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 I showed him the saw cuts & drill holes left in working the coffer, & the bosses dressed out of K.C. wall. We also examined the pinholes for coffer lid to see if there was anything left in them, like the bitumen in  $\Delta^2$ . We found a lot of hard brown matter, which I do not think bituminous, which will not melt. I bring a piece home for examination by some organic chemist.

Saturday 19 March  
 By 4 a.m. we left the  $\Delta$  & came down to tomb for a meal, &c. & then by daylight went off to see the  $\Delta^3$  casing & bosses on granite; also to the tomb with canon lines ruled over the figures, & then I saw him off home. Put things to rights, & to bed. Slept from 8 to 4, & then up writing letters.

Sunday 20 March In my afternoon walk I saw the heaps - or rather banking - of chips of an enormous extent S of  $\Delta^2$ , & also the masonry of the wall on that side, which looks as if only of heaped stones, but is really built, & Ali says, faced with fine limestone, which Arabs have dug in one place to take out.

Monday 21 March Had to go & look for Ali, whom I found just coming up with a traveller from the Sphinx. He carried my boxes out to  $\Delta^3$  & then left me to the care of Abu Saud, who though intelligent, more attentive than his father, cannot understand a word of English, which is awkward for an attendant in surveying. However I took azimuths from two stations.

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Tuesday 22 March

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Wednesday 23 March Measuring North one of the small  $\Delta$ s.

Took azimuths of station in front of  $\Delta^1$ , with 10 inch as alt-azimuth to see air channel mouth. Found that form so very awkward, as the telescope & alt-circle, continually come in the way of the azimuth micro, that I decided it to be impracticable for night work on Polaris; so took up 4 inch at sunset to try it: but the night came on cloudy & I could not do anything. . Much fuller

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[The previous two paragraphs of this page are crossed out diagonally, probably by Petrie's mother who also added the note 'Much fuller in next journal'-.]

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Cairo, XIV-



Tuesday 22 March

Too hot to do anything in surveying in morn; as I was not early. So took measures from such station marks of azimuth trenches as could be done without digging; then got candle & went into small  $\Delta^5$ . The passage is nearly blocked by Arabs throwing in large stones; & since Howard Vyse they ripped out most of the casing of the chamber, & left all one end & floor covered with pieces completely hiding the sarcophagus. I measured it all as well as I could. Then out & to tomb by 3, started off to do azimuths from station behind  $\Delta^2$ ; got through it tolerably; & then moved over to one of the tombs to take Polaris observation. Went home & got lamps, & set them up; but owing to several delays I could not get back till too late for greatest elongation; & then one <sup>signal</sup> burnt out quickly, & the lantern was continually blowing out, as I had supposed that the chimney would sufficiently protect it, & left two side glasses out. So I was obliged to pack up, & return with nothing but experience for tomorrow. After supper reducing obs<sup>ns</sup>, & looking through book to see what points have not been sufficiently observed on, so as to see what more is wanted. To bed abt 12, alas! - Ali was rather better to day, but left me pretty considerably to Abu Saud's care.

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In morn went into  $\Delta^4$ . It is a squeeze to get in, the passage being nearly blocked with stones. I measured all the inside, but the chamber is in as bad a state, or worse, than that of  $\Delta^5$ ; the lining all torn out & piled up anyhow & covering the floor at all angles [⊠]. I could not see anything either of floor or sarcophagus; the lining has been beautifully finished, & the insertion

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of blocks in faulty parts of rock in the outer chamber is finely done. In both these small  $\Delta$ s, there is a curious corner in the outer chamber to turn the sarcophagus in <sup>trunk chamber</sup> & in this  $\Delta$  there is a big hole in floor 7.3 diam<sup>r</sup> & a groove in wall behind it evidently for some machinery for lowering sarcoph. into lower chamber, down the sloping passage between the chambers. Probably a stout post of wood, with a few turns of rope round it, such as a sailor would use now.

I then came out, & after various preparations went off to station opposite  $\Delta$  entrance to take azimuths <sup>up to air channel</sup> with big theod. arranged as alt-azim, as it will not go over  $14^\circ$  alt in the ordinary use. Found it, as I had before, so very awkward to use, owing to the circle & telescope coming in the way of the lower circle micro<sup>s</sup> that I decided it to be impracticable for night work, & so must fall back on 4 or 5 inch theod. The radical fault is in having the circle to turn instead of the <sup>vernier</sup> micro<sup>s</sup> arms; these should be fixed to the cone of upper altitude circle so as to read easily, & then there would be no difficulty, the circle being fixed to the <sup>arm</sup> three-legged stand. It would not be a very bad job to alter the instrument. Then left off by 5, so as to have good time to arrange for Polaris observations. Went back to tomb, got the 4 inch theod. & lantern; put the latter up behind the signals, took theod. up to big tomb behind  $\Delta$  & set it up by twilight; a bank of clouds had been gathering & now it spread over the N. sky so much that by dusk it was impossible to see anything but Venus, & I found it hopeless again to do this. I tried working on the signals, & they did very well; but one of them blew out, though the

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wind was not very much; it was the lantern without chimney. I had some thought of using a circumpolar star far enough from pole to be seen within  $14^\circ$  alt, so as to use 10 inch arch;  $\beta^2$  Cephei is the only one for this, at NPD  $20^\circ$ ; this therefore moves <sup>great circle</sup> 5" in 1 sec; & in absence of any second observer to note time, & to illuminate telescope judiciously, I could hardly reckon on going nearer than 2 sec = 10", which I could do with 4 inch theod by careful work on polaris; hence it is not worth while.

Then back to tomb, had supper, reduced observations which are not satisfactory; must go over it with 4 inch & find what is wrong in air channel measures. In any case if I only use 4 inch, good to 10" say, this will fix channel mouths to  $\frac{1}{2}$  inch, which on 5000 ins or so of slope, will give angle  $\frac{1}{2}$  of slope of casing to  $20''$  about.

Thursday 24 March A windy sandy day. Just as I finished breakfast Ali walked in with Mr Mackenzie's wallet, & Mr M. soon followed. I don't remember if I said that I had a letter from him before he went up Nile, saying that he should come here today, & asking me to meet him if I could; so I was looking out for him. After a little talk I proposed to go & see the inside of  $2^{\text{nd}}$  &  $3^{\text{rd}}$   $\Delta$ s, as he had seen other things here, & wanted to see  $3^{\text{rd}}$   $\Delta$ . On our way he said he knew Brasil & Rio, & then I found that he knew the Bevest's well, & in fact had received some of his ideas on the Pyramid, &c, apparently from Mrs B. I must have delighted to find that we had an older mutual friend than Dr G., & took him up more heartily than before. We went all over inside of  $\Delta^2$ ; then to  $\Delta^3$  crawled in & saw that. The great granite room in that is very impressive; it is as beautifully


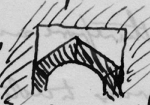
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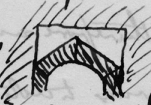
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wrought though not so large, as the King's chamber; & the cut out curve roof is striking ; a forced hollow shews that the granite slope roof is inserted in a rock chamber with a flat roof over it, thus ; this Kings hollow forced open in later times being in fact the only way to introduce the roof beams into a rockcut chamber on the top of the walls. The upper sides of the beams have exactly the same grooves across them as the big beams of the King's Chamber; & quite agree to the idea of their being bored holes to regulate the cleavage. Having seen this we went out to 2<sup>nd</sup> Δ temple, down to Sphinx, & then back to tomb. M<sup>r</sup> M's neuralgia in head & eye was troublesome. After a miscellaneous meal, I went outside & found that two men had brought the part of a statue with inscriptions, found at Abusir, for me to see on chance of purchase. I might take it for B.M., but it is nearly ½ cwt; finely cut however in hard limestone with green veins like serpentine; it is just the knees & hands of a figure kneeling, holding a shrine of Phthah. Then M<sup>r</sup> M. looked over his stock & took £2 worth of things; I rather dissuaded him from having such a lot of scarabei as they were not interesting types, but he stuck to them. He also was glad to have two of a lot of bronzes I took the other day. Then after some talk & packaging up he went up to his carriage & drove off. He asked to have M<sup>r</sup> B's address, which I gave him, & our own also: he is going to Palestine now, & then Italy, & does not expect to be in England for three months or so. Then I went home, had supper, & looked over Mariette's little book on Egypt, which M<sup>r</sup> M. kindly gave me; then copying inscriptions for D<sup>r</sup> Wiedemann, wrote this, & to bed about 10½.

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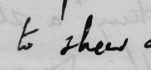
Cairo,  
XV.



Friday 25 March

As all the survey that I can do alone (for accurate levelling with long staff I feel hopeless with Ali only) is now done except a few brief bits, & what may be necessary after excavation; & as excavation I am postponing until visitors have disappeared for the season, & in hopes of the new rules being brought out in time for it, so as to get official leave, > I now begin to think of doing Sakkara <&c> before it is too hot to move. So determined on going to S. on Monday for a few days with Ali, taking a stock of food, stove & blankets on a donkey, & walking down the valley the 10 miles or so, which is not more than going into Cairo. So I ~~decide~~ settled to go to Cairo today, to tell Dr G. & Messrs Loftie & Wiedemann, so that no one should come out expecting to find me here. Ali has not got another donkey yet, so I walked in; ~~had~~ got fortnights letters at Post; for which many thanks both to home & to Miss Marston. Then had dinner, & while at it saw Dr Wied<sup>m</sup> pass, as the only way out of his Hotel is past my restaurant; so I bolted out, & gave him the inscrip<sup>ns</sup>, & told him that I should be away next week. Then had hair cut (not done since new year's day, quite often enough, as they charge 2 francs!), & to Dr Grants; had a talk on various matters. It seems that the Photographer will not ~~do it~~ come here to take 5 or 6 views & give only 2 copies of each under £10; & I do not consider the results would be worth it. It is not worth reducing the cost a trifle by only taking a single view; & or in other words, he asks too much for one view, & i.e. for

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coming at all; as extra plates would not be any matter of  
 difference between us I expect. I should say that 3 views of  
 casing are requisite, if any: (1) one general from above <sup>on rubbish heap</sup>  
 with several courses <sup>& strip of pavement</sup> (a front distant view is no good, as  
 the pavement ~~must~~ must be all cleared to make it effective)  
 (2) a close view in front with sun shining obliquely down  
 the stone to shew its surface (3) a side view exactly in line  
 of corner  to shew angle. Then (4) the rock cutting  
 for edge of pavement near NW corner, (5) NW socket,  
 not cleared in C.P.S. photo. So I said that if the man  
 came out to do a party here, as is not very uncommon, I would  
 give him £1 a plate or so for what I wanted, taking the  
 negatives; & Dr G. approved, & said that he would mention  
 it to him. Of course the (4) & (5) are our own affair, &  
 are worth having I think as being the only extra subjects  
 beyond what C.P.S. did here, except the casing. I hope Mr.  
 Hall will not be very much disappointed at my determination,  
 but as I have every datum recorded about the stones, & shall  
 bring exactly similar fragments of other low casing stones, shewing  
 the texture, it is purely a matter of taste & feeling, & on  
 which grounds my own aesthetics would not carry me  
 beyond £2 or so for them; i.e. I cannot reconcile it as  
 "worth while" to my economical soul: or in other words  
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for Abu Saïd, but none were at the American Mission, where  
 D<sup>r</sup> Grant recommended me to go. Then drew £10, which will  
 keep me afloat for about 5 or 6 weeks; in which time I hope  
 to do a good deal more worth having than half a dozen photos.  
 Then walked down to bridge took donkey expressly to the Pyramids  
 for 2 francs; got some oranges; had not gone far before the  
 urchin who drove wanted to transdonkey (I cannot say trans-  
 ship) me to the much worse beast of a man riding this way.  
 Of course I refused; then he got the man along side to pester  
 for bakhshish; but finding nothing forthcoming, he dropped  
 that game at last. Then reaching a group of carriages  
 waiting for sportsmen near a village, he stopped the  
 donkey just beyond & said it was wanted there; my only  
 reply was to stick my seat still him to go on. Then he  
 began to get up a sobbing & recount his woes in being  
 taken out so far, to some men in the fields; but I know  
 Arab boys can be lachrymose on occasions; so I only  
 kneed the donkey ahead. At last genuine tears came  
 at seeing the sun fairly down, & he hailed two countrymen  
 driving their oxen home, & called them in as arbitrators;  
 as he was demanding 4 francs now, & I expected a better  
 when I did dismiss him, I appealed to one of the men who  
 was a sensible looking fellah. He said 4 francs was not  
 wrong, as it was going on beyond sunset; but as I said

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4  
 210  
 that the boy had agreed for two fr. at the bridge, which he did not deny, the man altered his opinion. So being within a mile of home I offered to settle with 7 piastres, instead of 8, which the umpire agreed was good. So left the unforeseeing brat to finish his cry, as he rode back in the dusk; & shouldered my bags up home. I put this down as a sample of the thoughtlessness of (for the least consideration would shew that it must be dusk by reaching here) - & the wearisomeness of having to do with the common natives. Then had supper, read Pub Ops, wrote this, & to bed about 12, after a debauch of a whole fortnights news.

Saturday 26 March Out before breakfast to take azimuths from a station before it was too hot. I had gone there before, but these were necessitated owing to the points not being convenient to do from other stations which I had intended. I have thus fixed the S. air channel, & the tip of the arris of each corner of the casing of  $\Delta^2$ ; these will give a cross defining its centre, bearing, & apex, & also shew by prolongation where they the arris would come on socket floors. Then back just before noon. It was a lovely day to observe, a cool but slight N. wind keeping the cloudless sun from heating things up too much. Then had breakfast, & reduced obs<sup>ns</sup>. Then at 2 out & collected various signals left astray lately. None lost except the stolen one. Then took out 5 inch theod to check big theod & find circle obs<sup>ns</sup> on N air channel, & to practise with it before trying Polaris again. Finished about 5  $\frac{1}{2}$ , then to tomb, fetched lanterns, put them up & took up theod to big tomb W of  $\Delta$ . I selected, this

4  
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station for Polaris obs as it is one corner of the big  $\nabla$  around  $\Delta^1$ ; & hence is most closely connected with it, beside having its azimuths most accurately determined in connection with others (prob errors  $\pm .45$  &  $\pm .25$ ). Took a set of 7 obs partly before & after greatest elongation; beside this took two on Canopus for time, & 11 on triangle sides: dividing these <sup>some</sup> with circle right & <sup>some</sup> circle left. I have adopted reversal for cradle telescopes, as if for transit theods; lifting telescope out, & replacing upside down, then turn  $180^\circ$ , & it is done; <sup>thus</sup> reversing collimation <sup>transiting head over heels</sup> ~~theod~~ <sup>but not cradle error</sup>. transit errors as in a transiting theod: the only disadvantage. But I find that I corrected all these errors so closely by scraping, that the whole is only  $13''$  at  $30^\circ$  alt. being a risk of shaking theod. It was extremely awkward sitting on the stone, without the touching theod in the dash, & keeping one hand engaged with the tangent screw, while the other held the lantern at <sup>full</sup> arms length to illuminate the field of view by the object glass, which was very fatiguing to the arm. However the results are finer than I could have expected; average error on a signal  $8''$ , average error on Polaris  $3''$ , from verniers only reading to  $1'$  & very coarsely divided. The probable errors of the results are, on signals  $\pm 4''$  &  $\pm 5''$ , & on Polaris  $\pm 1''$ . I wish I had taken more signal obs now, but I did not imagine the Polaris obs would come out so well. The time by Canopus agrees within 5 secs of the time by Cairo apparent noon gun, which is probably less than my watch rate error <sup>the interval</sup>. Altogether we have the azimuth of the whole triangulation now certain to  $5''$ . Then home by  $8\frac{1}{2}$  or so, had supper, & reduced obs till I was astounded to find it 2 a.m.. Then wrote this & to bed. Ali has been good again today, & seems improved by the prospect of Sakkara, which I did not at all expect.

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Sunday 27 March

<sup>212</sup>  
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Cairo XXI  
 1st half

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Monday 28 March

Got up at 5 ½, had a scrap of rice & coffee, & then packed donkey, & off with Ali & Abu Saûd driving, at 6 ¾. Had a look at Gill's base which he measured for the Gov<sup>t</sup> Survey, the Arabs have torn out the terminal I saw, & taken up or broken most of the intermediate stones, & D<sup>r</sup> Grant told me that it has never been used. Then looked at a site of Roman village, full of pot. Then saw the fossil shell hill; but did not carry anything from these sites at present. Then walked on to Abusir Pyramids. Saw there a site of brick buildings, being dug for earth; they had turned up fragments of early tombs, which had been used by brick builders; two good pieces of figure sculpture, some among them carrying standards; I copied the hieroglyphics; & also off another bit I saw, <many flint hammers &c as at Gizeh.> Then on & looked at the Sakkara tomb of Ti; the outer court of it, inside being locked up. Then on to Mariette's house, a groundfloor building, with large covered terrace on N side. The caretaker or reis said I could not have a room, or even sleep on the terrace though Baedeker<sup>sic</sup> {Baedeker} mentions both. So I put my things pro-tem in the corner of the terrace, put some water in my kettle, boiled up, (as it is filthy muddy here) & had some chocolate, cold rice, & biscuit. Then about noon went off leaving Ali with the things, & looked where M<sup>r</sup> Loftie told me for the newly opened Pyramids but could not find any opened there: there must have been some mistake between Brugsch & him, then went down the hill edge, & into sundry tombs, some of which I measured: others were so rough, fallen in, built up with mud walls to support the roof, full of dust, & broken that I left them. I had a nap in one, for the long walk

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 he said he had had orders not to let people use even terrace,  
 but from the sequel I doubt it. After much talk, in which  
 the reis impressed on us with the most appalling gestures  
 the dangers of sleeping not locked up safe, & insisted that  
 we ought to go down to the village & (probably to some  
 friend of his who would charge handsomely) Ali & I agreed  
 to take the tomb <sup>near</sup>; so we carried the things in; but the  
 reis proposed to be shocked (all this is fudge, as Baedeker  
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

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

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 as I did not expect to want much; & went off light, without  
 coat, & only 3 of the thin measures, a bit of candle in pocket,  
 & a few matches in mem. book. Went two miles over  
 the desert to the big pyramid of Dahshûr. This is the  
 largest next to the two of Gizeh, & is better work than  
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 like Grand Gallery; then having measured this, I went  
 into the next <sup>chamber</sup>; here, while measuring, I heard the stones  
 knocking about at one end, & as I was unaware of the  
 number & nature of the beasts, & had nothing but thin  
 measuring rods, & was one within two miles, I beat a  
 retreat, without investigating the cause; it is probably  
<sup>but might be hyaena, or run away slave,</sup>  
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& I climbed up the foot holes broken in casing to it to examine it carefully. The casing is broken out below it & one goes up on one side.  The doorway has two large holes as if for pivots of a swing door, one on each side near top. But the sides have run outside without any alteration; the floor has been torn up apparently, & the roof is cut away somewhat thus . Beside this the roof has been cut horizontally & a small pivot hole in it, farther in, thus. Altogether I think there was a flap door of stone with metal pivots which filled up flush outside when at rest, & was lifted outward to go in; then inside that a ~~wood~~ door of wood on vertical pivot. Went down passage, two owls flying away in front of me from their nest just by the door, but found the passage was blocked close to bottom; it is all encumbered <sup>in lower part</sup>, about half full from floor up, & half full from W side, so that one has to go feet foremost <sup>(in 1/4 of the section of it)</sup> wriggling over the big stones & sand which fill it, not seeing ahead except in clear places. & One of the owls would not wait at the end but came flying up, so I lay flat, & held my candle low, & he flew over just clear of me & as I lay; the other was more timid & she tried to squeeze in under a stone when I came near the end; seeing it filled I crawled up again. ~~I was glad to~~ The other, Great Δ, which I went into was similarly

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
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<sup>12</sup> <sup>(218)</sup> encumbered, which made it the more awkward to manage with my beast one might find, & it was a slow matter to move at all. I was glad to do these, inside work, from 1 to 2/4 about, though the walk to them was stewing at noon in the desert. I had reckoned on finding similar work nearer, not knowing Brugsch & Marriettes passion for exclusiveness; but finding all blocked I had to go on, or do nothing. The passage of the  has been filled in ancient times, not with mere debris, as none has been broken around the mouth, nor with blown sand, but purposefully (by builders?) with fragments of limestone desert flints & sand, which must have been carried up & tipped in on purpose. I copied two hieroglyphic scribbles on the passage sides & one or two later. Then went back to Ali, not expecting that there would be anything that I could see or examine in the two ruined mud pyramids, though I should have liked to see them closer. On getting back we went down past an ancient village which I examined, to some wells & got water, & some tomatoes, which were refreshing. I rather astonished the man when I did get the ~~crook~~ crock to my lips, as I pulled away at a quart or so at one sip. Then up, & looked at another  which Brugsch opened, & closed again immediately, looked at another

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site of village; & then to a fourth  $\Delta$  lately opened, the passage of which has been blocked again, but the chamber has been broken into from the top, & I hope to examine it more tomorrow. Then back to Mariettes house in dusk, had supper, wrote this & to bed about 10: sleeping in an inner room on a table. The men have been at my things, the jam scraped out with a knife, & the chocolate licked out?.

Wednesday 30 March

Off after breakfast to the pyramid

I saw last night <No 5 Vyse>, taking the rope ladder to get down & measure it.

To my surprise I saw now that it has a mass of hieroglyphics in it, being in fact one of the two inscribed  $\Delta$ s opened by Brugsch. It has two chambers, one of which he has blocked up again, but the other being opened at top he could not fill up. The roofs of both were 2 blocks deep of enormous Mokattam blocks put slope  $\triangle$ . It had been forced open & the blocks broken & partly torn out in early times, & all the sides of the chamber torn out & smashed also; but the ends untouched strangely, though the sarcoph. close to one end had been split up by wedge holes, & lifted on to reused blocks to burn a fire under it to smash it. Strange to say it does not belong to Pepi <[ $\text{Pepi}$ ]> who is the only king in the inscrip, but to Rameri <[ $\text{Rameri}$ ]> whom I found on some stones built into a rude wall leading to entrance. One end of the chamber is still almost hidden by blocks & chips of the smashed up sides, but a scrap exposed is also covered with inscrip. The inscrip are all beautifully sharply cut

site of village; & then to a fourth  $\Delta$  lately opened, the passage of which has been blocked again, but the chamber has been broken into from the top, & I hope to examine it more tomorrow. Then back to Mariettes house in dusk, had supper, wrote this & to bed about 10: sleeping in an inner room on a table. The men have been at my things, the jam scraped out with a knife, & the chocolate licked out?.


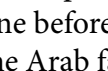
Wednesday 30 March Off after breakfast to the pyramid



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<sup>140</sup>  
 in the white limestone & colored bright green, all the feathers  
 & details of birds &c are drawn in the intaglio in the larger  
 hieroglyph. Seeing how it was I set to work & copied, with only  
 a brief stop to measure what I could, from 11 till 6; doing  
 most of what is visible, about 5000 figures; it would  
 take 4 or 5 hours more to finish what is visible, & a mass  
 more is still inaccessible. I do not care to do any more,  
 as it will doubtless be all done at last by Brugsch, &c; &  
 all I wanted was a good lot to shew the character of it, &  
 for Birch & Dr. W. to work on. Ali was in a fidget for fear  
 some of the people should come & see me copying, for it  
 is well known that Brugsch wishes to keep it all to himself; but  
 he has behaved so shabbily in covering up everything, inscribed  
 or not, that I rather relish doing him in a small way.  
 This it seems is not the greatest find, for in one pyramid  
 close to this <sup>6 or 8 Vyse</sup> he found two inscribed chambers of alabaster, &  
 sarcophagus. Altogether it is a grand turn up of inscriptions.  
 Then I left it when too dark to see anything more, & back  
 to Mariettes house, had supper, wrote this, & to bed abt 9 1/2

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 to Mariettes house, had supper, wrote this & to bed abt 9 1/2

Thursday 31<sup>st</sup> March

Up about 8 after a rather restless night on my table, which was rather too hard for comfort; three nights of it is enough. Went off, after just a drink of water, to copy inscrip<sup>s</sup> &c; had another look at step pyramid, & see not only one finished casing 8 ft inside present face, but another finished case, at a rather greater angle, 10 ½ ft inside the 1<sup>st</sup>. This is all important, for (1) it shews that the  $\Delta$  was not covered over with one surface of casing; like others, which are also in steps, but filled in with smaller stone in angles, thus ; & (2) that it was reckoned as finished (& not merely in progress, with successive coats put on, as Lepsius' theory is) at two dates before it was actually brought up to present state. It must have been cased in steps like the present . Then down to tombs, copied all the continuous passages in one tomb, which has evidently never been done before, as it is all plastered over with mud, just as left by some Arab family. A great deal more might be copied by cleaning & washing. It is clearly of late date by the style <sup>but very beautifully executed, like cameo cutting.</sup>. Then to another, also late, & copied all the distinct passages of that. Then up to house again to go to Apis tombs & Ti tomb when open for other visitors; found two Englishmen just leaving Apis for Ti, so hooked on to them, & they seemed glad of such explanations as I could give, for though I had never seen it before, one gets eyes for such things, & takes in with practise the meaning of a group more readily than at first. Then went off to Apis tombs; found door ajar, so went in; they are huge galleries cut in the rock <of> which my

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16 one candle scarcely shewed both sides, which at intervals they (222)  
 branch, or have great recesses or chambers, in which the enormous  
 black granite sarcophagi of the bulls ~~are~~ placed, about 13 ft long,  
 7 wide & 11 high in one piece of granite, with lids to match. The  
 inside of one <sup>coffin</sup> is in fact a respectable little room. After seeing  
 part of it Ali came in, & I looked at some more; but it is not a  
 favourable place to measure for many reasons, & I wanted to get  
 back this afternoon. So I left, back to house, had breakfast  
 about 12; then packed up, & Ali hunted for a donkey but could  
 not get one, so sent Abu Sa'ud, who had chanced to come over  
 (bringing his pater a stock of eggs & some mutton, a bunch of which  
 Ali endeavoured to favour me with) down to Abusir with one  
 of the men to look for one; meanwhile, not to lose time, I went off,  
 leaving Ali to settle with the reis, as I hate the perpetual  
 squabbles over every piastre, which are necessary here unless  
 one showers silver, & gold too, enough to fill all mouths. I  
 measured the outer part of the tomb of Ti, & then on to rock  
 tombs over Abusir, meeting Abu S. who said that there was no  
 donkey to be had, so I told him I should go on & things might  
 follow tomorrow. I found some curious little tablets of inscriptions  
 in the tombs, but nothing much to measure as they are all much  
 broken & scaled off & rough inside without much detail, mostly long  
 passages cut in rock with <sup>irregular</sup> tomb st wells along the floor. Ali had  
 passed, & when I left he waited, & I picked him up. The reis was  
 squabblesome on receiving 10/- for 3 days, <sup>besides 2 fr for the man</sup> & brought up all  
 the men he had chosen to send up there to sleep, asking which of  
 them all was to have the money, a favourite figure of action  
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of Abusir near which some Arabs were at work with camels; there getting a camel coming this way the things were thus taken on to about halfway; Ali branched off to see about them, & all I know is that they have come in by detachments from  $7\frac{1}{2}$  to  $8\frac{3}{4}$  & Ali himself has not appeared at all; how it all ended I know not yet. The said things were 'a tin can of surplus food & ancient pot, <sup>2</sup> roll of blankets, <sup>3</sup> sack with rope ladder &c &c, & <sup>4</sup> hand bag with pottery &c, & <sup>5</sup> measuring rod; beside Ali's bundle of Arab bread in an indescribable hank of dirty cotton cloth. It is a trial to one's stomach to have a supply of bread brought, each pat with the sign & counter sign of M<sup>rs</sup> Ali's two hands, & all bundled up in a cloth in which untold generations of fleas appear to have resided; the sm Arab odour of the cloth is not of so much consequence, & the bread itself smells similarly to begin with.

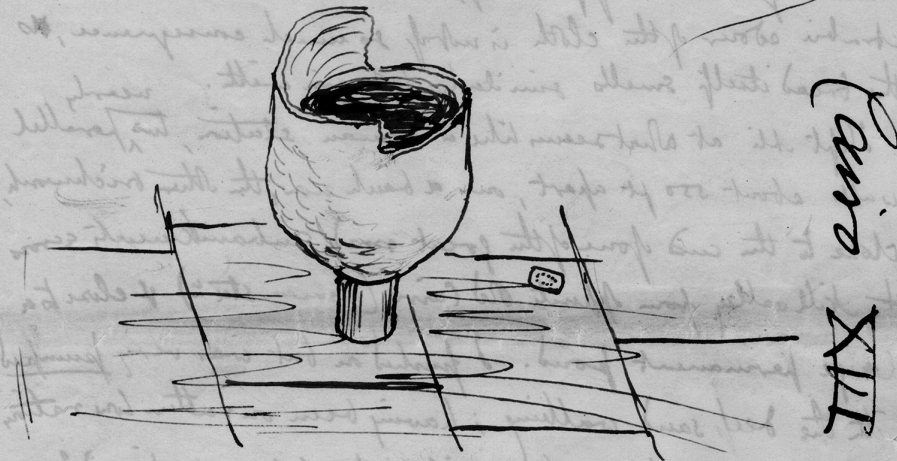
I left Ali at what seems like a Roman station, two <sup>nearly</sup> parallel walls about 550 ft apart, one a bank now, the other brickwork, close to the end of one of the great road embankments across the Nile valley from opposite old Cairo (Roman sta<sup>n</sup>) & close to a large permanent pond. I pushed on but was very pumped with the deep sand walking; having been on rather low rations lately while at Sakkara (4 biscuits & chocolate &c per diem) I was gaspy & oppressed with it, being very thirsty as well. I went up to two sundry shadoofs, but the water was all too thick of black mud to be bearable, so I had some very bitter tomatoes from the remains of a patch left wild, & got into home at  $6\frac{1}{4}$ , done up. After some water & oranges I lay down, glad

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18 To get something soft again, for my sacking is a most comfortable bed: when the installments of goods came in I had some supper. Then wrote this & to bed about 10  $\frac{1}{2}$ , having ordered donkey tomorrow for 8  $\frac{1}{2}$  for Cairo, as I want an easy day.

I got a wash this morn in the bottom of an ancient jar I think, which was brought in, & propped up in a corner with a scrap of sculpture; as it was useless there I set it on an empty tin pot, but evolutions of ablutions required care in such (or over such) a thing as this



Two beautiful pieces of very early tomb sculpture, which had been used by brickbuilders at Abusir, & which I saw turned up on Monday, I looked after to day; & found the wretched Arabs had pounded a hole through the middle of each to make it serve for a shadoof counterpoise. They would have graced any museum

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[☞]

## Cairo XVI

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I forgot to say that there is a piece of the filling up of the passage to Queens Chamber still in situ stuck to grand gallery floor. (225)

Also the two upper granite plugs in ascending passage, do not rest on lower one (or ones) but there is about 4 inches between them. The ends of the blocks were not all flat, or worked very true where flattened; about  $\frac{1}{2}$  surface of one is left original boulder shape.

Many thanks for the long & explicit reply to mine to P. If this heat is going to continue right on, I should pack up soon; but I expect it will go over in a day or two, & be about 70° or 80°, quite comfortable. One cannot do much in active work with air over bloodheat, let alone the risk of sun stroke if one does go into sunshine.

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The contraction of some dry boards here (dry in England)  
is .1 in 30.

Please send enclosed 9 sheets to D<sup>r</sup> Birch.

Cairo XVII-

The contraction of some dry boards here (dry in England)  
is .1 in 30. (226)  
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Cairo XVII-

Friday April 1

Friday April 1 Found I was short of clean fronts, so had to look up  
 the dirty ones & take them to be got up in Cairo. Off by about 9, but  
 the donkey (which I had to pick up with Abu Saud at about a mile off)  
 went so slowly that I could have walked quicker; one thing  
 was Abu S did not like to trot like Muhammed, & it was a  
 warm close morning. So I got off at the bridge & walked  
 into Cairo. Got to Hotel du Nil about 11½, found M<sup>r</sup> Loftie  
 in but Dr Wiedemann gone for the day. M<sup>r</sup> L was highly  
 delighted with the inscription of Pepi, copied a bit of it, &  
 we talked over it full length. As I do not wish my name  
 to appear about copying it, I gave him all the information  
 he wanted to write a brief account to Athenaeum. I also  
 talked over some other inscriptions. He is urgent on me to get  
 up hieroglyphics, & offers to lend me here or in England any  
 of his books, if not wanted at the moment. I staid lunch with  
 him, & after more talk went off; promising to lend him &  
 Dr W. the fair copy I made for Birch. Then to Dr Grant's,  
 had a talk over it, & other points, with him; Dr Lowe came  
 in with a young English friend, & Dr Sherrin also turned up  
 with a friend. They went off to look over Dr G's museum, &  
 then I went up to Dr Sherrin's room for a chat. He & his  
 friend were astounded at the rotten state of official  
 antiquarianism here that I revealed; the Museum  
 antiquities being sold out of it, & Brugsch driving a trade  
 as a king of dealers, & valuable remains being smashed  
 continually from the supine inefficiency of the present  
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228  
 Then after a further chat to Dr J. (who tells me that Pitt-Rivers found up at Thebes flint tools in a stratum of hard rubbish cut through by the 18<sup>th</sup> Dynasty people) I left, posted letter about 5 1/2 (having got 3 letters in more papers) went to a blanchisseur, then mounted donkey, & off. But off in another sense for the saddle soon went round & I had to alight as well as I could, on my feet fortunately. Got in home about 7 1/2 or 8; had supper & re-read letters, sucked papers, wrote this, & an Arabic-English alphabet for Abu Saud, (who asked me for it on the way, & who seems anxious to pick up all he can), & then to bed about 12. I settled with Ali for all expenses of Sakkara trip, & gave him a 10/- bonus in consideration of it. A pound or two given at intervals on special occasions thus, is perceived & valued more than by dribblets continually, or in a slight increase of wages; and it is quite fair to give him now more than he had when a young man 16 years ago with C.P.S.

Saturday April 2 Alas, I took up "Natura" again, & it was 2 before I was in bed. So not up early. After breakfast copied part of inscription fair. Then about 2 1/2 went out with 5 inch theod, & took azimuths from two stations connected with the azimuth trenches &c, then thus finishing them. Then after supper <sup>(beginning with 5 cucumbers)</sup> reducing observations, & copying inscrip. again.

Sunday 3<sup>rd</sup> April After breakfast doing various things in tomb & reading, then abt 1 out for a turn. I had not seen the Arab excavations

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 tion uncovered, & has hauled by men with sundry pottery &c. I secured three  
 fine perfect specimens, one 40 inches girth, which would probably  
 otherwise have been smashed for fear of that bogie here,  
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 Roman village that I had seen going to Sakkarah, & in one place  
 found it full of colored glass, white, green, blue, purple, & yellow,  
 all flat pieces, what I can hardly imagine: I stuffed my  
 pocket with 1 1/4 lbs of it, & picked up sundry pot. It seems  
 from the squareness of the ground covered, to have been the  
 site of a camp. Then back to tomb. An Arab asked me to  
 see some things in his house, but there was nothing that I  
 wanted; though he offered about 60 Constantines for 2 francs. Then  
 had supper, Abu Saud reading over his alphabet again, which I  
 saw him last night. Ali is rather against his acquiring such  
 infidel knowledge. I was tickled the other day, I offered Ali a rice  
 mould with currant jelly in it, he refused; so I took it out to  
 Abu S., out rushed Ali to see that his offspring did not eat  
 it because he believed (no matter what I said) that the red  
 jelly was wine; which as a pious Muslim he eschews. I  
 then exchanged it for a mould with marmalade, & that  
 was unobjectionable; though it might have been pale sherry!  
 Received a note from Mr Loftie saying that Dr Wied<sup>a</sup> was  
 not well enough to drive out here, & Mr L. did not expect  
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Monday April 4

(230) Monday April 4 Copying inscrip<sup>n</sup> in morning; finished off by 2, then wrote Mr Loftie with it, & went off up to kiosk; found a lot of travellers, among them some ladies from Hotel du Nil, one of whom kindly promised to deliver it. I did not like trusting it to a coachman as he might delay it, or might lose it, & being 5 sheets close of hieroglyphics & a sheet of description, it was valuable. I asked Mr L. to send it on to Birch by Brindisi this week if he had done with it. Then picked up Ali & went off to 2<sup>nd</sup> Δ to do its NW & SW sockets with 5 inch theod. Though not so satisfactory as 10 inch, yet it is so far more convenient that I use it if possible. The largest probable error of all today is only 4"; in fact the delicacy with which one can read such a coarsely graduated thing shows that with really delicate dividing (lines of 1/10,000 inch wide) one could get all needed accuracy from a small & easily portable instrument, not over 5 inches. Ali had a bad cold, which though apparently no hindrance to buzzing about travellers peddling his antiquities, yet developed considerably over surveying, so that I had to leave him to sleep most of the time. Back to supper, gave Ali some citric acid to be taken hot, & after supper reduced observations, & copied some inscrip<sup>s</sup>. Wanting some "support" I opened a tin of haddock, & was astonished to see that the white dog would not touch it, but looked up as much to say "d'ye call that wittles". However some time after I saw a cats tail disappear on looking out. To bed about 10 1/2. I picked up a very fine chipped flint knife yesterday, quite perfect & delicately chipped; lying at the mouth of a valley in the desert beyond the sphinx.

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This tomb under



Tuesday April 5

Tuesday April 5 Not up early enough to do anything before the  
 hot part of the day; so copied various inscriptions. Considered  
 going out at 2½, but it was a luxuriously hot day, in  
 which one was only inclined to sit still; 78° in tomb, & the  
 air at my door, without any radiation from hot ground,  
 was 93° in the shade: yet it was not as oppressive as  
 73° often is in England, being quite dry. About 4½ I  
 went out with Ali to see the tomb chamber lately  
 opened by museum people. The well is about 7½ ft  
 square, and 68 ft deep <sup>from</sup> the present top, which is many  
 courses degraded below its ancient height. We rigged the  
 ladder, & went down; but my arms ached considerably,  
 as nearly all one's weight hangs by them. I thoroughly  
 examined the chamber, which is interesting as being  
 unfinished, & shewing method of work. The whole surface  
 of the stone is covered with minute glittering crystals of  
 either sulphate or carbonate of lime. I copied two quarry-  
 marks on the stones. <sup>I found a bit of a bronze pick</sup> Then sent up the measures, &c,  
 by a cord, as they came down; & began the tug up myself;  
 I had to rest three times, & must go into training if I want to  
 do such work, for it was rather too much for heart &  
 arms. The ladder answered very well, without any  
 spinning, & only an occasional turn; the only fault was  
 that in coming up the steps get pushed up <sup>th</sup> by the body, &  
 are useless for the feet; this has to be avoided.

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 spinning, & only an occasional turn; the only fault was  
 that in coming up the steps get pushed up <sup>th</sup> by the body, &  
 are not there for the feet; this has to be avoided.

(232) Then had supper, wrote this, & to bed before 10. 75° in tomb.  
 Wednesday 6 April The worst of the hot weather is that it  
 drives all the fleas & flies into the cooler tombs, hence troubles  
 in all hours of the 24. Fleas abound in the sand of the ground,  
 in pottery heaps or in tombs they readily entertain you; but  
 when they all retire into the cooler recesses, one has to slaughter  
 by the dozen. Of flies I counted 70 in a biscuit tin lid, & 30 on  
 one side of a bowl, while at breakfast. It was again too  
 hot for outdoor work, so I set about measuring the tombs  
 all round mine. The true air temperature in the shade, by  
 briskly waving a thermometer about was 100°; which  
 went down to 98° when the therm<sup>e</sup> was laid on a rock ledge.  
 The tombs were better, only about 90°; but out on sunny  
 ground was rather scorching. ~~As~~ Ali says that only a  
 day or two occasionally is as hot as this in the summer; &  
 as Baedeker gives 104° as the extreme occasionally in Khamsin,  
 & 95° as usual maximum in Delta; I may console myself  
 that I have seen the worst in the way of heat; though the  
 dust of the Khamsin must be an interesting addition.  
 Went on measuring tombs all day, then a run in the  
 dusk to see what had been dug by the Arabs; then back  
 to the cool recesses of my tomb, at 78°; outside being 86° at  
 7.30 pm. Wrote this, had supper & ~~to bed~~. reduced the digit  
 value from one tomb <sup>of probably Dyn 4</sup>: this is a brilliant case, of 25 <sup>successive</sup> palm  
 lengths marked off to place hieroglyphics in; by examination,  
 I detected the length of rod used (8 palms = 23 ins) by a shift  
 at the 8 & 16 palm lengths. Then treating each rod length

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independantly, & weighting according to best method, I get a <sup>(233)</sup> mean digit value of  $.729 \pm .001$  ins; exactly what I had determined as true original value of digit; & within probable errors of the mean value I had found for Egyptian digit. The height of the little compartments is also exactly 5 digits (width 4 digits) giving a digit of  $.726 \pm .006$  which agrees within half the  $\pm$ . There are several other cases of similar divisions to be worked out, but this was too tempting to be left unreduced; the error of workmanship I still have to work out, it seems to be about  $\frac{1}{20}$  inch; it is from the great number of repetitions that I get such an accurate result. To bed abt 11; the Arabs, (that is <sup>1</sup> Muhammed, & <sup>2</sup> little Muhammed - Alis nephew - & <sup>3</sup> another boy, & <sup>4</sup> Abu Saud - who finds it more amusing than stopping in the house) all sleep on the sand outside, last night, & tonight: I should do the same, only the tomb is still rather cooler, <sup>(76°)</sup> & a few degrees difference is worth having.

Thursday 7<sup>th</sup> April after breakfast off before 10 to Pyramid.

I there measured skew of floor joints to try & find one square with passage, but all convenient ones were skew. C.P.S. did not measure their skew with square, & is much out in his supposition on it. I selected a good fine one, & laid measuring rod along floor from it to over my station mark fixed in triangulation on basement edge & hung a plumb bob over mark, & thus measured mark into connection with inside.

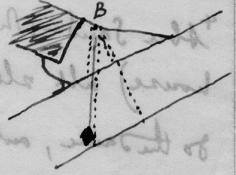
independantly, & weighting according to best method, I get a mean digit value of  $.729 \pm 1 \text{ } \frac{1}{20}$  ins; exactly what I had determined as true original value of digit; & within probable errors of the mean value I had found for Egyptian digit. The height of the little compartments is also exactly 5 digits (width 4 digits) giving a digit of  $.726 \pm 6$  which agrees within half the  $\pm$ . There are several other cases of similar divisions to be worked out, but this was too tempting to be left unreduced; the error of workmanship I still have to work out, it seems to be about  $\frac{1}{20}$  inch; it is from the great number of repetitions that I get such an accurate result. To bed abt 11; the Arabs, (that is <sup>1</sup> Muhammed, & <sup>2</sup> little Muhammed - Alis nephew - & <sup>3</sup> another boy, & <sup>4</sup> Abu Saud - who finds it more amusing than stopping in the house) all sleep on the sand outside, last night, & tonight: I should do the same, only the tomb is still rather cooler  $<(76^\circ)>$ , & a few degrees difference is worth having.

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Then laid the steel tape all down W. side of passage; tying  
 to a measuring rod laid across passage mouth: thus I read  
 off every wall & floor joint all the way on the tape, using  
 supplemented measures to  $\frac{1}{10}$  in & reading  $\frac{1}{100}$  inch. This  
 was much needed as all C.P.S. measures were calculations  
 by length of stones added, & measure was held by hand; here  
 there could not be any shift, & I re-read a pencil mark at  
 bottom end after finishing, without seeing too difference.  
 I find C.P.S. got about  $\frac{1}{2}$  inch wrong in his total, & his floor are  
 much worse than his wall measures in irregularity; my  
 measures cannot I think have errors greater than those of  
 estimation of joints. I also connected the ascending passage &  
 port cullis in a much better way; as it seemed to me that C.P.S.  
 drawn lines were not very true prolongations;   
 I hung a plumb bob from roof of ascending  
 passage at B, & measured from B both vertically  
 & perpendicularly to both floor & roof joint of entrance passage  
 (dotted lines); & read place of bob on steel tape. Also measured  
 from plumbline to end of granite block. This will give connection  
 of passages safe to .03 I expect. I read both here & in entrance joint  
 to  $\frac{1}{100}$ th inch always: & used candle to give equal sided illumination.  
 Then came out for another candle. I had left it in the shadow of  
 the entrance, but though Paraffin it was so soft that I coiled  
 it up without a central hollow, in two turns, & uncoiled again  
 without damage! It is hotter than yesterday I think, &  $75^{\circ}$  in  
 $\Delta$  was almost chilly. Then measured well passage thoroughly; &  
 finished about 7. Had supper, wrote this, & to bed abt 10. Temp. at 8  $\frac{1}{2}$   
 this evening,  $92^{\circ}$  outside.  $78^{\circ}$  in tomb. I counted 240 flies on edge of  
 sheet hanging over side of bed this morning. I go to Cairo early tomorrow.

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Cairo, XVII.

Friday 8 April

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 by 6.40 off to meet my donkey; which Ali, disbelieving that I should  
 be up early, had sent off to grass in his field about a mile on the Cairo  
 road. It was a new one, young, not strong, & in bad health: so we  
 did not get on very quickly though Mohammed did his best.  
 After 6 dragging miles, I got off at the bridge, & walked up Cairo,  
 as there is something like shade from there. Got letters, but no  
 Pub. Op. Sorry to find that my experiment (tried after sundry  
 remonstrances <sup>from home</sup> about delayed letters) ~~from home~~ of sending  
 a letter in for post has not answered, as it has not come to  
 hand apparently; though containing a special request to send  
 cash by P.O.O. instead of bank. This shews that it is best to  
 post myself, & not risk posting at more suitable times by a  
 messenger. Then to Hotel du Nil: found Mr Loftie, but  
 Dr Wiedemann had gone. Dr W. was delighted with the  
 inscription, & considered the copying highly satisfactory, as he  
 could test it by its sense all through; just as I could test the  
 accuracy of an illiterate Arab, by setting him to copy a page  
 of newspaper for me. Then after a talk ~~about~~ Mr L. took me  
 to the reading room (a kiosk in the middle of the garden) & I looked  
 over papers which he wrote his letter to Athenaeum; then  
 after reading it over, & adding a word or two, we chatted on  
 till lunch, which he pressed me to stay; & then a talk, & an  
 Arab with some antiques filled up the time till about 3.  
 Though Mr L. is, as Spurrell said, "not at all your sort of  
 man", & I expect he is of a very "advanced school" in many  
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quite ready to hear evidence, given in mild & suitable  
 doses; & as he is somewhat of an authority (revising Murray's  
 guide, writing for Quarterly, Saturday &c, besides his own works  
 & papers to Societies) it is important to overcome the  
 prejudice which the vagaries of the  $\Delta$ -ites have caused. So I  
 gave him what I thought a suitable talk on the accuracy &  
 mathematical feelings of the Egyptians; which seemed to  
 impress him so well that he told me he had a popular  
 account of the  $\Delta$ s &  $\Delta$  epoch, in view (probably with  
 Stanford) & that if I would join him on that part of the  
 matter "we" might make a good <sup>account</sup> business of it. I replied,  
 on both times he mentioned it, that I should be very happy to  
 supply him with any facts & information that he might  
 like to use; & I just mention this to shew how well a reasonable  
 dose of the mathematical & mechanical side of the matter was  
 accepted by an antiquary, what all in that line. I think  
 my attention to inscriptions, which is his line, has made him  
 more inclined to hear of anything else. We then parted,  
 exchanging addresses, & he pressing me to come up to his clubs  
 (Savile & Burlington) & see him. They live in Kensington Sheffield  
 Terrace, W. Then after some shopping (it was 99° in the  
 shade in Hotel du Nil) I went to Dr Grant's, & had a brief  
 chat to Dr Sherrin, who particularly asked me to come &  
 see him before he left. He was just going in an hour or so,  
 to Ramleh (Alexandria) driven out with the heat; & thence  
 to Italy, & home to Kensington about June. He is a most  
 genial nice fellow, & I think will be an acquisition to our

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"occasional" acquaintances in every way. ~~He~~ much pressed  
 me to come & see him, or his Mother if he had not returned <sup>(237)</sup>  
 when I do; & I hope his health will enable him to come down to  
 Bromley; but, alas! he is very consumptive, has wintered  
 out of England for two years, dare not walk quick, should not  
 talk much, & is in danger of breaking a blood vessel with any  
 exertion. Then had a talk to the Dr. on several ~~A~~ matters  
 that I had observed; & my view that the well was an  
 afterthought of the original constructors; it clearly has been  
 cut through the masonry as it stands, & yet has finely worked  
 surfaces at G. Gallery ramp, & is well lined through the grotto  
 shingle, & neither of which points mere plunderers would  
 attend. Then off about 4 1/2 back; by the time I got to Gizeh  
 (just opposite Cairo, 5 miles from here) the poor donkey broke  
 down, so I had to walk home, leaving him to carry my  
 coat & the toggery of civilization. Got in about 7, & as the  
 heat was going down it was not so bad. After supper,  
 wrote this, & somehow the time has gone, so that it is 11 1/2.  
 A brisk wind from NNE has sprung up now, so cool &  
 pleasant, down to 76°; in fact cooler than my tomb which  
 is about 78°, raised to 81° by candle & me. Mr. Loftie promised  
 to lend me certain measures of capacity, of very early date  
 which he got a few years ago; 3 vessels fitting into one another,  
 in glazed pottery: & wished me to take Vyse's 3<sup>rd</sup> out of ~~As~~ &  
 bring it home with me, but I had no time for working at it. He  
 will freely lend us Vyse & other books in England.

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 will freely lend us Vyse & other books in England.

(238)  
 Had a letter from Major Fraser, who most kindly epitomised Herodotus' account of Egypt (particularly  $\Delta$ s) for me, & sent it as I had not Hdtus here. Not at all worth while to do, but very kind in him, as it is 20 pages. I now have no one but Dr Grant to scale to in Cairo, beside Genl Stone. Certainly Egypt has increased my English acquaintance; Major Fraser, Mr Loftie Dr Sherrin, Mr Mackenzie, & Mr Chester; the latter 4 all to be looked up in London; & it was only by accident that I missed Mr Haynes (a constant Egyptian) & Prof. Hayter Lewis. Genl Stone Dr Grant, & I may add Dr Lowe, are I fear only Egyptian friends, though Dr G. talks of getting leave & coming to England occasionally; being a Govt physician he cannot, under present regulations it seems, take a long holiday.

Saturday April 9 Ali brought in some bits he got from a man digging, including a pretty little scribes-paint-tray of 3 holes, one still red & the others black. I was not early being tired after yesterday, & only intending to do inside  $\Delta$ . I did not care much about time. Took the indiarubber tube & a bottle of water to level round the granite plugs. On filling the tube I found all the flaws leaked, ~~thru~~ notwithstanding the glass tubes slipped over them; so I had to melt stearine over each place & so set it all solid into the bit of glass tube. Then I found another flaw, not detected before, & this would need the bit of tube to be shifted to get one over it, so I had to give it up, after a lot of bother. Then put tape down the lower 200 ins of the passage, & measured all joints, stretching the tape as the passage is much broken. Then shifted it up to the beginning of Grand Gallery, & measured all the rest of the ascending passage. According to this C.P.S. makes the passage from two 2 to 5

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inches too short, according to the joints observed at lower end: most of this error occurring just ~~after~~ <sup>over</sup> the broken part. It is impossible that the steel tape can be in error in this way, or even 1/10 inch, & I verified the starting point again after finishing; ~~the tape~~ so the error must be in the rod method I think. I must compare it with Dr Grants copy of Dixons measures; & as I took E wall also (which C.P.S. did not) we can compare it thoroughly. Then I shifted up, & did the Queens Chamber passage, only noting two or three joints just-as checks. The difference between this & C.P.S. is most curious, very ~~de~~ nearly proportionate throughout, & accumulating to 4.1, greater than his at the end: though the latter part was done by rods. I took the greatest care with it, & cannot suppose 4 ins error on using the tape on a flat surface; for I avoided a broken piece of floor, & the side which was encumbered with bits of stone stuck to it, & saw that ~~the tape~~ lay fairly flat all along. It will be as well to chain it also. Then back home by 8 1/4; had supper, intending to open a tin of peas, I found it to be pilchards, there was no label, only the make of the pot is peculiar. I finished the whole tinful, as fish does not keep nicely at about 80°. Then copied & compared my measures, & wrote this, & to bed about 12 1/2.

I see that direct levelling with staff would not be at all impossible ~~past~~ through Al Mamoons hole, & I think that staff with 4 or 5 ft of rubber tube to carry the level from it at each end will be the best way of all.

Sunday, April 10 The fish last night somehow disagreed considerably, & I have been rather upset today. After breakfast &c, & reading, I strolled about the neighbourhood all the afternoon; picked up

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The fish last night somehow disagreed considerably, & I have been rather upset to day. After breakfast &c, & reading, I strolled about the neighbourhood all the afternoon; picked up



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among other things a good scarabeus. Had another look at  $\Delta^3$  casing & see that the course on which the last piece of granite occurs on each side is the 15<sup>th</sup>; this I had concluded was the 4<sup>th</sup> of the granite, & the other day in an extract from Diodorus <sup>I saw</sup> he says the granite covered the lower 15 courses: so this is a fine corroboration both of Diod. & my own inference from the  $\Delta$ . The entrance was as low as in the 4<sup>th</sup> course. To day was very pleasant a cool wind, as yesterday; in fact the wind set in cooler exactly as poor Dr Sherrin fled to Alexandria to escape the heat. This has mitigated the flies & fleas. I do not remember meeting that the latter are a very prominent point in  $\Delta$  investigation; the inside abounding with them in many parts, so that the motto for research might well be "scrub & scratch, measure & catch". Dr Grant attributes this to the bats. Ali had sent Muhammed into Cairo for a cargo for me, as it is Gizeh market day: so had a quantity of small cucumbers for supper. Got another tin of petroleum, having nearly finished the first; it only cost 5/d, & it has lasted me over 3 1/2 months, for boiling kettle of 3 pints twice a day; & after cooking besides: very little over 1/2 d a day, including lantern occasionally. After supper wrote this & to bed about 10 1/2.

Monday 11 April Off before breakfast, as it was a half cloudy & cool morning, to do some outside work. Took azimuths of crosses drawn in NW & SE corners of NE socket, by theod over NE corner mark; so as to fix trend of socket sides. Then tried to take azimuth of air channel mouth, but the station saw it so skewly, & the mark was so small to be seen in 8 power telescope, that

among other things a good scarabeus. Had another look at  $\Delta^3$  casing & see that the course on which the last piece of granite occurs on each side is the 15<sup>th</sup>; this I had concluded was the top of the granite, & the other day in an extract from Diodorus, <I saw> he says the granite covered the lower 15 courses: so this is a fine corroboration both of Diod. & my own inference from the  $\Delta$ . The entrance was as low as in the 4<sup>th</sup> course. To day was very pleasant a cool wind, as yesterday; in fact the wind set in cooler exactly as poor Dr Sherrin fled to Alexandria to escape the heat. This has mitigated the flies & fleas. I do not remember mentioning that the latter are a very prominent point in  $\Delta$  investigation; the inside abounding with them in many parts, so that the motto for research might well be "scrub & scratch, measure & catch". Dr Grant attributes this to the bats. Ali had sent Muhammed into Cairo for a cargo for me, as it is Gizeh market day: so I had a quantity of small cucumbers for supper. I got another tin of petroleum, having nearly finished the first; it only cost 5/d, & it has lasted me over 3 1/2 months, for boiling kettle of 3 pints twice a day; & often cooking besides: very little over 1/2 d a day, including lantern occasionally. After supper wrote this & to bed about 10 1/2.

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I could not find it at all. Then up to entrance, after approximately (241) took level of ~~mark~~ survey station on passage floor below 3 different courses, by sighting across the entrance gap at each course level. Then measured in duplicate all the courses from the casing stones up to the entrance, thus taking two course levels above each step; this check is not perceived mentally while doing it, as the second measure is the difference of two readings. I levelled the horizontal rod I held out from the step surface by sighting it again the perfectly flat delta horizon, for the vertical rod could not be put close up owing to rubbish. Judging by the differences, I suppose  $\pm .05$  or  $.10$  would be about the prob. error; so on 16 courses  $\pm .3$  or so.

The special object of examining the courses about the entrance was because I had perceived that the casing was apparently the same course height as the steps (no other supposition is likely); hence we know the levels of courses of casing, by the steps. Then by thickness of casing below, there is ~~scarcely~~ no doubt as to ~~what~~ course the passage must have emerged. Next, in Dashur, the passage comes out in one course height, & no other idea is likely in  $\Delta^1$ . Hence we should be able to identify passage level. Is there then anything to prove this? The vertical height between top & bottom of passage on casing slope is 37.94, & I saw in C.P.S. measures a course suddenly thicker than others around it, marked 38 inches, at apparently not far from right level. So

I could not find it at all. Then up to entrance, & (for appropriate purposes) took level of mark survey station on passage floor below 3 different courses, by sighting across the entrance gap at each course level. Then measured in duplicate all the courses from the casing stones up to the entrance, thus taking two course levels above each step; this check is not perceived mentally while doing it, as the second measure is the difference of two readings. I levelled the horizontal rod I held out from the step surface by sighting it again the perfectly flat delta horizon, for the vertical rod could not be put close up owing to rubbish. Judging by the differences, I suppose  $\pm .05$  or  $.10$  would be about the prob. error; so on 16 courses  $\pm .3$  or so. The special object of examining the courses about the entrance was because I had perceived that the casing was apparently the same course height as the steps (no other supposition is likely); hence we know the levels of courses of casing, by the steps. Then by thickness of casing below, there is scarcely ~~no~~ doubt as to where/at course the passage must have emerged. Next, in Dashur, the passage comes out in one course height, & no other idea is likely in  $\Delta^1$ . Hence we should be able to identify passage level. Is there then anything to prove this? The vertical height between top & bottom of passage on casing slope is 37.94, & I saw in C.P.S. measures a course suddenly thicker than others around it, marked 38 inches, at apparently not far from right level. So

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 I specially measured it in view of this; although I must take a few more measures another day, the results are exactly concordant. (if the passage emerged in it). This course would require a casing of a thickness of about 95 on top & 125 below; the much thicker casing stone at the base being 85 " & 138 " or exactly the same mean thickness. Hence every thing fits together, a course level at the right height for mean thickness of casing to be added, & a course suddenly introduced (thus 29, 20, 32, 38, 24, 23) of the right height for the passage. This is marked course 20<sup>th</sup> in C.P.S. but is really 19<sup>th</sup> as his 79 ins ~~1<sup>st</sup>~~ 1<sup>st</sup> & 2<sup>nd</sup> course, is really 59 ins 1<sup>st</sup> course (pavement being 20 higher). The approximate measuring up, puts floor of entrance at 669 over pavement; hence floor 1123 ins to floor of ascending passage; & levels of intersection of floors 173, of N end Grand Gallery 854, Q.C. floor 832, K.C. floor 1695. These are within an inch I believe. This leaves (with Gills base) about 4114 over K.C. floor, not far from 4126 or 100 Karnak cubits as I propounded. From this connection of entrance & casing we shall get casing angle, within 5' or so. The method for casing angle by air channels cannot be applied until the levelling is carried right up the  $\Delta$ , which I cannot do alone. After this I had breakfast, & staid in tomb from 12 to 3 during the heat. Then out took angles for planning walls behind 2<sup>nd</sup> & 3<sup>rd</sup>  $\Delta$ s. These walls are certainly in some (perhaps all cases) built of stone, & in one place shown faced with fine (? Mokattam) stone, though now apparently mere heaps; hence their position is interesting, & the present measures are only approximations from their heap state, to be re-done more accurately whenever

I specially measured it in view of this; & though I must take a few more measures another day, the results are exactly concordant. This course <( if the passage emerged in it)> would require a casing of a thickness of about 95 on top & 125 below; the much thicker casing stone at the base being 85 " & 138 " or exactly the same mean thickness. Hence every thing fits together, a coarse level at the right height for mean thickness of casing to be added, & a course suddenly introduced (thus 29, 28, 32/<8>, 38, 24, 23) of the right height for the passage. This is marked course 20<sup>th</sup> in C.P.S. but is really 19<sup>th</sup>; as his 79 ins 1<sup>st</sup> & 2<sup>nd</sup> course, is really 59 ins 1<sup>st</sup> course <(pavement being 20 higher)>. The approximate measuring up, puts floor of entrance <(at original casing face)> at 664/<9> over pavement <(or 16 x 41.5)>; hence <length of> floor <is> 1,123 ins to <plane of> floor of ascending passage; & levels of intersection of floors 169/<73> <(4 x 42.1)>, of N end Grand Gallery 852/<4>, Q.C. floor 829/<32> <(20 x 41.45)> <or 899 see next page>, K.C. floor 1695. These are within an inch I believe. This leaves (with Gills base) about 4118/<4> over K.C. floor, not far from 4126 or 100 Karnak cubits as I propounded. From this connection of entrance & casing we shall get casing angle, within 5' or so. The method for casing angle by air channels cannot be applied until the levelling is carried right up the  $\Delta$ , which I cannot do alone. After this I had breakfast, & staid in tomb from 12 to 3 during the heat. Then out & took angles for planning walls behind 2<sup>nd</sup> & 3<sup>rd</sup>  $\Delta$ s. These walls are certainly in some (perhaps all cases) built of stone, & in one place I know faced with fine (? Mokattam) stone, though now apparently mere heaps; hence their position is interesting, & the present measures are only approximations from their heap state, to be re-done more accurately whenever



we may have them cleared in parts.

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But as they are unimportant probably, & can be done pretty nearly without digging, they are the last things to be opened up, & certainly not this season. Then home by 6  $\frac{3}{4}$ , supper, reducing obs<sup>ns</sup>, & to bed about 10  $\frac{1}{2}$ : telling Ali I intended to be up early.

Tuesday April 12 Woke when Muhammad was stirring, about dawn, but went off asleep again, & was woken by Ali at 6  $\frac{1}{4}$ : very sleepy, but turned up, & after my wash, off about 7, before breakfast. Took azimuths from four stations with 5-inch theod to fix the walls around  $\Delta^3$ ; a very good day with brisk NNW wind, cool, but not enough to shake the theod. Back to tomb by 12  $\frac{1}{2}$ ; had breakfast, & then lay down & had about an hour's sleep. Up by 3, & considering arrangements for ~~the~~ levelling with Ali if possible, but it was rather too breezy <sup>for him</sup> to hold a staff well. So out & finished off measuring steps of  $\Delta$  by entrance, in duplicate, up to course XXVII. Corrected somewhat the figures of yesterday, & have altered results accordingly in last page. By this bottom of course XXV is 854, beginning of Grand Gallery being 854 also; & Q.C. floor 833, which does not exactly tally with any course, as top of XXIII is 821: and K.C. floor 1695 will not tally with 50<sup>th</sup> course, which (by my measures <to XXVII> & CPS above) would be 1681 top, top of LI being 1699. Of course this all needs levelling up  $\Delta$  sadly, but still it is better than what we have already: <sup>though only stated here to nearest inch, all the measures are taken to 1/10 inch.</sup> Then took azimuth of entrance passage, correct to probably 10", from one of the external triangulation stations, not trusting to centring the theod correctly by sighting out passage sides, but putting a p mark on floor at top of complete passage

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where it could be measured from each wall, & a candle  
 at the bottom, observing on the white top, & wick of the candle;  
 which is as good as all the elaboration of a board with  
 slit & lamp. Then home, had supper, & to bed abt 9 1/2, hoping  
 to be really early, as the morning are delightfully fresh  
 & cool. Ali set Muhammed to clear the edge of the  
 pavement to form; it only remains <sup>at the</sup> ~~on one~~ side of the  
 main cut of the N. face: the edge he found is evidently  
 that of Vyse as it is about 400 ins out; but it seems to  
 me clearly only a joint, the farther stones having been  
 removed; both from the roughness of the vertical face, as  
 if for mortaring, & the presence of plaster on the rock in  
 front of it, also from the manner in which the one of the  
 stones has been broken. As Vyse only found it 200 or  
 so thick elsewhere, it has apparently been cleared off in  
 some parts for certain: if ~~this~~ it has been removed here, it  
 was in ancient times as all the sand lies over it  
 undisturbed, without any of the Arabic chips. I shall try  
 to see the rock surface at the same distance out as the  
 ledge cut by the NW corner, & see if there is any similar  
 trace visible.

Wednesday April 13 Off about 6 1/2, & went with azimuths  
 (by 5 inch theod, correct to 20" or so) to fix walls around  $\Delta^2$ .  
 Took from 5 stations, & this finished it. Then back about  
 12, & had breakfast. The worst of this arrangement is  
 that having got accustomed to go all day from 9 till 7

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 that having got accustomed to go all day from 9 till 7


without food or drink I find that I am not ready at 7 for  
 supper after breakfast <sup>on 3 biscuits & jam</sup> at 1. Then plotting section of <sup>(245)</sup>  
 $\Delta$  entrance courses, & fair copying it. Then out about  $3\frac{1}{2}$   
 to  $\Delta$  N face; settled where Muhammad must dig to find what  
 I believe to be pavement edge. Took planes of  $\Delta$  faces to  
 NE & NW socket floors. Took azimuths from two stations to  
 fix distance & trend of rock ledge, for pavement edge?.. Then  
 by sunset ran off to look at some new excavations,  
 in a most promising part where are dozens of fine  
 tombs never yet explored, though the valuables have  
 been ransacked; I look with longing for what may turn  
 up, as it is an early site of 4<sup>th</sup> Dynasty; one tomb of Cheops  
 architect is there, of which I copied the inscrip<sup>n</sup>. What we  
 want is the tomb of the great  $\Delta$  architect, with drawing  
 of the building & machinery, for such probably exists  
 somewhere. Then took planes of  $\Delta$  faces to SW & SE  
 socket floors. Home, & reduced obs. while kettle boiled.  
 It is very interesting to get proof that the casing did not  
 extend beyond the socket edges; but will not expatiate  
 on this as I send details on back of Entrance diagram. It is  
 strange that all these measures proving the alignment of  
 the casing, & the length of entrance passage, & thickness  
 of casing might all have been done by any passing traveller,

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much more by ~~redis~~ residents like C.P.S., Dixon, or Vyse, &  
 yet it has been left unnoticed all this time. I have bespoken  
 Ali early for Abu Roash tomorrow so must go to bed  
 early tonight, but not before 9 ½ I fear.

Thursday 14 April Off by 6 ¼ with Ali, & donkey to carry  
 pick & shovel (only strapped up in a sack, not to excite  
 remarks here); had a look at Kom el Ahmar again,  
 studied character of pottery more carefully, now that I know  
 every variety well by heart, so as to appreciate both  
 the absence as well as presence of each sort. Then on up to  
 Abu Roash; here we began cutting in mounds of chips by  
 the entrance, where we found diorite before; but although  
 I got several more fragments of statue, yet it was all  
 so extremely dispersed, that though one was sure to find  
 something in each half-hour's dig, yet there was never  
 a find of any quantity; & the whole proceeds were 6  
 scraps, with less than 20 square inches of surface altogether.

The heaps shew that the inside has been smashed up with the  
 same intense hatred as is shewn in the  $\Delta$  of Pepi at Sakkarah;  
 the bits of statue are pounded on many parts, & the bulk of  
 the rubbish is granite crushed to chips & powder, & burnt;  
 many bits of worked granite turned up, & among them two  
 pieces of sarcophagus, one 8.1, the other 10.2 ins thick, the  
 first curved as if part of shoulder of a modified box-  
 coffin . There were also bits of basalt, one chip

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with a worked surface, several scraps of prehistoric limestone also lay about. I had no expectation of the extremely unlikely find, of getting any more inscription; & it would probably need months of work to turn over enough rubbish to settle the attribution to the 2<sup>nd</sup> Menkara of the lists (☐☐☐☐☐) of Dynasty 4, or to Nitocris-Menkara (☐☐☐☐☐) of Dyn 6: but so far as general execution & memory so I should put it almost certainly in Dyn 4, rather than 6. After a spell of digging with Ali, I had breakfast; & then took another turn at it, stopping when it was too hot, about 10. But after resting sometime in the shade, I was astonished to find that somehow my head was congested, though I had pith hat on, & had taken great care not to let the sun shine fall on my back: however the slightest jolt in walking, or stooping, made me feel very queer; sickish, swimmy, & don't-care-&-can't-help-it-ish. By about 2 it was half cloudy, so I set off to a hill in the west, which looked like a ruined pyramid; on getting near it in about a mile I saw skew stratification which settled its natural character; then back in shadow for big cloud, had another feed, then dug a little more (not finding anything); had another look over the pottery heaps, in which I was so fortunate as to find two good chipped flints, & a bit of pot with a green bead in it, which fixes a maximum age for the pottery. Then packed up, & went down the long causeway, to some heaps beyond it from which Ali had brought some pottery; these

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(248)  
 were interesting as containing ~~ea~~ pot together of a character which I had never seen mixed before; apparently of middle Roman period. Then picked up Ali at just round the hill, & walked back in the dusk. The ants insist on drowning themselves in my water pots, so that I had to wait for a fresh batch before my supper. Then after supper to bed.

Friday 15 April Too headachy to get up early, & still obliged to "go delicately". Looked over my batch of finds of yesterday, & wrote up journal. Smyne's brother sent up a batch of things by Ali, but he wanted an exorbitant price; <sup>he</sup> coming in soon after I offered 8 fr for a few things wanted, but he indignantly asked £2, so I took nothing. He asked 1 fr each for coins, which I offered to supply him with at  $\frac{1}{2}$  franc. Then in afternoon out & remeasured place of planes of S & W faces of  $\Delta$  on SW socket to see if there was any mistake as they were so different to the others, but I only made them 1 or 2 ins less than before, so the difference is true. I saw that both S & W faces are somewhat hollowed in middle, like the N. Then I looked well at the W. face to see if there was any trace of a passage mouth, but did not see anything like it over the rubbish heap. Then up to some tombs further West & measured till ~~about~~ dark. Back to supper wrote this & to bed abt 9 $\frac{1}{2}$ .

Saturday 16 April after taking an extra nap this morning, I heard a sort of miscellaneous shuffling talking & lurching at my door, so jumping up I looked out & saw Dr Grant's boy (who is about 10) & a stranger who proved to be a young

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 picking up mummy; went with them to tomb of members  
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 Miss Mulock ~~de~~ was scarcely to be persuaded to go up the  
 Grand Gallery, then cut out to R.C. looking so ugly, &  
 sidling up a ledge 20 inches wide was alarming to her,  
 as though not tall - she is sufficiently ample in other  
 dimensions. However with Ali as well as her guide she  
 got up, Miss Mclean doing it easily, & M<sup>rs</sup> W. following  
 my example & straddling up the holes in the side of the  
 passage. Gave them sundry magnesia illuminations,  
 we examined the Kings Chamber; an Egyptian coming  
 in while we were there, looking very helpless & astonished  
 to see ladies, & disappearing soon. Then down to Q.C.,  
 & after a rest, & talk about the well, out again.  
 They then had some oranges &c, & after a rest, the other  
 ladies, leaving Miss Mulock in kiosk, went off to see the tombs  
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 had lunch, at which I slightly assisted; & then they all  
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Cairo. XVIII.