

PHOTOGRAMMETRIC TERMINOLOGY FOR THE INTERNATIONAL COMMUNITY

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ABSTRACT:

The Editorial team of *The Photogrammetric Record*, the international journal of photogrammetry published in the United Kingdom since 1953, has long felt the need for standardised photogrammetric terminology, in order both to eliminate inconsistency within individual authors' work and to maintain consistency within the journal over time. Various forms of guidance to authors have been issued over the years, and in 2000–2001 a terminology listing was produced for the internal use of the Remote Sensing and Photogrammetry Society's team of volunteers working on the *Record* and of the professional co-publishers, Blackwell Publishing (now Wiley-Blackwell). After a succession of revisions and enhancements, the full listing was made available to the wider public for the first time, through publication in *The Photogrammetric Record* in June 2007 (Newby, 2007). By this stage the list also included very many terms from the related fields of remote sensing, image processing, computer vision and indeed of geomatics as a whole, which inevitably occur in contributions relating to photogrammetry in the widest and most inclusive sense. It was hoped that, as well as helping authors to prepare papers for submission to *The Photogrammetric Record* itself, the list might become accepted across the whole international photogrammetric community of Academe, professional practice and industry, and thus also lead to greater consistency of terminology and improved use of English in contributions to kindred publications, to the meetings of the International Society for Photogrammetry and Remote Sensing and so ultimately to the *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*. It was also hoped that feedback from readers might lead to further revision and ultimately to a consensus and a more authoritative listing of standard terminology which will be of even greater benefit to photogrammetrists and to those who publish their work worldwide. Up to the time of writing it is clear from dialogue with authors and prospective authors that the guidance is being well received, although relatively little feedback has arrived from the readership at large. The ongoing process of editing incoming contributions has led, as usual, to an accumulation of further terms in need of standardisation and therefore worthy of inclusion in a future revision. This presentation to the ISPRS Beijing Congress details the process that led to the published listing, together with numerous examples of different types of confusing, contentious or difficult terms. It again invites feedback as well as general acceptance from the international community. The standard page allowance for ISPRS Congress papers will not permit republication of the full list, which ran to twelve pages in the format of *The Photogrammetric Record*. However, the original publication remains available both in print and online. It will also be available, free of charge for a limited period, to any individual Congress delegate who does not have ongoing access rights.

RESUME:

L'équipe éditoriale de *The Photogrammetric Record*, revue internationale de photogrammétrie publiée au Royaume Uni depuis 1953, a ressenti très tôt le besoin de standardiser la terminologie employée en photogrammétrie afin d'éliminer les incohérences au sein des travaux remis par ses contributeurs et de garantir la cohérence de la publication dans le temps. Des recommandations de différents types ont été faites aux auteurs au fil des ans et, en 2000–2001, une liste terminologique a été produite à l'usage à la fois de l'équipe de volontaires de la Remote Sensing and Photogrammetry Society oeuvrant pour la revue et de l'entreprise coéditrice Blackwell Publishing (désormais Wiley-Blackwell). Au terme d'une série de révisions, la liste complète a été publiée dans *The Photogrammetric Record* en juin 2007 (Newby, 2007). A ce stade, la liste incluait aussi de nombreux termes émanant de domaines connexes tels que la télédétection, le traitement d'image, l'infovision ou la géomatique dans son ensemble, employés dans des contributions traitant de la photogrammétrie au sens le plus large. Il était espéré que la liste aide non seulement les auteurs à préparer leurs articles en vue de les soumettre au *Record*, mais qu'elle soit largement acceptée au sein de la communauté photogrammétrique internationale et conduise ainsi à une cohérence terminologique accrue comme à une utilisation plus judicieuse de la langue anglaise au sein de contributions à des publications apparentées, de conférences de la Société Internationale de Photogrammétrie et de Télédétection (ISPRS) et au final, de ses archives (*International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*). Il était aussi escompté que des réactions de lecteurs entraînent une nouvelle révision, conduisent à un consensus et donc à une liste terminologique standard faisant autorité, profitant aux photogramètres comme à ceux publiant leurs travaux dans le monde entier. Les dialogues menés avec des auteurs potentiels et effectifs indiquent clairement que les conseils dispensés ont été bien accueillis, en dépit du faible retour émanant de la communauté élargie des lecteurs. L'édition des contributions reçues fait sans cesse apparaître de nouveaux termes requérant une standardisation et donc dignes d'être inclus dans une future révision. Cette présentation au congrès de l'ISPRS à Pékin expose le processus d'élaboration de la liste et l'illustre par divers exemples de termes litigieux, difficiles ou prêtant à confusion. La liste dévoilée réclame à nouveau des réactions et une large acceptation de la part de la communauté internationale. L'espace alloué à chaque auteur pour les contributions à l'ISPRS ne permet pas une republication de la liste entière, longue de 12 pages au format de *The Photogrammetric Record*. La publication originale

reste cependant disponible sous forme imprimée et en ligne. Elle est aussi accessible gratuitement pour une durée limitée à tout délégué du congrès qui ne bénéficie pas de droits d'accès en cours de validité.

KURZFASSUNG:

Die Herausgeber der seit 1953 im Vereinigten Königreich verlegten internationalen Fachzeitschrift für Photogrammetrie *The Photogrammetric Record* halten eine Standardisierung der Fachsprache seit langer Zeit für notwendig, um einerseits die Beiträge der einzelnen Autoren terminologisch zu vereinheitlichen und andererseits die terminologische Konsistenz der Publikation im Lauf der Zeit zu wahren. Über die Jahre hatte man den Autoren verschiedene Richtlinien an die Hand gegeben, und 2000/2001 wurde eine Terminogieliste für den internen Gebrauch der ehrenamtlichen Mitarbeiter der Zeitschrift von der Remote Sensing and Photogrammetry Society und des professionellen Mitherausgebers Blackwell Publishing (jetzt Wiley-Blackwell) erstellt. Nach mehreren Überarbeitungen und Ergänzungen wurde die gesamte Liste durch ihren Abdruck in *The Photogrammetric Record* im Juni 2007 (Newby, 2007) erstmals einer breiteren Leserschaft erschlossen. In diesem Stadium enthielt die Liste auch zahlreiche Begriffe aus angrenzenden Fachgebieten wie Fernerkundung, Bildverarbeitung, computerunterstütztes Sehen und Geomatik insgesamt, was unweigerlich zu deren Verwendung in photogrammetrischen Fachbeiträgen im weitesten Sinne führte. Neben der erhofften Hilfe für Autoren bei der Formulierung ihrer Beiträge für *The Photogrammetric Record* selbst, versprach man sich von der Liste auch eine zunehmende Akzeptanz innerhalb der internationalen photogrammetrischen Fachgemeinschaft aus Akademikern, Praktikern und der Industrie, und somit eine konsistentere Terminologie und einen besseren Gebrauch der englischen Begriffe in Beiträgen für artverwandte Publikationen, bei den Sitzungen der International Society for Photogrammetry and Remote Sensing und bei den *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*. Außerdem erhoffte man sich Rückmeldungen von Lesern, um die Liste weiter zu überarbeiten, und letztlich zu einem Konsens und einer höheren Anerkennung dieser Standardterminologie zu gelangen – zum Nutzen der Photogrammeter und derjenigen, die ihre Arbeiten weltweit veröffentlichen. Obwohl bisher nur wenige Reaktionen aus der breiten Leserschaft eingingen, ist aus dem Dialog mit bereits aktiven und künftigen Autoren bekannt, dass die Richtlinien gut aufgenommen wurden. Im Zuge der publizistischen Bearbeitung eingehender Beiträge kommen stetig neue Begriffe hinzu, die standardisiert werden müssen und einen Platz in der weiter zu überarbeitenden Liste verdienen. Diese Darlegung für den ISPRS Kongress in Beijing beschreibt den Prozess, der zu der veröffentlichten Liste führte, und enthält zahlreiche Beispiele für verwirrende, umstrittene oder schwierige Begriffe. Weitere Rückmeldungen und eine allgemeine Akzeptanz seitens der internationalen Fachgemeinschaft wären wünschenswert. Aufgrund der üblichen Beschränkung der Seitenzahl für die Kongressbeiträge ist ein erneuter vollständiger Abdruck der Liste (die sich in *The Photogrammetric Record* über zwölf Seiten erstreckte) nicht möglich. Die Ursprungsfassung ist jedoch weiterhin sowohl auf Papier als auch online verfügbar. Für begrenzte Zeit steht sie außerdem kostenlos allen Kongressteilnehmern zur Verfügung, die keine laufenden Zugangsrechte haben.

1. INTRODUCTION AND BACKGROUND

The Photogrammetric Record has been published in the United Kingdom since 1953, just a year after the formation of the Photogrammetric Society. Until 2002 the *Record* appeared twice per year (a total of 100 issues); from 2003 to date it has been jointly published, four times annually, by the Remote Sensing and Photogrammetry Society (successor to the Photogrammetric Society which merged with the Remote Sensing Society in 2001) and Blackwell Publishing of Oxford (now part of Wiley-Blackwell). While *The Photogrammetric Record* was expected from the very beginning to benefit the photogrammetric community worldwide, in recent years its international status has been formalised through the establishment of an International Editorial Board (IEB) and other measures. *The Photogrammetric Record* is now explicitly styled "An International Journal of Photogrammetry"; it is in fact the only scholarly journal dedicated entirely to photogrammetry as opposed to wider aspects of geomatics and earth observation, albeit considering photogrammetry in its widest and most inclusive sense.

Technical and scientific editors are continually faced with minor but sometimes difficult decisions when handling authors' texts. Many technical terms have evolved without rigorous definition, and consensus on exact forms may be hard to achieve. It has been the experience of successive Editors of *The Photogrammetric Record* that contributors are frequently inconsistent within a single article, but it is not always easy to decide which of several versions of a given term to adopt as definitive. Even within the educated native English-speaking community, variations in the use of upper and lower case, of

hyphenation or even of spelling are commonly tolerated, especially in acronyms or neologisms; thus it is not surprising that even greater variation occurs internationally. However, any scholarly journal of record aims to maintain consistency; changes of style are made only after the most careful consideration.

Various forms of guidance have therefore been issued over the years to prospective contributors to *The Photogrammetric Record*, including the frequently updated *Hints to Authors*, published in every issue and on the Society's website, www.rspso.org. In 2000–2001 a terminology listing was produced for internal use by the Society's team of volunteers and by the professional co-publishers, Blackwell Publishing. After a succession of revisions and enhancements, by which stage it also included very many terms from the related fields of remote sensing, image processing, computer vision and indeed of geomatics as a whole, it was decided that the full listing should be made available to a wider public, together with an explanation of the background. After being subjected to *The Photogrammetric Record's* formal peer review process as applied to all technical papers, this was published in June 2007 in *The Photogrammetric Record* 22(118): 164–179 (Newby, 2007). It was hoped that, as well as helping authors to prepare papers for submission to *The Photogrammetric Record* itself, the list might become accepted across the whole international geomatics community, and thus also lead to greater consistency of terminology and improved use of English in contributions to kindred publications and meetings. This contribution to the 21st Congress of the International Society for Photogrammetry and Remote Sensing (ISPRS) is a further step in promoting this aim, although the page allowance for ISPRS papers will not permit

republication of the full list. Interested readers should use one of the several methods of access to *The Photogrammetric Record* detailed in Section 6 below, which include availability of Newby (2007) free of charge for a limited period to any individual participant in the ISPRS Beijing Congress.

2. EARLY DEVELOPMENT: THE TERMINOLOGY GUIDE

When this writer took office as Editor of *The Photogrammetric Record* in 1999 he was greatly encouraged to have the help and support both of his predecessor, K. B. Atkinson (now Editor Emeritus), and of an extremely experienced Assistant Editor, Veronica Brown. The latter agreed to remain in post for an extended transitional period. The new Editor found that this team had long ago accepted as authoritative, for general use of English, the precepts of *The Oxford Dictionary for Writers and Editors (ODWE)* (Oxford English Dictionary Department, 1981), of which the publication of a Second Edition (Ritter, 2000) was then imminent. For guidance on scientific terminology and mathematical notation they had also made good use of *The Oxford Dictionary for Scientific Writers and Editors* (Isaacs et al., 1991). Other reputable dictionaries too numerous to cite individually have of course been consulted by the present and all previous Editors.

With the aid of these authoritative publications and making use of their long experience both of teaching photogrammetry and of editing authors' contributions, Atkinson and Brown had achieved a very clear consensus on the forms to be used in *The Photogrammetric Record*. The incoming Editor therefore asked Mrs Brown to compile, over a period up to her eventual retirement, a guide to photogrammetric terms, both on the basis of her earlier experience and the consensus with Atkinson, and of the ongoing editing process on live contributions. By the time of her retirement in 2002, the list already ran to about four pages and covered a significant portion of the terms which might present difficulty to any incoming team member; thanks to an ongoing dialogue within the team it was already in its fourth iteration. This author had also by then publicly laid down some markers in an Editorial (Newby, 2001), in relation to the use of British (UK) English as well as the limitations of *ODWE*. It was recognised that British (UK) and North American (US) conventions inevitably differ and that in some international contexts US English might be more appropriate, but, as a journal published in the United Kingdom, *The Photogrammetric Record* will always naturally observe British English spellings and other conventions and asks its contributors to do the same.

At about this time the decision was also made to invoke additional professional help with the production of *The Photogrammetric Record*, in order to reduce the volume of effort required of volunteers recruited from within the Remote Sensing and Photogrammetry Society. The equal partnership eventually negotiated between the Society and Blackwell Publishing Ltd (now Wiley-Blackwell) would result in more work being done in future by skilled professional members of the Blackwell team, who could not, however, be expected to be photogrammetric specialists nor to master our continually evolving terminology. This greatly increased the need for the *Terminology Guide*, as the document had become known, and it was also supplied to all relevant members of the Blackwell team, who have been using it to good effect ever since.

3. CONTINUING EVOLUTION: A GUIDE, NOT A DICTIONARY

These changes in the management of *The Photogrammetric Record* provided the incentives to think carefully about the evolving terminology of geomatics, to develop the in-house *Terminology Guide* very considerably and, with the aid of the general precepts embodied in the Oxford dictionary, to attempt to give a lead to the photogrammetric community as a whole. In many cases of doubt, especially where there appears to be no Anglo-American consensus or where the consensus is at variance with Oxford precepts, selected members of the IEB have also been consulted at various times. Encouraging discussions also took place with the IEB as well as other members of the international photogrammetric and remote sensing community, in the course of the ISPRS Congress in Istanbul in 2004.

The short article and extended listing of terminology accepted for use in *The Photogrammetric Record* (Newby, 2007) emerged as the result of this process. The listing itself was laid out under two column heads: (i) *Accepted, authoritative or preferred term, and a few terms to be avoided* and (ii) *Abbreviation/Acronym/Alternative/Comment/Context*. Authors considering submitting contributions to the *Record* have been encouraged to adopt the accepted forms at the outset, thereby greatly reducing the labour of editing and hence the risk of errors in typesetting and the volume of subsequent corrections. It has been particularly appreciated when authors have acknowledged this guidance and cited the source! It was also hoped that, on receiving this clear public lead, the international photogrammetric community would be ready to accept the guidance provided or at least to discuss it and put forward other opinions where appropriate, leading eventually to a consensus accepted for general worldwide use.

There was never any intention that the listing should in general include definitions and thus become a dictionary or even a glossary; it was certainly not considered as an attempt at a treatise on the fundamentals of photogrammetry. Numerous useful multilingual dictionaries have been produced over the years, some of them including definitions as well as photogrammetric terms in multiple languages, ever since the pioneering *Photogrammetric Dictionary* published in seven slim volumes (one for each of the languages then addressed – English, French, German, Italian, Polish, Spanish and Swedish – with numerical cross references to each of the other six) under the direction of Technical Commission VI of the International Society for Photogrammetry (ISP, 1961). This was reviewed in *The Photogrammetric Record* by Veronica Brown herself (1962). Other notable examples have been produced in the USA (Rabchevsky, 1984) and France (Paul et al., 1997), as well as the successor to the original ISP publication, the *ISPRS Multilingual Dictionary of Photogrammetry and Remote Sensing* produced in Germany by the Institut für Angewandte Geodäsie (Lindig, 1993). A later German private-enterprise publication (Sallet, 2002) has also included substantial photogrammetric content.

None of these dictionaries has come to be considered sufficiently authoritative in its English language component to eliminate the need for *The Photogrammetric Record* to form an opinion of its own and to provide a guide to the correct use of technical words, phrases and abbreviations. Moreover, it had been felt necessary to explain the use, origin or even occasionally the pronunciation of certain terms, for the benefit

of Blackwell's non-specialist staff, and also to cross-reference some related expressions and to highlight terms to be avoided if possible. It is only a short step from such explanation to definition, but there seemed little point in removing explanations from the internal document in order to guard the purity of the public version; on the other hand it was not thought necessary to make special efforts to extend the range of explanations to be published. It was hoped that those which were included would also be valuable to the wider public, without raising expectations for any more complete dictionary or glossary in the future.

Land surveyors traditionally acknowledge the inevitability of errors of many kinds, and in order to eliminate them they are accustomed to devising and using self-checking systems for their observations and computations. The written word is not so open to such forms of quality management, although modern word processors do offer valuable help. Habitual users of guides such as *ODWE* soon become aware that not even the Oxford University Press is infallible and that it is easy to compile small collections of errors and discrepancies within its publications and between successive editions. It was acknowledged that the published listing contained some idiosyncrasies and inconsistencies, perhaps most especially with regard to the minor matter of hyphenation of compound expressions. However, this defect was considered inevitable, given that technical terms which have become accepted have developed in different places over long periods, and it did not invalidate the objective of achieving internal consistency even though worldwide consensus may be more elusive. For example, although hyphenation can reasonably be governed, in general, by principles such as "two-word compounds should be hyphenated when adjectival", there seems little point in rejecting widely accepted usages such as *close range photogrammetry* (three words, no hyphen). Some readers will doubtless enjoy, and have no difficulty in, finding other examples of inconsistent or even unexpected treatment. And where there appears to be no existing common usage nor any consensus, this writer and Editor offers no apology for adopting personal preferences in the last resort.

4. CATEGORIES OF LISTED TERMS

The terms which it was thought necessary to include in the *Terminology Guide* fall into a small number of distinct categories which will be discussed, with suitable examples, below. As the two-column format of official ISPRS publications precludes the use of tables with two wide columns as employed by *The Photogrammetric Record*, it is not possible to reproduce any complete entry from Newby (2007) here in its original form.

4.1 New terminology for new technology

Prime examples on which individual authors have found it both impossible to agree and challenging to maintain consistency even within their own documents include the neologisms *InSAR* and *lidar*. These expressions above all others provided the stimulus for this attempt by the Editor of *The Photogrammetric Record* to lay down standards not only for his own journal but for the wider community. There seems to have been little difficulty in arriving at a consensus on the full versions of these new terms, across Academe, professional practice and industry. *Interferometric synthetic aperture radar* is widely accepted but *InSAR*, *IfSAR* and the numerous other permutations and

combinations of upper and lower case letters represented variations which are entirely unacceptable to tidy-minded editors! After due consideration, *InSAR* was listed by Newby (2007) and *IfSAR* was noted as to be avoided. *Light detection and ranging (lidar)*, by analogy with the universally accepted and *ODWE*-endorsed *radar* for *radio detection and ranging*, not *direction*) has perhaps achieved less consensus, with many expert practitioners, at least in the geomatics community, preferring *laser scanning*. Only time will tell whether *lidar* or *laser scanning* prevails, or whether the two terms will continue to be interchangeable, or indeed whether one will be preferred for certain specific applications (perhaps *lidar* for atmospheric physics and *laser scanning* for land surveying and industrial metrology). But while *lidar* continues to be used, *The Photogrammetric Record* will continue to insist on following the analogy with *radar*: all lower case except at the start of an English sentence; and, following advice from international colleagues, *Lidar* in German (because it is a noun); *lídár* in Spanish (accent presumably to secure correct pronunciation).

4.2 Fine detail of presentation of accepted terms, including guidance to non-specialists

Many terms present no difficulty in speech or in non-rigorous writing, but conscientious publishers and editors seek consistency across their whole work and especially abhor inconsistency within individual documents. Non-specialist members of any publishing team must also be guided on accepted forms of specialised terms: simple examples in our discipline include *aerial triangulation*, *analytical plotter*, while more subtle preferences include *air/water interface* (cf. *human-computer interface*: en-rule, not *solidus* nor hyphen here, though this distinction may be purely diagrammatic). Therefore an attempt has been made to distil the essence of the experience of successive Editors of *The Photogrammetric Record*, the consensus among academics and practitioners, and the general scholarly guidance provided by *ODWE* and other good dictionaries, both British and American. As already indicated in Section 3 above, this distillation of the minutiae sometimes leads to discrepancies in treatment and to the need to express – and then follow – a personal preference. Examples include the treatment of the various compounds involving the term *stereo*, where guidance is given on whether these should appear as one word (*stereoplotter*), two words (*stereo view*), be hyphenated (*stereo-image*) or be considered for avoidance (*stereo-orthophotography*) or use of two alternative words of which the first would certainly be *stereoscopic*.

Usage concerning the Latin plural *data* remains a matter of scientific and literary debate and of tidally shifting consensus, but this Editor's preference, here endorsed by the second edition, but not the first, of *ODWE*, includes *data* as a collective noun taking a singular verb ("this data shows", not "these data show") and *data-sets* (hyphen). This leads to the suggested compromise between the Editor and authors who attempt to demand *data* in the plural, of simply avoiding this word and instead using *data-sets*, which are unquestionably plural. Other arguably inconsistent but certainly consensual compounds here include *data cloud*, *data fusion* and *database*, while the Latin and English singular *datum* has to be acknowledged as possessing a special and precise meaning in geomatics, given as "the underlying geometrical information providing the spatial reference frame in which coordinates are computed, plural *datums*; see OSGB36, WGS 84".

Finally, no attempt is made to conceal expressions where *The Photogrammetric Record's* preferences or the industry consensus are not backed up by logic or consistency. Examples include *close range photogrammetry*, *large scale map*, *small scale photography* (three words each, no hyphens) but *small-format camera* (one hyphen). Once again, the commentary in the second column of the listing offers extra clarity and cross-referencing, for example between *large scale* and *small scale*.

4.3 Use of abbreviations and acronyms

Most short upper-case abbreviations and acronyms seem to present relatively little difficulty to authors. *The Photogrammetric Record* does in general insist that they are first introduced in full, although this precept may be safely ignored for widely accepted terms such as *GPS*. Newby (2007) indicates a large number of correct and acceptable abbreviations, mainly as a vehicle for the exposition of the correct long form and sometimes also in order to express an opinion on the correct pronunciation of the abbreviation: “*digital elevation model, DEM*, (not *Dem* or *dem*; pronounced *dee-ee-em*, never say ‘*dem*’). The opportunity is also taken to point out the common author error of using the same abbreviation for different ideas in the same document, for example “*Transverse Mercator, TM*, in various forms a very widely used map projection; avoid using abbreviation in same paper as *Thematic Mapper*”!

4.4 Foreign (including American) usages which can cause inconsistency or confusion in English

It is standard on both sides of the Atlantic for editors to accept the need to edit incoming texts to conform to their British or American preference. This rarely presents any major difficulty although those authors who take the trouble to follow British (UK) English deserve thanks for saving our team considerable effort. However, recent discussion of a seminal publication (Brown, 1966) involving the difficult word *decentring* (lens distortion – US *decentering*) showed that the process is not invariably easy and even led to an assertion (finally found to be false) that Brown had in fact used the UK spelling in his original work. Newby (2007) concedes that the US spelling here provides a useful clue to pronunciation, and notes that *The Photogrammetric Record* does not convert from US to UK spelling when citing the titles of original publications.

Of far more concern is the propagation of differences in technical terminology or general language between different European languages. In a general context the problem is known by the French expression “*faux amis*” (false friends). A good example from the normally immaculate English of some of our German contributors is the use of the inappropriate words *mesh*, *meshing* where the contexts of the German *Masche*, *maschen* are in fact triangular irregular networks, Delaunay triangulation and sometimes other grid-based systems. There is a risk that the wider international community will be misled into believing that *mesh* is in fact the correct English term for these contexts and processes. In Newby (2007) and again here, foreign authors are urged to take special care to avoid *faux amis* such as these; some are not always easily detectable even by this alert and knowledgeable Editor!

Going beyond the aim of improving presentation of photogrammetric ideas in English, *The Photogrammetric Record* also ventures to suggest that the German term *Kamerakonstante* (symbol *c*), often translated by *camera constant*, should be abandoned in favour of *principal distance*,

because this physical distance between the perspective centre of a camera lens and the imaging surface is not in general constant. Naturally the entries dealing with these terms are cross-referenced to *focal length* which does have the merit of being a constant except for zoom lenses.

Finally, this section provides a rare opportunity to comment on another widespread error in English language texts written by German authors. It took many years of bafflement as a reader before the discovery that the non-English abbreviation “*resp.*” stems directly from the German *beziehungsweise* (normally abbreviated in German as *bzw.*). This word can indeed sometimes mean *respectively* (never abbreviated in English), but far more commonly *bzw.* is better translated by the simpler and usually more appropriate *and* or *or*. Presumably the frequent occurrence of *resp.* in German-authored English technical papers, software instructions and even occasionally in more general usage could be traced back to some widely used and highly influential school textbook; in the absence of the culprit or the smoking gun, our friends and contributors are merely urged to avoid this infelicity in the future!

4.5 Proper names of institutions and other entities; exonyms

Nowadays it is so easy for anybody with access to the Internet to check the proper names of organisations, companies, equipment, software or anything else, that authors have no excuses for their errors in this regard nor for relying on the vigilance of their editors for correct publication. It simply should not be necessary for editors to be suspicious of submitted material nor to make time-consuming checks on textual minutiae on the basis of their suspicions. However, the frequency of such errors has made it necessary to devote a substantial amount of space to this topic. Examples include the UK's *Royal Institution of Chartered Surveyors, RICS* (not *Institute*; pronounced *are-eye-see-ess* – never say ‘*ricks*’!) and the *German Aerospace Center, DLR (Deutsches Zentrum für Luft- und Raumfahrt)* which also provides an example of an official English equivalent of a foreign name, which *The Photogrammetric Record* therefore does not convert into British English (*Center* is retained despite the UK preference for *Centre*).

The Photogrammetric Record has always preferred to use the English forms (exonyms) of overseas place names (toponyms). While this may at times appear petty (for example Hanover for Hannover) the preference is easier to justify for other hotbeds of European photogrammetric activity, such as Munich for München and Florence for Firenze; in such cases English or American speakers attempting to pronounce the German or Italian names risk sounding either pompous and pretentious or ignorant and ridiculous, depending on their accent and/or their level of knowledge. A senior member of ISPRS Council at a Congress not too long ago appeared not to realise that his “*Firrenzzz*” was in fact the same place as Florence. Thus the use of appropriate exonyms in the language of any international publisher or speaker is strongly advocated; this is only likely to cause offence to the hypersensitive. For several reasons it might be necessary to make an exception to this precept for Llanfairpwllgwyngyllgogerychwyrndrobwlllantysiliogogoch, a village on the island of Anglesey (Ynys Môn), famous both for its long Welsh name and for the Britannia Tubular Bridge, a historic feat of 19th century civil engineering, surveying and industrial metrology, which links it to the mainland of Wales; but even the British have no trouble in accepting (for example)

that Frenchmen will insist on referring to Londres and Edimbourg.

5. CONCLUSION AND APPEAL FOR FEEDBACK

It is recognised that there remains room for discussion among qualified individuals about some of the consensus and preferences expressed in Newby (2007). Moreover, the current listing cannot claim to be infallible, as shown by correspondence from a reader who criticised the treatment of the term *aperture* (Thomson, 2008). It was clear that *relative aperture* was originally intended but that conversational jargon and *Photogrammetric Record* precedent had been accepted unquestioningly, without examining the underlying physical camera system. Naturally this author does always try to be more careful, and this example will certainly feature in any future revision of the listing. Readers of this paper and of Newby (2007) are urged to respond with comments on the current list as well as suggestions for amendments and additions for consideration for a future revision or supplement. The present paper deliberately avoids any attempt to create a supplement to Newby (2007), but one will be prepared on the basis of ongoing experience of editing *The Photogrammetric Record* and of feedback from the ISPRS audience.

It is very much hoped that this attempt to encourage standardisation will receive general acceptance across the photogrammetric, indeed perhaps the whole geomatics, community, thus also benefiting other editors and leading eventually to greater consistency in contributions to publications worldwide, to the meetings of ISPRS and so ultimately to the *International Archives of Photogrammetry, Remote Sensing and the Spatial Information Sciences* (of which, incidentally, other variants have been noted even in official ISPRS publications). Such standardisation can only be to the benefit of practitioners and academics, of teachers and students, and of those who publish their work worldwide. Those who do make use of this material are invited to give credit to it by way of direct citation, as (Newby, 2007), in their own work.

6. ACCESS TO THE TERMINOLOGY GUIDE

The June 2007 issue of *The Photogrammetric Record* is still available in print, and will remain online on Blackwell Synergy (<http://www.blackwell-synergy.com/loi/phor>) and its Wiley-Blackwell successor, Wiley *Interscience*. This facility includes backfile access for all institutional premium rate subscribers including academic consortia, and for all members of the Remote Sensing and Photogrammetry Society who opt to receive *The Photogrammetric Record*. Newby (2007) is also available, free of charge for a limited period, to any individual ISPRS Congress delegate who does not belong in one of the above categories. Full instructions for access will be made available at the ISPRS Beijing Congress.

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