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Visions of Contract

‘Do not get me wrong – reading cases is important. It is just not enough.’

Said Stewart Macaulay.¹ In this article I explore the visions of contract offered by Macaulay and Ian Macneil. For the Law and Society movement the quite different but ultimately co-dependent perspectives on contract they put forward have become the orthodoxy within contract scholarship. The *Journal of Law and Society*, as the premier vehicle for socio-legal scholarship in the UK, has done much to aid this journey and I reference work published in the journal throughout the paper. Macneil and Macaulay’s work on contracts moves Law and Society scholarship in that area further away from the relevant formal or doctrinal legal structures² than any other doctrinal area that socio-legal scholarship has turned its attention to. Their work suggests that the doctrinal model is embracing not only the wrong values but in doing so is limiting its relevance to a very small number of business transactions. My intention is test the durability of their scholarship against what is presented as a new and revolutionary methodology for contract; the blockchain contract.

The first part of the paper looks at Macaulay’s work and the development of contract scholarship as a result of that work’s reception and influence.³ It explains that his position on contract is frequently misunderstood and that the sophistication of his position is then lost. The second section looks at the work of Ian Macneil. This has achieved rather less traction than Macaulay’s in the community of doctrinal legal scholars but has been more readily taken up by some leading scholars in the fields of law and economics and economics.⁴ I suggest that the reasons for this difference are

¹ S Macaulay, ‘Notes on the Margins of Lawyering, in Three and Half Minutes’ (2011) 40 *Hofstra L Rev* 25 at p37. Macaulay’s comment came in a review arising from a workshop devoted to Gulati and Scott’s project at Hofstra Law School, see M Gulati and R Scott, ‘The Three and a Half Minute Transaction: Boilerplate and the Limits of Contract Design’ (2011) 40 *Hofstra L Rev* 1. Gulati and Scott subsequently published a more extensive and developed version of their work in *The 3½ Minute Transaction* (Chicago Uni Press 2013).

² I take doctrinal contract law or formal contract law to be the edifice constructed in the nineteenth century around the Will Theory and the ideas of laissez-faire and consent, see D Campbell and H Collins ‘Discovering the Implicit Dimensions of Contracts’ in D Campbell, H Collins and J Wightman (eds) *Implicit Dimensions of Contract* (2003) Hart Publishing Oxford 25. In their paper Campbell and Collins set the parameters of the doctrinal model against the type of issues that an empirically informed model of contract would consider to reveal the gaps and flaws in the internal logic of the former model.

³ I have drawn inspiration for this part of the paper from the excellent observations of David Campbell, in particular his contribution to the papers published from the 2011 conference that was held at Wisconsin Law School in honour of Stewart Macaulay where he offers a sophisticated analysis of Macaulay’s position on the doctrinal law of contract and the misunderstanding of Macaulay by doctrinal scholars, see D Campbell ‘What Do We Mean by the Non-Use of Contract’ in J Braucher, J Kidwell and W Whitford (eds) *Revisiting the Contracts Scholarship of Stewart Macaulay* (2013) Hart Publishing, Oxford 159

⁴ Compare for example the respective positions of Williamson and Posner on the merits of Macneil’s work, see O Williamson *The Mechanics of Governance* (1996) OUP Oxford and R Posner ‘The New Institutional Economics Meets Law and Economics’ (1993) 149 *Journal of Institutional and Theoretical Economics* 73

twofold; first legal scholars find the language that Macneil uses and the structures that he places on exchange activity (which do admittedly obscure his attempts to situate contract in a broad pattern of social relations) alien, and second Macneil is offering a model of contract which presents a significant challenge to the formal contract model. It is hard to continue to accept the formal model of contract and its philosophical underpinnings as having very much explanatory force if one accepts the validity of Macneil's position. That said, as Lewis points out the formal model of contract is largely illusory even without the contribution of Macneil. On close examination its universal rules melt away into a series of special cases and relationships to which different rules apply and different dispute resolution regimes apply.⁵

The work of Macaulay offers less of a challenge to the formal model of contract because it is more accessible in a linguistic sense and because it does not attempt to offer a complete theory of exchange behaviour. Macaulay's work is given an easy reception but a flawed reading within the world of doctrinal scholars of contract. He is frequently and erroneously referred to as suggesting that the formalities of contract simply do not exist in some loci of business practice. This allows scholars in the formal school to relegate his work to that of separate parallel track and thus it merely becomes a curiosity referenced in a footnote.⁶ The third section looks at what I think is a new evolution of contract; blockchain and so called smart contracts. These I think push contract scholars, whether they are followers of Macaulay and Macneil, or adherents of the formal School either as doctrinal or philosophical scholars, to look at exchange behaviour in a different way. Blockchain is designed to be rigid and inflexible requiring no interpretative intervention because, at base, it is a computer code that scripts, literally, the relationship between many parties in a network. In conclusion, I wonder whether the evolution of blockchain as an exchange mechanism that is an entirely computer based interaction means that Macneil's rather tongue in cheek concept of *Technical Man* has indeed triumphed in a way that he certainly did not suggest that it would.

Section 1 – Macaulay's 'Non-Contractual Relations in Business'

In 1963 Macaulay produced two empirically informed papers on the business context of contract.⁷ One of these papers, 'Non-Contractual Relations in Business: A Preliminary Study'⁸ has become a foundational tool for modern contract scholarship. It is currently the 4th most highly cited paper in Sociology from the 1960s⁹, though not necessarily the

⁵ See R Lewis 'Contracts Between Businessmen: Reform of the Law of Firm Offers and an Empirical Study of Tendering Practices in the Building Industry' (1982) 9 *JLS* 153. Lewis' piece is the first attempt to pinpoint the failures of the classical model of contract in a critical fashion rather than a descriptive one. It has never received the recognition as a field-defining piece that it should have in my view.

⁶ See for example M Furmston *Cheshire, Fifoot & Furmston's Law of Contract* (2012) 16th Ed OUP Oxford at p30.

⁷ S Macaulay 'The Use and Non-Use of Contracts in the Manufacturing Industry' (1963) 9 *Practical Lawyer* 13

⁸ S Macaulay (1968) 28 *Am Soc Rev* 55. Rather bizarrely Furmston (op cit n6) suggests that this may be a piece that is hard to find. This perhaps says something about the narrow and self-referentially closed system of reasoning that doctrinal contract law has become.

⁹ <<http://kieranhealy.org/blog/archives/2014/11/15/top-ten-by-decade/>> accessed 3rd February 2017.

most highly cited in the decade of its publication, and the only paper from its year of publication to achieve more than 500 citations.¹⁰ Where is it being cited is harder to trace but some thirty years after its publication it was declared to be the 15th most cited law review article of all time.¹¹ Given that its locus of publication was a Sociology journal and that this declaration occurred in 1996 long before internet search engines¹² made knowledge of what was in the journals of other disciplines relatively easy to access this is an indication of phenomenal penetration into legal academic literature. However this picture of influence becomes clouded when we triangulate it against accounts of citation metrics for articles that we might have expected to draw upon Macaulay's work. One account that looked for US Law Review articles on 'empirical contract law scholarship' claimed to have found less than 30 such pieces in the years 1985 to 2002¹³ while a second account found a veritable 'cottage industry' of such studies; it identified 113 between the years 2005-2011.¹⁴ For sure there are some definitional differences at play here but not ones that explain numerical disparities of this order. Fashions in scholarship change over time in relation to both area of study¹⁵ and methodology¹⁶ as does the availability of funding for extra-library based work. Measuring influence is not something that can be done purely by citation metrics.

What we can say is that post Macaulay's 1963 contribution a discernable body of contract scholarship not just in the US and the UK but globally¹⁷ emerges that is answering questions raised by inquiries that lie outside the immediate purview of traditional doctrinal scholarship.¹⁸ This is also true of accounts of contract that are theoretical in their orientation; the increasingly ambitious projects in this area are fuelled by the desire to respond to Macaulay's observations about the limited nature of formal models of contracting.¹⁹ This assertion runs counter to the proposition put forward by Robert Scott in his magisterial account of relational contract theory. Scott's

¹⁰ J Jacobs, 'ASR's Greatest Hits' (2005) 70 *Am Soc Rev* 1.

¹¹ F Shapiro, 'The Most-Cited Law Review Articles Revisited' (1996) 71 *Chi Kent L Rev* 751. Shapiro was using a definition of 'law review article' that turned on article title rather placement in a conventional law review.

¹² Google Scholar now records in excess of 5000 citations for this article.

¹³ R Korobkin 'Empirical Scholarship in Contract Law: Possibilities and Pitfalls' (2002) *U Ill Rev* 1033

¹⁴ Z Eigen 'Empirical Studies of Contract' (2012) 8 *Annual Review of Law and Social Science* 291

¹⁵ See the observations of the *Nuffield Inquiry on Empirical Legal Research* http://www.ucl.ac.uk/laws/socio-legal/empirical/docs/inquiry_report.pdf (accessed March 17th 2017)

¹⁶ See R Collier, 'We're All Socio-Legal Now – Legal Education, Scholarship and the Global Knowledge Economy: Reflections on the UK Experience' (2004) 26 *Sydney L R* 503

¹⁷ See for example the multi country study of contract flexibility funded by the Finnish Cultural Foundation and reported in a special issue of the *Lapland Law Review*; 'Flexibility in Contract' (2015) 2 *Lapland Law Review* and Y Hu and L Qui 'An Empirical Analysis of Contracting by Chinese firms' (2010) 21 *China Economic Review* 423.

¹⁸ A Bradney, 'The Place of Empirical Legal Research in the Law School Curriculum' in P Cane and H Kritzer (eds), *The Oxford Handbook of Empirical Legal Research* (OUP 2013) 1025, 1033.

¹⁹ See for example M Radin *Boilerplate* (2013) Princeton Univ Press, New Haven. Radin is setting out a thesis around standard form contracts and whilst her arguments are infused with theoretical insights the questions she is posing and answering are contextual ones. It is to be hoped that her observations about marriage and relational contract (p91) are not an adverse reaction to Macneil's position on the same, see I Macneil 'Relational Contract Theory as Sociology: A Reply to Professors Lindenberg and de Vos' (1987) 143 *J of Inst and Th Econ* 272.

view is that the Macaulay inspired 'law in action' approach is losing ground in popularity as the focus of research to a law and economics inspired scholarship which *inter alia* assumes simplified concepts within contract law and practise that can be tested through complex micro economic modelling techniques.²⁰ This may reflect the strongly quantitative bias that exists in what is called Empirical Legal Studies in the US²¹ but it does not reflect the general trajectory of scholarship elsewhere. Eigen tells us that in his survey of US law review articles on empirical studies in contract economic theories were dominant in framing the questions that researchers asked about contract. This should not surprise us; contract concerns the arrangements for exchange and exchange is an economic activity.²² If the centrality of economics is a surprise then this is because Macaulay has been misunderstood as talking only about the absence of contract law and not about the social relations between the parties which naturally include the economic context of their behaviour. I expand upon this proposition below. In fact what has occurred is that the existence of the Macaulay School of contract has encouraged some scholars to test the validity of descriptive propositions founded in economics that seek to explain contracting behaviour.²³

Macaulay began his 1963 empirical work with a definition of contract that most lawyers would recognise as being broadly within the legal canon; contract is a mechanism not for necessarily achieving an efficient allocation of resources in the terms that an economist would model but as the device that facilitates, and encapsulates the terms of, the exchange as the parties plan it. To facilitate exchange, a contract must do two things: it must try to capture an element of rational planning by offering a risk-based solution for future contingencies, and it must include legal sanctions to either induce performance or compensate for non-performance.²⁴ Macaulay's findings were that his sample of manufacturers attempted to plan exchanges completely. Written contracts took the form of standardized documents which were only very rarely used subsequently to adjust or enforce exchanges; adjustment or enforcement took place informally with legal sanctions being resorted to only after careful consideration of the possible undesirable consequences of such a course of action. Using law to achieve a remedy risked turning a co-operative relationship into an adversarial one which would see performance occur only according to the terms of the contract strictly construed. The presence of 'non-contractual relations' allowed disputes to be avoided as the

²⁰ R Scott 'The Promise and the Peril of Relational Contract Theory' in J Braucher, J Kidwell and W Whitford (eds) *Revisiting the Contracts Scholarship of Stewart Macaulay* (2013) Hart Publishing, Oxford 105 at p 107, 124.

²¹ Within the US Law and Society community, quantitative studies have more traction and the sub-group that is the Empirical Legal Studies movement is almost entirely dominated by scholarship based on large data sets assembled in the US. For empirical confirmation of the US situation in relation to the balance between qualitative and quantitative studies, see Eigen, op cit n14 at p301 and C Boyd, 'In Defense of Empirical Legal Studies' (2015) 63 *Buffalo Law Review* 363.

²² See D Smith and B King, 'Contracts as Organizations' (2009) 51 *Arizona L R* 1 for an informative discussion of the shared questions that legal academics and economists have about contract and some interesting vignettes about the careers of Stewart Macaulay and Iain Macneil.

²³ See for example T Wilkinson-Ryan and J Baron, 'Moral Judgment and Moral Heuristics in Breach of Contract' (2009) 4 *J of Emp Legal Studies* 405 and Z Eigen, 'When and Why Individuals Obey Contracts: Experimental Evidence of Consent, Compliance, Promise, and Performance' (2012) *J of Legal Studies* 67.

²⁴ Op cit n7 at p56

importance of maintaining these relations acted as an enforcement mechanism. These non-contractual relations were based around ideas of good faith in business, such as industry-wide customs, past dealings and personal relations between actors in different organizations, and ideas of trust, reciprocity and reputation, both personal and professional. The focus was on ensuring that business continued between the parties to the exchange. In particular two behavioural norms were identified as being more important than the rational planning of an exchange: being seen as having and supporting a good product; and not 'welching' on a deal. Formal instruments of contract were of more assistance in explaining detailed product specifications and requirements within the firm than in securing inter-firm exchanges.

Macaulay's 1963 study was situated in the machinery manufacturing industry of Wisconsin. By the end of his project Macaulay had assembled an impressive sample; he had contact with 68 lawyers and business executives from 43 manufacturing firms and 6 law firms.²⁵ The manufacturing firms represented some of the largest in the US at the time – General Electric, S.C. Johnson and Harley Davidson.²⁶ That these actors should have a manufacturing or production facility in the American Midwest takes us back to an era pre-globalization. The business world is a much bigger place than it was in 1963. There are likely to be far fewer 'local' deals enhanced by stable personal relationships as production industries have gradually relocated to economies with low labour and other external costs,²⁷ introducing the dimension of contracting across national boundaries. The dislocations that result from these dynamics will persist even in markets for standardised goods. As Macaulay himself recognised the specific non-contractual relations he identified were culturally contingent.²⁸ By 1985, based upon his own further work and the work of others, he had added power, dependence and exploitation as further relationship dynamics.²⁹ Macaulay is not offering an alternative theory of contract in opposition to formal contract law. There is no suggestion that formal

²⁵ This evidences the scale of Macaulay's empirical work in 1963 which is not clear from the piece itself. Throughout his career, and as late as 2009, Macaulay expressed concerns about assumptions that his sample was representative, see 'Stewart Macaulay and "Non-Contractual Relations in Business"' in S Halliday and P Schmidt, *Conducting Law and Society Research* (CUP 2009) 14. Much of his concern about the legitimacy in terms of representativeness of his informants seems to come from the fact that his father-in-law arranged his initial contacts and thereafter he pursued a snowball sample approach. To the extent that Macneil acknowledged Macaulay's concerns about his work Macneil supported Macaulay by asserting that those who used the term 'casual empiricism' to criticise empirical findings usually did so on the basis that the findings did not accord with their own 'casual empiricism', see I Macneil *The new social contract: an enquiry into modern contractual relations* (1980) Yale University Press, New Haven at p128 n7.

²⁶ I Bozovic and G Hadfield 'Scaffolding: Using Formal Contracts to Build Informal Relations in Support of Innovation' (2016) *Wisconsin LR* 981 citing on p984 'private communication, Stewart Macaulay'.

²⁷ On this see the findings of John Esser. Esser set out to replicate Macaulay's inquiry with manufacturers in Wisconsin producing the same or similar products. He was able to reproduce three categories; paper mills, farm machinery and construction materials. He found long term exclusive supply contracts called 'partnerships' which were designed to allow regular reordering and changes to specification in a temporal context of just in time delivery with enhanced service standards, J Esser, 'Institutionalising Industry: The Changing Forms of Contract' (1996) 21 *Law and Social Inquiry* 593.

²⁸ S Macaulay 'Long-term Continuing Relations: The American Experience Regulating Dealerships and Franchises' in C Joerges (ed) *Franchising and the Law: Theoretical and Comparative Approaches in Europe and the United States* (1991) Nomos Verlagsgesellschaft 179 at p188

²⁹ S Macaulay 'An Empirical View of Contract' (1985) *Wisconsin Law Review* 465

contract law should be abandoned. He rejects this as a suggestion on numerous occasions.³⁰ Instead he emphasises that formal contract focuses on a small subset of contract disputes adjudicated upon by courts³¹ where drafting, legislative intervention or technological change would deal with adverse or unforeseen consequences in a time frame of less than two decades.³²

Macaulay saw himself as explaining, informed by empirical research, that formal contract law was not as conclusive of contractual relationships as lawyers thought it was. It forms only part of the relationship between contracting parties,³³ perhaps the entire relationship for only in the context of 'one-shot transactions'³⁴ that Macneil would later describe as discrete contracts. He does not present himself as a theorist and in the absence of his offering a general alternative theory of contract what results are small but beautifully drawn and detailed empirical pictures of different aspects of contract relations unearthed by researchers. These tell us about particular aspects of business transactions in particular industries and often in particular locations. Unsurprisingly this gives us a fragmented and ungeneralizable account.³⁵ Our knowledge of the development of blockchain has been very similar with much of the literature relying on describing particular applications.³⁶ Building on Macaulay,³⁷ Beale and Dugdale in their study of engineering firms in the UK tell us that non-payment and payment disputes were litigated because debt recovery was relatively inexpensive.³⁸ Arrighetti, Bachmann and Deakin in their cross-country study (UK, Italy and Germany) of kitchen unit manufacturers and mining machinery manufacturers report significant jurisdictional differences in terms of the type of risks covered in contracts and the level of detail

³⁰ See for example S Macaulay (1985) supra n29 and S Macaulay 'The Real and the Paper Deal: Empirical Pictures of Relationships, Complexity and the Urge for Transparent and Simple Rules' (2003) 66 *MLR* 44 at p45

³¹ S Macaulay 'Freedom From Contract: Solutions in Search of a Problem' (2004) *Wisconsin Law Review* 777

³² S Macaulay 'Contracts, New Legal Realism, and Improving the Navigation of *The Yellow Submarine*' (2006) 80 *Tulane L R* 1161

³³ Opinions differ on how difficult Macaulay's findings are for formal contract law. Certainly for Gilmore they sound the death knell, see G Gilmore *The Death of Contract* (1974) Ohio State U P Columbus, others are more sanguine seeing it as exposing the inadequacy of classic contract law as the sole governing norm for complex contracts see D Campbell 'Reflexivity and Welfarism in the Modern Law of Contract' (2000) 20 *OJLS* 477.

³⁴ S Macaulay 'Elegant Models, Empirical Pictures and the Complexities of Contract' (1977) *L and S Rev* 507 at p509

³⁵ Bernstein points to the non-existence of general norms and customs in business transactions across industries in her criticism of the UCC's desire to include the same, see L Bernstein 'The Questionable Empirical Basis of Article 2's Incorporation Strategy: A Preliminary Study' (1999) 66 *U Chi L R* 710 and more generally in 'Private Commercial Law in the Cotton Industry: Creating Co-operation Through Rules, Norms and Institutions' (2001) 99 *Mich L R* 1724.

³⁶ D Tapscott and A Tapscott *Blockchain Revolution* (2016) Penguin London

³⁷ Another excellent example would be the work of Lisa Bernstein across several different commodity markets (cotton, diamonds and grain). What Bernstein identifies is the presence of essentially a formalist private ordering system for dispute resolution in these markets underpinned by network connections, trade association rules and social norms such as reputation, see L Bernstein 'Opting Out of the Legal System: Extralegal Contractual Relations in the Diamond Industry' (1992) 21 *J of Legal Studies* 115. See further C Mitchell *Contract Law and Contract Practice* (2013) Hart Oxford at p72-75

³⁸ H Beale and T Dugdale, 'Contracts Between Businessmen: Planning and the Use of Contractual Remedies' (1975) 2 *Brit J Law Soc* 45

contained in contracts. The most formal contracts were found in Germany where there was (contra Macaulay) the greatest reluctance to undertake litigation.³⁹ In the context of Spanish film distribution arrangements Gil tells us that film distributors use both informal and formal contracts. Contractual arrangements even in long term arrangements are adjusted to take account of the viewing figures for individual films with formal contracts more likely to be used for films with expected higher viewing figures as there is a greater incentive for the exhibitor to renege on the contract.⁴⁰

Section 2 – Macneil’s New Social Contract

The question of why some transactions are more formal than others in terms of the contract entered into is not one that Macaulay seeks to answer. Nor is he telling us that contract law does not matter. Rather, he is explaining that contract law matters, but perhaps not as much as we might have thought, and in very different ways to those highlighted by the doctrinal model. The norms that are revealed by Macaulay are ones which tell us about the character of the individuals involved and the relationships between them, but convey little about the nature of the transactions they are undertaking, or about the wider social norms that frame their interactions. Macaulay exhorted those thinking of undertaking empirical work on contract, not to do so without first considering Macneil and his contribution to contract scholarship.⁴¹ It is to Macneil that we must turn to find something approaching a general theory of contract.⁴²

Macneil described his theory of contract as creating a unified law of contract by moving it from the transactional principles which underpin the formal model⁴³ to a relational model which includes the formal model but extends it to embrace a much broader and richer social or perhaps philosophical relational context that more accurately explained how exchange took place.⁴⁴ For Macneil the transactional approach of the formal contract model existed within his broader understanding of exchange. He was certainly not of the view that the current construction of legal discourse as applied to contracting

³⁹ A Arrighetti, R Bachmann and S Deakin ‘Contract law, social norms and inter-firm co-operation’ (1997) 21 *Cam J Econ* 171

⁴⁰ R Gil ‘The Interplay of Formal and Relational Contracts: Evidence from Movies’ (2011) 29 *J Law, Econ and Org* 681

⁴¹ S Macaulay, ‘Relational Contracts Floating on a Sea of Custom? Thoughts About the Ideas of Ian Macneil and Lisa Bernstein’ (2000) 94 *Northwestern University L R* 755. Macneil was equally complimentary about Macaulay’s contribution to his own scholarship, describing Macaulay’s 1963 article (n 5) as a ‘demolition effort’ that cleared the way for relational contract theory, I Macneil, ‘Relational Contract: What We Do and Do Not Know’ (1985) *Wis L Rev* 483 at p509.

⁴² The most detailed statement of Macneil’s work is his monograph; I Macneil, *The New Social Contract: An Enquiry into Modern Contractual Relations* (Yale Uni Press 1980). He began to produce US law review articles in the mid-1970s, but his work on contract began much earlier in his career, see I Macneil, *Contract: Instruments for Social Cooperation* (F B Rothman 1968), and I Macneil, ‘The Tanzania Hire-Purchase Act’ (1966) 2 *East Africa L J* 84.

⁴³ Atiyah considered formal contract law to deal largely with discrete contracts because of its propositions based upon ideas of individual utility maximization set out at the point of contract formation, see P Atiyah *Essays on Contract* (1986) OUP Oxford at p5-6 as did Scott, see R Scott ‘The Case for Formalism in Relational Contract’ (2009) 94 *Northwestern Uni L R* 847 at p852

⁴⁴ I Macneil “Barriers to the idea of relational contracts” in F Nicklisch (ed) *Der komplexe Langzeitvertrag: Strukturen und international Schiedsgerichtsbarkeit / The complex long-term contract: structures and international arbitration* (1987) C F Muller Heidelberg 31

behaviour was of no utility.⁴⁵ Barnett contends⁴⁶ that ‘Macneil’s relational theory of contract has changed how every contract scholar views the subject’. This is sadly not true and often if Macneil’s work has been referred to, it has been misunderstood and misdescribed⁴⁷ in the way that I explain below. It is much more likely that while Macneil has had a considerable impact on some contract scholarship,⁴⁸ it has certainly not had the impact that it should have had⁴⁹ and too many contract scholars pass up⁵⁰ the opportunity to consider their intellectual framework for contract transactions against the one that he posits.

Macneil’s philosophy of contract is a sociology of the contracting process which sees contract as social behaviour rooted in co-operation the function of which is to plan exchange into the future. Within this notion of co-operation, the parties retain their separate goals; the significance of this is that Macneil believes that co-operation is key, not to the conclusion of the transaction, but to the attainment of separate goals. By co-operation Macneil means not the sacrifice or subjugation of self interest but a dynamic of self and shared interest between the parties that brings them together and keeps them together such that they search for relational solutions to problems that arise in long term contracts in particular so that each can achieve their own aim.⁵¹ Macneil’s model of contracting behaviour has three levels. At the first level, there is the common bond of ‘society’ – shared meanings, language etc. – and at the second level, there are the political bonds of polite society, which contain exchange behaviour among utility-maximizing individuals within the market place, and prevent them from simply stealing from each other. These two levels are the necessary foundations for exchange behaviour to take place. At the third level come Macneil’s ten external and internal norms which he asserts will be present to some degree or another in each exchange. More likely to be present in relational exchanges are the norms of role integrity, reciprocity, flexibility, contractual solidarity, power and the linking norms of reliance, expectation and

⁴⁵ E Mertz ‘An Afterword: tapping the promise of relational contract theory – “real” legal language and a new legal realism’ (2000) 94 *Northwestern U L R* 909

⁴⁶ R Barnett ‘Conflicting Visions: a critique of Ian Macneil’s Relational Theory of Contract’ (1992) 78 *Virginia L R* 1175. See also P Linzer ‘Rough Justice: a theory of restitution and reliance, contracts and torts’ (2001) *Wis L R* 695 for the expression of similar sentiments.

⁴⁷ This point is made by both Campbell, see D Campbell ‘Reflexivity and Welfarism in the Modern Law of Contract’ (2000) 20 *OJLS* 477, and Vincent-Jones, see P Vincent-Jones ‘The Reception of Ian Macneil’s Work on Contract in the UK’ in D Campbell (ed), *The Relational Theory of Contract: Selected Works of Ian Macneil* (2001) Sweet and Maxwell London 67. Campbell and Vincent-Jones have been tireless advocates for Macneil’s work in the UK.

⁴⁸ See for example C Mitchell *Contract Law and Contract Practice* (2013) Hart Publishing Oxford. This is a *tour de force*. It is an attempt (and the only serious attempt) to advance Macneil’s work from the process of contracting to a legal framework that embraces relationality between contracting parties as a determinative point in adjudication.

⁴⁹ J Feinman ‘The Reception of Ian Macneil’s Work on Contract in the US’ in D Campbell (ed), *The Relational Theory of Contract: Selected Works of Ian Macneil* (2001) Sweet and Maxwell London 59

⁵⁰ M Frug ‘Rescuing Impossibility Doctrine: A Postmodern Feminist Analysis of Contract Law’ (1992) 140 *U Penn LR* 1029 at p1043.

⁵¹ D Campbell and D Harris ‘Flexibility in Long-term Contractual Relationships: The Role of Co-operation’ (1993) 20 *JLS* 166

restitution, propriety of means, and harmonization of the social matrix.⁵² These will be generated in the relationship over time. Some norms will come to the fore when exchanges are more discrete, namely 'implementation of planning' and 'effectuation of consent'.

The contrast between a Macneil approach to contract and a Macaulay approach to contract might be seen through the role that each ascribes to trust in exchange relationships.⁵³ Whereas for Macaulay we might say that trust is essentially about interpersonal trust generated through social norms and that while it is not necessarily crowded out by the presence of a formal contract, the use of that formal contract as a reliance or resolution mechanism brings interpersonal trust to an end, the position for Macneil is rather different. Trust in Macneil's world is institutional in that it is what is required for a functioning market economy in which relational exchanges will dominate. Trust for Macneil exists as a pre-condition for human interdependence. Defined in this way it also encompasses interpersonal trust.⁵⁴ The presence of interpersonal trust is not a signal of altruism in exchange or of the adoption of a shared co-operative position but rather it may demonstrate self-interest and even a conflict of interest between the parties. For Macneil⁵⁵ these positions are not incompatible with trust and several studies have demonstrated that from an empirical perspective this is an accurate reflection.⁵⁶ Trust can emerge from conflict as parties test each other and build up shared understandings and respect.⁵⁷ In the context of blockchain these interests and behaviours around trust are re-ordered. Institutional trust in code design and the platform removes interpersonal trust as a factor in the exchange relationship itself which then signifies co-operation and removes conflict.

The interplay between discrete and relational exchanges are crucial to understanding Macneil's position. There is a suggestion in his work that the discrete contract is situated at the opposite end of a spectrum to relational contract.⁵⁸ Macneil does not develop this idea but it remains part of his thinking, if only as something which has purely mythical

⁵² I Macneil, 'Values in Contract: Internal and External' (1983) 78 *Northwestern University L R* 340 and R Spediell, 'The Characteristics and Challenges of Relational Contracts' (1999) 94 *Northwestern Univ L Rev* 823.

⁵³ See C Mitchell 'Contracts and Contract Law: Challenging the Distinction Between the 'Real' and the 'Paper' Deal (2009) 29 *OJLS* 675 at p684f for an account of the multifaceted relationship between contract and trust

⁵⁴ Once Macneil moves away from seeing parties in an exchange relationship as individual utility maximizers but rather as co-operating, trust is required, see A Baier 'Trust and Antitrust' (1986) 96 *Ethics* 231. Thus Macneil is viewing co-operation, and through it trust, from a broader perspective than the game-theoretical Hobbesian approach usually associated with models of contract. His position is complimentary rather in opposition to that of Baier who sees trust emanating from interpersonal dependence rather than simply co-operation, see p252-253.

⁵⁵ I Macneil op cit n19

⁵⁶ S Deakin, T Goodwin, A Hughes 'Co-operation and trust in inter-firm relations: beyond competition policy?' in S Deakin and J Michie (eds) *Contracts, Co-operation and Competition* (1997) OUP Oxford 105 and the analysis of market individualism provided by Campbell in D Campbell 'Arcos v Ronaasen as a Relational Contract' in D Campbell, L Mulcahy and S Wheeler (eds), *Changing Concepts of Contract* (2013) Palgrave Macmillan Basingstoke 138

⁵⁷ S Deakin, C Lane and F Wilkinson "Trust" or Law? Towards an Integrated Theory of Contractual Relations Between Firms' (1994) *JLS* 329

⁵⁸ I Macneil, 'The Many Futures of Contracts' (1974) 47 *Southern California Law Review* 691 at p 737f.

force.⁵⁹ A discrete contract is a contract made without social relations Macneil tells us, and yet he also tells us that all contracts are relational in that they are embedded in social relations. Even the most discrete contract on Macneil's terms is encircled by social relations⁶⁰ a concept which Macneil understandably draws very widely⁶¹ expanding outwards from his four core elements; order, means of enforcement, means of exchange and communication.⁶² The "gas station on the Jersey turnpike" that is visited by someone who rarely travels the road is the most well-known example of the discrete scenario.⁶³ What is largely ignored is the material in the footnotes to the gas station example. In those notes Macneil placed the purchase in a web of social relations based on brand and advertising and in a network of other contracts concerning the provision of credit.⁶⁴ He does a similar thing in relation to supermarket purchases; the "this for that" so characteristic of depersonalized self-service shopping is not a discrete contract but instead one that is embedded in social relationships and a network of other contract transactions: shopper and brand loyalty to product or retailer, credit transactions between shopper and bank, and the customary practices of different supermarket retailers. What Macneil does not do is draw a distinction in discrete and relational terms between the atomized process of making the contract itself in these situations and the informational and network structure that surround them. This is a distinction that informs the discussion of blockchain contracts below.

We might deduce from this that the discrete contract is something that is impossible to achieve and that all contracts are in some degree relational. What Macneil means⁶⁵ by this idea of a discrete to relational spectrum is not a device for plotting contracts by type, from spot to supply, say, or for mapping individual contract scenarios, but a mechanism by which we can examine contract at a macro level. Macneil uses distance between discrete and relational scenarios to give a sociological account of how society evolves and then works.⁶⁶ If an economy was dependent on discrete contracts (a discrete economy, as Macneil describes it)⁶⁷ as its primary method of facilitating exchange, productivity would be very low and transaction costs would be very high.⁶⁸ However this might be something that needs to be reassessed in the light of the revolutionary potential of blockchain contracts which seem to have a closer relationship with the discrete form than the relational form.

⁵⁹ I Macneil, 'Relational Contract Theory: Challenges and Queries' (1999) 94 *Northwestern Univ L Rev* 877 at p 894f.

⁶⁰ I Macneil 'Exchange Revisited: Individual Utility and Social Solidarity' (1986) 96 *Ethics* 567

⁶¹ Op cit n51.

⁶² Op cit n59

⁶³ I Macneil 'Contracts Adjustments of Long-term Economic Relations under Classical, Neoclassical and Relational Contract Law' (1978) 72 *Northwestern U L R* 854 at p857

⁶⁴ I Macneil op cit n58 at p720

⁶⁵ D Campbell, 'The Relational Constitution of the Discrete Contract' in D Campbell and P Vincent-Jones (eds), *Contract and Economic Organisation* (1996) Dartmouth Aldershot 40; D Campbell, 'Ian Macneil and the Relational Theory of Contract' in D Campbell (ed) *The Relational Theory of Contract* (2001) Sweet and Maxwell, London.

⁶⁶ R Scott, 'The Promise and Peril of Relational Contract Theory' in J Braucher et al, op cit n18 at p114-115.

⁶⁷ I Macneil op cit n41 at p 490.

⁶⁸ S Wheeler, 'What Ian Macneil Might Have Said About Using eBay?' in D Campbell, L Mulcahy and S Wheeler (eds), *Changing Concepts of Contract* (2013) Palgrave Macmillan Basingstoke 38.

Macneil's descriptive vocabulary and complex writing style do much to mask the conceptual depth of his theoretical contribution,⁶⁹ despite his own views to the contrary.⁷⁰ He reasons from the conceptual to the particular and this is difficult for an audience of contract lawyers who despite their protestations about the existence of universal general principles reason around detailed rules and their voluminous exceptions. Macaulay's work is easier to accommodate within their intellectual framework as he starts with contractual relations in the formal sense as his unit of analysis and moves outwards from that into *non-contractual* relations. This distinction allows his work to be seen as somehow separate from formal contract rules. Much of the terminology Macneil uses – for example 'presentation', 'social matrix', 'solidarity' and 'vertical (command) or horizontal (exchange) economic ordering'⁷¹ are not part of contract law's terminological family. He uses a bewildering plethora of classification systems; 'roots of contract', 'contract norms', 'core propositions' and 'axes'. At one point he even seemed to move away from the one definitional construct that formal lawyers had grasped by declaring that that exchange relations that were the opposite of discrete would be known as "intertwined", a proposition he later lost faith in.⁷²

Section 3 – The Promises of Blockchain

When writing *The New Social Contract* in 1980⁷³ Macneil cannot have foreseen the technological advances in the functionality of the internet and computing that would occur or the speed at which they would occur in the last two decades of the twentieth century. This makes the last ten pages of his great statement seem remarkably prescient. In that section of his book he voices concern about the abstracting and dehumanizing effect of technology that might occur in a world controlled by Technical Man. According to Macneil, Technical Man can organize his world so that the 'messy reality'⁷⁴ which attends the use of contract in both the practice sense of the word and in its broadest relational sense need not be part of it. Spontaneity and reflection can be designed out of interactions and replaced instead by entirely bureaucratic structures that recognize only demands 'for presentation and discreteness'⁷⁵ even in a world which demands flexibility. Technical Man cannot iron out human imperfections but he can make their institutions perfect by ensuring that every objective is achieved in the best way.

Macneil's alternative to the world of Technical Man is the life offered in the country he calls Post-Technique. In the land of Post-Technique citizens want as much flexibility as

⁶⁹ J Feinman 'The Significance of Contract Theory' (1990) 58 *Cincinnati L R* 1283 at p1299-1304 where coincidentally Feinman provides a very incisive account of the deficiencies of doctrinal contract law exposed by Macneil.

⁷⁰ Op cit n19 and I Macneil 'Economic Analysis of Contractual Relations: its shortfalls and the need for a "rich classificatory apparatus" (1981) 75 *Northwestern Law Rev* 1018

⁷¹ I Macneil 'A Primer of Contract Planning' (1975) 48 *Southern California Law Review* 627

⁷² Op cit n59

⁷³ Op cit n42 (1980) at p108-118

⁷⁴ Describing contracting as 'messy' was something that both Macneil and Macaulay did throughout their work. Macaulay went so far as to describe formal contract law as 'elegant' no doubt reflecting its neat and ordered world of strangers making one-off never to be repeated deals with each other, see Macaulay op cit n29 and n34

⁷⁵ Op cit n42 (1980) at p110

possible and want others to have as little control as possible over planning. They are looking for a balance between the power and possibilities of technocratic intervention and humanity as evidenced through social relations. Decentralised planning and decision making is considered to be key to achieving this balance as is a preservation of existing multiple solutions to all problems rather than a rationalisation through competition into an approved approach. Controlling or at least managing the consequences of innovation⁷⁶ are key to a successful Post-Technique society. The effect of these choices might be to trade the highest level of productivity for spontaneity and continuing social relations but that is the only choice that will keep the rise of Technical Man in check.⁷⁷

Alongside his concerns about the disassociation of Technical Man from social relations in a broad social contract sense, we have to set Macneil's observation also from within *The New Social Contract* about the effect of the existence of technology on contracting practice. Macneil sees technology requiring contracts to have high levels of specification in both service and product production scenarios such that "even the most specific and measured exchanges [are tied] into on-going relational patterns,"⁷⁸ no doubt this would have aided the citizens of Post-Technique in resisting the advances of Technical Man. The technological world of 2016 is far advanced from anything that Macneil could have thought possible in 1980 but the influence of technology on contracting practice has been that contracts have become less, not more, relational in the conventional sense of the word. Macaulay does not speculate on the role that technology might play in contracting practice but the importance that he places on interpersonal dialogue would suggest that he too sees a high degree of relationality as essential to business transactions.

Advances in technology in general, and in the functionality of the internet⁷⁹ in particular after it was opened to commercial applications in the early 1990s⁸⁰ have transformed human life. Broadband technology, telecommunications innovation and the development of social media platforms⁸¹ have resulted in the more precise articulation of what I term vertical relationships between individual qua citizen and state and between citizen and corporation. In general terms we can see that technology has

⁷⁶ Op cit n42 (1980) at p113. See also R Owen et al 'A Framework for Responsible Innovation' in R Owen, J Bessant and M Heintz (eds) *Responsible Innovation* (2013) Wiley London 27

⁷⁷ The only substantial discussion of worlds of Technical Man and Post-Technique is offered by Brownsword, see R Brownsword "'Post-Technique": The New Social Contract Today' in D Campbell, L Mulchay and S Wheeler op cit n68, 14. Brownsword suggests that the citizens and legislators of Post-Technique should adopt a regulatory solution to support a new social contract. The suggested solution focuses on the control of technology to support self-governance in the pursuit of flexibility and autonomy, but also to regulate it where asymmetries of power emerge. Brownsword's analysis is a sophisticated one that considers prudential, moral and practical regulation.

⁷⁸ Op cit n42 (1980) at p22

⁷⁹ T Karagiannis 'The New Face of the Internet' in R Harper (ed) *Trust Computing and Society* (2014) CUP Cambridge 38

⁸⁰ T Wu *The Master Switch* (2010) Atlantic Books London at pp168-175,262-268

⁸¹ A Martin, A de Rosario and M Del Carmen Caba Pérez 'Using Twitter for Dialogic Communication: Local Government Strategies in the European Union' (2015) 41 *Local Government Studies* 421.

enhanced or at least has the potential to enhance the formal⁸² and informal democratic process⁸³ and improved the targeting and delivery of some public services.⁸⁴ Potentially more concerning are third generation screens;⁸⁵ 'smart' internet developments. Through these both the corporate sector and the state have, for different reasons, engaged in internet based surveillance of individuals, their habits and their interests. Algorithms can predict future behaviour of individuals and the decisions they might make from big data gathered during that surveillance. This then has implications⁸⁶ in areas such as product choice and newsfeeds through what is 'offered' to people via their smart devices and personal security and risk management⁸⁷ for them in terms of what information is known and stored and who has access to that information.

Hildebrandt⁸⁸ presents an analysis of these technologies which are, in her terms, the 'complete agents' and their relationship to human agency which suggests that we should not see ourselves as merely passive users of these technologies but as interacting with them.⁸⁹ These technologies should not be seen as information processing devices but instead we should view using them as engaging in communication with them in an active sense. Their agency is manifested in the decisions and choices that they make for us. Rather than the world of Post-Technique or the domain of Technical Man, Hildebrandt's world is 'onlife';⁹⁰ a place where human life is mediated by technologies which need to be factored into our lives as part of our active environment in the same way that written and spoken language are. These ideas around the relationality and communicative (in a non-traditional) potential of technological applications have considerable significance for a Macneilian analysis of blockchain.

Blockchain is a piece of computer code which creates a database, or, more accurately a digital ledger, which allows transactions to be stored publically in chronological order. The example that is frequently given to explain it is that of the vending machine; a

⁸² R Sandoval-Almazan and J Gil-Garcia 'Toward an integrative assessment of open government: Proposing conceptual lenses and practical components' (2016) 26 *J of Organizational Computing and Electronic Commerce* 170

⁸³ J Van Laer 'Activists "Online" and "Offline": The Internet as an Information Channel for Protest Demonstrations' (2010) 15 *Mobalization* 405

⁸⁴ A Cordella and N Tempini 'E-government and organizational change: Reappraising the role of ICT and bureaucracy in public service delivery' (2015) 32 *Government Information Quarterly* 279

⁸⁵ From a marketing perspective smart devices such as the iPhone are the third screen behind the television and personal computer, see C Martin *The Third Screen: marketing to your customers in a world gone mobile* (2011) Nicholas Brealey Boston

⁸⁶ R Kitchin *The Data Revolution: Big Data, Open Data, Data Infrastructures and Their Consequences* (2014) Sage London London

⁸⁷ M Hildebrandt 'Who needs stories if you can get the data? ISPs in the era of big number crunching' (2011) 24 *Philosophy and Technology* 371

⁸⁸ M Hildebrandt *Smart Technologies and the End(s) of Law* (2015) Edward Elgar Cheltenham. Hildebrandt's principal argument is a very interesting one around using systems theory to interrogate and reconstitute the concept of privacy and set out how law might relate to a world of complete agents.

⁸⁹ Compare for example the position of Morozov which sees humans as passive information machines feeding a technobureaucratic structure, E Morozov, 'The Real Privacy Problem' *MIT Technology Review* (2013) <https://www.technologyreview.com/s/520426/the-real-privacy-problem/> (accessed March 17 2017).

⁹⁰ M Hildebrandt 'The Public(s) Onlife' in L Floridi (ed) *The Onlife Manifesto* (2015) Springer Heidelberg 181

vending machine is a device that is programmed to transfer ownership of a chocolate bar, say, when the price of the bar is inserted into the sealed machine. In the same way computer code can be used to execute certain tasks once particular inputs have occurred. When information is added to the digital ledger it remains on the ledger. No one individual controls the blockchain, rather the blockchain is shared between a network of participating computers. The absence of a single point of control or authority gives each user of the blockchain a very high level of trust in the instrument itself without this trust having to be supported by anything or anyone outside the chain. Each computer has a full copy of the blockchain ledger and the shared copy is updated on each participating computer by a consensus algorithm. Blockchains are ideal repositories of ownership records as only one record of ownership can exist on the ledger.⁹¹ No asset for example can be pledged twice as a security as the database can not be edited once it has been updated.

The best known application of blockchain is the digital currency Bitcoin.⁹² Since Bitcoin was launched numerous other applications and platforms have been developed; Ethereum and HydraChain for example. Blockchain works by using mathematical encryptions that can only be resolved by significant computational power, so significant that an attacker would need to control a majority of the available power on the internet. This will not occur as long as a mathematical error in the code is not made.⁹³ Importantly in the context of a discussion of Macneil and Macaulay blockchain contracts are now being used not just as static instruments of record but as devices to execute and enforce transactions and are in themselves contracts⁹⁴ with pre-determined terms; 'a set of promises specified in digital form, including protocols which the parties [represented by computers in the network] perform on the other promises'.⁹⁵ The code can be constructed in a way that can impose limits on actions before they are taken meaning that an enforcement mechanism is redundant; the code ensures that the terms are complied with so non-performance or a performance that is in breach of the rules cannot occur.⁹⁶

⁹¹ J Fairfield 'Bitproperty' (2015) 88 *Southern Calif L R* 805

⁹² The name 'blockchain' for these arrangements probably comes from the 2008 statement from Satoshi Nakamoto, who may or may not be the Nick Szabo referred to note 95, that announced the development of Bitcoin. Blockchain was not expressly referred to but mention was made of blocks being chained together see <http://nakamotoinstitute.org/bitcoin/> (accessed March 20th 2017).

⁹³ The most well known example of such an error is the collapse of the world's first user controlled venture fund – the DAO – a \$150m fund of which around \$60m was lost in a hack, see <http://www.coindesk.com/author-daos-original-code-minimize-regulatory-backlash/>

⁹⁴ The extent to which blockchain complies with all the legal formalities of doctrinal contract law in terms of formation is yet to be determined. Discussion is still at the stage of examining each application of the technology against its non-computer based alternative, see K Lauslahti, J Mattila and T Seppälä 'Smart Contracts – How will Blockchain Technology Affect Contractual Practices?' *ETLA Reports* No 68 (2017) <https://pub.etla.fi/ETLA-Raportit-Reports-68.pdf>

⁹⁵ N Szabo *Smart Contracts: Building Blocks for Digital Markets* (1996) http://www.alamut.com/subj/economics/nick_szabo/smartContracts.html (accessed March 20th 2017).

⁹⁶ P De Filippi and S Hassan 'Blockchain Technology as a Regulatory Technology: From Code is Law to Law is Code' (2016) 21 *First Monday* <http://firstmonday.org/ojs/index.php/fm/article/view/7113> (accessed April 1st 2017)

In the consumer space an example of blockchain would be the P2P marketplace *OpenBazar* which is a decentralised market that runs on the internet with no fees for buyers or sellers. A more commercial application is the development of insurance policies designed for the sharing economy in house and room rentals. Once a potential renter and a potential hoster have found each other using a platform such as *AirBnB* or *Vrumi*, blockchain technology allows the host to opt for an insurance policy the terms of which are locked, date stamped and uploaded to a distributed ledger. Once on the ledger the policy cannot be amended or duplicated and can be viewed by host, guest and underwriter. Like *OpenBazar* all back office functions and intermediaries are eliminated and consequently transaction costs are reduced.⁹⁷ Similar gains could occur in a host of other transactional contexts; finance, capital markets, supply chains and nonpayments for example.⁹⁸ The only trust the parties require is in the blockchain itself. Trust in conventional others such as banks, courts, brokers and trading partners can be dispensed with in favour of trust in a thing - the computational power of the internet.

In a different register blockchain has the potential to deliver us to the world of Macneil's Technical Man; the governance of corporations and states can become decentralised⁹⁹ and more transparent in terms of the information about individuals that is held but also less reflexive. There would be no complaints about centralisation or about regulatory incompetence or capture.¹⁰⁰ Government services could be customised on a household level basis through a frictionless interface. Local communities could set their own rules without the need for central design or enforcement.¹⁰¹ Digital voting systems could enhance participatory budgeting. Hierarchies are flattened but the freedom from central control has to be assessed against the removal of discretion as the blockchain's code binds immutably nodes that are connected to it. For some the absence of the state's central co-ordinating function might be liberating, for others, like Macneil, it will provoke concern about the absence of a guarantor of fundamental rights and about the decline of citizenship of a collective as an identity.¹⁰²

Conclusion

Blockchain disrupts the role that Macneil and Macaulay give in contracting behaviour to communicative social relations. None of the usual social cues that generate trust and confidence or wariness and mistrust in a face-to-face perhaps more discrete, in a Macneilian sense, interaction are present. More relational extended course of dealing transactions during which the parties might discover something of each other's humanity do not occur in a blockchain world. Macaulay's more fluid culturally based non-contractual relations are not present either in a situation where execution and

⁹⁷ See <https://www.vrumi.com/insurance> (accessed April 1st 2017)

⁹⁸ Juri Mattila *The Blockchain Phenomenon: The Disruptive Potential of Distributed Consensus Architectures* (2016) ELTA Working Paper 38 <https://www.etla.fi/julkaisut/the-blockchain-phenomenon-the-disruptive-potential-of-distributed-consensus-architectures/>

⁹⁹ M Stone 'The Tiny European Country That Became A Global Leader in Digital Government' (2016) *Forbes* <https://www.forbes.com/sites/delltechnologies/2016/06/14/the-tiny-european-country-that-became-a-global-leader-in-digital-government/#4573466ce13a>

¹⁰⁰ A Wright and P De Filippi *Decentralized Blockchain Technology and the Rise of Lex Cryptographia* (2015) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2580664

¹⁰¹ M Swan *Blockchain: Blueprint for a New Economy* (2015) O'Reilly Media Sebastopol CA at p44-48

¹⁰² M Atzori 'Blockchain Technology and Decentralised Governance: Is the State Still Necessary' (2015) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2709713

enforcement are pre-destined to happen. Blockchain creates a world where discrete transactions with few value extraction opportunities, unlike Macneil's gas station and supermarket examples, outside the immediate peer to peer matrix will be the driver of the economy. The markers of planning and consent that Macneil identifies as key to discrete transactions will be present. The trust and reliance that the parties have are not immediately in and on each other but in the 'distributed, immutable and algorithmic'¹⁰³ nature of the blockchain. Concerns about the bad character of a contracting party melt away and the number of individuals who can trade without fear of fraud increases. This does not necessarily render obsolete Macneil's and Maculay's framing of the importance of sociality to exchange behaviour rather it requires it to be re-arranged within the transaction space. Blockchain arrangements are still underpinned by subjective intention. Those intentions are translated by people into codes which computers, as our agents, then execute. The results of those executed instructions deliver position enhancing benefits back to the parties.

¹⁰³ K Werbach 'Trustless Trust' (2016) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2844409