Media and their Emergence: The Ontology

Peter Simons

Trinity College Dublin

CONFERENCE DRAFT

In any field of research, especially a new one, the first step to philosophical groundedness is an ontology, a structured inventory of the objects of the field and an account of their principal kinds, interrelations and modes of operation. In respect to the emergence of new media, the two obvious places to begin are with the media themselves and with emergence. The concept of emergence was developed in the 19th century in connection with debates about the status of life and mind, and has been pursued with renewed vigor in recent years. While there are different varieties of emergence, and some inevitable debate about details, emergence is philosophically fairly well understood and we shall return to it at the end.

By contrast the more specific notion of a medium and the taxonomy of the various media is less well defined and correspondingly its ontology is in need of more work. It is with this that we shall start, taking our philosophical cue from ideas in the ontology of objects in general and various kinds of artwork in particular by the Polish ontologist Roman Ingarden, deployed using modern methods of taxonomy as found notably in biology and library science. The goal is to offer the tools to construct a rational ontology and taxonomy of media which provides room for new and unexpected media.

Medium: the Essentials

The Oxford English Dictionary defines a medium, in the sense which concerns us here, as

> An intermediate agency, instrument, or channel; a means; *esp.* a means or channel of communication or expression.

An early citation of this use is in Francis Bacon's *The Advancement of Learning* of 1605. Taking the definition as our point of departure, it would seem on reflection that there are the following essential components to a medium in use:

PACKAGE: that which is specifically communicated, transmitted or expressed.

SOURCE: the person, persons or other agency in which the package originates.

RECIPIENT: the person, persons or other agency which receives the package.

MODALITY: the general nature of the package as expressed and received (e.g. verbal, visual, acoustic, etc.)

CARRIER: the physical mechanism or process by which the package is conveyed from source to recipient.

INSTRUMENT: the physical equipment required to operate or sustain the carrier.

Some other aspects may be important in some cases, for example as part of the carrier there may need to be mechanisms of encoding and decoding enabling the package to be conveyed from source to recipient. A television picture is not transmitted visually, unlike old-fashioned cinema projection, nor are radio programs transmitted as sound. Technically such mechanisms are often crucial in enabling the medium in question to work as intended, but they are less central to our considerations here.

Taxonomy

When classifying a domain one may either proceed top–down, starting from antecedent ideas of how to divide the domain, or bottom–up, starting from distinguishing features of the items classified. The two approaches may felicitously meet in the middle as it were, but the bottom–up approach is the more flexible and adaptable of the two. It informs the two sciences where classification is a primary activity and goal, namely library science and biological systematics. In library science the top–down approach is exemplified by archaic classification systems such as Dewey, Library of Congress, and the Russian Library–Bibliographic Classification, which are subject to the problem of cross-classification, since few documents deal with a sole subject but are classifiable in several dimensions, while these systems force librarians always to choose a primary dimension of classification and separate documents similar in other ways. The solution is *faceted classification*, invented by the Indian library scientist Shiyali Ramandrita Ranganathan (1892–1972), the father and in many ways the Darwin of library science. Facets are simply features occurring in families, what logicians call *determinables*, by which documents are distinguished. A document such as a book or a research paper typically has a number of facets and these may serve to group or collect items in different ways. Upper levels of classification are suggested by a number of more or less universal facets, so the procedure is not solely bottom–up, but it is flexible and informs many modern bibliographic systems such as the AMS classification of mathematical subjects, updated every ten years with interim minor updates between.

What facets are to librarians, apomorphic characters are to biological systematists. A character, like a facet, is any distinguishing feature: apomorphic characters are ones which give clues to an organism's genealogy. Since the vast majority of biological speciation events are past and not directly accessible, biologists use the examinable features of contemporary specimens and contemporary traces (fossils, tracks, chemical traces etc.) of past specimens to conjecture the order in which lineages of biota diverged. Unlike library science, biology deals with items which have an evolutionary ancestry, and the system of classification has been generally expected to reflect this since Darwin and Wallace. Characters are numerous and complex, especially in the light of extensive genotype mapping, so biologists typically employ computer algorithms to search for branching tree systems or dendrograms to reflect the most parsimonious way to explain the successive appearance of new characters (synapomorphic characters) diagnostic of a given new group. The scientist corresponding to Ranganathan in this domain is equally obscure to the general public: Willi Hennig (1913–1976) was the father of phylogenetic systematics, or as it is now generally known, *cladistics*.

While biology, unlike library science, proceeds within the overarching scientific theory of evolution by natural selection, the two are otherwise analogous in their use of features. It might be thought that such considerations are alien to philosophy, but in fact notable philosophers have organised their systems of categories along similar lines. The most explicit is the Polish philosopher Roman Ingarden (1893–1970), whose ontological magnum opus *The Controversy over the Existence of the World* orders the major types of entity, each corresponding to a different *modes of being*, by consistent combinations of facets or characters that he calls *existential moments*. Ingarden was a student of Franz Brentano's students Kazimierz Twardowski and Edmund Husserl, and was probably aware that in Brentano's doctoral dissertation *On the Several Senses of Being in Aristotle* the categories of Aristotle had been anatomized by facets: ±[independent]; ±[in respect of something else]; [intrinsic, circumstantial, kinetic], and so on, refuting the accusations of Kant and Mill that Aristotle's categories were unsystematic or "rhapsodic".

Classification by facets, characters or moments – we co-opt the term *facets* – promises flexibility and is especially suited to new or under-taxonomized domains, avoiding the dangers of excessive apriorism that beset many classification systems.

Old and New Media: Some Descriptive History

The oldest media of relevance to human beings are those of interpersonal expression and communication: gesture and similar behaviors and spoken language. Source and recipients are humans, the modality being typically visual or auditory, and the source's own body being the principal instrument, though in some cases augmented by other things, drums or smoke for example. Language is what Bacon calls "the medium of words". A more indirect form of communication involved a third person as messenger, herald, or go-between, freeing the source–recipient pair from the need to be within earshot of one another. Writing probably evolved principally for financial record-keeping, but in the form of missives: letters, written orders, and so on, took on the medial aspect of spoken words while further amplifying the size of deliverable package: a courier no longer needed to remember or even know the message, and could avail of faster intermediary transport: horse, arrow or carrier pigeon for example, latterly other mechanical means of transport. The use of writing materials allowed pictures as well as words to be conveyed. Electrical telegraphy, telephone, radio and television increased both speed and range of transmission, being limited ultimately only by the speed of light. All required some form of encoding of electrical impulses to allow letters or sounds to be carried.

The other broad type of old medium in use, though less centrally concerned with communication than with expression and entertainment, was the arts: sculpture, painting, music, dance, poetry, prose, theatre, and, later, recordings of these using various technologies from cave paintings to stereophonic LPs.

Those forms of media bring us up to about 1970. Enhancements employing undersea cables, long-range radio and satellite transmission improved speed, distance and bandwidth without changing the general nature of the media involved.

Some forms of new media consist in making the same kinds of content or package available using alternative carrier technologies: music players from Walkman to iPod allow increased mobility to the listener, while the use of computer graphics and broadband internet allows film, video and television content to be played on computers, tablets and phones, and freed from contingent limitations of specialized static screens.

Another new medium which has preserved an old form of content (talking) but changed some parts of the world more radically than any technology since the automobile is mobile telephony. The principles go back to the 1920s and early mobile telephones date to the 1940s, but cellular technology and miniaturization of processors has put mobile telephony within the geographic reach of much of the world and within the budgetary reach of much of its population. This has been particularly evident in poorer countries such as those of sub-

Saharan Africa, where poverty inhibited the installation of widespread landline coverage, especially in sparsely populated and rural areas. What we have here are essentially new carriers and instruments for old types of package. The radical social difference turns on the mobility, affordability, ubiquity and consequent democratization rather than on anything drastically novel about talking live to someone over a long distance. I can wish my son in West Africa a happy birthday from a mountain top in Austria or Ireland, but so can many people on a more modest income than mine. Likewise broadband media such as Skype allow cheap conversations often with video link to reach to anywhere in the world with an internet connection. They have also incidentally assisted academic recruitment: colleagues in both philosophy and sociology departments in my school have recently been appointed on the strength of transcontinental Skype interviews, to the relief of strained Irish budgets.

I chose the watershed date 1970 because it sits between two important dates. The first satellite navigation system, TRANSIT or NAVSAT, went live in 1964, for the use of Polaris submarines only. Also in 1964 we have the first digitized searchable large database, MEDLARS, based on medical abstracts for *Index Medicus* (which itself incidentally started in 1879, the birthdate of modern mathematical logic. I did my own first online search in 1971, accessing MEDLARS at the US National Library of Medicine in Bethesda via the Medline system from the Medical Library of the University of Manchester, via satellite link. At that time the system could accept only 30 users at a time. Also in 1971 the first Arpanet e-mail was sent. While ideas for e-book go back to the 1930s, one of the first widely used systems was Brown University's FRESS (File Retrieval and Editing SyStem) from 1968, employed incidentally by our late philosopher colleague Roderick M. Chisholm in the production of such texts as *Person and Object* (1979). These things tended for a while to affect only small groups of users because of costs, bandwidth limitations, and in some cases strategic military considerations. Since 1990 the pace of change has quickened. The following are dates of some subsequent firsts: website 1991; AOL Instant Message 1993, wiki 1994; (marketed) smartphone 1994; eBay sale 1995; Amazon sale 1995; Wikipedia 2001; Facebook 2004; YouTube 2005; Twitter 2006; touchscreen phone (iPhone) 2006. Many of these technologies are now so much part of our daily lives that it is hard to imagine life without them, but what is astonishing in retrospect is how rapidly they have effected change and how recent many of the changes are.

It is fairly clear what the principal technological drivers for these new media are: small and cheap computer chips; the internet and the servers and protocols that run it; and wireless transmission of data. What is remarkable about these is that, despite the

5

thoroughgoing changes they have wrought in most lives, they are incremental developments of what went before. The packages these devices deliver are even more conservative in content: written words, mail, music, images, still and moving. What is new about these media is therefore less their technology and even less their content, than something else.

Certain forms of new technology closely related to the new media mentioned above are at best borderline cases of media and I am reluctant to count them as such. These are computer games. A game played with or against a computer lacks the communicative or expressive element to a large extent: it has creators and designers, and indeed graphic designers and composers obtain professional and artistic recognition for their creative roles in some of the more elaborate games. Interactive games played by two or more players such as online chess or online poker are carrier-enhanced versions of their face-to-face counterparts and no one would count a chess or poker game as a medium.

Facets for Media Classification

The basic features of a medium, identified above, offer ready-made facets for classification: classify by types of package, carrier, source, recipient, instrument. These are certainly important classificatory facets for media. As explained above however, other facets are likely to be more crucial in helping to separate out new media from old, namely SPREAD, SPEED, SIMPLICITY, UBIQUITY and IMPACT.

By SPREAD we mean the facet of how widely a given medium is in use. An analogy may serve. As a means of transport, horses were always the preserve of the relatively well-off, carriages even more so. The advent of the bicycle made medium-distance transport available to a much wider proportion of the population. Automobiles were initially only affordable by the rich, but as their price relative to average income has fallen they are now in much wider use. Likewise air travel is now enjoyed by the masses where even a generation ago it was much rarer. Examples of media technologies whose unit costs have so fallen that they are affordable by billions include personal computers, mobile phones and smartphones. New media are characterized by high (or wide) spread.

By SPEED we obviously mean the rate at which packages can be accessed and delivered. E-mail is faster than snail mail, posting a photo on Facebook or sending it as an e-mail attachment is faster than sending a print through the post. It is quicker to download an e-book than to travel to a bookstore to buy a copy, quicker to download music on iTunes than to buy a CD from the record store, and quicker to book a holiday or buy a ticket for a journey

or a show online than to go to the travel agent or box office. New media are characterized by higher speed than old for similar functions.

By SIMPLICITY we mean the ease of operation, dispensing with long apprenticeships and complex operating instructions. Early computers required programmers to write in machine code, then came compilers and high-level languages. Today a user with no programming experience can operate a laptop, tablet or smartphone with a few simple intuitive gestures and movements. New media are characterized by greater simplicity than old.

By UBIQUITY we mean the range of types of location in which the media may be used or operated. The obvious difference between a traditional telephone and a mobile phone is that use of the former is limited by its attachment to a fixed wire, while the latter is not. Landlines have low ubiquity, mobile phones high ubiquity. Laptop computers are portable and have higher ubiquity than desktops or mainframes; those with wireless internet capability have more uniquity than those requiring an ethernet cable. New media are characterized by high ubiquity.

By IMPACT we mean the extent to which the availability and use of a medium changes a user's lifestyle. It is a broad and rather amorphous facet but in many ways the most significant of those distinguishing new media. It could be quantified for sociological or economic purposes by time spent per day, expenditure or other measurables. All transformative technologies from fire to aotomobiles to antibiotics to smartphones have had high impact, resulting in a large difference between modes of life before and after the introduction of the technology. New media have cumulatively had a high impact. The way in which teenagers spend their days and nights now feels more different from the way I spent mine than mine is from the way my parents or indeed grandparents spent theirs. As mentioned above, the impact of mobile telephony has been higher in the third than in the first world, where the phenomonon of the teenager hogging the family telephone was familiar to the affluent postwar generation.

Since impact is a matter of change, with before and after states, technologies do not continue to have high impact once behaviors have been changed. However the extent to which the lifestyle of one generation differs from that of the previous generation or two is a permanent historical feature. So the lives of our Victorian forebears were transformed by rail transport, those of our grandparents by cars, and of our parents and ourselves by cheap air transport. For a mode of transport to have similarly radical transformative effects in future

generations it will probably have to be something completely different such as teleportation or cheap space colonization.

Emergence

There is an everyday and a philosophical sense of 'emergence'. The everyday sense as used of cultural phenomena (not e.g. of a lion emerging or egressing from a cave or a forest) is simply that of the appearance of something new. In this sense, both rock and roll and bikinis emerged in the 1950s. Neither was radically new: one was a new style of popular music, of which there had been many previous styles, the other a newly fashionable and widespread (but not unprecedented) type of swimwear for women. In this sense, all the new media we have talked about have emerged, and some dates have been given for their emergence.

Philosophically the idea of emergence was first formulated by John Stuart Mill and given its name by another 19th century English philosopher, George Henry Lewes (1817–1878). The basic idea of emergence is not simply the appearance of something new but the appearance of something new that is theoretically inexplicable or unpredictable on the basis of what wwent before and what appears to sustain the new phenomenon. In his incomplete *Problems of Life and Mind* (1875–9). Lewes insisted that organic processes are inexplicable by mechanical principles alone. Emergence about phenomenon X offers a middle way between reductionism of X to more basic phenomena Y on the one hand and ontological dualism of X and Y on the other. the idea is that X does not simply coexist alongside Y, as Cartesian souls coexist alongside bodies, but nor are Xs nothing but Ys. Rather the point is that once Ys are suitably complexly organised, Xs unexpectedly and inexplicably appear as a result. Life and mind were the obvious application points for this idea, though since the death of vitalism emergence about life has more or less vanished. The heyday of emergence was the 1920s, when thinkers such as Samuel Alexander, Alfred Whitehead and C. Lloyd Morgan exploited it as a way to give broadly naturalistic accounts of life, consciousness and mind.

The concept of emergence proved too slippery and elusive for positivistic and post-positivistic analytic philosophers for many decades but was somewhat revived in the 1990s in response to the recurring dilemma in philosophy of mind of the perceived unpalatableness of both reductionism and dualism. Tackling the imprecision of the emergence concept is a requirement for advancement. Call a feature F *epistemically emergent* with respect to basis of phenomena B if and only if (Def.) no knowledge of B and its principles of combination and operation is sufficient to explain or predict F. Call it *weakly* epistemically emergent if no

actual knowledge does the job and *strongly* epistemically emergent if no ideal knowledge or knowledge in principle can explain F. Strong epistemic emergence is often (e.g. by David Chalmers) equated with ontic emergence, but for reasons to do with the distinction between ontology and epistemology we resist the identification. Call a feature F *ontically emergent* with respect to basis B if and only if (Def.) no combinations and operations from B are sufficient to generate F, where the combinations accord with the ontological repertoire belonging to B and operations are characteristic (law-governed) modes of (inter)acting for B. F is reducible to B (B *generate* F) if it is not ontically emergent with respect to B.

So let us raise the question whether the new media are emergent in any of the philosophical senses. Suppose the basis phenomena B to be known materials governed by known laws of physics. Then clearly since the new technologies exploit physical devices of a kind not dissimilar from others known before and operating according to the known laws of physics, the new media are clearly not ontically emergent. Are they then epistemically emergent, in either the strong or the weak sense? Since some prescient or fortuitously imaginative writers foresaw such technologies decades before their implementation the phenomena of new media are predictable, or at least envisageable, and explainable, albeit that simple extrapolation from previous trends might have not predicted what happened. It is true that the majority of users would not have been in a position to predict the wide-ranging effects of new media long before they came about, but that is no test of emergence.

I conclude that the sense in which new media are emergent is simply that they have appeared as something new and that their nature and effects were unanticipated by nearly everyone. Their novelty is culturally significant, but to date not sufficient to warrant philosophical revision. What changes the future may bring and whether some of them may count as emergent in at least an epistemic sense is not something on which it is our job to speculate. Ontologists are not prophets.