Assignment 1: Critically evaluate a tool for information organisation.

It is high time to tackle the subject headings.
(Jackson, 1968, p. 3526)

In a #UKMedLibs Twitter chat on 19 March 2019, a suggestion that health libraries should follow academic libraries in decolonising their collections turned the discussion towards knowledge organisation, with the comment 'Collections *and also cataloguing systems*' [my italics] catalysing further replies: 'Yeeeeees classification schemes have a lot to answer for!!'; 'Yes! And MESH etc' [sic] (Burscheidt, 2019).

While the Medical Subject Headings (MeSH) controlled vocabulary namechecked above may fit the definition of a lightweight ontology as a tool designed 'to solve problems of semantic interoperability' (Romá-Ferri and Palomar, 2008), the freight of responsibility shouldered by it means that it is far from being ethically 'lightweight' in its influence.[1] As the thesaurus for the National Library of Medicine (NLM) – which like Library of Congress Subject Headings (LCSH) can be described as *inter*national in use, if not in name – it is a 'heavyweight' player in the classification world. MeSH literally writes the rules: it prescriptively defines what can be diagnosed and prescribed in line with the NLM's version of ontological realism and its remit 'to provide a reproducible partition of concepts relevant to biomedicine for purposes of organization of medical knowledge and information' (NLM, 2019k).

NLM notes that this mission statement 'bears close examination, as many of the words selected for it have deep meanings' and goes on to parse the language used in more detail, highlighting the importance of 'approachable' subject headings with 'meaningful distinctions' between them 'to support retrieval' (NLM, 2019k). MeSH demonstrates that boundaries between one type of KOS (Knowledge Organisation System) and another can be permeable; its ontological attributes include the diversity of its relationships, which extend beyond the usual hierarchical (BT/NT), equivalent (USE/UF) or associative (RT) categories to encompass MeSH tree numbers and previous indexing notes. These 'extras' make MeSH – in other respects very much part of the subject headings family in its 'hierarchical ordering of terms', 'use of authoritative language' and encoded expectation of an ideal audience (McTavish et al., 2011) – eligible to be 'reused' as an ontology.

This potential for 'reuse' links to an aspect of the MeSH mission statement under-examined by NLM in their tutorial on MeSH relationships: the word 'reproducible'. The availability of MeSH online through the open access MeSH Browser (NLM, 2019c) and MeSH on Demand (NLM, 2019d) allows the creation of new KOS which reproduce and repurpose its terminology for use in new contexts. In this essay, I will assess the extent to which MeSH can be considered 'reproducible' by analysing one 'reuse': a localised adaptation of MeSH developed to meet the needs of UK medicine within National Health Service (NHS) library and information services, named (misleadingly) Wessex MeSH.

Wessex MeSH, or WMeSH, denotes subject headings added to a local version of MeSH to fill gaps in coverage that have 'not yet been picked up by Mesh' [sic] (Noyes, 2006, 11) and to offer an alternative level of granularity pertinent to healthcare in the context of the UK. WMeSH is a component of the Wessex Classification Scheme, a revision of the NLM schedules to reflect UK medical practices (for example, the insertion of terms with application to NHS-specific services, and the alteration of spellings to British English).Throughout I will use WMeSH to refer to subject headings originating in Wessex (not present in NLM), and (W)MeSH for MeSH as it is used within Wessex.

Like MeSH, the UK translation is open access and open to suggestions for updates. Documentation for the latest (ninth) edition, updated in March 2018, is split into two PDF collections of subject headings overtly intended for two different user groups: the Wessex Annotated Subject Headings Index 'for cataloguers', and the Readers' Index 'to help end-users locate stock' (the Readers' Index is also defined in Wessex documentation as an aid for 'readers to find books on the

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[1] Romá-Ferri and Palomar (2008) categorise ontologies according to 'whether the aim is for healthcare information systems to solve problems of semantic interoperability (lightweight ontologies) or to reuse the systems' knowledge as an aid to decision making (heavyweight ontologies)' [from English-language abstract].

shelves' – a description which fails to account for the use of Wessex in cataloguing non-book items used in hospital libraries, such as games-with-a-purpose [GWAP]).These dual indexes – both inconsistently titled – are symptomatic of the (mis)representation and issues of accessibility hindering this KOS that will form the subject of discussion here, with some tentative solutions towards a (re-named) Wessex that would leverage linked data and facilitate knowledge sharing.

A truly open access model of (W)MeSH would not just be available to view online – it would go further, becoming a dynamic boundary object that better serves its users by offering 'a shared syntax' and 'concrete means for individuals to specify and learn about their differences and dependencies across a given boundary' (Carlile, 2002, 451–452). As the interface for 'a process where individuals can jointly transform their knowledge', (W)Mesh could act as a mediating layer between medical belief systems (Bowker and Star, 1999, 262) – at least, once the artificial distinction between its two indexes is collapsed.

I concur with McTavish et al. (2011) on the utility of applying Bowker and Star's (1999) infrastructural inversion to other KOS, particularly one with such blurred edges as (W)MeSH. The relevance of this theory and other classification reparations (Adler, 2016) to this case can be demonstrated by focusing on the 'practical politics, or the pragmatic reasons behind decisions to designate certain categories as visible or relevant and other categories as invisible or irrelevant' (McTavish et al, 2011). In drawing out the properties latent in (W)MeSH that would foster a change of subject towards inclusion and convergence, I hope to offer a blueprint for a KOS well-prepared to meet the health information needs of consumers.[2]

Happily, (W)MeSH already incorporates co-production practices. It is overseen by the SWIMS (South and West Information Management System) Network of NHS libraries, which cover a geographical area wider than the name suggests: survey data from 2002/3 based on a sample of 536 UK health libraries reported 50 using 'NLM with Wessex' (Watson, 2010).[3] As a product of the shared efforts of this cataloguing cooperative, Wessex 'has been developed over a period of time by many different librarians, often working voluntarily' (SWIMS, 2013b, 2) – and it shows, in imperfections both inherited and native. Its documentation hastens to pre-empt criticism with the disclaimer that 'All those who have worked on it are conscious that the Wessex Scheme is not perfect!' (SWIMS, 2013b, 2). Its unrepresentative name is one such blemish: a KOS designed to signpost to information by deploying subject headings is known by a misnomer that is not even indexed in its own KOS. The only instance of WESSEX (in the Annotated Subject Headings Index) refers to the region:

WESSEX	G
Z1 An ancient name for an area roughly co-existant with the current Hampshire, Dorset, Wiltshire and Somerset. It was used as the name of a region in the National Health Services.	

WESSEX: This WMeSH-original entry is underlined, distinguishing it from the entries carried over from MeSH. 'Z1' indicates the position of this heading in the MeSH tree structure (here, under Geographicals). 'G' denotes the Wessex classmark (Geography). (SWIMS, 2018a)

Users may never need to know the 'brand' of the subject headings they follow around the library, but the uptake of the Scheme beyond the Wessex region suggests that another WMeSH entry should be created and a '**see**' reference applied for WESSEX (the Scheme). SWIMS, on the other hand – if considered as an acronym rather than an initialism – is apt, given that participating libraries can use the catalogue curated by the Network to check how an item has been organised by colleagues,

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[2] McTavish et al. (2011, 384) profile NLM as providing 'a single authoritative access point to both academic and consumer health information resources', with MeSH offering 'health-specific subject headings for indexers, cataloguers, researchers, and consumer health-information seekers.' However, as will be discussed, (W)MeSH can be inhospitable to consumers not versed in medical terminology. The insistence in (W)MeSH on preferring terms found in 'Sources Used in Creating and Maintaining the MeSH Vocabulary' (NLM, 2019l), is out of step with an 'increasingly globalized and digitized clientèle' (McTavish et al., 2011, 383) wishing to undertake their own research, encouraged by self-care and prevention initiatives like the Expert Patients Programme (EPP) in the UK.

[3] More recent data was not available from HLISD, the Health Library & Information Services Directory.

'pooling' together practices to aid comparison and consistency (particularly helpful for real-world cataloguing of hospital libraries' non-bibliographic holdings, like wellbeing baskets). But a change to 'UK Health Libraries Classification Scheme' or similar, with a concomitant change to the designation of its authors, could enrich the discoverability of Wessex by LIS researchers (via the reduction in hits related to Thomas Hardy in LISTA results, for example), and offer a more accurate reflection of its distributed usage.

A further flaw is the missed opportunity for Wessex to improve upon MeSH. Instead, the new WMeSH headings – only a fraction of the total subject headings used in Wessex, as original MeSH dominates – perpetuate MeSH biases. Indicated by underlining and the inconsistent tags 'Wessex Mesh' and 'Wessex MeSH' in the Annotated Subject Headings Index (but not differentiated at all in the Readers' Index), the localised subject headings introduced by SWIMS 'for British usages' (Noyes, 2007) appear idiosyncratic and even unwarranted on occasion. This is surprising, given that their inclusion at all is permitted 'very infrequently and only if there is no possible alternative' (ibid.), a condition presumably subject to scrutiny. Intervening in the subject headings in the system in general 'can be quite scary', caution the Wessex instructions for cataloguers: 'you must make sure that you really want to do this. If you make a mistake, you will have to replace the heading and all its qualifiers manually and there can be 42 qualifiers at a maximum for a heading' (ibid.). Such discouraging documentation renders the WMeSH use-case effectively a last resort – which is exactly how the Wessex documentation, without irony, describes its new subject headings: 'As a last resort, additional local headings are created where there is literary warrant, and no possible NLM MeSH heading or combination of headings can be used' (SWIMS, 2013a). It is notable that only literary warrant is mentioned by SWIMS, in contrast to the addition of user warrant as a criterion to the MeSH selection process reported by McTavish et al. (2011), giving consideration to terms 'suggested by indexers *and others*' [my italics].

The reluctance of SWIMS to innovate beyond essential regional requirements, and to limit how new entries are warranted, is understandable: any attempt to sustainably implement more substantial changes to the MeSH behemoth would require far greater resources than those at the disposal of a consortium of NHS libraries. After all, it makes good practical sense for public-sector health libraries to outsource, deriving their subject headings from a global thesaurus with its own system of maintenance and modifications already in place and filtered through the localised interface of Wessex for those tricky situations when only PRIMARY CARE TRUSTS (WMeSH) will do; as Neath Port Talbot Hospital Education Library so succinctly put it, 'Scheme is fine for a very small library' (Watson, 2010).

But the repercussions of what WMeSH adds, and conversely of edits *not* made, on the '[d]iverse (local) communities [which] have to sacrifice meaningful aspects of their cultures while adopting and accepting the efficiency of the standards' (Adler et al., 2016), remind us of the global scale and power wielded by WMeSH's parent – an outlook inherited by the emphatically unendorsed WMeSH through mother MeSH despite its bastard status [italics present in the original]:

> *NLM have asked us to make it clear that the Wessex Scheme is not an official NLM revision of its classification scheme [...] The National Library of Medicine neither endorses nor supports the Wessex Scheme.* (SWIMS, 2013b, 2)

WMeSH is thus simultaneously the offspring of a KOS with universal reach (with the responsibilities that position of power entails) and disowned by it, a precarious position that perhaps explains some of the oddities of this hybrid.

Of the new entries grafted onto the MeSH trees by SWIMS, the majority are place-names: BOURNEMOUTH, HAMPSHIRE, SOUTHAMPTON (distinguished over other, lesser places in the topographical hierarchy by being 'A University city' in the Annotated Subject Headings) and, intriguingly, CLWYD are all underlined as WMeSH. What warrants the inclusion of the single Welsh

place-name in a KOS whose authors were unaware was even used in Wales?[4] It is difficult to make a case for literary or user warrant: searching for CLWYD in the SWIMS catalogue returns only three hits, all of which are coordinated with the region Gwynedd – conspicuous by its absence from WMeSH. Even more confusingly, the two Wessex indexes do not map onto each other: WALES appears in the Annotated Subject Headings, but does not exist in the geography of the Readers' Index (let alone CLWYD). And that is not all: place-names as subject access points also prove problematic in their related terms. We are told, in no uncertain all-caps, that CUMBRIA and LANCASHIRE are included in NORTH EAST ENGLAND – yet neither of these places are indexed. PLYMOUTH overcompensates for the orphan terms by being qualified as 'The principal city of Devon', with the latter uncapitalised and no '**see**' reference – yet DEVON does appear, as a full WMeSH entry, in both sets of subject headings.

At a time when information organisation is taking the Kuhnian leap towards linked data, MeSH's refusal to recognise WMeSH suggests its resistance to becoming enmeshed with 'concepts peripheral to the interests of the NLM' (Noyes, 2006, 1); Bowker and Star's (1999) theory of infrastructural inversion, referring to 'the reality that is constructed through the categories that resist or remain visible' (McTavish et al., 2011), is valuable here. WMeSH, which usually does as its mother tells it, contributes to the construction of such resistance. Looking at the underlined WMeSH entries in the Annotated Subject Headings index gives some indication of what the 'peripheral' issues are, as well as disclosing a lack of organisation seriously concerning within a KOS. The following is an instructive example, on the 'peripheral' issue of patient involvement:

COMMISSION FOR PATIENT AND PUBLIC INVOLVEMENT IN HEALTH   **WX125**
N3 N5. Wessex Mesh. The replacement organisation for Community Health Councils.(superseded in 2012 by Healthwatch) **See** CONSUMER ADVOCACY; COMMUNITY PARTICIPATION

(SWIMS, 2018a)

Even disregarding the sloppy punctuation in the text inserted by SWIMS here – when punctuation itself is a key component of other KOS like MARC – this scope note is problematic. At any rate, punctuation should not be disregarded: consider the erosion of trust placed in a knowledge apparatus that fails to structure a sentence correctly in the British English it claims to uphold. Despite the strict guidelines surrounding Wessex, nobody at SWIMS appears to have proofread WMeSH scope notes and relational mappings before publishing them. The inconsistency in capitalisation demonstrated in place-names above persists in other subject heading entries: 'Community Health Councils' is not capitalised as a subject heading, yet as soon as alphabetical order allows there it is, with its all-caps entitlement loudly calling into question its previous designation:

COMMUNITY HEALTH COUNCILS   **WX125**
N3 N5 Wessex Mesh. Superseded by COMMISSION FOR PATIENT AND PUBLIC INVOLVEMENT IN HEALTH and in 2013 by Healthwatch **see** CONSUMER ADVOCACY; COMMUNITY PARTICIPATION

(SWIMS, 2018a)

Comparing this with the previous example, we see – or '**see**', although the usage of that reference indicator is also inconsistent – that, as already demonstrated by the Typographical Errors in Library Databases project (Ballard, 2009), the many eyes of cooperative cataloguing still do not prevent errors from entering the canon. The handwritten definition for this WMeSH instance

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[4] Personal communication with Anne Lancey, writing on behalf of the SWIMS Network. On being asked about how Wessex manages non-English works – for example, in libraries based in Wales where Welsh-language health information may be held – she responded: 'That is an interesting question… I don't think there is any way within Wessex to distinguish […] The library would have to find another way of identifying them somehow […] I'm afraid I don't know of any Welsh libraries within the small group on the mailing list that you could ask either' (15 February 2019). As evidenced from the quote from Neath Port Talbot above, at least one NHS library in Wales is using Wessex; email correspondence with Lizzy Evans, Swansea Bay Health Board (16 April 2019), documents three further libraries using it, with others preferring Dewey or pure NLM.

introduces ambiguity – in which year did Healthwatch supersede these bodies? – and obfuscates: users of the Readers' Index, not trusted with scope notes, will know only that Healthwatch exists (subsumed under '**see** CONSUMER ADVOCACY'), not that it is the current manifestation of two other entities. Looking up COMMUNITY HEALTH COUNCILS leaves the user with no indication of the obsolescence of that subject heading, just a **see related** reference to COMMISSION FOR PATIENT AND PUBLIC INVOLVEMENT IN HEALTH (which circles back around to CONSUMER ADVOCACY). Berman has previously recommended the inclusion of specific local information, extending to contact details (Berman, 1982): WMeSH could benefit from taking a leaf out of his book in this regard.

Elsewhere in the WMeSH maze, prescriptive injunctions like 'Do not confuse learning disabilities with learning disorders' (SWIMS, 2018a) backfire when neither WMeSH LEARNING DISABILITY nor (W)MeSH LEARNING DISORDERS are capitalised in the scope note, and the plural form used for 'learning disabilities' does not match its appearance in the index:

LEARNING DISABILITY	WM800-96
C10 C23 F1 F3 Wessex Mesh. A condition of significant mental impairment in which the subject has difficulty in learning skills and acquiring information. (Chambers Concise Dictionary) For / education use EDUCATION OF LEARNING DISABLED	

(SWIMS, 2018a)

The same is true for WMeSH PRACTICE NURSE, in contrast to its pointedly plural WMeSH sisters: 'Midwife **see** MIDWIVES' (SWIMS, 2018a).

Inadequate cross-referencing like this brings to light the hypocrisy of Wessex in not making allowances for end-user errors, like mis-spelled words: its own typo AMBULTION – not dissimilar to the 'skizophrenia' that a user might enter and to which Wessex would be wilfully blind – appears as a related term under SELF-HELP DEVICES, effectively ensuring that no keyword search for AMBULATION in that PDF section will discover the reference. And that is a case where, at least, there is a cross-reference; subject headings MIA include CRABS (DISEASE), LICE and SEX CHANGE, all non-existent in a Readers' Index that trumps even Berman's powers of parody. Compare his comic 'The Cataloging Game' (n.d.) ('There are no directions. Make them up as you go along'), where landing on the square marked STOMACH ACHE directs players to 'Cross to abdominal discomfort', with (W)MeSH, where stomach ache does not exist as a heading; the most(ly) related term is ABDOMINAL PAIN (which is not cross-referenced to STOMACH at all).

So much for the content; what of its envelope and its users? Considering that the Annotated Subject Headings Index is reserved for those with a LIS degree, it seems highly unprofessional that there appears to be no file-naming protocol in place. The PDF for 'N' entries is startlingly labelled '22 July 1994', which conflicts with the more reassuring document footer 'Last updated 09/03/2018'. Personal information management should be baked-in to any KOS that aims to be a framework for distributed libraries, yet the conditions of production on display in the online documentation suggest that this KOS does not practice the KOP (Knowledge Organisation Processes) it preaches. The charge is given weight by the poor referencing in SWIMS-authored scope notes, which raises the suspicion that the authors of the introductory notes to Wessex may not be the same as those tasked with the WMeSH entry for ALEXANDER TECHNIQUE, which takes its definition from '(Web site of The Society of Teachers of The Alexander Technique.)' [sic]. Scope notes are not public-facing, but an example should be set for colleagues by using a recognised form of referencing consistently and accurately, in place of the satisfied vagueness of '(From their web site.)' [sic] or the incomprehensible string '(E.M Boyles & A.W Fayles Journal of Humanistic Psychology April 1983 vol. 23 no. 2 99- 117)' [sic] (the reference given for REFLECTIVE LEARNING, which is of course a part of the LIS skillset – alongside maintaining the scholarly record and educating others on how to cite correctly).

Bowker and Star (1999), riffing on the tree structure of MeSH, compare the business of classification with describing a forest: 'You may write a basic manual of forestry, or paint a landscape, compose an opera, or improve the maps'. The forest of WMeSH is on the wilder side, with dead-ends and tangles of criss-crossing roots ready to trip up those with an information need. In adapting MeSH, (W)MeSH co-opts a thesaurus with universal ambitions to serve specific purposes –

an approach that should include providing details of KOP to all, not just to those with an information science background. The classification of the universal *as* particular (Adler et al, 2016) points to the 'importance of doing [KO] history' (Tennis, 2012): '[w]hat can we learn from examining the records of classificationists as they assembled their schemes?' (ibid.); from looking at SWIMS documentation, the answer is quite a lot about attitudes and assumptions around access.

Historically, medical libraries in the UK were the preserve of doctors. In a letter to the *British Medical Journal* on 'Postgraduate Medical Centres' – the forerunners to libraries in hospitals – co-author Keep, whose name is now eponymous with the NHS library where I work, argued in favour of widening access: 'we feel that this is an appropriate time to take stock and see whether the role of the postgraduate centre cannot be further extended' to cater for 'a multidisciplinary team in the fullest sense' (Brook and Keep, 1972). But as Keep rightly recognised, 'This may not be a popular view at the present time': the letter was in response to the 'Hands Off [our] Postgraduate Centres' brigade, for whom such facilities were 'built by doctors for doctors' and should 'cater for doctors only' (Ferriman, 1972). In their view, the 'combined use of centres' threatened the 'established pattern' of 'doctors working in the library, listening to audiotapes, or looking at colour transparencies' without sharing with other patrons, and that this tradition 'should be allowed to remain as it is', 'because the educational interests of doctors and the other professions are totally different and can never coincide' (Ferriman, 1972).

Today, libraries using Wessex open their doors to nurses and allied health professionals as well as doctors, with some also extending access to members of the public (HLISD, 2019). In our global information society, where 'one can no longer be certain of a particular audience' and 'anyone with Internet access is able to view MeSH terminology, not just medical specialists' (Joudrey and Taylor, 2017), it is critical that KOS should adapt accordingly. In the light of these developments, the inhospitable segregation between users enforced by the two Wessex indexes demonstrates a disconnection in this KOS between its roots in NLM's mission statement and the prejudices of its creators. Wessex Annotated Subject Headings follow MeSH 2019 verbatim in describing SUBJECT HEADINGS (in its own meta-entry) as 'Terms or expressions which provide the major means of access by subject to the bibliographic unit' (this definition, although again limited by excluding non-bibliographic referents, would have been a useful addition to SUBJECT HEADINGS in the Readers' Index by affording behind-the-scenes insights into the classification process; instead, it appears there with no explanation). Thus the clue, as it often is, is in the name: subject headings are subjective, and (W)MeSH are no exception (as we have already seen, despite Kipp and Campbell's (2010) assertion to the contrary: 'while users value social and subjective factors when searching, they also find utility in objective factors such as subject headings').

Subjectivity can be desirable, and even a means to re-centre 'concepts peripheral' in communities where what are marginal paratexts for NLM are the nuclei of discussion. Wessex actively encourages its indexers to look at paratexts: 'Never classify by title alone […] Read prefaces, blurbs, introductions, contents pages etc. for information on the true nature of the publication' (SWIMS, 2013b, 2). This positive emphasis in Wessex on paratexts reflects Bowker and Star's description of classifications as 'objects for cooperation across social worlds, or as boundary objects' (1999, 15); '[o]ur lives are henged round with systems of classification' (ibid., 1), and the principle paratext of the KOS itself has much to tell us: 'who learns what from the fact that the coding book always falls open on a given page?' (ibid., 281). But the two-tier access system represented by the Wessex pair of indexes denies the diversity of library users. In this dichotomy, where might the expert patient be categorised – who, with long-term lived experience of their condition, might assess the scope notes appended to the many DIABETES entries in the Annotated Subject Headings with a more critical eye than the junior doctor (that is, if neither were deterred by the Wessex stipulation that the Annotated version is not for their non-cataloguer eyes)? In (W)MeSH, the eschewing of patient-friendly terminology for preferred terms in Greek and Latin implies that there is a preferred *reader* as well: 'such terms as "clear", "easy to read", "useful" and "for the layperson" may well say more about the librarian reviewer than the intended, or optimal, reader' (Elsesser, 1985).

A controlled vocabulary by nature will not speak the same language as everyone who consults it. Cross-references and related terms are intended to expand on the limited vocabulary selected for the subject heading positions. Analysis of which terms are bolded, which relegated to '**see**' references,

and which absent is revealing. The emboldened FATIGUE SYNDROME, CHRONIC ignores the controversy surrounding this nomenclature: 'Many patients feel one of the great burdens of having chronic fatigue syndrome is the name of the illness. The word fatigue (which many patients refer to as the 'F' word) indicates everyday tiredness. It reinforces negative perceptions that remain with the public and most medical doctors' (Bowker and Star, 1999, 67). The lack of sensitivity here is exacerbated by the fact that the condition, in accordance with Wessex filing order, is listed under F. The addition of a reference in the scope note to disagreement over the agreed term could help earmark the term for future revision; instead, all that Wessex offers is an instruction towards correct coordination (copied word-for-word from MeSH): 'Do not confuse with "chronic fatigue", use FATIGUE + CHRONIC DISEASE' (SWIMS, 2018a).

This reluctance to allow currency into the rarefied world of the KOS has led, in 2019, to the pinballing of patients searching first under the terms they know and use to the proper, 'preferred' term; preferred by whom? Or, to borrow from Murdock et al. (2012), 'usability by whom or by what?' Not, apparently, 'clients' ('**see** PATIENTS'), who are too often confronted by the very 'curl up and die' words that they turn to an authoritative KOS to avoid (DEEP, 2014). As 'a controlled vocabulary can exist only insofar as there is agreement on the meaning and application of the terms' (Young and Mandelstam, 2013, 13), the fracturing of such agreement – if any consensus ever existed – may signal the evolution of a KOS into an ontology.

This is seen in the increasing challenges to authority encoded in subject headings (the title of the film *Change the Subject* speaks volumes) (Baron and Broadley, 2019). (W)MeSH could learn from the Health A-Z list on the NHS website (NHS, 2019), which is currently undergoing review to introduce simpler language (Wilcox, 2019). Compare the Wessex copying-and-pasting of Chronic Fatigue Syndrome as (insensitively) indexed by MeSH with the Health A-Z entry: 'CFS is also known as ME, which stands for myalgic encephalomyelitis. There's some debate over the correct term to use for the condition, but these pages will refer to it as CFS/ME.' (NHS, 2017). This is the sort of contextualised approach advocated by Berman (1982), with specificity co-existing alongside accessible yet non-patronising scope notes.

In another example of Wessex having much to learn from its own collections, 'Dr Jargon', a GWAP at our library catalogued (imprecisely) under WS100 – 'Children. Paediatrics. Child health. General works' (SWIMS, 2015) in the absence of a subject heading for board games. The game works by taking the sorts of clinical terms actually used as subject headings in the Readers' Index (awkward, as these terms are the same ones that Wessex encourages library staff to print out for user-friendly display) and challenging players to describe those concepts in alternative terms. 'Dr Jargon' is a useful teaching resource which, as an unintended side-effect, puts clinical staff in the shoes of a cataloguer and provides first-hand experience of what Elsesser has termed 'cataloging trauma', 'inherent to a field as prone to revision as medicine' (1985). The 'trauma' is the attempt to reconcile consumer health vocabularies with their clinical equivalents: '[i]t will be argued here that the catalog must reflect the vernacular, but it is also argued that the catalog can (must?) instruct' (ibid.).

Szostak (2014a) views this 'trauma' as the manifestation of a 'tension between classification and the recognition, appreciation, and support of social diversity' (2014b, 160) – a tension which I posit could be remedied by narrowing the gap between conceptual universality and universality-as-interoperability in KOS (Gnoli and Szostak, 2015). If one understands universality (the concept) as a privileging of one viewpoint or domain at the expense of others, can special schemes like Wessex also be 'universal' in the sense of championing accessibility and interdisciplinarity? I would argue 'yes', and add that topics constructed as marginal in the (W)MeSH world-view can take centre-stage in a system espousing the principles of proportionate universalism.

Fittingly for a discussion of a medical KOS, I borrow the model of proportionate universalism from the healthcare domain. The NHS defines proportionate universalism as 'the resourcing and delivering of universal services at a scale and intensity proportionate to the degree of need' (NHS Health Scotland, 2014) – that is, services should be universally accessible to all, but with proportionately greater resources funnelled to the more disadvantaged. The application of this in practice to a KOS like WMeSH could be achieved by building on the ontological qualities already present and re-situating access points as linked data nodes connected to the semantic web, supporting

the organic creation of subject headings that take multiple perspectives into account. It is a vision that has already been fruitfully expanded on by Rasmussen Pennington and Spiteri (2018), whose dementia ontology offers a model more compellingly 'reproducible' for marginalised voices than (W)MeSH.

In Rasmussen Pennington and Spiteri's ontology, the dementia patient is given a voice and placed at the nexus of the knowledge web: their terminology, and their narratives, link out to entries by clinicians and caregivers, producing a living KOS that enables all parties to inter-operate in one another's language (and putting the 'natural' into natural language processing). The idea is akin to dictionary 'slips' updated for the digital, citizen-science age: in the compilation of historical dictionaries like the Oxford English Dictionary (OED), 'slips' or index cards with illustrative quotations demonstrating the headword in use were submitted by volunteers from all walks of life. Today, this can be replicated in subject headings reconfigured as tags with URIs, well-suited to sharing online and not necessarily constrained to text: for example, a caregiver's entry, #ConfusedAtNight, could link to the #sundowning concept submitted by a dementia charity, which in turn links to a visual or physical object tag chosen by the patient to convey their feelings of unease at the end of the day – a photograph of a darkening sky, perhaps (Rasmussen Pennington and Spiteri, 2018).

This model responds to a call for future research into classification systems that would help meet the information needs of people living with dementia (Howarth, 2014). The use of objects within a (boundary-) object-based KOS can compensate for impaired language abilities: 'By using objects as a surrogate for a narrative we are stripping off the baggage of human language […] a given surrogate may be the key to clustering narratives in such a way that the object is somewhat like the connections made by a switching language or crosswalk' (Howarth and Olson, 2013). The use of linked data in a KOS like Wessex to connect seemingly disparate tags semantically promises a rewrite of subject headings as the 'communicative facilitator' (Albrechtsen and Jacob, 1998) in a network of code-switching that could solve the 'problematic' domain divisions identified by Hjørland and cited by him as preventing the possibility of a 'reproducible' KOS: classification cannot be 'reused in different contexts', because 'different discourse communities develop their own terminology, meanings, and relevance criteria (2012a, 302).

But if, as Howarth (2014) claims, 'information science as a discipline has demonstrated through its tools and techniques an alignment, even a complicity with the normative', then the integration of representative substitutes in KOS that allow people to 'describe information in their terms' (Rasmussen Pennington and Spiteri, 2018) has the potential 'to shift the focus from consistency to commonality' (Howarth and Olson, 2013). The embrace and elevation of dialogue between different communities as the major scaffolding forming its infrastructure could absolve Wessex of much of the criticism directed at it in this essay. Albrechtsen and Jacob (1998, 297–298), writing of a HIV/AIDS vocabulary developed to further understanding between 'clinical and medical researchers, practitioners of alternative medicine, nutritionists, psychotherapists and other professionals, as well as those individuals who are either living with the disorder themselves or are caring for someone who has contracted disease', noted that their framework was 'not intended as a classification per se but as a mediating vocabulary'. 'Mediating' deserves, but does not warrant, its own subject heading in (W)MeSH ('**see** NEGOTIATING') (SWIMS, 2018a): it is through mediation like this that (W)MeSH could upend the standard top-down method of biomedical knowledge production to form a bottom-up epistemology where 'research in lived experience must necessarily feed into basic clinical research' (Albrechtsen and Jacob, 1998, 298). The outcome is not too remote from the capabilities of a reworked (W)MeSH: 'a tool for facilitating communication both within and across diverse interest groups […] the scheme is also hospitable to adaptations and extensions as an indexing language in local contexts' (ibid.). Sounds familiar? It is what MeSH could be, it if were more flexible and open to 'concepts peripheral'. The nimbler, relatively small-scale (W)MeSH, however, is in a position to take this idea of a 'hospitable' scheme for hospital use forward, offering a more equitable route to information and finally addressing Elsesser's (1985) contention – '[f]requently not addressed' – that 'the ethical standards applied to materials selection, rendering of services, and physical access to the library must be applied to cognitive access as well'.

If (W)MeSH were to take on this refashioning of itself, people living with conditions described by subject headings could be empowered to classify their experiences in their own ways while aiding the understanding of and between other groups. In such a system, the flaws in (W)MeSH could be corrected via crowdsourcing of interested parties, like patient representatives, and its latent ontological features activated. Users attempting to retrieve information on their 'cirhosis', or seeking next steps after a diagnosis of 'prostrate' cancer, or even vainly trying to find any resources on cancer at all (hint: it's not under C. Both Wessex indexes follow MeSH in filing cancer under NEOPLASMS), would find their queries matched with and validated by folksonomic entries in the ontology – a vast improvement on the current blank refusal of Wessex to recognise the ontological realism of any term not indexed by it, whether due to a typo or not. A linked data rendition of (W)MeSH would grant Elsesser's wish of 'finding the client's "key word" in the catalog or index… the way they *think* it is spelled', and would make extrapolative cataloguing much easier for non-subject specialists unafraid to draw upon 'the most useful and overlooked tool […] the user' (ibid.). If 'it seems a bit arrogant to require the patron to come up to the artificial level of erudition imposed by our technically correct tools' (ibid.), it is just as arrogant to imagine that these tools evidence an infallible erudition in the first place (a list of sources used by NLM in the compilation and curation of MeSH can be seen at NLM, 2019l).

Berman's criticism (1982) of subject heading access to consumer health information as 'A frequently awkward, technical, clinical vocabulary that frustrates "first-try hits" by lay users' nails hapless searches in (W)MeSH for 'cancer drug tests' (**see** DRUG SCREENING ASSAYS, ANTITUMOUR) and 'cervical cancer' (which gets translated to 'cancer of the cervix' before coordination as UTERINE CERVICAL NEOPLASMS) (SWIMS, 2018a). The chasm between tools and users here is reminiscent of Whitelaw's thought-experiment (2015):

> Imagine yourself outside an art gallery in a far-off city, with a collection you don't know well. You enter the building to find a small, drab lobby with an attendant at a desk. The attendant asks you to enter your query on a small slip of paper. Not knowing the collection […] you write down something arbitrary, and pass it over. The attendant disappears for a moment before returning with a line of artworks sitting on trolleys. These are paraded, ten at a time, through the lobby. You can submit another query at any time, calling forth more trolleys, but there seems to be no way to explore the gallery beyond this small lobby.

Walsh (2011) – in the context of LCSH, but still applicable here – has noted that, bereft of the predefined starting points, 'users are unaware of the appropriate term to use and forced into the hit-or-miss search method' already described by Berman. But what linked data proposes is the explosion of *the* appropriate term into *terms* appropriate for the user (pre-coordinated or post-, as needed), leading to less appropriation, more liberation and even, Elsesser (1985) suggests, 'a collection arranged anatomically' (if such an arrangement would be helpful to users). Wessex already has the makings of a Wessex 2.0 within it: a collaboration of precision and exhaustivity which, combined, create a generous interface (Whitelaw, 2015) in tune with Elsesser's policy of 'generosity' when deciding whether a resource falls under the rubric 'relevant to biomedicine', given that 'The distinguishing features of health information are more perceived than real'.

(W)MeSH could enhance both its generosity and its dedication to the NLM mission statement by publishing minutes of the meetings where changes to subject headings are discussed. The 'practical politics' of such decisions are visible only in their product, erecting a screen between general audiences and the mysterious machinations of the Wizard of Oz. The removal of this screen as an exercise in infrastructural inversion would be of benefit to cross-boundary learning and understanding of how a subject heading 'comes to be reified by modifying an operational definition' until the (ostensible) convergence of perceptual distinction with classifier (Roth, 2005). This would be particularly helpful from a health literacy point of view and could help move forward changes to the structure of Wessex, bringing it closer to the heavyweight ontologies of shared decision-making, Rasmussen Pennington and Spiteri's dementia ontology model, and a fully open record of how changes to terms are ratified.

I suggest health literacy as a lens through which to critically view the readiness of Wessex for a future linked data edition because health literacy itself encapsulates, in microcosm, how knowledge organisation can both enable and disable (Clarke et al, 2011). Ironically for a term used to promote clear communication and shared decision-making in healthcare, definitions of health literacy differ (Berkman et al., 2010; Mallows, 2016; Sørensen and Brand, 2014), and it surprises by being changeable not only in name but calibration when applied to an individual or system in different contexts. If the preparedness of Wessex to join the semantic web is appraised in terms of its health literacy, the aspects that need to change become apparent: first and foremost, the admittance of HEALTH LITERACY itself to full membership of the Scheme. Although the term can be traced back to the late 1950s using the Google Books Ngram Viewer (Google Books Team, 2013), it did not warrant introduction into (W)MeSH until 2010, when SWIMS also chose to add it upon reviewing the terms added to MeSH in that year. But after nine years, this subject heading still lacks an access point in the Wessex schedules, an oversight that my correspondence with SWIMS brought to light; in the words of my contact, 'it may be good to add [health literacy] in to the schedules at WA82[5] now it is in fashion! I will discuss with the Cataloguing Group at our next meeting'[6] (Lancey, personal communication, 7 March 2019).

While 'fashion' certainly has a role to play in the selection of subject headings as part of a living classification – MINDFULNESS was first promoted to full subject heading status in (W)MeSH in 2014, an enlightened decision that avoids the ongoing stresses experienced by libraries using other KOS as they attempt to fit adult colouring books into Procrustean beds of Dewey's making (Fox, 2019b) – it is concerning that the 'fashionable' nature of a term can exert such authority. Concerning too is the discrepancy in Wessex between the schedules (latest version 2015) and the subject headings (latest version March 2018), noted but not remedied: 'Never classify by relying on the classification numbers in the Annotated Subject Index to the Wessex Classification Scheme. Always check the classification numbers given in the Index against the actual schedules' (SWIMS 2013b, 2–3).

Notwithstanding its flaws, however, Wessex is in the excellent position of being able to borrow the best of MeSH while forging its own, more flexible, infrastructure. The combination of NLM's resources with the scalable testbed of Wessex could put into practice the theory that '[w]ith international authority control, technical terms and their equivalent popular terms could reside on the same record, which could be activated by a search on any of the equivalent terms' (Joudrey and Taylor, 2017, 488). Better yet, trials along this course may in time succeed in finding the 'better terminology' Joudrey and Taylor desired should replace 'authority control' altogether (ibid., 375). Even before we reach a mature Wessex ontology that has embraced linked open data, this KOS has shown signs of defying its own scare-mongering on the perils of introducing the very WMeSH terms it was designed to accommodate to instead set out ahead of NLM in the introduction of new terms with applicability outside the UK. GUIDE DOGS is one example that WMeSH took it upon itself to add, a compound term absent from MeSH (a KOS that includes ICE CREAM and ICE SKATING, but seemingly no instances of assistance animals beyond the entry term Companion Animals). Astonishingly (and worryingly), WELLBEING is another WMeSH innovation presumably too 'peripheral' for NLM (which only added a class number for 'Health information' [patient-facing resources] in its 2019 Winter Edition) (NLM, 2019f). Finally, a Wessex-original scope note for GRAPHIC NOVEL [PUBLICATION TYPE] is also an improvement, differing from the MeSH version to highlight the inclusion of non-fiction in this category.

In such innovations, one sees a bright future for this bastard child of MeSH. LIS professionals – contrary to Dahlberg's damning judgment of 'universal' classifications DDC and UDC, that 'we really cannot decently pass them on to our children' (2017) – *can* feel confident passing on (W)MeSH to the next generations of students, practitioners and lay contributors. NLM may not endorse (W)MeSH, but in making its outputs 'reproducible', it tacitly supports the spirit of cooperative cataloguing by allowing others to remix its content with more familiar consumer health vocabulary within the biomedical domain. (W)MeSH could formalise the relationship without full endorsement by applying a CC BY-NC-SA license (derivatives allowed) to its reinterpretation. The badge of a

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[5] WA82: 'Patient choice. Consumer/client choice. Include the 'informed patient', the 'expert patient'. Patient-centred diagnosis. Medical tourism' (SWIMS, 2015).

[6] The next meeting is scheduled for 1 May 2019 (post-submission of this essay).

Creative Commons license on Wessex documentation would also support (W)MeSH's endeavours to become open access in more than the 'view online' sense, by licensing its own protocols for onward reuse as well – in the libraries of health charities, for example – and facilitating access to the undiscovered public knowledge of lived experience (Nunn and Pinfield, 2014).

In this essay, I have attempted a critical analysis of the WMeSH and (W)MeSH aspects of the Wessex KOS. I have also tentatively submitted some ways forward, in recognition that such analysis is not just about 'challenging existing conceptions, systems or practices', but harnessing the energy of these challenges to answer the question that remains 'as to what should be put and used in their place' (Ragaller and Rafferty, 2012, 263). (W)MeSH does not need to be replaced, but rather should be supported to grow into its potential as a linked data ontology. This development could be achieved in a variety of ways: the posting of open minutes of cataloguing meetings on the Wessex site, standardised versioning of index PDFs, co-production with patients on the representation of sensitive terms. My correspondence with the SWIMS Network echoes the experience of Watson (2010), whose request for permission to study their work 'was met with much enthusiasm and a willingness to help as they also feel more research in this area is needed'. Hjørland (2002, 428) may opine that classification research 'is difficult and time-consuming and has too little academic reward', but I disagree: in my view, the future work to be done promises great intellectual satisfaction and improvements in how people access information about their health. Why not emulate the periodic table (Nature Editors, 2019) and expand the ambitions for Wessex to be able to predict new information needs? This dream has been previously articulated:

> There is no foretelling what information will be relevant […] In future years, [data] collected could be re-mined as advances in medical knowledge re-configure the attributes. For example, the discovery of a new disease could be read backwards into existing data, and entities unknown at the time of data collection could be read out of the data. In practice, the infinite possible ontologies of objects are limited by the pragmatics of data collection and by the inescapable inertia of categories already in use. (Bowker and Star,1999, 116)

By recognising HEALTH LITERACY as a subject heading, Wessex could be said to have already taken a step out of 'inertia' and towards the concluding vision:

> Why is this of relevance, even importance to Information Science? It is our tools and approaches that have contributed to normalizing world views – to constructing (if not always creating) naming devices, labels, categories, and logical ways of sorting and finding supportive of the normative. To the extent that we can imaginatively rethink our ways of representing, of substituting, of designing surrogates for persons, places, events, and things, we may contribute to innovative, perhaps groundbreaking approaches to conjoining "the One" with "the Other". (Howarth, 2014)

First, we need to get the basics right – the 'correspondence with the way in which end-users understand and search for information, a clear exposition of the relationships between terms […] hospitality to new topics, alternative routes to resource discovery and the clear exposition of the rules underpinning a system and its application' (Broughton, 2008, 54). Developing (W)MeSH as an ontology would help to tick these boxes, experiment outside those boxes – like colouring outside the lines of those difficult-to-categorise 'colouring for mindfulness' books – and, at last, go some way towards addressing Jackson's (1968) call to action on subject headings at the head of this essay.

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