 1
{ Kent Mare

Thoroughbred
{
{

Kitty Goldsmith
Showed 2:25 gait in four year old form, but was afterwards crippled. She is Dam of Favorite (4). Her owner claims she has gone a mile in 2:18.

Miss Kitty

Eldorado, 124
{ Toronto Chief, 85
{

Daughter of Son of
{ Andrew Jackson
{ The Founder of Clay Family

Fourth Dam by Wild Irishman, (Thoroughbred.)

WOODSTOCK, 19899.   Standard Under Rule 1 & 6.

RECORD, 217½.

Chestnut Sorrel, 16 hands high; Weight 1,200 pounds.   His breeding is first-class, and he is first-class individual; fine style and action, and a Trotter.   It is believed by good judges, that he will trot in 2:10 or 2:12 when in condition.   He has never started in but few races, and now has a record as fast as his sire, Rob't McGregor, 2:17½, whose service fee last year was $300 00.   Woodstock's fee will not be raised in 1895.

TERMS:

$25.00 the season, with return privilege in '96, or 'till mare is in foal, if horse remains in my possession.   Should the mare be sold or traded, the return privileges will be forfeited.   Money due at time of service.   If not paid, a note due 6 months after date, with approved security, will be required of parties not known.   Pasturage for mares, if required, $1.00 per week.   Will not be responsible for accidents or escapes.   Season will close not later than July 1st, as I desire to put him in training after that date.   He will be located at Fair Grounds after April 1, 1895.

W. M. AKIN, SR.,
EVANSVILLE, IND.

ROCK FARM.

_____ 189

The Mares Evadne, Young Portia
& Hermosa in the pedigree of Clourmore
which I enclose, have no way of finding
age & Vol. registered in. But they
are in the year book volume 6 as in
the great brood mare list.

G. K. Foster.

Francis Galton Esq,

Dear Sir,

Enclosed herewith you will find the first lot of photographs, nineteen in all.

The remainder I shall endeavour to get ready so as to reach you by first post on Friday morning. Failing that, they can be sent on to Spain, as per address given in your letter of yesterday's date.

I note your instructions as to leaving the packet open at the ends.

My Father will not be home for some time yet. Yours truly

Robert Reid.
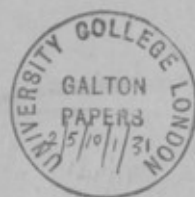
The Studio.

WISHAW, 16th March 1899
N.B.

Francis Galton Esq,

Dear Sir,

I now send on the remaining photographs, twenty-two in number, making forty-one in all, + trust you will get them before leaving London.

Yours truly
Robert Reid.

Horses

f.3
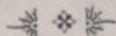
Photographs.   ❖❖   t.

Francis Galton Esq

42 Rutland Gate

London . S.W

From **Charles Reid**, *Photographer,*
YOUNG STREET, WISHAW, N.B.
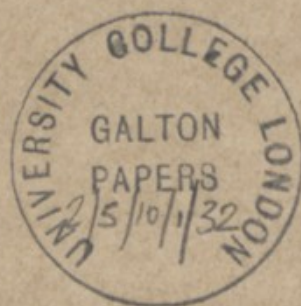
se lo suplico

pimienta

pimienta

¿ sirviera v. hacerme el favor de

Vsted Vuestra merced de

Gracias galitas:

¿ Me haria v. el favor ?

¿ sirviera v. hacerme el

Refinamiento of House
Reg: Com. 1 March 1/99

Measurements of Horses
Royal Commission.
March 7 1899

Horses
R. Commⁿ   at Agricult Hall March/99

My Set

Premiums   28
provisionally but not selected
finally   13
Total   41

My Set

13 non pairunnm

~~13~~

13

C. Reid,
Photographer,
YOUNG STREET,
WISHAW.

From

UNIVERSITY COLLEGE
LONDON
GALTON PAPERS

617

My Set
2δ Premium

C. Reid,
Photographer.
YOUNG STREET,
WISHAW.

FROM

FROM

C. Reid,

Photographer,

YOUNG STREET,

WISHAW.

f. 8v

4 (not mentioned)
(by returned)

f. 9 v

3

prob: inherited)
by veterinary

3.

f. 10v

//.

f.11v

12.

f. 12v

25.

36.

38.

48.

f. 17v

5/.

84.

f.19v

90.

f.20

98

Bright Hampton

Stone platform

52.0

G #4 Bk W

Brn

4'

98.

47.5 42.3 44.9 47.5

7.52

f.21v

9.

9.

10

14

f. 24 v

25 A.   Button Park

29.

f.26v

31.

f. 27v

35.

f.28v

39.

42

f. 30v

43.

f. 31v

44

f.32v

45.
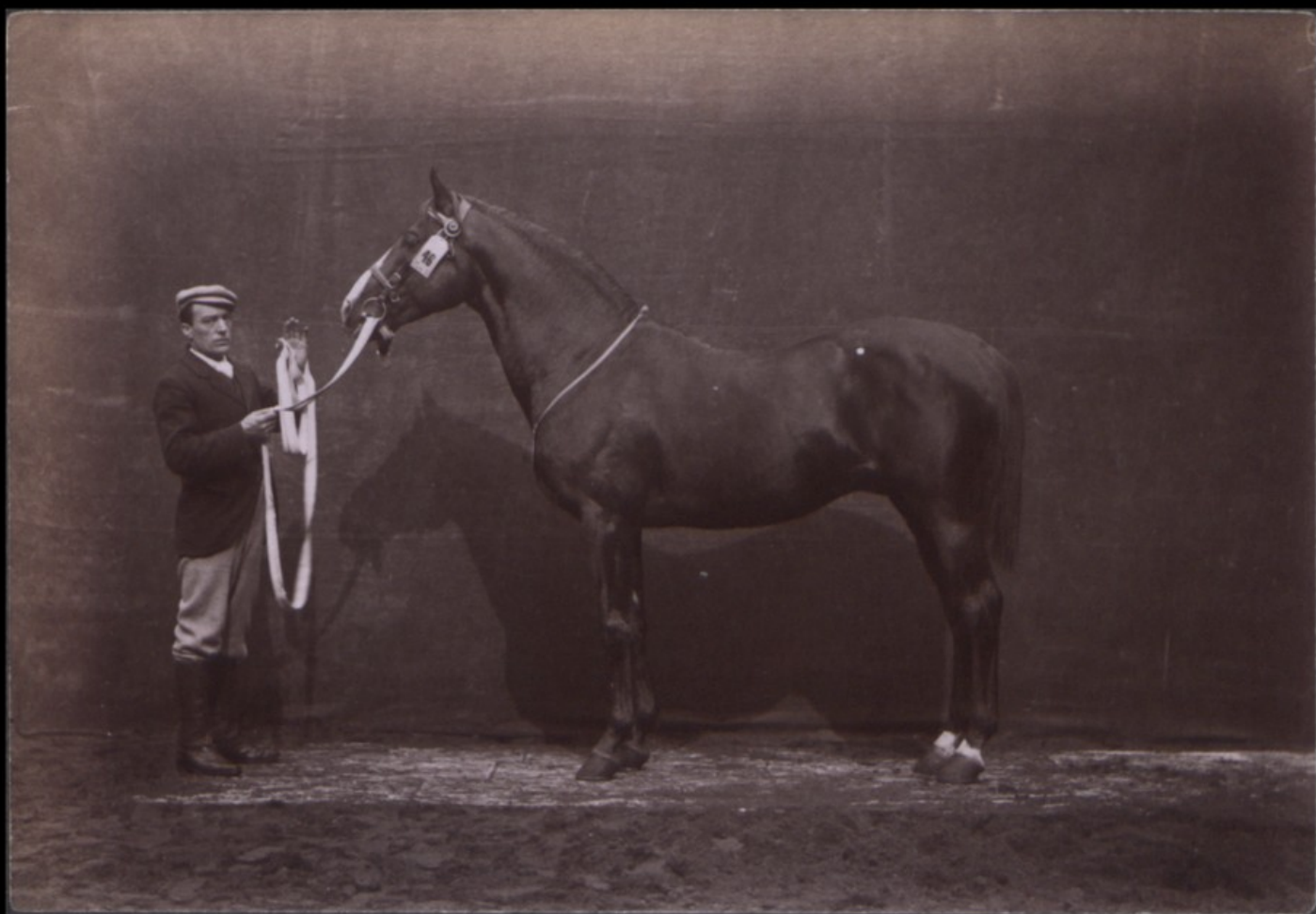
f.33v

46.
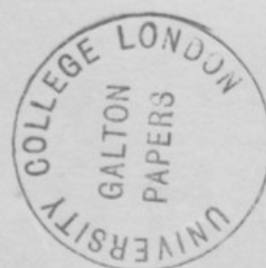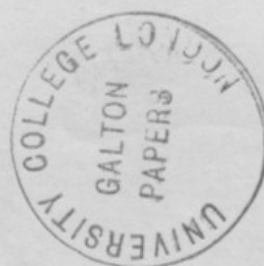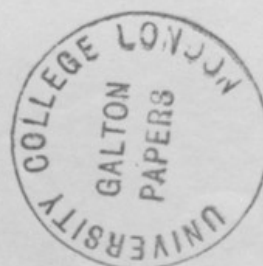
5/.

f. 35v

54.

f. 36v

55.

f.37v

62

7/.

f.39v

73.

f. 40 v

79.

f.41v

82.

87.

91.

f.44v

92. Cartridge

92.

Cr

Bk.

W

15.0

52.3

Bra

50.8

26.0

48.0

26.2

26.2

Stones

outer edge of warehouse

f. 45v

96 . Oatlands

Ct

Bk

W

Hb

53.0

Bris

96.

Stone platform

f.46 x 97.

Flristmart

97.

Cr
4h
Bk
W
Bris

· 50·2

27·5

stone platform

f. 47v

99 x

Crème de la Crème

99.

Stone Platform

f.48v X 104 Wentworth

53

Brie

50.0 42.5 48.0 49.6 47.0

104 Stone platform Nearer edge of platform
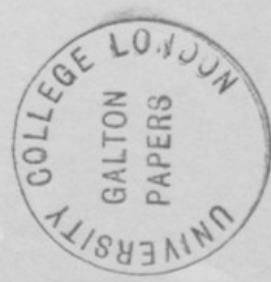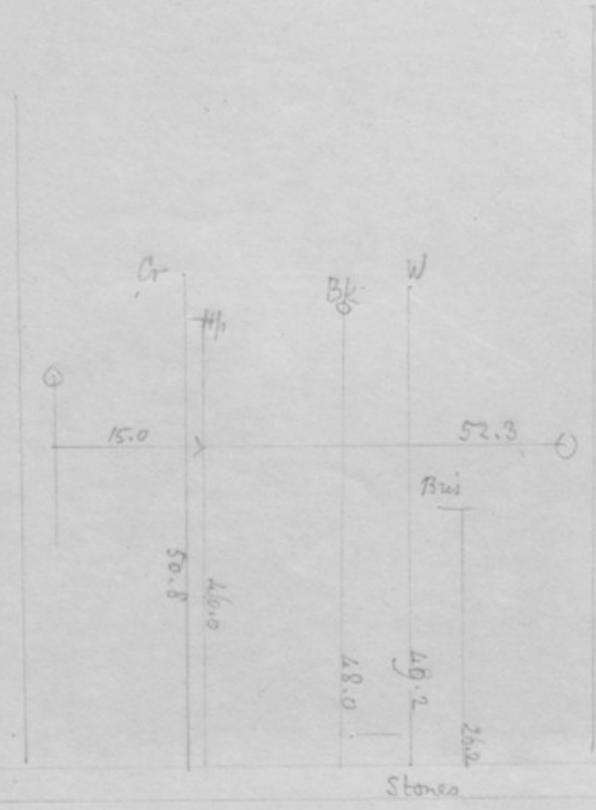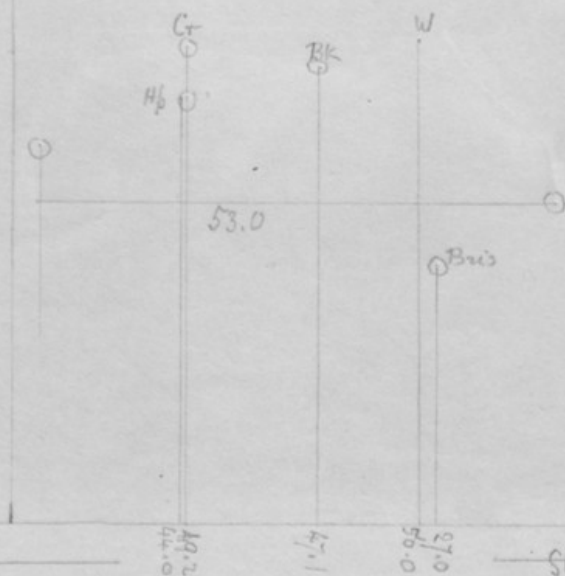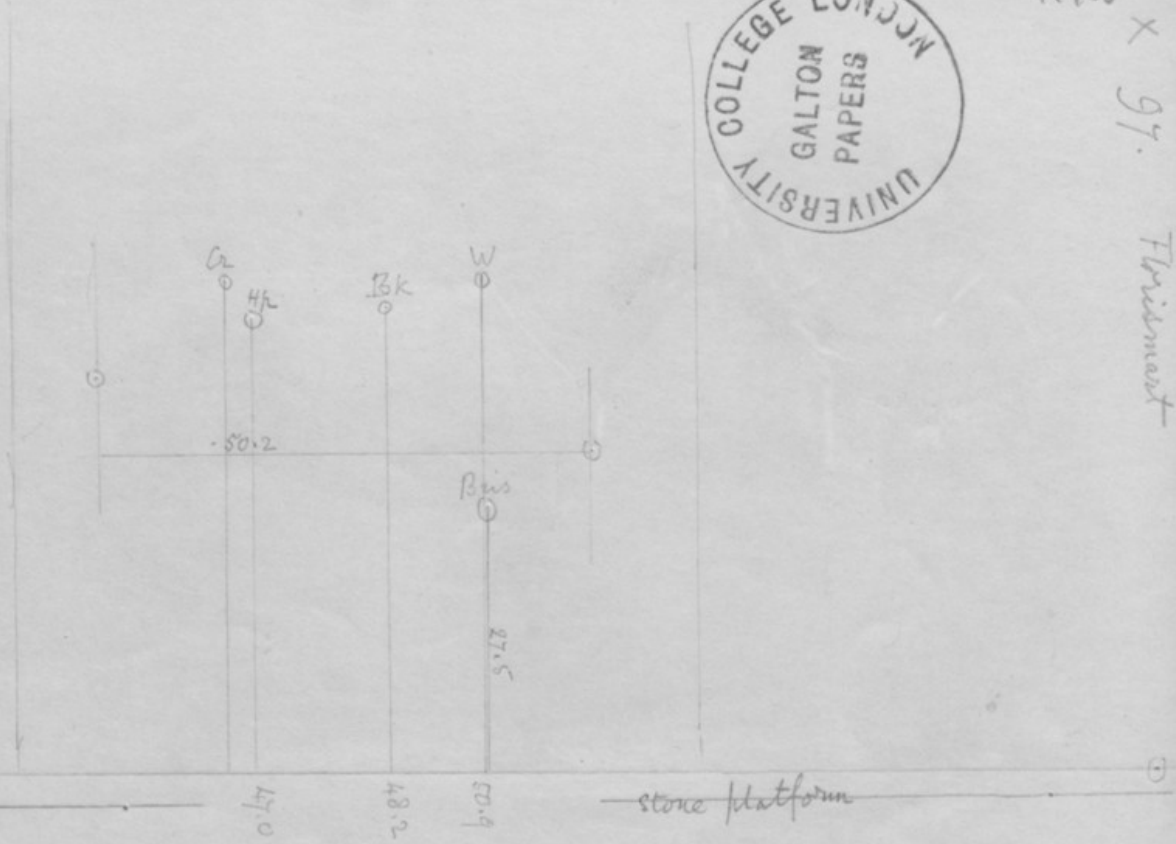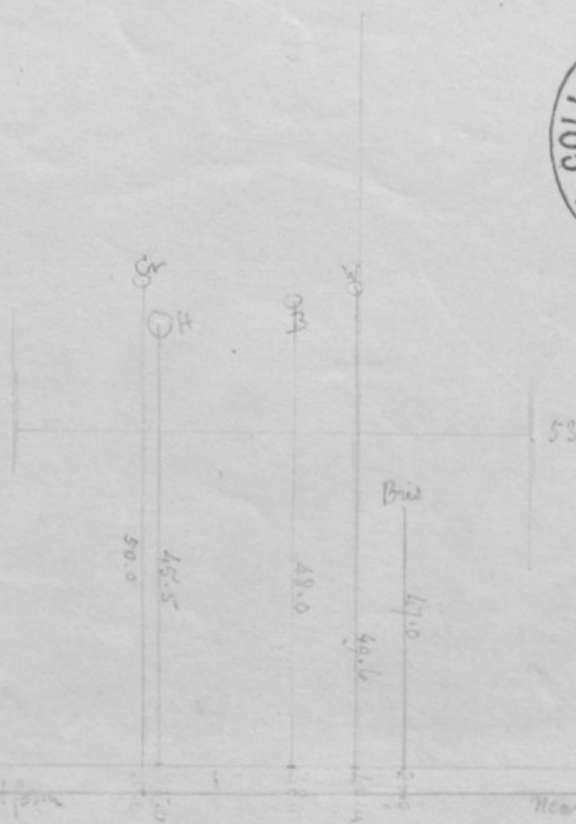
These are 4% larger than the
recommended set

28 Premium Horses F.1
R Comm Agr Hall

March /99

Mounted set

f. 2r

9

No. 9. "Marioni"

f.2v

f.3r

10

Nr. 10. "Old Coin"

f.45

14

Nr. 14. "Pumpernickel"

25- 4 "Button Rack"

29

29 "Four. Poster"

31. "Mountain Dew."

35 "Ringoat"

f.8v

39. "Trap"

42

42. "Behrille"

43

43. "Chidiatos."

44

No. 44. "Dry. Trait"

45

45ᵉ "Grand National"

46

Nr. 46. Just in Time

51

5-1 "Cyclops." f.15r

54

54. ("Hindley")

f.17r

55

5-5. "Impériа"

f. 17v

No. 62. "Alvin"

f. 19r

No. 71. "Pantaloon"

73. "Red Hat"

f.20

79. "Withernam"

82

82. "Homely."

87

87. "Robbins"

91

Nr 91. "The Tinman"

f.24v

Nr 92 "Carruss"

96. "Oatlands"

f.26v

97. "Florismart."

f.27v

99

Nr. 99 "Crême-de-la-Crême".

f.28v

104

"   "

No. 104. Wentworth

Wm R. Allen

Allen Farm — Pittsfield — Mass — USA

f. 1

see Meston Dec 10/97. Dec 11/97.
Sends draft form filled. on Dec 11/97.
with Brava's Pedigree
Pres: of Am: Trot: Register Assn. wh:
publishes the Year Bk & Register.
Sent message through Meston Jan 1
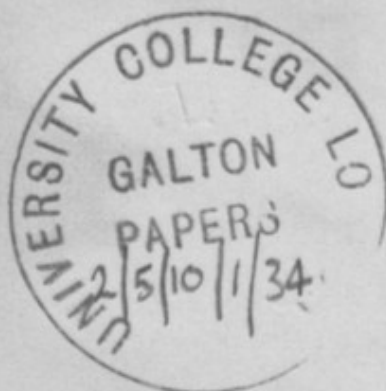
L. Brodhead

Woodburn Farm, Spring Station,
Kentucky — USA.

see Meston's letter Dec. 10/97.
now in Europe. Very useful man.
Of the oldest breeding farm in U.S.
Try to meet him.
Jan 1. wrote a said I th be abroad too
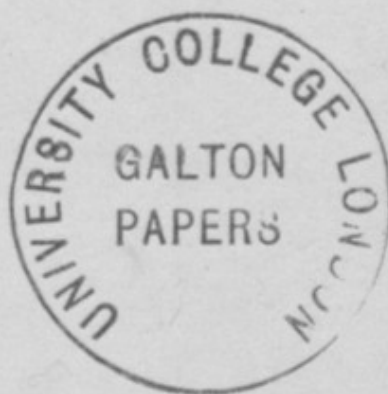
J. Malcolm Forbes

30 Sears Building - Boston - Mass.

See Meston's letter Dec. 10/97.
Wealthy. Paid 25,000£ for Arion 2.07¾
Jan 11th sent forms (4). initiated
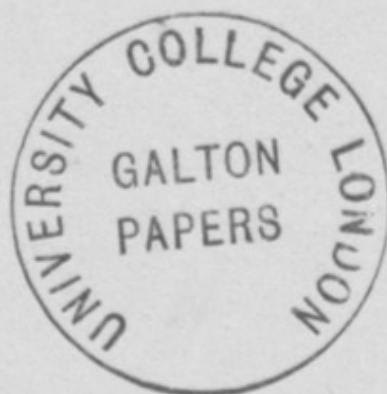
W. H. Gocher.

Sec: national Trot: Ass:- Hartford,
Connecticut_ USA.

see Meston's letter. Dec. 10/97.

Jan 11. 98. Sent 4 forms initiated

F.4
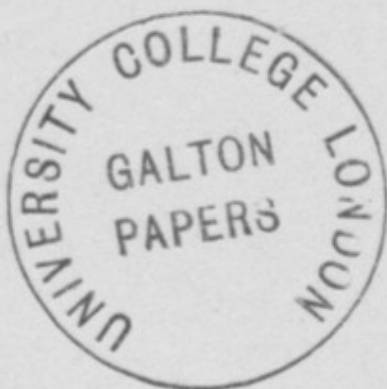
C. J. Hamlin

Buffalo _ New York _ USA.

f.5

see Meston. Dec. 10/97.
I have his catalogues. Largest & most
successful breeder.
Jan. 11. 98. Sent 4 forms initiated.
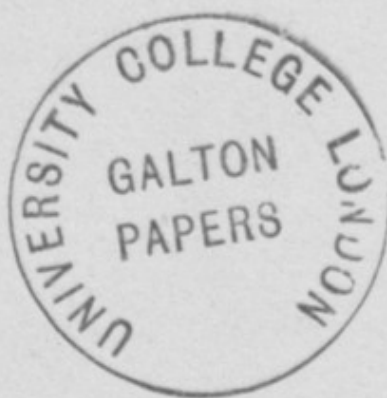
The **Horseman**.

323 Dearborn S<u>t</u> _ Chicago _ Ills _ USA

see Treston's letter Dec. 10/97.
Editor & Proprietor _ Daniel J. Campau,
lawyer . Private address _ Detroit. Mich-
igan.   Officer of Am: Frot: Ass: &
Pres: of Detroit Driving Park.

wrote him Jan 1.

W. J. Ijams   f. 7
Terre Haute _ Ind.
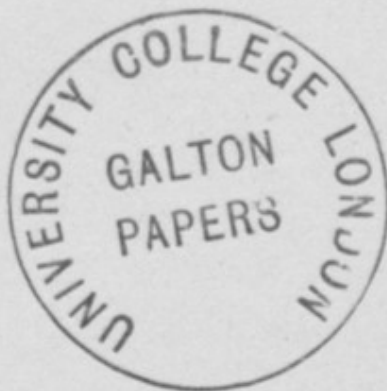
see Meston Dec. 11/97.
Pres: of the Am: Trot: Assn.
Jan. 11. 98. sent 4 forms initiated.
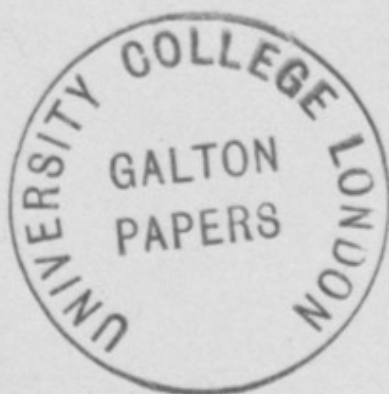
Maj. P. P. Johnston   F. 8
         Lexington Kentucky

see Meston Dec. 11/97.   Lawyer.
Pres: Nat: Trot: Assn: & Pres: ky. Trott:
Horse Breeders' Assn: Also a breeder.
Jan. 11. 98. Sent 4 forms initialed
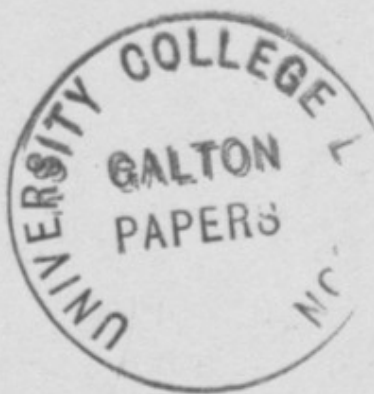
H. D. McKinney
Janesville — Wisconsin.

see Meston Dec. 10/97.
Small breeder, but v. well informed.
Useful.

Jan. 11. 98. Sent 4 forms initiated.
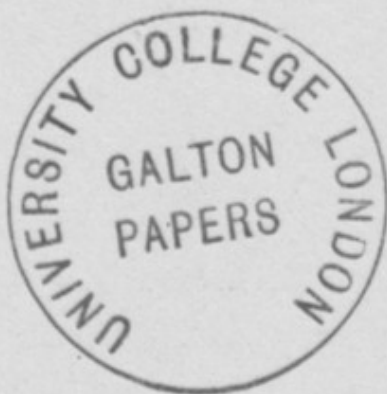
A. J. Meston.

Allen Farm, Pittsfield. Mass. USA.

Wrote him Jan 1. & sent circ. & book post
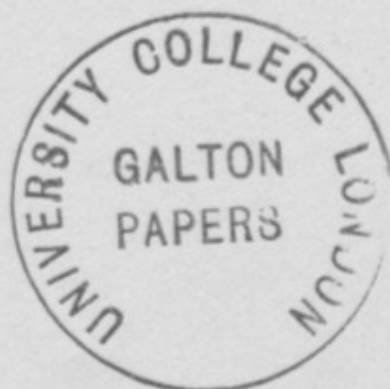
May _Overton_
Hermitage Stud, Nashville _ Tenn _
see Meston. Dec. 10/97.
Owns Bow Bells 2.19¼. Leading
breeder in Tenn:

Jan. 11. 98. Sent 4 forms initiated
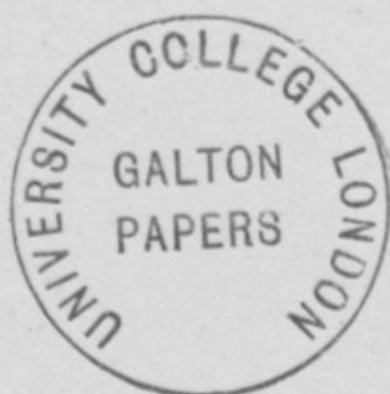
John H. Steiner
Sec: Am. Trot. Assn. — Ellsworth Bldg —
Chicago — Ills —

See Meston Dec. 11/97.
Am: Trot: Assn: governing body for nearly
all Western Tracts.
Jan. 11. 98. sent 4 forms initiated.
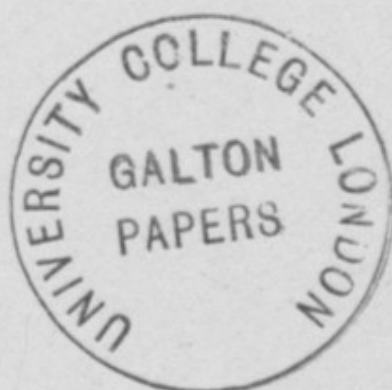
Col John E. Thayer

Lancaster - Mass - USA.

see Meston's letter Dec.10/97
Owns Baron Wilkes 2.18. Pres: of the
New England Breeders' Assn.

Jan. 11. 97. Sent 4 forms initialed.
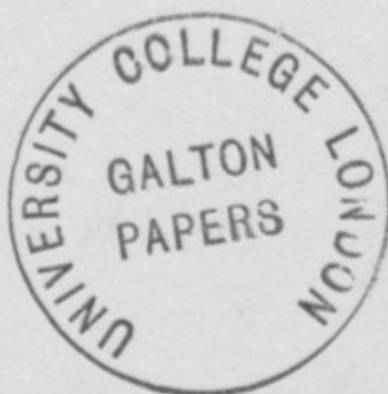
Genl. B. F. Tracy
Ex-Sec: of the Navy – Brooklyn – N.Y.

see Meston's letter, Dec. 10/97.
Owns kentucky Wilkes 2.21/4; a leading
public man.

Jan. 11. 98. Sent 4 forms initiated.
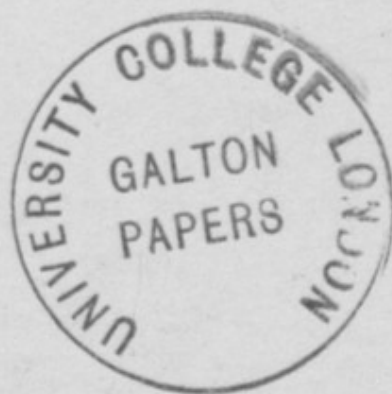
C. W. Williams
Galesburg — Illinois — USA.

See Meston Dec. 10/97.
Owns Allerton 2.09¼.   Not wealthy
nor educated ; but works ; & is
well posted.

Jan. 11. 98. sent 4 forms initialed
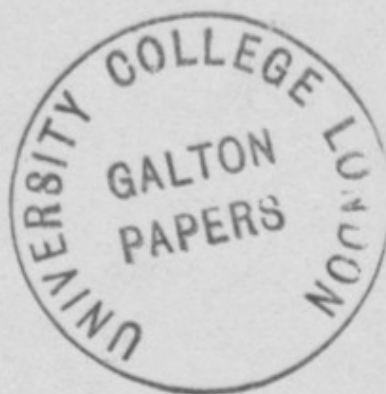
CLASS A

Number	Name	Colour
9 ✗	Marioni see farther on	
10	Old Corn	
14	Pumpernickel	

CLASS A

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees

CLASS B

Number	Name	Colour

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees
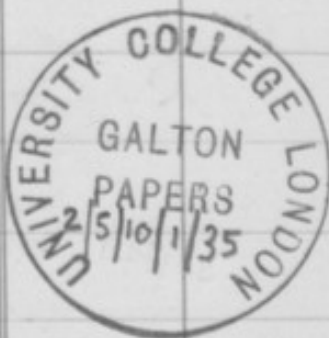
CLASS C

Number	Name	Colour
2 5		
2 5A ✗		
2 9 ✗		
3 1 ✗		
3 4		
3 5 ✗		
3 8		
3 9 ✗		
3 6		
42 ✗		
43 ✗		
44 ✗		
45. ✗		
46 ✗		
48		
51 ✗		

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees
16-1	15-1	16-1	64	7¾	7 5½	9½
16	15	16	68	7¾	7 7	9
15-3	14-3	15-2½	65	6¾	7 3	8½
16-0	15-0	16-0½	68	7	7 6	8¼
16-0½	15-0¾	15-3	66½	7¾	7 3½	8½
16-0	15-0¾	16-0	66	7	7 7	8
16-0	15-0	16-0	68	6	7 8	8
16-1	15-1	16-1	66	7	7 5	8½
16-0	15-1	16-0	64	6½	7 6	8
16-½	15-¼	16-0	68	6½	7 8	8½
15-3	15-1½	15-3½	62	7	7 5	7¾
15-3¼	15-0	15-3¼	66	7	7 7	8
16-2	15-2½	16-1¼	67	7¼	7 8	9¼
16-0	15-0	16-½	64	7	7 1	8¼
16-0	15-0	16-0	67½	6¾	7 8½	8½
15-¾	14-3	15-3¼	66	6½	8 4	8¼

CLASS D

Number		Name	Colour
54	x		
55	x		
57			
62	x		
71	x		
73.	x		
79	x		
9	x	Marioni	
84			
82	x		
87	x		
90			
91	x		
92	x		
96	x		
97	x		

CLASS D

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees
16-0.	15-¼	16-¼	65	7¾	7 8	8
16-0	15-0	16-0	66	7½	7 8	8
16-1	15-0½	16-1	64¾	7	7 5½	8
16-½	15-¼	16-1¼	68	7	7 4	8
16-0	15-¼	15-3¼	68	7	7 7½	8
16-¼	15-2	16-0	66	7	7 6	8¼
15-3	14-3	15-2¾	65	7¼	6	8¼
16-1¼	15-1	1.6-½	69½	7	78½	8-¾
16-1	15-¼	16-¼	66	7 8½	7 5	8
16-¼	15-0	16-0	69	7 8¾	7 8	8
16-0	15-0	15-¾	65½	7 3¾	7 3	8½
15-3	15-0	15-2½	66½	6	7 5½	8
16-0	15-0	16-0	64	7¼	7 1	8
16-0	15-½	15-3¾	68	7¼	7 8½	8
16-0	15-¼	15-3½	63¼	8	7 7	8
15-3½	14-3	15-3½	65	7	7 5	8⅛

CLASS _E_

Number	Name	Colour
98		
99 ✗		
104 ✗		

CLASS E.

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of forleg below knees
15-3	14-3	15-2 $\frac{3}{4}$	64	7	77	7 $\frac{3}{4}$
16-$\frac{1}{4}$	15-$\frac{1}{2}$	15-3	63	7	78 ⑤	8
15-3 $\frac{1}{2}$	14-0	15-3	68 $\frac{1}{2}$	7	80 $\frac{1}{2}$	8 $\frac{1}{4}$

CLASS F

Number	name	colour

CLASS F

CLASS *F*

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees

CLASS G

Number	Name	Colour

CLASS G

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees

CLASS H

Number	Name	Colour

CLASS H

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees

CLASS I

Number	Name	Colour

CLASS I

CLASS I

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	Of body at saddle place	of foreleg below knees

CLASS J

Number	Name	Colour

CLASS J

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	Of body at saddle place	of foreleg below knees

CLASS K

Number	Name	Colour

CLASS K

Vertical height above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	Of body at saddle place	of foreleg below knees

CLASS L.

Number	Name	Colour

CLASS L

Vertical hieght above ground			Horizontal		Girth	
Withers	Hollow of back	Croup	Length of body	Distance between the eyes	of body at saddle place	of foreleg below knees

9 Examples hair-colour
or cattle hair

UNIVERSITY COLLEGE LONDON
GALTON PAPERS

f.1
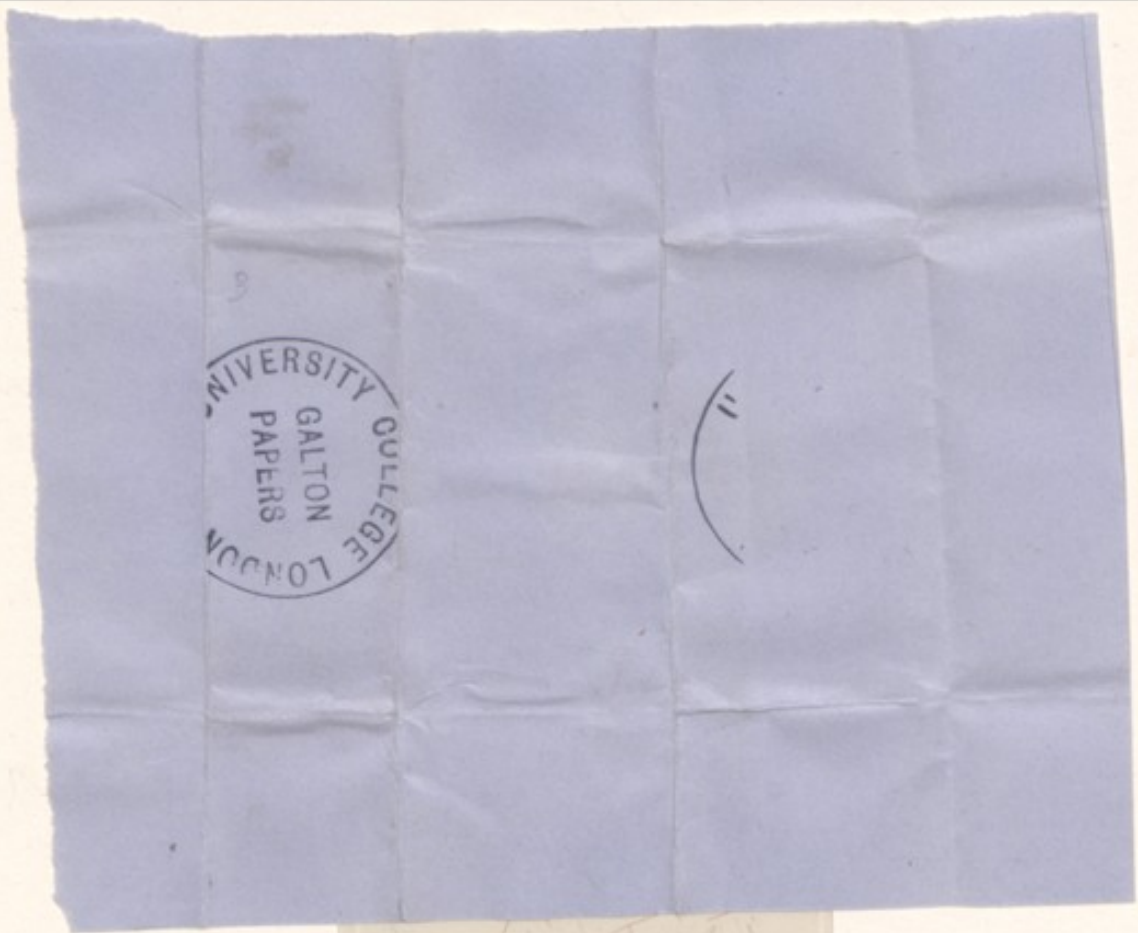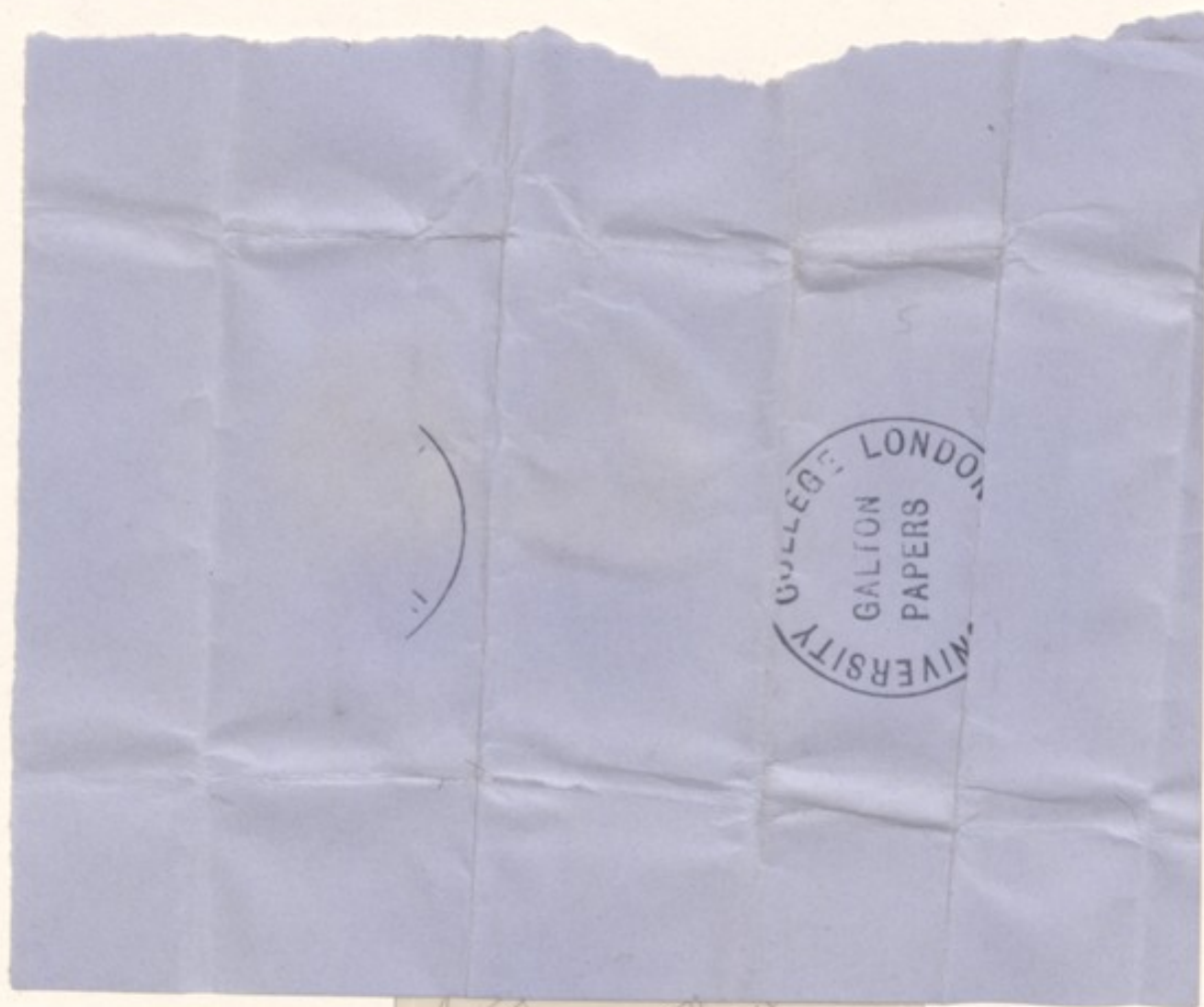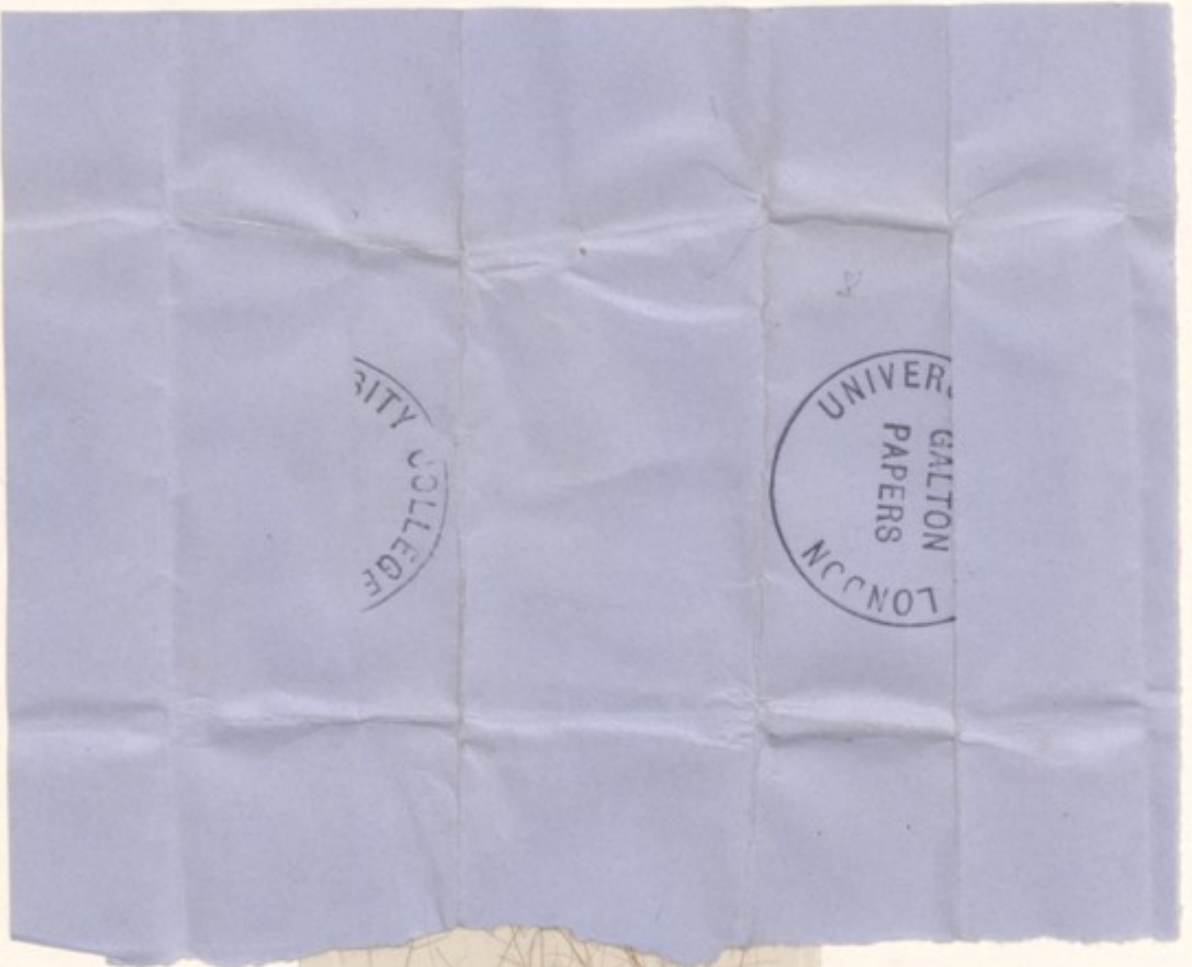
THE

(1)

American Trotting Horses

Completed Nov 26/97

52 PAGES.

❦

SCHOOL.

American Trotting Horses

Name,   F. Galton   Oct & Nov   /97

:15			:46	III
:14	I		:45	I
:13			:44	
:12			:43	III
:11			:42	II
:10	I		:41	I
:9			:40	III
:8			:39	III
:7			:38	I
:6			2 :37	III
:5			2 :36	
:4			:35	II
:3			:34	
:2			:33	I
:1			:32	I
2 :0			:31	ℍℕ I

1892

2:30 ||
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:27 ||
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:22 |
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:19 |
:18 |
:17 |
:16 ||

Anita 59.02 gr m (12016) 2:29.
2 (347) hh (2:10 , 3 , (478) ch m 2:30. 4 (5281) hh, 18 30 20
5
ch m (10573) 2:05 . 2 (24310) hh m 2:30
3 (4462r) hh m 2:10 . 4 (7868) gr m 2:17
6
7

3:8
3:7
3:6
3:5
3:4
3:3
3:2
3:1
3:0
2:59
:58
:57 ||
:56
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52 |
:51
:50 |||
:49 |||
:48 |
:47 ||

Objects.

(1) is the observed curve of frequency a smooth one? If not the statistics would be hardly worth taking pains about

The answer is given by p. 4 in the affirmative. There are irregularities but the numbers are small 800 divided in some 25-30 classes, and (in contemplation of another inquiry) there were not taken from the same year but from 1892, -4, and 6 respectively. They are 5 year horses and older whose records were made in the year in question. This got rid of difficulty arising from the records of different years not being strictly comparable owing to improvements in build of the sulkies and in the tracks

[The next attempt is to be with on 2000 horses, 5 y⁵ old, whose records were made in 1894]

(2) What marks ought to be given for different speeds? Is the rarity with which a speed of say 2:5 is obtained as compared with that of a speed of say 2:30 to be accepted as the direct measure of the marks? or on the other hand, is this rarity merely the familiar result of the law of frequency of error?, in which case the speed is the direct measure of the marks?

The answer is given by the work on page 6, by which the best fit (approximately) is obtained of the observed curve with the tail of the normal curve. An inferior limit was taken for purposes of comparison in the observed curve at 2:4 where the frequency was practically zero, and an upper limit at 2:29 dividing the interval of 25 grades as observed into 5 equal parts, the observed frequency at the 6 grades which bounded these was 98, 54, 31, 15, 5, 0.

Guided at first by the eye, corresponding limits were taken in
the normal curve and a comparison made , then a second attempt
with limits that erred in the opposite direction, so gradually
narrowing it proved that the tail of a normal curve $\varepsilon^{-h^2x^2}$ in which
the inner limit was 1.5 and the outer was 2.4 suited well

In other words a speed of 2:2q should be marked 1.5 and
a speed of 2:4 should be marked 2·4 and all other speeds
according to that scale.

I only tested the flag the upper limit ; when the better data shall
have come to hand the lower limit must also be tested

Of course caution must be exercised in respect to the body
of the curves , their tails only having been verified

The signification of the observed curve of frequency is that the whole curve
applies to horses of "fair pedigree stock" who show such and such speed
after being trained for races ; of course it is difficult to define "fair pedigree"
with any exactness, all that can The middle of such a curve standing
at deviation 0, lies told by 1.5 of the point at which the speed
of 0:2q "is found" and 2·4 of that at which is 2:4

I should not trust any inference as to the shape of the other side
of the curve of fact ; in short the whole curve may really be very skew.

						18
2 : 15	THL THL THL IIII				19	18
15	14	THL THL IIII		3	13	15
	13	THL THL II		42 39	11	13
f 4	12	THL THL IIII III			18	11
	11	THL IIII			9	9
	10	IIII I			6	7
20	9	III			2	5
	8	I			1	3
	7					2
	6					1
	5					1
25	4					1
	3	II			1	
	2					
2 : 0						
2 : 0						

add 6 beginning at 54

800   800

802   800

(of 2:30 Trotters in harness) Wallace's Year Books

Trotters from Tables X. of Vols 8, 10, 12, of American Trotting Register

	10	20	30	40	50	60	70	80	90	100	Obs'd	Smoo
										1	116	
2:30	omitted ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ ‖‖‖ 1111											
29	(tallies)											98
28	(tallies)										43	87
27	(tallies)										74	77
26	(tallies)										68	68
25	(tallies)										75	60
24	(tallies)										71	54
23	(tallies)										51	49
22	(tallies)										38	44
21	(tallies)										40	39
20	(tallies)										31	35
19	(tallies)										32	31
18	(tallies)										34	27
17	(tallies)										24	24
16	(tallies)										23	21

Wallace's Year book Vol X p.471. Table of Z:2q Trotters acceptity to Record & date of 1894

	413	
2·20	130	2·20
·19	346	2·19
·18	261	·18
·17	185	·17
·16	149	·16
·15	102	·15
·14	75	·14
·13	54	·13
·12	48	·12
·11	23	·11
·10	14	·10
·9	7	·9
·8	11	·8
·7	3	·7
·6	2	·6
·5	1	·5
·4	1	·4
·3	1	·3

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350

for more explanation see p 3

2) Inner limit 1.4   3) 1.9   4) 1.5
   interval   .2.0   interval 0.10 interval 0.18

(0)	0.9 (1)	1.4 (2)	1.9 (3)	1.5 (4)
98	98	98	98	98
54	52	53.5	65	56
31	23	27	43	30
15	8	12.5	30	15
5	3	5.6	18	6.5
0				

Here the normal ordinates are reduced so as to compare with the observed ones

accept
this

X

inner limit 1.50 of normal curve
outer "   2.40 " " "
interval
between grades 0.18

5 × 0.18 =	0.90
+	1.50
	2.40

Comparison of the Trotting Horse's curve b with the foot of the Curve of Frequency

outer limit = 2.4 (abscissa of Frequency curve)

Divide the Observed curve into 5 parts. Their ordinates (of their terminals) are 98 54 31 15 5 0

= Inner limit of abscissa of Frequency tabulation

(1) = 9.0 outer 24.0 interval 15.0 or 3.0 for each grade

(1) abc frequency	A_1	B obs⁰	$A_1 \times 22$	(2)	A_2	$A_2 \times 695$ C_2
9.0	0.445	98	98	14	0.141	98
12	0.237	54	52	16	0.077	53.5
15	0.105	31	23	18	0.039	27
18	0.039	15	8	20	0.018	12.5
21	0.012	5	3	22	0.000	5.6
24	0.003	0		24		

Here the obs: ordinates are reduced to a 60.5 to compare with the natural ones, which is awkward, & their opposite is adopted on the opposite page, matter

(3)	A_3		$A_3 \times 363$	(4)		A_4
19	0.027	98	98	15.0	0.105	98
20	0.018	54	65	16.8	0.060	56
21	0.012	31	43	18.6	0.032	30
22	0.008	15	30	20.4	0.016	15
23	0.005	5	18	22.2	0.007	6.5
24	0.003	0	0	24.0	0.003	0

110	120	130	140	150	160		
卌 卌	卌 卌	卌 卌	卌 卌 卌	卌 卌 卌	卌 卌 卌 卌 IIII	164	

卌 IIII

77
96
100
114
100
73
81
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58
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35
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5
4
4
1
1
1
1
1

1 | 1204

18 f

10

10   20   30   40   50   60   70   80   90   100

2·29 | THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL
·28 | THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL II
·27 | THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL I
·26 | THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL
·25 | THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL
·24 | THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL
·23 | THL THL THL THL THL THL THL THL THL THL THL THL THL III
·22 | THL THL THL THL THL THL THL THL THL THL THL THL THL THL THL I
·21 | THL THL THL THL THL THL THL THL THL THL THL II
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·18 | THL THL THL THL THL THL THL THL THL THL THL III
·17 | THL THL THL THL THL THL THL THL THL I III
·16 | THL THL THL THL THL THL THL I
·15 | THL THL THL THL THL THL THL
·14 | THL THL THL IIII
·13 | THL THL THL IIII
·12 | THL THL THL I
·11 | THL
·10 | THL
·9 | IIII
·8 | IIIII
·7 | I
·6 | I
·5 |
·4 |
·3 | I

1894
The whole of it

No 1 2:30
93

(8)   f. 9+

0 1 2 3 4 5 6 7 8 9 10 11 12

h.e 1 e 2755

124	12.6
75	6.5
101	8.6
101	8.6
78	8.3
95	8.4
61	5.8
67	6.1
61	5.0
62	4.4
50	4.4
45	4.2
40	3.6
29	2.8
32	2.9
28	2.0
24	1.7
20	1.7
14	0.9
8	0.6
4	0.3
3	0.3
1	0.1
1	

curve of all etc 2755

Total 1124   99.7

6.7

	10	20	30	40	50	60	70	80	90	100

2.29 |||||...||||
.28 |||||...||||
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.25 |||||...|||
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.22 |||||...||||| ||
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N° 1. 2:30
6 2

f. 40r
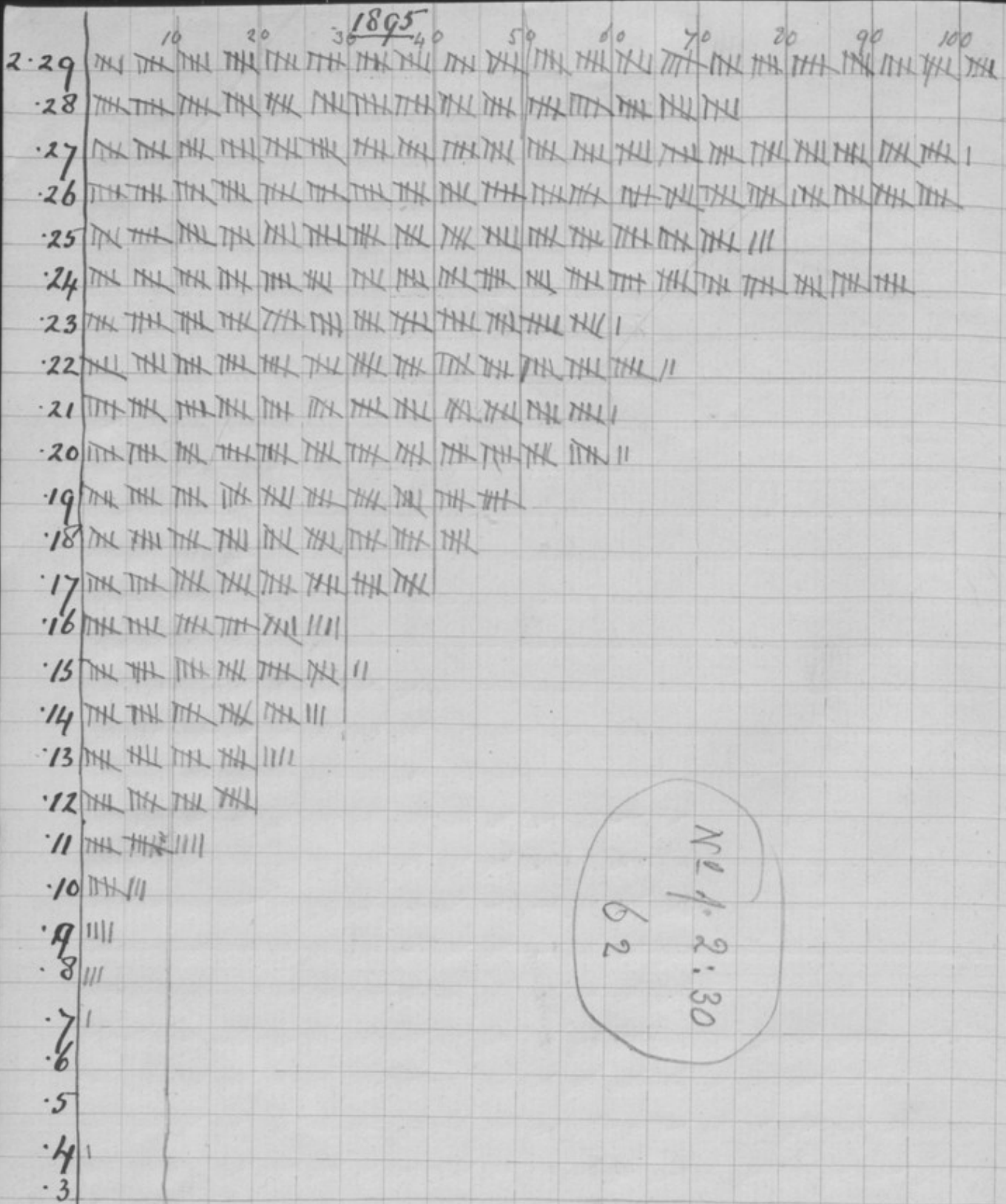
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under 30	page 4 800 A2	page 5 931 P.C	page 9 1124 AC	all three 2755	
29 -	14·5	12·7	11·0	12·6	
28 -	5·4	7·3	6·7	6·5	} 19·1
27 -	9·3	7·6	9·0	8·6	
26 -	8·5	8·1	9·0	8·6	} 17·2
25 -	9·4	9·3	6·9	8·4	
24 -	8·9	7·9	8·4	8·4	} 16·8
23 -	6·4	5·9	5·4	5·8	
22 -	4·7	7·6	6·0	6·1	} 11·9
21 -	5·0	4·5	5·4	5·0	
20 -	3·9	3·5	5·6	4·4	} 9·4
19 -	4·0	4·7	4·4	4·4	
18 -	4·3	4·6	4·0	4·3	} 8·7
17 -	3·0	4·3	3·6	3·6	
16 -	2·9	2·9	2·6	2·8	} 6·4
15 -	2·4	3·5	2·8	2·9	
14 -	1·6	1·6	2·5	2·0	} 4·9
13 -	1·4	1·4	2·1	1·7	
12 -	2·2	1·2	1·8	1·7	} 3·4
11 -	1·1	0·4	1·2	0·9	
10 -	0·7	0·2	0·7	0·6	} 1·5
9 -	0·2	0·2	0·4	0·3	
8 -	0·1	0·4	0·3	0·3	} 0·6
7 -	+	0·1	0·1	0·1	} 0·1
6 -	+	0·1	—	—	
5 -	+	+	—	+	
4 -	+	+	0·1	—	
3 -	0·1	+	+	—	
	100·0	100·0	100·0	100·0	

Date	Tally marks
2·29	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
2·29	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
2·28	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
·26	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
·25	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 III
·24	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
23	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 II
22	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
21	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 I
20	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 IIII
19	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌
18	卌 卌 卌 卌 卌 卌 卌 卌 卌 III
17	卌 卌 卌 卌 卌 卌 卌 卌 I
16	卌 卌 卌 卌 卌 卌 卌 卌 III
15	卌 卌 卌 卌 卌 II
14	卌 卌 卌 III
13	卌 卌 III
12	卌 卌 II
11	卌
10	卌
9	II
8	II
7	I
6	
5	
4	
3	

11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0		f. 12r	(11
✗✗✗ ✗✗	✗✗ ✗✗ ✗✗	✗✗✗	✗✗✗	✗✗✗	✗✗✗	✗✗✗	✗✗✗ ✗✗✗	✗✗✗ ✗✗ ✗✗✗ IIII		18.9	14.4
✗✗✗ IIII								29	23.1 {	11 4	8.7
IIII										10 9	8.3
✗✗✗ ✗✗✗								27	17.1 {	11 5	8.8
										10 3	7.9
III								25	16.2 {	10 8	8.3 (2)
										72	5.5
		Year 1893						23	10.9 {	70	5.4 (3)
										71	5.4
								21	10.7 {	69	5.3
										70	5.4 (3)
								19	9.1 {	48	3.7
										41	3.1
								17	6.4 {	43	3.3
										27	2.1
		Nº 12:30						15	3.5 {	18	1.4
										13	1.0
		93						13	1.9 {	12	0.9
										5	0.4
								11	0.8 {	5	0.4
										2	0.2
								9	0.3 {	2	0.1 (2)
										1	0.0
								7	0.0 {	—	—
										—	—
										—	—
										—	—

reciprocal 76511   Total 100.0 1307 100.0

	10	20	30	40	50	60	70	80	90	100
2·29	THL THL THL	THL THL THL	THL THL	THL THL THL	THL THL THL	THL THL	THL THL	THL THL THL	THL THL	THL THL
·28	THL THL THL THL	THL THL	THL THL THL THL	THL THL THL I						
·27	THL THL THL THL THL	THL THL THL THL	THL THL THL THL THL	THL THL THL						
·26	THL THL THL THL THL	THL THL THL THL	THL THL THL THL THL	THL THL THL THL	THL III					
·25	THL THL THL THL THL THL	THL THL THL THL	THL THL THL THL THL I							
·24	THL THL THL THL	THL THL THL THL	THL THL THL THL	THL THL THL THL THL	THL THL THL THL	THL THL IIII				
·23	THL THL THL THL THL	THL THL THL THL	THL THL THL XIII			I	I	I	I	I
·22	THL THL THL THL	THL THL THL THL	THL THL							
·21	THL THL THL THL	THL THL THL THL	THL III							
·20	THL THL THL THL THL	THL THL THL THL	THL THL II							
·19	THL THL THL THL	THL THL THL THL	THL THL							
·18	THL THL THL THL THL	THL I								
·17	THL THL THL THL THL	THL THL THL THL								
·16	THL THL THL THL THL II									
·15	THL THL THL THL THL IIII					I	I			
·14	THL THL THL THL				I					
·13	THL THL II									
·12	THL THL THL THL II									
·11	THL THL II									
·10	THL IIII									
·9	IIII									
·8										
·7	II									
·6										
·5										
·4										
·3										

(The whole of 1896 vol 12)

11	0	12	0	13	0	14	0	
ⵏ ⵏⵏ ⵏⵏ ⵏⵏ ⵏⵏ ⵏⵏ				136
				56
				75
				78
				71
				94
				59
				50
				48
				52
				50
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				982

Nº 1 2:30

55

grad Abscissae	vol VIII 1892	vol IX 1893	vol X 1894 kast 1	vol XI 1895	vol XII 1896	parts of vol 8. 10 & 12 1892, 1894, 1896
		1307	831	1124		800
	page	page 11	page 8	page 9	page	page 4
29		23.1	20.0	17.7		19.9
27		17.7	15.7	18.0		17.8
25		16.2	17.2	15.3		18.3
23		10.9	13.5	11.4		11.1
21		10.7	8.0	11.0		8.9
19		9.1	9.3	8.4		8.3
17		6.4	7.2	6.2		5.9
15		3.5	5.1	5.3		4.0
13		1.9	2.6	3.9		3.6
11		0.8	0.6	1.9		1.8
9		0.3	0.6	0.7		0.3
7		—	0.2	0.1		—
5		—	—	—		—
3		—	—	0.1		—
		—	—	—		0.1
		100.0	100.0	100.0		100.0
28		40.2	35.7	35.7		
24		27.1	30.7	26.7		
20		19.8	17.3	19.4		
16		9.9	12.3	11.5		
12		2.7	3.2	5.8		
8		0.3	0.8	0.8		
4		—	—	0.1		
		100.0	100.0	100.0		

	10	20	30	40	50	60	70	80	90	100	110
2·29	‖‖ ‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖
·28	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖
·27	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖
·26	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖
·25	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖ ‖‖ ‖‖		
·24	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖		
·23	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖ I			
·22	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖ I			
·21	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖				
·20	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖				
·19	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖ I				
·18	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ III						
·17	‖‖ ‖‖	‖‖ ‖‖	‖‖ ‖‖	‖‖ III							
·16	‖‖ ‖‖	‖‖ ‖‖	‖‖								
·15	‖‖ ‖‖	‖‖ I									
·14	‖‖ ‖‖	‖‖ ‖‖ II									
·13	‖‖ ‖‖ I										
·12	‖‖ IIII										
·11	III										
·10	‖‖										
·9											
·8	II										
·7											
·6											
·5											
·4	I										
·3											

1892
the whole of it

120	130	140	150	160	170	180

236
122
133
127
97
90
81
81
60
60

190	200	210	220	230	240

61
43
35
25
16
22
11
9
3
5
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2
1
—
—
1
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—————
1324

N⁰ 9 2:30

88

	1892 obs: 1324 p.c.	1893 obs: 1307 p.c.	1894 obs: 1207 p.c.	1895 obs: 1124 p.c.	1896 obs: 982 p.c.	sums	means
							f.16r 16
2":29 –	17·8	14·4	13·6	11·0	14·1		
:28 –	9·2	8·7	6·4	6·7	5·7		
:27 –	10·0	8·3	8·0	9·0	7·6		
:26 –	9·6	8·8	8·3	9·0	7·9		
:25 –	7·3	7·9	9·5	6·9	7·2		
:24 –	6·8	8·3	8·3	8·5	9·6		
:23 –	6·1	5·5	6·1	5·4	6·0		
:22 –	6·1	5·3	6·7	6·0	5·1		
:21 –	4·6	5·4	4·7	5·4	4·9		
:20 –	4·5	5·3	3·3	5·5	5·3		
:19 –	4·6	5·3	4·2	4·4	5·1		
:18 –	3·2	3·7	4·8	4·0	3·1		
:17 –	2·9	3·1	4·1	3·6	4·6		
:16 –	1·9	3·3	3·1	2·6	2·7		
:15 –	1·2	2·1	2·9	2·8	3·0		
:14 –	1·7	1·4	1·5	2·5	2·0		
:13 –	0·8	1·0	1·6	2·1	1·2		
:12 –	0·7	0·9	1·2	1·8	2·2		
:11 –	0·2	0·4	0·4	1·2	1·2		
:10 –	0·4	0·4	0·4	0·7	0·9		
:9 –	—	0·2	0·3	0·4	0·4		
:8 –	0·2	0·2	0·3	0·3	—		
:7 –	0·1	0·1	0·1	0·1	0·2		
:6 –	—	—	0·1	—	—		
:5 –	—	—	—	—	—		
:4 –	0·1	—	—	0·1	—		
:3 –	—	—	0·1	—	—		
:2 –	—	—	—	—	—		
	100·0	100·0	100·0	100·0	100·0		

Comparison of Per centages

	29 –		28 –		Total	p.c
	1895	1896	1895	1896	Total	
3/4	15	15	13	10	53	13
1/2	24	25	28	27	104	26
1/4	52	55	38	37	182	46
0	9	5	21	26	61	15
					400	100

per cents

1895

	10	20	30	40	50	60	70		
2:29 3/4	‖‖ ‖‖ ‖‖ ‖‖							19	16
2:29 2/4	‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖							29	24
2:29 1/4	‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖							64	52
2:29 -	‖‖ ‖‖ ‖							11	9
								123	100

1896

	10	20	30	40	50	60	70		
2:29 3/4	‖‖ ‖‖ ‖‖ ‖‖							20	15
2:29 2/4	‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖							33	25
2:29 1/4	‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖							72	55
2:29	‖‖ ‖							7	5
								132	100

1895

2:28 3/4	‖‖ ‖		9	13
" " 2/4	‖‖ ‖‖ ‖‖ ‖‖		20	28
" 1/4	‖‖ ‖‖ ‖‖ ‖‖ ‖‖ ‖		27	38
" 0	‖‖ ‖‖ ‖‖		15	21
			71	100

1896

28 3/4	‖‖ ‖		6	10
" 2/4	‖‖ ‖‖ ‖‖		15	27
" 1/4	‖‖ ‖‖ ‖‖ ‖‖		20	37
" 0	‖‖ ‖‖ ‖		14	26
			55	100

Total Ms   381

From protracted curve   in units of a square

1895—6

15.2	15.2
13.6	28.8
11.1	39.9
{ 7.7	47.6
{ 7.7	55.3
4.7	60.0
{ 2.5	62.5
{ 2.5	65.0
0.8	65.8
{ 0.2	66.0
{ 0.2	66.2

66.2
5

−11.1

28.8
33.1
———
4.3
1.1
———
4.3

4.3
4.7
28.8
———
33.5

nearest exact ablution	1892 and 1893 to be halved	1894	1895 and 1896 to be halved
2 : 28	36.2	14.5	29.0
26	33.6	?,	31.0
24	26.7		29.5
22	21.4		21.4
20	19.7		20.3
18	12.9		15.3
16	8.5		11.1
14	4.9		7.8
12	2.2		6.4
10	1.0		2.4
8	0.6		0.6
below	0.1		0.1
add	2.0		
m 2:29	32.2		25.1
	200.0		200.0

	page	A No of 2:30	B Total exclusive of foregoing	4A	4A+B
1892	15	88	1324	352	1676
3	11	93	1307	372	1679
4	8	93	1204	372	1576
5	9	62	1124	248	1372
6	13	55	982	220	1202

A+

	No of 4x 2:30	2:29	2:28	2:27	2:26	2:25	2:24
1892	352	236	122	(133)	127	97	90
3	372	189	(114)	109	(115)	103	108
4	372	164	77	(96)	(100)	114	100
5	248	124	75	(101)	(101)	78	95
6	220	136	56	75	78	71	(94)

48 ≡ 110
57 ≡ 108

f. 26r

ARITHMETICAL TABLES.

Numeration Table.

Units, ...1
Tens, ...12
Hundreds, ...123
Thousands, ...1234
Tens of Thousands, ...12,345
Hundreds of Thousands,...123,456
Millions, ...1,234,567
Tens of Millions,........12,345,678
C. of Millions,......123,456,789

Sterling Money Table.

4 Farthings..............1 Penny ....d.
12 Pence...............1 Shilling...s.
2 Shillings...............1 Florin.
2 Shillings & Sixpence 1 Half Crown
5 Shillings................1 Crown...cr.
10 Shillings.............1 Half Sov.
20 Shillings, 1 Sov. or 1 Pound...£
21 Shillings...............1 Guinea.

Arithmetical Signs.

+ Plus; Sign of Addition.
— Minus; Sign of Subtraction.
× Sign of Multiplication.
÷ Sign of Division.
= Sign of Equality.
: :: : Sign of Proportion.
√ Sign of the Square Root.
³√ Sign of the Cube Root.
° Degree, 'minute, "second.
∴ Therefore.

Troy Weight.

For Gold, Silver, and Jewels.

24 Grains............1 Pennyweight, dwt
20 Pennyweights 1 Ounce............oz.
12 Ounces ....1 Pound. ....lb.

Apothecaries' Weight.

For Mixing Medicines.

20 Grains............1 Scruple......scr.
3 Scruples...........1 Dram........dr.
8 Drams ....1 Ounce........oz.
12 Ounces............1 Pound ......lb.

Avoirdupois Weight.

For all goods except Gold, Silver, and Jewels.

16 Drams.....1 Ounce........
16 Ounces .....1 Pound........
14 Pounds .....1 Stone..........
28 Pounds....1 Quarter......
4 Quarters...1 Hundredwe
20 Cwt..........1 Ton........

Hay and Straw Wei

36 ℔ Straw ....
56 ℔ Old Hay................
60 ℔ New Hay...............
36 Trusses..................

Long or Lineal Meas

12 Lines............1 Inch.....
12 Inches.........1 Foot ....
3 Feet............1 Yard...
2 Yards...........1 Fathom
5½ Yards ....1 Pole.
40 Poles............1 Furlong
8 Furlongs or 1760 yards..

Cloth Measure.

2¼ inches ..=1 nail.
4 nails........=1 quarter of a yard.
4 quarters..=1 yard.

Solid or Cubic Measure.

1728 cubic inches=1 cubic foot.
27 cubic feet =1 cubic yard.
24¾ cubic feet =1 solid perch mason's work.
12⅝ cubic feet =1 solid perch brickwork.

Imperial Heaped Measure.

Lbs. Avoird. of water.
8 gallons..........=1 bushel...= 80
3 bushels..........=1 sack .....= 240
12 sacks...........=1 chaldron=2880

Imperial Dry Measure.

Avoird. of water   ℔. oz.
2 glasses ....=1 naggin...= 0 5
4 naggins =1 pint ...= 1 4

60 Seconds............1 Minute.
60 Minutes............1 Hour.
24 Hours..............1 Day.
7 Days.................1 Week.
4 Weeks...............1 Month.
365 Days ....1 Year.
366 Days ....1 Leap Year.
52 Weeks ....1 Year.
12 Calendar or
13 Lunar Months 1 Year.

Days in the Months.

Thirty days hath September,
April, June, and November,
All the rest have thirty-one,
Excepting February alone, [clear,
Which has but twenty-eight days
And twenty-nine in each leap year.

MULTIPLICATION TABLE.

2 TIMES	3 TIMES	4 TIMES	5 TIMES	6 TIMES	7 TIMES	8 TIMES	9 TIMES	10 TIMES	11 TIMES	12 TIMES
1 are 2	1 are 3	1 are 4	1 are 5	1 are 6	1 are 7	1 are 8	1 are 9	1 are 10	1 are 11	1 are 12
2 — 4	2 — 6	2 — 8	2 — 10	2 — 12	2 — 14	2 — 16	2 — 18	2 — 20	2 — 22	2 — 24
3 — 6	3 — 9	3 — 12	3 — 15	3 — 18	3 — 21	3 — 24	3 — 27	3 — 30	3 — 33	3 — 36
4 — 8	4 — 12	4 — 16	4 — 20	4 — 24	4 — 28	4 — 32	4 — 36	4 — 40	4 — 44	4 — 48
5 — 10	5 — 15	5 — 20	5 — 25	5 — 30	5 — 35	5 — 40	5 — 45	5 — 50	5 — 55	5 — 60
6 — 12	6 — 18	6 — 24	6 — 30	6 — 36	6 — 42	6 — 48	6 — 54	6 — 60	6 — 66	6 — 72
7 — 14	7 — 21	7 — 28	7 — 35	7 — 42	7 — 49	7 — 56	7 — 63	7 — 70	7 — 77	7 — 84
8 — 16	8 — 24	8 — 32	8 — 40	8 — 48	8 — 56	8 — 64	8 — 72	8 — 80	8 — 88	8 — 96
9 — 18	9 — 27	9 — 36	9 — 45	9 — 54	9 — 63	9 — 72	9 — 81	9 — 90	9 — 99	9 — 108
10 — 20	10 — 30	10 — 40	10 — 50	10 — 60	10 — 70	10 — 80	10 — 90	10 — 100	10 — 110	10 — 120
11 — 22	11 — 33	11 — 44	11 — 55	11 — 66	11 — 77	11 — 88	11 — 99	11 — 110	11 — 121	11 — 132
12 — 24	12 — 36	12 — 48	12 — 60	12 — 72	12 — 84	12 — 96	12 — 108	12 — 120	12 — 132	12 — 144

(2)

American Trotting Horses

Completed Noo 26/97

(The loose papers contain the
principal calculations)

f. 1a   1

page 2 of book II A mean sec 2:29→ 236	Deviation in seconds	Sums from top PE	Deviation in units of PE of seconds	Corr. values in Prob Int Table **B**	Percent of A. which is A×.919	Differences in B
			−0.24	−12.9	21.7	
28– 122	1	122	0.24	12.9	11.2	12.9
27– 133	2	255	.47	24.9	12.2	12.0
26– 127	3	382	.71	36.8	11.7	11.9
25– 97	4	479	.94	47.4	8.9	10.6
24– 90	5	569	1.18	57.4	8.3	10.0
23– 81	6		1.41	6.5.8	7.4	8.4
22– 81	7		1.65	73.4	7.4	7.6
21– 60	8		1.88	79.5	5.5	6.1
20– 60	9		2.12	84.7	5.5	5.2
19– 61	10		2.35	88.7	5.6	4.0
18– 43	11		2.59	91.9	4.0	3.2
17– 38	12		2.82	94.3	3.5	2.4
16– 25	13		3.06	96.1	2.3	1.8
15– 16	14		3.29	97.4	1.5	1.3
14– 22	15		3.52	98.2	2.0	0.8
13– 11	16		3.76	98.8	1.0	0.6
12– 9	17		4.00	99.3	0.8	0.5
11– 3	18		4.23	99.55	0.3	0.2
10– 5	19		4.46	99.7	0.5	0.2
9–			4.70	99.8	0.2	0.1
8– 2	21					
7– 1	22			100.0	0.1	0.2
below (1)	23					

add the 1088
          236
as it sh be – 1324

reciprocal = 919

Position of zero   29 sec
          "   " PE   24.75
            PE = 4.25 second
position of mode at ─── 29.0 second

Each second = $\frac{1}{4.25}$ units = 0.235 unit

1893 from page 3 of book II

Mode 28   PE

	1st method	Sums from top of the descent area	Deviation in units of PE	Corr values of Prob. Int (merriman p.187)	Differ	observed see first col...
2 : 29 -	(189) 303				(10.6)	(18.8)
— 28 -	114			00.0	10.7	11.4	.35
27 -	109	109	0.2	10.73	10.7	10.8	2.
26 -	115	224	.4	21.3	10.6	11.4
25 -	103	327	.6	31.43	10.1	10.2
24 -	108	435	.8	41.05	9.6	10.7
23 -	72	507	1.0	50.00	9.0	7.2
22	70		.2	58.3	8.2	7.0
21	71		.4	65.50	7.3	7.1
20	69		.6	72.0	6.5	6.9
19	70		.8	77.5	5.5	7.0
18	48		2.0	82.3	4.8	4.8
17	41		2	86.2	3.9	4.1
16	43		4	89.5	3.3	4.3
15	27		6	92.1	2.6	2.7
14	18		8	94.1	2.0	1.8
13	13		3 0	95.7	1.6	1.3
12	12		2	96.9	1.2	1.2
11	5		4	97.8	0.9	0.5
10	5		6	98.5	0.7	0.5
9	2		8	99.0	0.5	0.2
below	3			100.0	0.0	0.3
	1307 303 1004 half = 502				100.0	100.0

Position of zero   28th

of PE   23

value of PE   5 seconds

each second in PE units = 0.2

Mode 27ˢᵉᶜ   PE 4.5 secon

min sec	A		Deviations in units of PE x.222	corr values Prob Int table	calc differ	obs A × $\frac{100}{867}$ = A × .115.4
2: 29–	164					18.9
28–29	77					8.8
27–28	96					11.0
26–	100	100	.222	11.89	11.89	11.6
25–	114	214	.444	23.35	11.86	13.2
24–	100	314	.666	34.47	11.12	11.6
23–24	73	387	.888	45.37	10.84	8.4
22–23	81	468	1.110	54.2	9.21	9.3
21	57		1.332	63.01	8.89	8.6
20	40		1.554	70.45	7.4	4.6
19	50		1.776	77.0	6.6	5.7
18	58		2.00	82.3	5.3	6.7
17	49		2.22	86.6	4.3	5.6
16	36		2.44	90.0	3.4	4.1
15	35		2.66	92.7	2.7	4.0
14	18		2.89	94.9	2.2	2.5
13	19		3.11	96.4	1.5	2.2
12	16		3.33	97.5	1.1	1.8
11	5		3.55	98.2	0.7	0.6
10	5		3.77	98.8	0.6	0.6
9	4		4.00	99.3	.5	0.5
8	4					
7	1			100.0	7	0.8
under	2				100.0	100.0

Subtract 1204 / 337

$\frac{867}{433}$ recip = 115.4

halved for finding PE

position of mode   27.0
7   PE   22.5
value of P.E.   4.5   reciprocal = 222

2nd second as in last page = 0.235 unit

Mode 27 seconds   PE 5 seconds

	Δ		Deviation of limits code values in units of PE	under code values of Prob. Integral	$\frac{A \times 100}{824}$ $= A \times .121$	
					Calc	obs
(2: 29 –	124)				10.8	(28.6)
28–29	75	300	0.40	21.3	10.8	9.1
27–28	101		0.20	10.7	10.7	12.2
26–27	101	101	0.20	10.7	10.7	12.2
25	78	179	0.40	21.3	10.8	9.4
24	95	277	0.60	31.4	10.1	11.5
23 –	61	338	0.80	41.1	9.7	7.4
22 ·	67	405	1.00	50.0	8.9	8.1
21	61		1.2	58.2	8.2	7.4
20	62		1.4	65.3	7.3	7.5
19 –	50		1.6	72.0	6.5	6.0
18 ·	45		1.8	77.5	5.5	5.4
17 –	40		2.0	82.3	4.8	4.8
16 –	29		2.2	86.2	3.9	3.5
15 –	32		2.4	89.5	3.3	3.9
14 ·	28		2.6	92.1	2.6	3.4
13 ·	24		2.8	94.1	2.0	2.9
12 ·	20		3.0	95.7	1.6	2.4
11 ·	14		3.2	96.9	1.2	1.7
10 ·	8		3.4	97.9	1.0	1.0
9 –	4		3.6	98.5	0.6	.5
under	5			100.0	1.5	0.5
	1124				100.0	100.0
subtract	300					
	824					
half of it	(412)					
reciprocal	121.36					

Mode   27 sec.

Position of PE   22

value of PE   5 seconds

1896

Mode 26 seconds PE 5 seconds

Time in running one mile (min seconds)	A Observed frequencies	Sums from tops	Successive grades in units of PE	Probability Interval		A × 100/637 = A × .157
				values	differ	
2 : 29 – 30	136					21.4
2 : 28 – 29	56		– 0.60	31.4	10.1	8.8 ✓
27 – 28	75 ³⁴⁵		– 0.40	21.3	10.6	11.8 ✓
26 – 27	78		– 0.20	10.7	10.7	12.2 ✓
25 – 26	71	71	0.20	10.7	10.7	11.1 ✓
24 – 25	94	165	0.40	21.3	10.6	14.7
23 – 24	59	224	0.60	31.4	10.1	9.2
22 – 23	50	274	0.80	41.1	9.7	7.9
21 – 22	48	322	1.00	50.0	8.9	7.5
20 – 21	52	374	1.20	58.2	8.2	8.2
19 – 20	50		1.40	65.5	7.3	7.9
18 – 19	31		1.60	72.0	6.5	4.9
17 – 18	45		1.80	77.5	5.5	7.1
16 – 17	27		2.00	82.3	4.8	4.2
15 – 16	29		2.20	86.2	3.9	4.6
14 – 15	20		2.40	89.5	3.3	3.1
13 – 14	12		2.60	92.1	2.6	1.9
12 – 13	22		2.80	94.1	2.0	3.5
11 – 12	12		2.00	95.7	1.6	1.9
10 – 11	9		2.20	96.9	1.2	1.4
9 – 10	4		2.40	97.9	1.0	0.6
			2.60			
under	2			100.0	2.1	0.3
	982					100 0
Subtract	345					
	637					
halved	318					

Mode at   26 seconds
PE   at   21   "
Value of PE   5   "

American trotters of 5 years old and upwards
Comparison of observation with calculation

Time of running one mile	1892 Per Cent of cases		1893 Per Cent of cases		1894 Per Cent of cases		1895 Per Cent of cases		1896 Per Cent of cases	
	Obs:	Calc:	Obs:	Calc:	Obs:	Calc:	Obs:	Calc:	Obs	Calc
min sec sec 2 : 29 and under 30	(21.7)	12.0	(18.8)	10.6	(18.9)	11.1	(28.6)	10.7	(21.4)	9.7
28 " 29	11.2	12.9	11.4	10.7	8.8	11.5	9.1	10.6	8.8	10.1
27 " 28	12.2	12.0	10.8	10.7	11.6	11.8	12.1	10.7	11.8	10.6
26 " 27	11.7	11.9	11.4	10.6	11.6	11.8	12.1	10.7	12.2	10.7
25 " 26	8.9	10.6	10.2	10.1	13.2	11.5	9.3	10.6	11.1	10.7
24 " 25	8.3	10.0	10.7	9.6	11.6	11.1	11.4	10.1	14.7	10.6
23 " 24	7.5	8.4	7.2	9.0	8.4	10.8	7.4	9.7	9.2	10.1
22 " 23	7.4	7.6	7.0	8.2	9.3	9.0	8.0	8.9	7.9	9.7
21 " 22	5.5	6.1	7.1	7.3	6.6	8.8	7.4	8.2	7.5	8.9
20 " 21	5.5	5.2	6.9	6.5	4.6	7.4	7.5	7.3	8.2	8.2
19 " 20	5.6	4.0	7.0	5.5	5.7	6.6	6.0	6.5	7.9	7.3
18 " 19	4.0	3.2	4.8	4.8	6.7	5.3	5.4	5.5	4.9	6.5
17 " 18	3.5	2.4	4.1	3.9	5.6	4.3	4.8	4.8	7.1	5.5
16 " 17	2.3	1.8	4.3	3.3	4.1	3.4	3.5	3.9	4.2	4.8
15 " 16	1.5	1.3	2.7	2.6	4.0	2.7	3.9	3.3	4.6	3.9
14 " 15	2.0	0.8	1.8	2.0	2.1	2.2	3.4	2.6	3.1	3.3
13 " 14	1.0	0.6	1.3	1.6	2.2	1.5	2.9	2.0	1.9	2.6
12 " 13	0.8	0.5	1.2	1.2	1.8	1.1	2.4	1.6	3.5	2.0
11 " 12	0.3	0.2	0.5	0.9	0.6	0.7	1.7	1.2	1.9	1.6
10 " 11	0.5	0.2	0.5	0.7	0.6	0.6	1.0	1.0	1.4	1.2
9 " 10	0.0	0.1	0.2	0.5	0.5	0.5	0.5	0.6	0.6	1.0
under 2 min: 9 sec	0.3	0.2	0.3	1.0	0.8	0.7	0.5	1.5	0.3	2.1
Total up to Median (i.e. up to Italics).	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Mean value of differences between Obs. and Calc: and their distribution (top line not regarded)

	1892	1893	1894	1895	1896
Mean diff	0.63	0.52	0.95	0.80	1.11
0 and under 1	16	16	13	14	11
1 " " 2	5	5	5	6	8
2 " " 3	0	0	3	1	1
3 and above	0	0	0	0	1

American trotters of 5 years old and upwards.

Time of running one mile	Observed number of cases				
	1892	1893	1894	1895	1896
min secs. secs					
2:29 and under 30	236	189	164	124	136
2:28 " " 29	122	114	77	75	56
2:27 " " 28	133	109	96	101	75
2:26 " " 27	127	115	100	101	78
2:25 " " 26	97	103	114	78	71
2:24 " " 25	90	108	100	95	94
2:23 " " 24	81	72	73	61	59
2:22 " " 23	81	70	81	67	50
2:21 " " 22	60	71	57	61	48
2:20 " " 21	60	69	40	62	52
2:19 " " 20	61	70	50	50	50
2:18 " " 19	43	48	58	45	31
2:17 " " 18	39	41	49	40	45
2:16 " " 17	25	43	36	29	27
2:15 " " 16	16	27	35	32	29
2:14 " " 15	22	18	18	28	20
2:13 " " 14	11	13	19	24	12
2:12 " " 13	9	12	16	20	22
2:11 " " 12	3	5	5	14	12
2:10 " " 11	5	5	5	8	9
2:9 " " 10	–	2	4	4	4
under 2 min: 9 secs	4	3	7	5	2
Total	1088	1307	1204	1124	932
Accepted Median	29 secs	28 secs	27 secs	27 secs	26 secs
Accepted Quartile	4¼ secs	5 secs	4½ secs	5 secs	5 secs

2:19 and 20   21.7
2:20

min sec / sec 2:29 and under 30	min sec / sec 2:28 and under 29
21.7	12.0
18.8	10.6
18.9	11.1
28.6	10.7
21.4	9.7
109.4	54.1

1892

2.29-	236	358	17.8	27.0
.28-	122		9.2	
.27-	133	260	10.0	19.6
.26-	127		9.6	
.25-	97	187	7.3	14.1
.24-	90		6.8	
.23-	81	162	6.1	12.2
.22-	81		6.1	
.21-	60	120	4.6	9.1
.20-	60		4.5	
.19-	61	104	4.6	7.8
.18-	43		3.2	
.17-	38	63	2.9	4.8
.16-	25		1.9	
.15-	16	38	1.2	2.9
.14-	22		1.7	
.13-	11	20	0.8	1.5
.12-	9		0.7	
.11-	3	8	0.2	0.6
.10-	5		0.4	
.9-	-	2	-	0.2
.8-	2		0.2	
.7-	1	1	0.1	0.1
.6-	-		-	
.5-	-	1	-	0.1
.4-	1		0.1	
.3-	-	-	=	
.2-	-		=	
	1324	1324	100.0	100.0

reciprocal = 755.3

2.29 =	189	303	14.4 / 8.7	23.2
.28	114			
.27	109	224	8.3 / 8.8	17.1
.26	115			
.25	103	211	7.9 / 8.3	16.1
.24	108			
.23	72	142	5.5 / 5.3	10.9
.22	70			
.21	71	140	5.4 / 5.3	10.7
.20	69			
.19	70	118	5.3 / 3.7	9.0
.18	48			
.17	41	84	3.1 / 3.3	6.4
.16	43			
.15	27	45	2.1 / 1.4	3.5
.14	18			
.13	13	25	1.0 / 0.9	1.9
.12	12			
.11	5	10	0.4 / 0.4	.7
.10	5			
.9 =	2	4	0.2 / 0.2	.3
.8	2			
.7	1	1	0.1	.1
.6	—		—	
.5	—	—	—	=
.4	—	—	—	
.3	—		—	
.2	—		—	—
	1307	1307	100.0	100.0

Reciprocal 65

1894

2.29	164	241	13.6	20.0
.28	77		6.4	
.27	96	196	8.0	16.3
.26	100		8.3	
.25	114	214	9.5	17.8
.24	100		8.3	
.23	73	154	6.1	12.8
.22	81		6.7	
.21	57	97	4.7	8.0
.20	40		3.3	
.19	50	108	4.2	9.0
.18	58		4.8	
.17	49	85	4.1	7.0
.16	36		3.0	
.15	35	53	2.9	4.4
.14	18		1.5	
.13	19	35	1.6	2.9
.12	16		1.2	
.11	5	10	0.4	.8
.10	5		0.4	
.9	4	8	0.3	.7
.8	4		0.3	
.7	1	2	0.1	.2
.6	1		0.1	
.5	—	0	—	.0
.4	—		—	
.3	1	1	0.1	.1
.2	—		—	
	1204	1204	100.0	100.0

reciprocal = 830.56

not sent fair

2.29	124	199	11.0	17.7
.28	75		6.7	
.27	101	202	9.0	18.0
.26	101		9.0	
.25	78	173	6.9	15.4
.24	95		8.5	
.23	61	128	5.4	11.4
.22	67		6.0	
.21	61	123	5.4	10.9
.20	62		5.5	
.19	50	95	4.4	8.5
.18	45		4.0	
.17	40	69	3.6	6.1
.16	29		2.6	
.15	32	60	2.8	5.3
.14	28		2.5	
.13	24	44	2.1	3.9
.12	20		1.8	
.11	14	22	1.2	2.0
.10	8		0.7	
.9	4	7	0.4	.6
.8	3		0.3	
.7	1	1	0.1	.1
.6	—		—	
.5	—	1	—	.1
.4	1		0.1	
.3	—	—	—	—
.2	—		—	
	1124	1124	100.0	100.0

Reciprocal = 889.68

2 ·29	136	192	14·1	19·6
·28	56		5·7	
·27	75	153	7·6	15·6
·26	78		7·9	
·25	71	165	7·2	16·8
·24	94		9·6	
·23	59	109	6·0	11·1
·22	50		5·1	
·21	48	100	4·9	10·2
·20	52		5·3	
·19	50	81	5·1	8·2
·18	31		3·1	
·17	45	72	4·6	7·3
·16	27		2·7	
·15	29	49	3·0	5·0
·14	20		2·0	
·13	12	34	1·2	3·5
·12	22		2·2	
·11	12	21	1·2	2·1
·10	9		0·9	
· 9	4	4	0·4	4
· 8	0		—0	
· 7	2	2	0·2	2
· 6	0		—0	
· 5	0	0	—0	0
· 4	0		—0	
· 3	0	0	—0	0
· 2	0		—0	
	982	982	100·0	100·0

Reciprocal ·101·0

1892

Mode
28.5

PE by graphic
take as 4.7 sec
$x\frac{1}{4.7}$ = .213

Corr vals
in Probable
table

	Mode 28.5				× 100/77.4 = ×1.29	Deviation in second	Deviation in unity each = 5 sec		add c.
29 than 30	17.8	100.0							
27 – 29 {	4.8	82.2				0.5		0.16.7	23
	14.4	77.4	14.4	18.3	1.5	0.32	0.17		23
25 – 27	16.9	63.0	31.3	40.4	3.5	.75	0.38		21
23 – 25	12.9	46.1	44.2	57.0	5.5	1.17	0.57		19
21 – 23	10.7	33.2	54.9	70.8	7.5	1.60	0.72		15
19 – 21	9.1	22.5	64.0	82.6	9.5	2.02	0.82		10
	6.1	13.4	70.1	90.4	11.5	2.45	0.90		8
	3.1	7.3	73.2	94.4	13.5	2.88	0.95		5
	2.5	4.2	75.7	97.7	15.5	3.30	0.97		2
	0.9	1.7	76.6	98.8	17.5	3.73	0.99		2
	0.4	0.8	77.0	99.3	19.5	4.15			
	0.3	0.4	77.3	99.8	21.5				1
	0.1	0.1	77.4	100.0					

1892

Per cent of cases less than 2 : 23 in 42.8

25 in 59.5

PE   27 + x in 50.0

16.7 : 7.2 :: 2 : x ; x = 0.9 sec (0.86)

27 + x = 27.86

mode   = 28.50

PE   = 6.64

16.7 = Nº of cases between them
(in an interval of 2 sec.

7.2 = Nº between 23 & position of PE

from p 16 & 18 of the other book (Nº I).

modes after protracting from p 16 in the other book

		28.5	27.5	26.5	27.0	26.0
exact abscissae (for Curve of Frequency)		1892 obs. 1324	1893 obs. 1307	1894 obs. 1204	1895 obs. 1124	1896 obs. 982
27-29	2 : 28	19.2	17.0	14.4	15.7	13.3
25-27	26	16.9	16.7	17.8	15.9	15.1
23-25	24	12.9	13.8	14.4	13.9	15.6
21.23	22	10.7	10.7	11.4	11.4	10.0
19.21	20	9.1	10.6	7.5	9.9	10.4
	18	6.1	6.8	8.9	7.6	7.7
	16	3.1	5.4	6.0	5.4	5.7
	14	2.5	2.4	3.1	4.6	3.2
	12	0.9	1.3	1.6	3.0	3.4
	10	0.4	0.6	0.7	1.1	1.3
	8	0.3	0.3	0.4	0.4	0.2
	6					
below		0.1	0.0	0.2	0.1	0.0
add						
for 2 : 29		17.8	14.4	13.6	11.0	14.1
		100.0	100.0	100.0	100.0	100.0

? is not 29^{sec} or a little more
a more likely mean, considering
the results of 1894 a of 1895-6

in tracking one mile $\boxed{PE = 6.1^{sec}}$

27 seconds 64.1   2 seconds 50.0

: 25 second 47.7   47.7

diff in tr'g 2 seconds, 16.4 cases occur

$x =$ 15   occurrences   less occur   2. 3 cases between it above

$2.0 : 16.4 :: x : 2.3$

$x = \dfrac{4.6.0}{16.4} = 4.6 \times .61 = 0.28$

Abscisse corr t PE $\begin{array}{l} 25.00 \\ \hline 25.3 \\ 31.4 \\ \hline \end{array}$

$PE = 6.1 \text{ seconds}$

mean N°d seconds	$\div 2^m$: 31.4	: 6.1		Calc
-(29.0 =	2.4	0.4	0.21	21
-27 =	4.4	0.72	0.37	16
-25	6.4	1.0	0.52	15
-23	8.4	1.4	0.64	12
-21	10.4	1.7	0.75	11
-19	12.4	2.0	.82	9
-17	14.4	2.4	.89	7
-15	16.4	2.7	.93	4
-13	18.4	3.0	.96	3
-11	20.4	3.3	.97	
-9	22.4	3.7	.99	
	24.4	4.0	1.00	

From last page, see also p. 18 ? I

1892 – 3

	Sunset	haloes	x.974	same from bottom	sunspots with	calc
2:29 under 31.4	—	18.8	18.3	100.0	18.3	21
2:27 x under 29	3.6	18.1	17.6	81.7	35.9	16
25 — 27	32.6	16.8	16.4	64.1	52.3	15
23 — 25	26.9	13.3	13.0	47.7	65.3	12
21 — 23	21.4	10.7	10.4	34.7	75.7	11
19 — 21	19.7	9.9	9.6	24.3	85.3	7
17 — 19	12.9	6.4	6.2	14.7	91.5	7
15 — 17	8.5	4.3	4.1	8.5	95.6	4
13 — 15	4.9	2.4	2.4	4.4	98.0	3
— 13	2.2	1.1	1.1	2.0	99.1	1
9 — 11	1.0	0.5	0.5	0.9	99.6	2
7 — 9	0.6	0.3	0.3	0.4	99.9	1
	—	—	—		—	
below	0.1	0.1	0.1	0.1	100.0	
	167.8 — 83.9		100.0			

obtained graphically 7 × 10.5
the stated figures being ignored

half 83.9   102.7

32.2   reciprocal = 974

70.0 0

27 – 29
25 – 27 = ·26^{tec} = mode of curve
23 –25
21 –23   20·5 = quartile
19 –21
17 – 19
15
13
11
9

under 8

27
25
23
21
19

subtr / 0·5 from 21 = 20·5
13·4   mode = 27·0
                0·5

mode 26·0^{tec}
Quartile 20·5
        5·5 = prob error

P.E

1895-6

from page 18 of other book (additions are on a scrap not kept)

and under			descent's arm of curve made	reduced per cent	Sums from top
			2:27	19.4 & 17	
2:27	2:29	14.5	7.3	9.13	100.0
25	–	15.5	15.5	19.4	90.9
23	–	14.7	14.7	18.2	71.5
21 to 23		10.7	10.7	13.4	53.3
19	–	10.2	10.2	12.7	39.9
17	–	7.7	7.7	9.6	27.2
15	–	5.5	5.5	6.9	17.6
13	–	3.9	3.9	4.9	10.7
11	–	3.2	3.2	4.0	5.8
9	–	1.2	1.2	1.5	1.8
8	–	0.2	0.2	0.2	0.3
6		—	—	—	—
and under 6		0.1	1	0.1	0.1
		87.4	80.2	100.0	

12.6 for 29 - having been subtracted

7.2 being subtracted

mode :26 tect
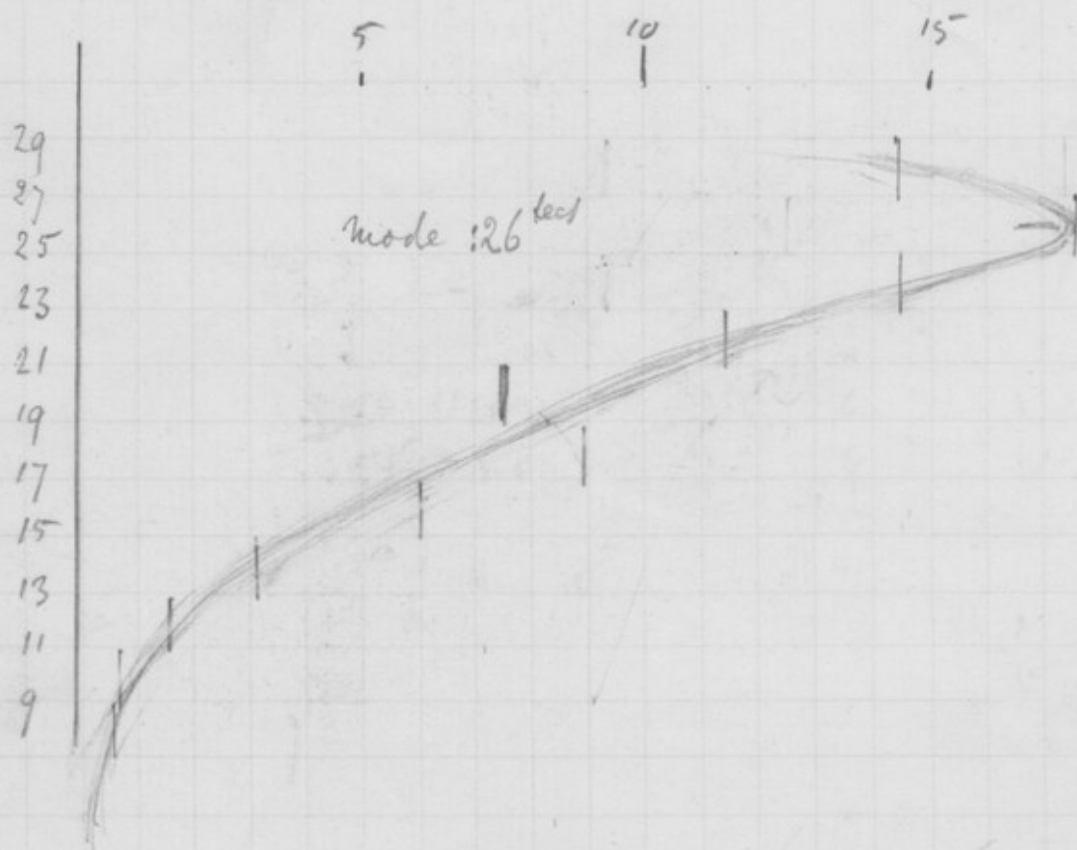
ignored	(13.6)	(13.6)?	percent for descendg arm (× 158)	
2:27 – 2.29	14.4	14.4 } 36.9	(× 158) 22.9	
95 – 27	17.8	8.9	14.1	
		8.9 mode	14.1	100.0
23 – 25	14.4	14.4	22.8 8	85.9
21 – 23	11.4	11.4	18.0	63.1
19 – 21	7.5	7.5	11.9	45.1
17 – 19	8.9	8.9	14.1	33.2
15 – 17	6.0	6.0	9.5	19.1
13 to 15	3.1	3.1	4.9	9.6
11 to 13	1.6	1.6	2.5	4.7
9 to 11	0.7	0.73	1.2	2.2
			0.9	
below 9	0.6	0.6	1.0	1.0

100.0   63.1   100.0

63.1
36.9
63.1

63.1   63.1   13.1 : 18.0 ∷ 2 : 20 $z = \frac{262}{18} = 9$
50.0   45.1
13.1   18.0

21.0 – 0.9 = 20.1   for quartile

26.0   for mode

5.9   for value of PE

see p.11 values for		
1892-3	1894	1895-6
5.0	5.9	5.5
29.0	26.0	26.0

1) PE say 5.5 or between 5 & 6 seconds

1892-3
from p. 8

Take mode at 29 sec

27 and under 29	sec 18.1	raised to per cents 21.6	100.0
25	27	16.8	20.1	78.4
23	25	13.3	15.8	58.3
21	23	10.7	12.7	42.5
19	21	9.9	11.8	29.8
17	19	6.4	7.6	18.0
15	17	4.3	5.1	10.4
13	15	2.4	2.9	5.3
11	13	1.1	1.3	2.4
9	11	0.5	0.6	1.1
below 9		0.4	0.5	0.5
	√	83.9	100.0	

(reciprocal 119)⁺

$$58.3 \qquad 50.0 \qquad 15.8 : 7.5 :: 2.0 : x$$

$$\frac{42.5}{15.8} \qquad \frac{42.5}{7.5} \qquad x = \frac{15.0}{15.8} = 0.96 = 1 \, sec$$

$$23^{sec} + 1.0 = 24^{sec} = \text{position of Quartile}$$

$$29 = \text{" mode}$$

$$\frac{5^{sec}}{} = PE$$

Take 100 ^{sec} as the conventional Zero — then write as below

later $P.E. = \pm 1^{st}$ secs
Allow 0.2 st to each grade

for 29 with 100 − 29 = 71
 28   10 − 28   72
 27   "   73
 26   74
 25   75
 24   76
 23   77
 22   78
 21   79
 20   "   80
 19   81
 18   82
 17   83
 16   84
 15   85
 14   86
 13   87
 12   88
 11   89
 10   90
  9 with 100 − 9 =   91
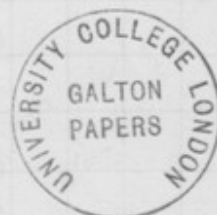
A fair approximation but work all over again varying the position of the mode & the value of the PE

	1892-3		1894		1895-6	
	Observed	calc mode 29 PE=5 sec	Obs PE	calc mode 26 PE=5 sec	obs pq	calc mode 28 PE=5 sec
27 and under 29	22	21	23	20	18	21
25 " 27	20	20	28	22	19	20
23 " 25	16	17	23	20	18	17
21 " 23	13	14	18	19	13	14
19 " 21	12	10	12	16	13	10
17 " 19	8	7	14	12	10	7
15 " 17	5	5	9	8	7	5
13 " 15	3	3	5	6	5	3
11 " 13	1	2	3	4	4	2
9 " 11	1	1	1	2	2	1
below 9			1	2		

and 1895-6

For 1892-3 the gradient are 2 sec from the modes & the prob error is 5 sec

so the intervals in the Prob: Integral Table are 0.4 throughout on, 0.8, 1.2 h

For the others the first interval is 1 sec & the subsequent ones are 2

hence the intervals are 0.2, 0.6, 1.0, 1.4, 1.8, 2.2 h

1892 – 3

in Prob Int. units P.E=1		Calc	obs p.11
.4	0.21	21	22
.8	0.41	20	20
1.2	0.58	17	16
1.6	0.72	14	13
2.0	0.82	10	12
2.4	0.89	7	8
2.8	0.94	5	5
3.2	0.97	3	3
3.8	0.99	2	1
beyond	1.00	1	1
		100	

1894 and 1895-6

		Calc	observation p10. 1894	p.9. 1895-6
.2	.11	11	14	9
.6	31	20	23	19
1.0	.50	19	18	18
1.4	66	16	12	13
1.8	78	12	14	13
2.2	86	8	9	10
2.6	92	6	5	7
3.0	96	4	3	5
3.4	98	2	1	4
100		2	1	2
		100	100	100

The extreme interest taken in trials of speeds and the
watchfulness of competitors have resulted in
a satisfactory method of timing trotters which
works well and is generally accepted as
authoritative.

The length of the track is scrupulously measured
and they many other conditions are satisfied that shall
so far as possible make the horse's record
a just and exact measure, to professedly the nearest
quarter of a second

Exam^n of the Registered Speeds of American Trotting Horses,
— with remarks on their value as Hereditary data.

It is strange that the vast sums spent on ~~the~~ pedigree
breeding, whether of horses cattle or other kinds of stock,
and the wide interest felt in ~~the~~ its results, should not ~~have~~ ~~an~~
~~you~~ given rise to a system of careful authentic records, ~~forming to~~ which would form
a suitable basis for scientific inquiry into the laws of
heredity. An almost solitary exception to the general
disregard of exact measures by breeders and owners, ~~and~~ for
~~to their~~ record in stud books, exists in the United States,
with respect to the measured speed of "Trotters" and "Pacers"
under well defined conditions. The ~~achievement of~~ performance by a
trotter of one mile in 2 minutes and 30 seconds is ~~now~~
the qualification for his entry in the trotting register, thereby
giving him as ~~bodily passed~~ it were a pass-degree into a ~~recognised~~
class of horses, whose individual merits are determined
by their fastest recorded speeds. To avoid prolixity I will
not speak particularly of ~~the~~ Pacers (pace = amble) ~~but~~ at what will
be said of the Trotters applies generally principle to ~~them~~ Pacers also.
The extreme interest taken in ~~races and~~ watchful trials of speed
in the United States, and the jealousy of competitors have given rise to a satisfactory method of
determining the timing ~~of running~~ which meets with
measured track to professedly the nearest quarter of a
second, ~~that seems to hold with~~ at all events it receives general acceptance.
I was however informed that some small laxity ~~has been~~
tolerated when a horse had nearly, but not quite qualified
itself for the above mentioned pass-degree, profailure by only a quarter of a
second being commonly overlooked. ~~In this~~ I shall again refer to this

later

The system of timing & began in 1869
and has been somewhat modified in
time went on

again later on. The present system of racing & timing became
established in its present form in 1892, when the extremely
light vehicles, sulkies as they are called, were generally fitted
with bicycle wheels and pneumatic tires, and other improvements both
in them and in the tracks over which they ran, were introduced.
There is much discussion as to the average gain in time due
to these changes, which cannot be easily submitted to direct
measurement, as a horse trained for one kind of vehicle does not
do justice to himself when harnessed to another, but a common
opinion is that the gain amounts to about 5 seconds in the mile.
A time race to the nearest quarter of a second is but a
rough estimation of the exact speed of a horse, as compared with
the method of rough method of determining the speed of
a horse relatively to his competitors, and is by no means
so exact as the differential method of ordinary races.
The speed of one mile in 2:30 (to employ the usual
American notation) or of 1760 yards in 150 seconds,
is about 12 yards in one second. Now the extended length
of a horse, as I gather at full trotting speed is, as I gather
from Muybridge's instantaneous photographs, half as long
again as his height at the withers, or barely 3 yards
therefore at a 2:30 speed he travels through his whole
length in a quarter of a second. In an ordinary race
the gain by even a half-length is a notable victory,
while that of a neck or even of a head, suffices to
determine the winner. Therefore the record of the speed
of a horse to the nearest half second, is by no means
quarter

But it is difficult under the circumstances to measure time accurately. If quarter seconds were exactly noted the numbers of entries of 0, ¼, ½ and ¾ would be equal; on examination they are not to. I extracted ~~several~~ a number of entries, and *is from distant batches* found the relative frequency of ~~their~~ occurrence *to be* ~~twice~~ as 13, 26 46 & 15, *say as 1, 2, 3, & 1* showing a ~~strong~~ *they were* bias towards ~~entering ½ seconds~~ particular numbers, twice as strong towards the ½ as towards 0 or ¾, and three times as strong towards the ¼. It may *well* be that the entry of the ¼ seconds is of more use than their total disregard, but clearly they cannot be depended on.

an absurd refinement, always supposing the time to be accurately measured.) ^ All trotting performances of the required standard are contained ~~for each year~~ registered in the large and closely printed volumes of Wallace's Year Book, by the American Trotting Association, ~~of which that for~~ vol XII referring to 1896. ~~is the twelfth~~. The following remarks are based upon an analysis of ~~their~~ contents of vols XIII to XII.

The object of the inquiry, ~~and the~~ now to be described, was to test the trustworthiness of the ~~volumes~~ registered records by internal evidence, and ~~otherwise~~ to ascertain learn how far they would ~~be~~ afford suitable materials for investigations into the laws of heredity. In respect to the latter ~~purpose~~, it was necessary to be assured of the correct ^principle ~~according~~ which marks ~~should~~ ought to be ~~fairly~~ assigned to different speeds. The ~~question~~ (to be considered) ~~may be~~ ~~simply~~ put in their ~~form~~: Thus. Suppose the particular ancestor, whom we will call A, of a certain horse, has a record of 2:30, and another ancestor in the same degree, whom we will call B, has a record of 2:10, what is their mean ~~influence~~ hereditary influence?. Is it the same as if the record of ~~both~~ each of them had been 2:20, or not?. In other words, is the Arithmetical Mean the value to be adopted, or is some other form of mean (more appropriate)? It seemed to me that the ~~latter question~~ one ~~would be answered~~ shd in favour of the (arithmetic mean shd be adopted^ if it could be shown that the relative frequencies of the records of 2:30, 2:29, 2:28, &c, corresponded with the theoretical frequencies as determined by the common Law of Error. ~~Because~~ If they did so, they would

fall into the ~~same category as~~ line with those numerous anthropometric & other bodily
measures, which in ~~each case~~ follow approximately the
theoretical law and in these, as ~~much~~ experience has
shown, the arithmetic mean suffices to bring calculations
concerning hereditary & other influences, in accordance with
observed facts. The causes that ~~pick out~~ determine which horses should be selected for
racing are however by no means so homogeneous as to justify an
à priori assumption that their performances would ~~as each~~
~~forming a system that~~ ~~as the accords~~ with that law of the frequency of error; ~~but this~~ is decidedly a question that has
to be settled by an appeal to fact. Therefore the task ~~therefore~~ to
~~that~~ which I addressed myself, was double; first to test the
trustworthiness of the records by ascertaining whether or no
their frequencies at the various ~~equal~~ grades of speed, separated from one another by equal
intervals, say of 1 second, formed a fairly continuous
curve; ~~and~~ secondly, whether that curve coincided with
~~one of the~~ a part of one of the ~~to pass or with part~~ limbs of a curve of normal frequency.
The answer given to both of these ~~questions is found~~
in the accompanying diagrams which are far more easily
appreciated than the somewhat bulky tables on which
they are founded. It is affirmative in both cases; for
although the trace of the observations runs ruggedly, we must
recollect that the grades are close; when they are combined
in grades of 2 seconds interval they are much smoother,
and we see that the traces are very fairly fitted by the
smooth curves which are those of frequency having
the Medians (M) and the Probable Errors (P.E) as entered in
each case. The one notable and extraordinary exception

in the table and corresponding imaginary columns in the diagram
The successive columns run as follows, beginning
from the left, Per cent of observation Under 2·30 × up to 2.29 inclusive, Under 2·29 and
up to 2·28 inclusive and so on. Consequently the dots in the diagram
whose position as read from the scale at the side represent these numbers
percentages of observation, are placed in the middles of the imaginary
columns whose bounds are defined by the time scale at the
base.

The investigation was troublesome and tedious. It was necessary to pick out of a large collection of printed entries those stallions, geldings and mares (all these classes being found to equally efficient trotters) whose "records" had been made during the year under consideration, and who also had arrived at maturity, that is who were then at least 5 years old. Had younger horses been included the proportion of the lower speeds would have been much increased. With the assistance of a friend, the appropriate entries were marked in the printed book; then one of us called out the number of the seconds in each entry and the other made a corresponding mark in the appropriate column of a page ruled for that purpose. Finally the marks in each column in each page were counted. In this way 5705 extracts were made from the entries for the 5 years 1892–6. I did not verify the work, so a small number of entries may have been overlooked of what I have therefore dealt with which may be considered as a large sample that includes nearly but not the whole of the available data, and which is quite sufficient for the present purpose.

The answers given to the above two questions by discussing this material were in the first instance in the form of rather bulky tables, which I do not reproduce here as their significance will be much more easily appreciated from an inspection of the accompanying diagrams, that are founded upon them. The smooth curves are those of theoretical frequency, when

I have indicated by small crosses the means of each consecutive pair of observed values, and it will be easily seen that a trace drawn through these would run much more smoothly that that which I have drawn

the Median (M) and the Probable Error (P.E) have the values
assigned to them in each diagram; ~~the dots which are joined with straight lines indicate the observed facts.~~ Leaving aside for the moment
the strange pinnacle at the left hand of each ~~and every~~
diagram, we see that, though, the trace of the observations ~~is though~~
very rough, it runs in fair accordance with the smooth
curve. ~~Also~~ A practised eye will easily see that if
the means of each consecutive pair of observations were
used instead, ~~of treating them independently~~ the accordance between trace and curve would
be considerably closer. On the whole then, for the ~~whole~~ ~~body~~
of these curves, with the exception of the pinnacles, it may be fairly claimed that the observations
run with sufficient ~~smoothness~~ regularity to certify, than general trustworthiness
and that the type of the curve to which they approximate
is that of the normal ~~curve of~~ frequency. Consequently, ~~that~~
when combining the records of different speeds, we are justified
in employing their arithmetic Mean.

Now as regards the pinnacles to the left. Beginning as
I did, by working with the 1892 records alone, the pinnacle caused ~~my~~
great perplexity, by suggesting a ~~quite~~ different strange type of irregular
curve in which the maximum lay far to the left. But
by persevering and discussing the records of the other four
years, it became plain that the maximum did not lie
~~to the left without~~ in large case beyond the bounds of the table, by the left, this was
decisively the case in 1896. The cause of the pinnacle
then became plain - it was the ~~much~~ larger tolerance given
to horses that ~~would~~ nearly but not quite attained the 2:30
standard, a tolerance that reached ~~beyond~~ had the ¼ second
of which I had heard, to considerably beyond 1 ~~second~~

what
of the character, would be of its unknown
probongation for a short distance,
beyond any ~~her~~

(the column of " under 2:30 to and inclusive)
of 2:29"

~~and would~~ seconds. Estimating something Judging as we can justly do, ~~(a considerable degree further on)~~ from the general run of the known portion of the curve, we see that if the top of the pinnacle were removed & placed in the next division to the ~~next~~ last outside the diagram, namely to that of 2:30 and under 2:31, the exigencies of the case would even be hardly fulfilled; certainly not in the year 1895 when the laxity was greatest. It should be added ~~mentioned~~ that I took out the entries of 2:30, but they were not very numerous and their addition failed to account for more than a small portion of the irregular pinnacle.

Under these circumstances I had no hesitation in disregarding altogether the entries under of 2:29 and "under 2:30" in each and every year. Thenceforward the treatment of the observations was clear and easy. The position of the maximum in each year was somewhat ~~decided~~ by referring to the adjacent years, and after that was ~~done~~ placed the value of the P.E. was of course found easily enough. Now that all is done I see that trifling alterations in the accepted values of the means and Probable Errors would yield an better fits, and next so in 1896, ~~by increasing the latter~~, but they are quite good enough as they stand, for the present purpose. Therefore I conclude that the ~~solitary~~ exception of a solitary pinnacle in each case in the diagram is of no real importance ~~weight at all~~, and that the results arrived at subject to that solitary exception, hold good altogether.

there are numerous and Elaborate tables of many kinds and of great length are printed at and requiring much research to make them are freely printed in the volumes of the Year Book, but not one of them affords the needed material in an accessible form

I now come to the final object of this memoir,
which is to point out ~~the existence~~ that in the registered
and published records of the American Trotting Association
there exists a store of most valuable material for
research into the laws of heredity, which increases in
value year by year.   Unfortunately, it lies hopelessly
buried, simply as it seems to me through the need of
having its importance publickly insisted upon. all that
is wanted is a list of those horses whose ancestral performances
are known with exceptional completeness, ~~say do~~ so far as
their trotting or pacing ~~speeds~~ are concerned. It is hardly
worth while to trouble about the heredity of a horses unless
the records of ~~th~~ its dam and of its sire, and those
of each of its four grandparents, are known, as well as the
records of itself.   The number of such horses cannot be
large at present, ~~for the institution of time records is compara-
tively recent, and~~ the records of the dams are much less
generally known than those of the sires.   It is practically
impossible to discover these horses from the pages of the
trotting register, the search in each attempt being tedious
and the number of attempts requisite to yield one success
being obviously very great.   On the other hand the breeder
& possessors of these notably bred horses ~~are assuredly~~ must be
familiar with all the required facts about them, and could
not be otherwise than gratified at having these facts generally
known.   If a table of such horses were inserted in the
Annual Trotting Register it would be of ~~great~~ very high utility

to those who endeavour to make a really scientific study, as based on measurements, (of the laws of heredity) and it would (assuredly) be of great interest to the horse-loving American public.   In the mean time I am sending circulars to the chief horse breeders, in the United States, and hope to receive some information to start work upon.

The need for data of this exact description are too great, while it is hardly possible to obtain them in sufficient numbers for any other feature or faculty in any other animal, that I venture to think that I am not taking an undue advantage of the publications of the Royal Society in submitting these views for publication in their Proceedings.

For <u>consideration</u>

Papers for the

Fuller explanation of Mr. Galton's proposal

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1. Purpose of the Inquiry

2. Schedule to be circulated

3. Explanations and

4. Standard Photographs

5. Suggested outline of Proceedings

Francis Galton

42 Rutland Gate S W

Jan 24 / 99

PURPOSE OF THE INQUIRY.

The object of circulating the Schedule among Owners *on the back of this page,* of Pedigree Stock, is to collect systematic information that shall be hereafter of high importance to the Advancement of the Art of Breeding.

It may be objected that the points which a Breeder takes into account are so much more numerous than those to which the Schedule refers, that the useful information to be derived from the desired returns cannot be large; but this objection is invalid. The problems of most interest to Breeders are connected with Prepotency, Reversion, the Average Contribution of each ancestor to the offspring, Fixity of Type, Blendings, Effects of In-breeding, and so on. Now all of these are best investigated by discussing a single point at a time, and it hardly matters what that point is, so long as it is suitable for statistical treatment. The results obtained as regards any one point, are to be verified by comparison with those from a second, from a third, and from others. Entries in the Schedule, taken in connection with the Photograph that is furnished at the same time, will supply numerous points suitable for the above investigation. It must be recollected that many additional measurements may be obtained from the photograph (for which a scale is furnished by the measured height of the horse at the withers and croup) such as depth of chest, length of legs, hollowness of the back, slope of shoulders, and of pasterns, diameter of fore-leg below the knee, and so forth.

The returns are wanted for a serious and important purpose, and it is trusted that they will be furnished with corresponding zeal and care, and that the remarkable opportunities possessed by the Owners of Pedigree Stock of preserving materials serviceable for the scientific study of Heredity, will at length cease to be wasted.

(Signed
by the Inquirer   )

SCHEDULE

FOR RECORDS OF PEDIGREE STOCK.
Hackneys

Return with entries to - -

Name of Animal		Sex	
Date when born		Register. Nº	
Sire			
Dam			
Colour of -			
(1) Side of Body			
(2) Mane & Tail			
(3) Face			
Peculiar marks			
Measurements of -			
(1) Height at Withers			
(2) Height at Croup			
(3) Girth of Chest			
Name of measurer			
Marked Resemblances			
to particular ancestors			
(1) in colour			
(2) in form			
(3) in action			
Standard Photograph. two unmounted prints, freed from copyright (see Explanations)			
Name and Address			
of the Photographer			
Date of Photographing		Focal length of lens	
Remarks			
Owner and his full address			
Signature of Sender and his full address			
His Title and Occupation			
Date of Sending			

EXPLANATION OF THE SCHEDULE.

Colour. The distribution of white is only in part shown in the photograph. The nearer legs may hide the further ones, and the blaze on the face cannot be properly guessed from a side view; so description is needed.

Measurements. Those of height are valuable both on their own account and as giving a scale to the photograph. They should be made with scrupulous care and be recorded to the nearest half inch. The essentials in measuring heights are that (1) the animal should stand on hard and level ground, to give a satisfactory base to measure from, (2) that his attitude should be normal (3) that the measuring staff be strictly upright. The girth of the chest indicates the breadth of the animal; which a side photograph cannot shew. The set of measurements should be repeated in rotation, as a safeguard against mistake.

Marked Resemblances. Specify the relationship of any ancestor that is mentioned and trace the line of descent downwards from him or her to the animal (A) that is the subject of the Schedule. Suppose the ancestor to be called Actæon, and to be the g.g. grandsire of A, through the line Belthazar, Esther, and Napoleon; then the entry should be of the form of Resemblances (in such and such particulars to "g.g. grandsire Actæon, through his son Belthazar, dau. Esther, son Napoleon, son (or dau) A."

STANDARD PHOTOGRAPHS.

(1) They must present a strictly side view.
(2) The animal, to be taken squarely to the camera, while
(3) standing on sufficiently hard ground to show his hoofs, and
(4) at not less than 25 feet from the camera; better at 30 ft.
(5) The focal length of the lens must be recorded: i.e. the distance between the stop and the plate, when the camera is focussed on a distant object.
(6) Two unmounted prints are required from the negative.
(7) Claims to copyright must be waived in respect to the prints that are sent.

A careful inspection of the photograph will shew whether the conditions (1) and (2) have been adequately observed; they are essential for the purpose in view.

Photography of animals is best effected by the careful use of a hand camera, while they are unaware, it being extremely difficult to induce a skittish horse to stand in the right place and position and in a natural attitude, in front of a fixed camera.

The most convenient focus for a lens is 8 or 9 inches which at a distance of 30 feet will reduce to $1/44^{th}$ or $1/39^{th}$ of the natural size: consequently a measurement on the photograph that is correct to $1/100^{th}$ of an inch corresponds to a measurement on the animal that is correct to well within 1/2 inch, which is as near as is wanted. A lens of 7 inches focus reduces to between $1/50^{th}$ and $1/51^{st}$. One of 6 inches reduces to $1/59^{th}$; this is too small a scale to work by.

A suitable size of plate is 5 × 4; a quarter plate is too small.

The prints should be thoroughly washed, that they may be durable. They must not be mounted.

The following entries are to be written in pencil on the back of both prints. Name of animal: name and address of photographer: Date of photograph: Focal length of lens; The words "not copyright" must be added by the photographer, and be initialed by him.

Suggested outline of Proceedings
to be ~~read~~ in connection with the papers page 1 to 4.

It is intended that the cost of Registration be defrayed ultimately by a small registration fee, say of 1 shilling.

M? F. Galton would be happy to put a small sum at the disposal of the Council, for preliminary expenses, in the event of their being disposed to vigorously carry out his proposal.

The draft Schedule and accompanying explanations to be carefully discussed and emended; when approved, to be printed for circulation.

The circulation to be confined at first to a few of the leading breeders, in order to test the working, and to profit by suggestions.

Subsequently when all details shall have been revised and arranged satisfactorily, to circulate them widely, and keep others on sale, say two by post for 1^d.

The returns together with one of the photo prints, to be bound for reference, subject to reasonable conditions. The other print to be put aside and kept clean, that a negative may hereafter be made of it, which shall in all cases be reduced or enlarged as the case may be to the uniform scale of, say, 1/30th the size of the animal.

It is hoped that an arrangement may be come to with an accredited photographer, to make and store the negatives, and to supply rough prints from them to the public, at a reasonably remunerative price, doing all this at his own cost and risk.

A stud book of the Society shall have marks put in writing before the names of those Pedigree Animals, whose Schedules and photographs have been sent to the Society, and accepted by them as fulfilling their conditions.

Owners of Stallions in service, to be encouraged to issue photographs of the stallions, and of their sires & dams, as a legitimate form of advertisement.

Pearson
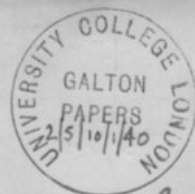
Correlations.

	Coat Colour. Horse		Man, Eye Colour
	observed	calculated	
Parents & Offspring	·52	·48	·49
Grandparents - —	·30	·32	·32
G. Grandparents - —	·19	·21	
G.G. Grandparents - —	·15	·14	

"Calculated" means best fitting geometrical series. The ratio is ·66 almost $\frac{2}{3}$ for the horse, It is $\frac{32}{49} = \frac{2}{3}\left(1 - \frac{1}{48}\right)$ nearly for man, so far as we yet have results. The g. grandparents can be worked out for eye colour.

Ampler records of Pedig: 5th
    Descriptive in Stud books .
Regulation Photographs   kept by Societies

I can undertake
    whole cost of starting it and proving its capabilities during one year
    also the scientific part

I want and ask for
    practical advice as to proceedure
    abundant opportunities for photographing horses & cattle
    a small advisory ctee who are really interested.

I have to get a fair (scientific) photographer
to send into country, — I am old & winter health bad.

Should send him gratis to & from station nearest
to farm, the owner to do the rest. Of course photos
to be given to owner, &c. sharp boy-help wanted.
No time shd be wasted on farm but all prepared
before hand, the cattle led out to a prearranged spot.

Lord Moretons bull & donkey
Trouble with thoroughbred horses —

Alnwick

Sir Walter Gilbey Nov 1/98

Alfred Duncombe
Shores.   Darbyshire

Animal painter
Palfrey.
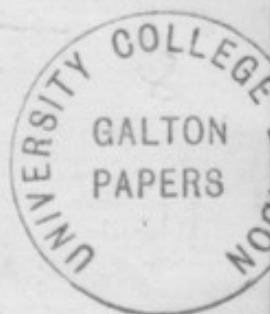
George Garard. RA. Extensive practice
Special grant & permission

Cattle —

The important sires are not the most
showy. They are not exhibited much the
their looks w⁴ not get them prizes Still they
beget the best progeny. Their owners w⁴ not
perhaps like tad ugly creatures (to be photo'd)
(the last phrase is mine not Sir W's)

To speak more exactly correctly, it is an imaginary horse that where place in the running lies between the 99th & the 100th, that ran the mile exactly in 2 min 27 sec; consequently in plotting the curve of running, we make our dot for 2 min 27 sec on the in the middle of the interspace between the 99th & the 100th ordinate, and similarly the dot for 2m 25 sec is placed half way between the 40th & the 41st ordinate

Nov 10/83

Rough trial of Measurements of Thoroughbreds at Show of N. Counties Agricult. Hall

long

45

Horses

Has set. I measured from
& documents

		My Set - Aliiall	Mounted for R.Con.	Unmounted for Prejudice
5	Curley	–	–	
9	Marioni	✓	✓	✓
10	Old Croix	✓	✓	✓
14	Pumpernickel	✓	✓	✓
25a	Button Park	✓		✓
29	Four porter	✓	✓	✓
31	Mountain Dew	✓	✓	✓
35	Ringoal	✓	✓	✓
39	Trap	✓	✓	✓
42	Belleville	✓	✓	✓
43	Chibiabos	✓	✓	✓
44	Dry Toast	✓	✓	✓
45	Grand National	✓	✓	✓
46	Just in Time	✓	✓	✓
51	Cyclops	✓	✓	✓
54	Hindley	✓	✓	✓
55	Imprévu	✓	✓	✓
62	Alvin	✓	✓	✓
71	Pantaloon	✓	✓	✓
73	Red Heat	✓	✓	✓
79	Wethernam	✓	✓	✓
82	Homely	✓	✓	✓
87	Radus	✓	✓	✓
91	The Tinman	✓	✓	✓
92	Carorte	✓	✓	✓
96	Oatlands	✓	✓	✓
97	Florismert	✓	✓	✓
99	Crème de la crème	✓	✓	✓
104	Wentworth	✓	✓	✓
	N of 5° of mounting	28		
3		✓		
4		✓		
10		✓		
11		✓		
12		✓		
24		✓		
25		✓		
36		✓		
38		✓		
48		✓		
57		✓		
84		✓		
90		✓		
98		✓		
		13		
	Grand total	41		

F.7

f. 8

altered at
31·4 − 23·3 PE = 2 : 25·3 round
= 6.1 sec   divided in halves.

1874–78   1878–82

in finals 4 years   3 sec
in 1 sec in $\frac{4?}{3}$ = 18 month

it now takes 2 year & semi 1 sec / sheet

in 1 sec in 24 month

in 4 years 2 sec

$3:2::0.8:x$
$x = \frac{5}{1.2}$
0.5

$\mathcal{B}: 2::1.3:x$
$x = \frac{3}{26}$
0.8

$3:2::2:x$
$x = \frac{4}{3}$
$= 1.3$

The feeblest averages at least all these

	hundred knots 2m+sec per year	actual 2m+sec per year	hypothetical 2m+sec per year	length per yr 2+sec per year
1874	25.1	23.4	20.5	18.8
5	24.1	22.5	19.9	18.2
6	23.5	21.6	19.5	17.7
7	22.9	21.0	19.0	17.4
8	22.1	20.2	18.5	17.0
9	21.3	19.6	18.0	16.6
1880	20.8	19.3	17.6	16.0
1	20.4	18.8	17.2	15.7
2	19.9	18.4	17.0	15.4
anticipate 1890	16.8	15.5	16.4	13.4
1900				13.4

After making the entries, please return this Form by post, addressed to *Francis Galton, 42 Rutland Gate, London, England.*

PEDIGREE RECORDS.

Form for use only when <u>the performances of the horse itself, of its two parents, and of its four grand parents are all known.</u>

	Name.	Number in Register.	Color	Year when foaled	Record	Trotter or Pacer?	Year when the Record was made.	Where the Record was published
Subject. 1 Source of the Pedigree (Stallion, Gelding, or Mare?)	Brava	Vol 9. p.33b	Bay	1885	2.14½	Trotter	1892	Year Book Vol 8. p.24.
Parents. 2 Sire	Baron Wilkes	4758	Brown	1882	2.18	Trotter	1888	Year Book
3 Dam	Mary A. Whitney	Vol 4.	Bay	1867	2.28	Trotter	1874	Year Book
Grand Parents. 4 Sire of the Sire	George Wilkes	№ 519	Brown	1856	2.22	Trotter	1868	Year Book
5 Dam of the Sire	Belle Patchen		Bay	1874	2.30¾	Trotter	(Wagon) 1861 1862	Chester's Record Vol 1.
6 Sire of the Dam	Volunteer	55	Bay	(Wagon 1854 2.37	2.31¼ (Saddle) 2.36¾ wagon	Trotter "		Wallace Monthly Vol 2. Year Book Vol 8. p.147.
7 Dam of the Dam	Peggy Slender	Vol 2.p.269	Bay	1850	⊕2.56	Trotter	1859	Wallace Register Vol 2
Great Grand Parents. 8 Sire of 4	Hambletonian	10	Bay	1849	trial 2.48	Trotter	1852	Wallace Monthly
9 Dam of 4	Dolly Spanker	—	—	—	—	—	—	—
10 Sire of 5	Mambrino Patchen	58	Black	1852		Trotter		
11 Dam of 5	Sally Chorister		Brown	186-				
12 Sire of 6	Hambletonian	10	Bay	Sire of 4 as above				
13 Dam of 6	Lady Patriot		Bay	1850		Fast Trotter & runner		
14 Sire of 7	Unknown							
15 Dam of 7	Unknown							

Signature and full address of the sender } Wm. Russell Allen
Allen Farm
Pittsfield Mass. U.S.A.

⊕ Wm at Buxton Ohio 7½ heat in a race. & who second time trotted is given by John W. Conley as 2.35. He say 2.55 in Wallace Register is a typographical error for 2.35; & that he furnished Mr. Wallace this information Para published.

F. 11

f. 13

f. 13

Pedigree of **Duchess of Sarsden**   Breed ____

No. ____

			Gladys Boy 49643	Gladys Prince 47873 — Prince of Brailes 42193 / Gladys
		Gladys Hero 52440		Lady Rosy — Lord Rosy 34661 / Frank Stout
			Grateful	Duke Wild Eyes 2. 43155 — Duke of Gloster 5. 36494 / Lady Worcester 14.
	Gladys Hero 4 59013			Lady Grace Darlington — Grand Duke of Darlington 2. 41647 / Gaiety
			Grand Duke of Darlington 2 41647	Grand Duke 22. 34062 — Duke of Clarence 3. 25727 / Grand Duchess 23
		Lady Grace Darlington		Deerdale — Duke of Nottingham 2. 23730 / Darlington 15
Prince of Rose SIRE 66076			Gaiety	Prince Imre 32130 — General Napier 24023 / Blanche Flower
				Greyfinch — Archduke 23318 / Goldfinch
			Gladys Boy 49643	Gladys Prince 44873 — Prince of Brailes 42193 / Gladys
		Gladys Hero 52440		Lady Rosy — Lord Rosy 34661 / Frank Stout
			Grateful	Duke Wild Eyes 2. 43155 — Duke of Gloster 5. 36494 / Lady Worcester 14
	Gladys Rose			Lady Grace Darlington — Grand Duke of Darlington 2. 41647 / Gaiety
			Duke Wild Eyes 2 43155	Duke of Gloster 5. 36494 — Duke of Geneva 4. 28341 / Duchess of Airdrie 14
		Wild Rose		Lady Worcester 14 — Duke of Geneva 6. 30454 / Lady Worcester 2.
			Moss Rose	Grand Duke of Darlington 2. 41647 — Grand Duke 22. 34062 / Deerdale
				Mary Rose — Lord Chancellor 20160 / May Flower
			Duke of York 9 51139	Duke of Nuthurst 28401 — Duke of Thorndale 14. 28454 / Duchess 47
		Duke of York 9 51139		Duchess 108 — Duke of York 8. 23480 / Duchess 101.
			Duchess of Underley 3	Grand Duke 31. 38374 — Grand Duke of Waterloo 34077 / Grand Duchess 17
	Earl of Oxford 5 55871			Duchess of Nuthurst 5 — Duke of Nuthurst 2. 39748 / Airdrie Duchess
			Duke of Nottingham 2 23730	Duke of Wharfdale 5. 21619 — Duke of Wharfdale 2. 19649 / Duchess 86
		Matchless of Oxford 3		Duchess 84 — Arch Duke 14099 / Duchess 72
			Maid of Oxford 8	Duke of Geneva 2. 25752 — Imperial Oxford 24185 / Duchess of Geneva 3.
Duchess of York 14 DAM				Maid of Oxford 2 — Grand Duke of Oxford 16184 / Oxford 20
			Duke of Wetherby 5 31033	Duke of Wharfdale 3. 21614 — Duke of Wharfdale 2. 19649 / Duchess 86
		Baron Oxford 9 42758		Duchess 92 — Duke of Oxford 4. 11387 / Duchess 84
			Baroness Oxford	Duke of Clara 2. 21576 — Duke of Oxford 4. 11387 / Duchess 74
	Duchess of York 4			Lady Oxford 5 — Duke of Thorndale 3. 17749 / Lady Oxford 4.
			Duke of Underley 33745	Duke of Underley — Duke of Oneida 33702 / Duchess of Geneva 10
		Duchess of Underley Baron Oxford 78 41057		Baroness Oxford 4 — Duke of Nuthurst 3. 30975 / Baroness Oxford
			Grand Duke 31 38374	Grand Duke of Waterloo 34077 — Grand Duchess 17
		Duchess of Underley 3		Duchess of Nuthurst 5 — Duke of Nuthurst 2. 39748 / Airdrie Duchess.

Breeder ____

Owner ____   When Born ____

Chief Performances ____

Lord Mulgrave[?]

Pedigree of

Duchess of Sweden