The swamp construction
Klaus Abels, UCL

Ross 1969, 281 fn. 10 mentions (1a) as an example where the otherwise striking correlation between the ability of a phrase to undergo wh-movement and its ability to appear as a sluicing remnant breaks down. Pied-piping of 'a picture of' by 'whom' (so called massive pied-piping) is illicit under regular, overt wh-movement (whether or not there is additional topicalization of the containing question, (1a) vs. (1b)); even under sluicing, massive pied-piping is possible only in conjunction with fronting of the remnant. Of course, the remnant alone cannot front in the absence of sluicing, (1c).

(1) a.   He has a picture of somebody, but a picture of whom (*he has) I don't know.
     b.   *He has a picture of somebody but I don't know a picture of whom (he has).
     c.   *He has a picture of somebody but a picture of whom I don't know he has.

The existence of this construction, which I refer to as the swamp construction ('Sluicing' With Apparent Massive Pied-piping), has been taken to threaten the otherwise well-motivated theory of sluicing as ellipsis fed by wh-movement (Abe 2015; Bechhofer 1976; Ross 1969).

What is the pre-sulice? Abe 2015, chapter 4 discusses (1a) at some length. He assumes without argument that the pre-sluice of (1a) involves DP topicalization (as in (1c)) rather than CP fronting (as in (1a)). The DP-topicalization hypothesis turns out to be implausible, once we investigate it.

First, sluicing with massive pied-piping in English is impossible with CPs that cannot be fronted, for example, with CPs that have undergone *it*-extraposition. This follows directly if the source of such examples is CP-fronting rather than DP fronting.

(2) a.   Something causes this effect, but what (causes the effect) (*it) is unclear.
     b.   Something causes this effect, but it is unclear what (causes this effect).
     c.   *The influence of something causes this effect, but the influence of what it is unclear.

Second, environments for topicalized sluicing are compatible with multiple sluicing. In such cases all wh-remnants appear fronted together obligatorily, as they would be if the entire CP fronts, (3). Third, the environments for topicalized sluicing allow swiping, which, under most analyses of swiping, they could only do if there is CP fronting (cf. Ott 2014, ex. 74).

(3) a.   Every student talked about a paper, but I don't know which student about which paper
     b.   Every student talked about a paper, but which student about which paper I don't know.
     c.   *Every student talked about a paper, but which student I don't know about which paper.

Pursuing an intuition substantially different from Abe's, Bechhofer, 1976 had suggested that 'I don't know' is used parenthetically in (1a). A parenthetical analysis is implausible, however: quantifiers in parenthetical clauses, (4b), do not bind variables in the host clause unlike quantifiers in the matrix of syntactic embedding structures, (4a). The swamp construction thus shows regular embedding behavior, (4c).

(4)   a.   Nobody$_i$ claims he$_i$ bought all the necessary books already.
       b.   *He$_i$ bought, nobody$_i$ claims all the necessary books already.
       c.   Everybody will have to take a picture of someone (different), but a picture of who nobody knows yet.
      =   ...nobody$_i$ knows yet who he$_i$ will have to take a picture of.

The swamp construction involves a fronted CP with the properties of regular embedding. **Towards an analysis:** German reveals quite clearly that the swamp construction has contrastive left dislocation (CLD) of a CP as its source. CLD involves a topic resumed by a left-peripheral proform which matches the left-dislocated phrase in phi-features. CPs are resumed by third singular neuter elements. With this as background, (5) shows that, like in English, the fronted element must be a CP and cannot be a DP.

(5)   Er hat die Zeichnung von einem Mann gesehen, aber die Zeichnung von welchen
       he has the sketch.F   of   a   man   seen,   but the sketch   of   which
       Mann, {das | *die} weiss ich nicht.
       man   that   her know I   not
       He saw the sketch of some man, but the sketch of which man, that I don't know.

Taking the CLD structure above as a starting point, I propose to analyze sluicing with massive pied-piping in terms of (recursive) CLD with clausal ellipsis, (6):

(6)   [$_{\text{CP}_{\text{host}}}$ [$_{\text{CP}_{\text{CLD}}}$ [$_{\text{DP}_k}$ a picture of who] ~~[CP$_{\text{CLD}}$~~   ~~[DP$_i$ Q [DP~~ *wh*-~~PROFORM$_k$]] [~~ ~~C [IP he has t$_i$]]]~~] [$_{\text{CP}_{\text{host}}}$ (that) [C [$_{\text{IP}}$ I don't know t$_{(\text{that})}$]]]]

I show that the analysis directly derives the distribution of the swamp construction: First, CLD with clausal ellipsis is independently attested in German. Like the swamp construction, it is restricted to main clause environments and root coordinations (Wiltschko 1997). Questions in selected positions do not allow CLD with clausal ellipsis. This derives the badness of (1b). Second, CLD is recursive (Wiltschko 1997), as required for (6), where the host of left dislocation of DP (CP$_{\text{CLD}}$) is itself left dislocated. Finally, CLD exhibits connectivity effects like the variable binding illustrated in (4c) above (see Ott 2014 for an overview).

Structure (6) can readily be interpreted using the mechanism proposed for independent reasons in Cable 2010; Sternefeld 2001: wh-elements introduce alternatives quantified over by Q.

The remaining question is why sluicing is obligatory in (1a), that is, why the lower segment of CP$_{\text{CLD}}$ in (6) undergoes obligatory clausal ellipsis. We can model obligatory ellipsis in a late lexical insertion model in terms of the existence of a syntactically well-formed anaphoric *wh*-PROFORM, for which there is no morphological realization. This morphological gap will force ellipsis (see Kennedy and Merchant 2000; Merchant 1999 for a similar approach to left branch violations under VP ellipsis).

Conclusions: Both previous analyses of (1a) (Abe 2015; Bechhofer 1976) are based on faulty assumptions. The correct analysis involves a pre-sluice that CLD (transparently so in German). While the analysis proposed here remains somewhat speculative for English, it improves on both of its predecessors and has the advantage of being fully compatible with Ross' conclusion that sluicing proper is clausal ellipsis fed by wh-movement. This undermines Abe's argument for his in-situ theory of sluicing from (1a).

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