

Cryptocurrency, Crypto-Tokens, and Crypto-Assets as “Data Objects”: A Novel Form of Property

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ABSTRACT

This Article explores the “data object,” the United Kingdom Law Commission’s proposal for a third form of personal property designed to protect crypto-assets. It contains three Parts. The first examines the rationale for the data object’s recognition and its legal content. The second considers the “property question”: what does this proposed new category tell us about the nature and content of property itself, and which branches of government are best suited to effect such reform—the courts or the legislature? The Article concludes with brief reflections relevant to how other jurisdictions may follow the United Kingdom Law Commission’s lead in considering the data object as a possible third category of personal property.

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I. INTRODUCTION

Despite recent market instability, the popularity and use of emerging digital assets,¹ such as cryptocurrency and non-fungible tokens (NFTs), continues to grow.² Regulatory efforts have been minimal, largely due to the rapid evolution of these and related

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1. A digital asset is any item of media or text which has been formatted into a binary source that includes the right to use that item. See Alp Toygar, C.E. Tapie Rohm Jr. & Jake Zhu, *A New Asset Type: Digital Assets*, 22 J. INT’L TECH. & INFO. MGMT. 113, 113 (2013).

2. See Medora Lee, *Interest in Crypto, Other Digital Assets Still Strong Despite Recent Crash, Survey Shows*, USA TODAY (June 14, 2022, 2:07 PM ET), <https://bit.ly/3XIUNnI>.

technologies, most notably the blockchain. In one of the most comprehensive contributions to law reform in this field to date, the United Kingdom Law Commission (U.K.L.C.) published a 529-page consultation paper entitled *Digital Assets* on July 28, 2022, in which it “examines how existing personal property law does—and should—apply to digital assets (including crypto-tokens and crypto[-]assets).”³ *Digital Assets* proposes a series of reforms aimed at the recognition and protection of digital assets and the rights of their users to maximize the practical and commercial potential of those assets.

Without question, the U.K.L.C.’s most intriguing and controversial recommendation surrounds the explicit recognition of a new category of personal property, known as “data objects,” to be distinguished from the well-established choses in possession and choses in action.⁴ While there is nothing inherently problematic with the legislative creation of new proprietary interests—indeed, great innovation was effected this way throughout the common law world during the 19th and 20th centuries, both in real property⁵ and personal property⁶—such a proposal, if enacted, carries with it significant implications for the simple reason that innovations made to English law tend to be strongly influential in the legal developments of many other common law jurisdictions.⁷ For that reason, it is worth considering the nature of the change, from both theoretical and legal perspectives.

Theoretically, *Digital Assets* raises what we have elsewhere called the “property question,”⁸ itself broadly divisible into two sets of questions. First, proposals for new forms of property invoke questions about the very nature and content of property. And second, as already alluded to, questions arise concerning the source of such change, namely, whether it is the courts or the legislature that ought to drive such sweeping reforms to the recognized forms of property. This

3. *Digital Assets: Consultation Paper*, U.K.L. COMM’N (July 28, 2022), <https://bit.ly/3GTWMIM>.

4. *See id.* at 4, 51. *See generally id.* at 51–76.

5. In England, consider the Victorian land law reform. *See generally* J. STUART ANDERSON, *LAWYERS AND THE MAKING OF ENGLISH LAND LAW 1832-1940* (1992); Law of Property Act, 1925, 15 Geo. 5 c. 20 (Eng.). In Australia, the Crown land tenures. *See generally* T.P. Fry, *Land Tenures in Australian Law*, 3 RES JUDICATAE 158 (1947). In the United States, the law of prior appropriation in relation to water resources law. *See generally* A. Dan Tarlock, *Prior Appropriation: Rule, Principle, or Rhetoric?*, 76 N.D. L. REV. 881 (2000).

6. Every jurisdiction has adopted, for instance, copyright, patent, and trademark law. *See, e.g.*, Copyright Act of 1976, 17 U.S.C. §§ 101–810; 35 U.S.C. §§ 100–105; Lanham Act, 15 U.S.C. §§ 1051–1129.

7. Although the influence of English precedent in Australia has waned over time, “great assistance continues to be derived by [the Australian courts] from the learning and reasoning of United Kingdom courts . . .” *Gifford v. Strang Patrick Stevedoring Pty Ltd.* (2003) 214 C.L.R. 269, 299 (Austl.).

8. *See* Paul Babie, David Brown, Ryan Catterwell & Mark Giancaspro, *Cryptocurrencies as Property: Ruscoe and Moore v. Cryptopia Limited* (In Liquidation), 29 AUSTL. PROP. L.J. 106, 106 (2020).

Article addresses both of these points; it contains three Parts. Part II examines the U.K.L.C.'s proposal for the data object—the rationale given for its recognition and its legal content. Part III considers the property question raised by the data object—whether such a reform is necessary and, if so, whether the judiciary, the legislature, or both ought to effect this change. Part IV offers some brief concluding reflections relevant to how other jurisdictions may follow the U.K.L.C.'s lead in considering the data object as a possible third category of personal property.

II. THE “DATA OBJECT”

In this Part we briefly outline, first, the rationale or justification offered by the U.K.L.C. for the data object and, second, its legal content.

A. *Rationale*

In *Digital Assets*, the U.K.L.C. first observed the traditional binary taxonomy of personal property (“chattels personal”): choses in possession and choses in action.⁹ The former encompasses tangible items that are capable of being the subject of actual possession,¹⁰ such as cars or furniture. The latter encompasses intangible items that are incapable of physical possession, and which can only be enforced or claimed through legal or equitable action.¹¹ Common examples of such things include enforceable debts, shares in a company, copyrights, and contractual rights to damages. Of course, as the U.K.L.C. points out, this taxonomy has sometimes proven problematic—some things simply do not fit neatly into either of the traditional categories.¹² This most frequently occurs when a legal system deals with the emergence of a new technology. The solution, in the U.K.L.C.'s view, involves the creation of a new category of personal property.¹³

The U.K.L.C.'s proposed third category accommodates emergent digital assets, with cryptocurrency at the forefront of the medley. Prior to advancing its proposal for a third category, the U.K.L.C. acknowledged the longstanding legal position that there is no category of personal property hovering between choses in possession and choses in action.¹⁴ However, it then noted that this position was no

9. See *Digital Assets*, *supra* note 3, at 51; see also Kenneth J. Vandavelde, *The New Property of the Nineteenth Century: The Development of the Modern Concept of Property*, 29 BUFF. L. REV. 325, 332 (1980).

10. See *Colonial Bank v. Whinney* (1885) 30 Ch. D. 261, 285–86 (Eng.); *Fuller & Cummings v. Beach Petroleum NL* (1993) 117 A.L.R. 235, 248 (Austl.).

11. See *Torkington v. Magee* (1902) 2 K.B. 427, 430 (Eng.); *Loxton v. Moir* (1914) 18 C.L.R. 360, 379 (Austl.); *Comm’r of Austl. Fed. Police v. Kalimuthu* [No. 2] (2018) 340 F.L.R. 1, 32 (Austl.).

12. See *Digital Assets*, *supra* note 3, at 53.

13. See *id.* at 54.

14. See *id.* at 51 (citing *Colonial Bank*, 30 Ch. D. at 285).

longer accurate, given that digital assets are both factually and functionally different from both choses in possession and choses in action.¹⁵ Indeed, citing milk quotas¹⁶ and European Union carbon emissions allowances¹⁷ as examples, the U.K.L.C. suggested that English law is “moving towards the recognition of a third category of personal property” distinct from the two traditional categories.¹⁸

The U.K.L.C. rightly noted that crypto-tokens have been judicially regarded as a form of property. In some cases, the question of whether such digital assets constituted property has not arisen, as the parties and the courts have blindly accepted them to do so.¹⁹ But in other cases, the question has been the subject of more detailed examination. In *B2C2 Limited v. Quoine Pte Limited*,²⁰ Justice Thorley of the Singapore International Commercial Court agreed with the defendant’s concession that cryptocurrency was “property,” but went further and considered this proposition from the perspective of the common law of property. His Lordship observed that while cryptocurrency was not legal tender it possessed the “fundamental characteristic of intangible property as being an identifiable thing of value.”²¹ The High Court of Justice of England and Wales, in *AA v. Persons Unknown, Re Bitcoin*, cited and agreed with this reasoning.²² The AA court drew heavily upon the *Legal Statement on Cryptoassets and Smart Contracts* authored by leading English barristers.²³ This statement also supports the idea that cryptocurrency can be classified as property notwithstanding that it does not cleanly fit into either of the traditional categories of choses in possession and choses in action.

In *Ruscoe and Moore v. Cryptopia Limited (in Liquidation)*,²⁴ Justice Gendall, sitting alone in the New Zealand High Court, dismissed *AA v. Persons Unknown* but nonetheless held that crypto-tokens could attract property rights. His Honour felt that such assets satisfied the “classic” criteria for identifying property,²⁵ as expressed in the seminal decision of *National Provincial Bank Limited v. Ainsworth*.²⁶ Cryptocurrency was described as “a species of intangible personal property and clearly an identifiable thing of

15. *See id.*

16. *See id.* at 53 (citing *Swift v. Dairywise (No 1)* (2000) 1 W.L.R. 1177 (Eng.)).

17. *See id.* at 54 (citing *Armstrong DLW GmbH v. Winnington Networks Ltd.* [2012] E.W.H.C. (Ch) 10 (Eng.)).

18. *Id.* at 51.

19. *See id.* at 59 (citing *Vorotyntseva v. Money-4 Ltd.* [2018] E.W.H.C. (Ch) 2596 [13] (Eng.); *Ion Sci. v. Persons Unknown*, 21 Dec. 2020 (unreported) [11] (Eng.)).

20. *B2C2 Ltd. v. Quoine Pte Ltd.* [2019] S.G.H.C.(I) 03 (Sing.).

21. *Id.* at [142].

22. *See Digital Assets, supra* note 3, at 59 (citing *AA v. Persons Unknown, Re Bitcoin* [2019] E.W.H.C. (Comm) 3556 [59], [61] (Eng.)).

23. *See id.* (citing *AA*, [2019] E.W.H.C. at [56]–[59]).

24. *Ruscoe & Moore v. Cryptopia Ltd. (in Liquidation)* [2020] N.Z.H.C. 728 (N.Z.).

25. *See id.* at [102]–[121].

26. *See Nat’l Provincial Bank Ltd. v. Ainsworth* [1965] A.C. 1175 (Eng.).

value.”²⁷ A string of United States cases were also discussed, all of which, the U.K.L.C. noted, repeatedly affirmed that crypto-tokens can attract property rights notwithstanding that those cases typically arose in the context of specific statutory definitions, remedies, or rights of action.²⁸ The U.K.L.C. also referred to several decisions from civil law jurisdictions which “have held that crypto-tokens are things of value, while avoiding the doctrinal questions as to what those things are, or whether they can attract property rights.”²⁹

Ultimately, the U.K.L.C. suggested that the case law highlights challenges posed to the conventional categories of the common law of personal property by “a rapidly digiti[z]ing economic and financial system.”³⁰ Alongside trends in case law, the U.K.L.C. noted four reasons for English law explicitly to recognize a third category of personal property. First, doing so would “enable a more nuanced consideration of emergent objects of property rights, including digital assets.”³¹ Second, such recognition was well-supported by concerned stakeholders.³² Third, such a development is “consistent with international law reform in this area.”³³ Finally, such recognition would clarify questions concerning the property status of digital assets and cultivate a clear and consistent legal framework to govern such assets.³⁴ Assuming, then, that we accept the rationale for its recognition, what legal content would the data object contain? We turn now to that question.

B. Legal Content

The U.K.L.C. identified three criteria that any given thing must satisfy in order to fall within the third category of personal property: such a “thing” must: (1) be “composed of data represented in an electronic medium” (including such formats as computer code and electronic, digital, or analogue signals); (2) exist independently of persons and the legal system; and (3) be “rivalrous.”³⁵ The concept of “divestibility,” though accepted as a common characteristic of data objects and addressed in the U.K.L.C.’s analysis of various types of digital assets, was not stipulated as a “gateway criterion.”³⁶

27. *Ruscoe & Moore*, [2020] N.Z.H.C. at [69].

28. *See Digital Assets*, *supra* note 3, at 64.

29. *Id.* at 65. These cases from Japan, China, Liechtenstein, and Switzerland are discussed by the U.K.L.C. *See id.* at 66–68.

30. *Id.* at 60.

31. *Id.* at 69.

32. *See id.*

33. *Id.*

34. *See id.*

35. *Id.* at 79.

36. *Id.*

The first criterion is naturally designed to exclude tangible objects (choses in possession) and to acknowledge the “informational quality” of digital assets that are conceived and operate exclusively within a computerized network or system.³⁷ The second criterion excludes things lacking independent existence and legal status, such as—to use the U.K.L.C.’s examples—unsevered body parts, personalities, and creatures of law, including things in action or statutorily-reified things.³⁸ The third criterion requires the thing in question to be incapable of simultaneous use. That is, the thing will be rivalrous where its use by one person “necessarily prejudices the ability of others to make equivalent use of it at the same time.”³⁹ According to the U.K.L.C., this criterion reflected the fact that “property law is concerned with resources that are rivalrous.”⁴⁰

Applying its criteria to determine if a thing was a “data object,” the U.K.L.C. defined five broad categories: (1) digital files and digital records; (2) email accounts and certain in-game digital assets; (3) domain names; (4) various types of carbon emissions schemes; and (5) crypto-tokens.⁴¹ The U.K.L.C. considered various subtypes found within each category, as outlined in Table 1.

TABLE 1.
SUB-TYPES OF DATA OBJECT

Category of digital asset	Data object?
Digital files and digital records	
Media files	No
Program files	No
Digital records	No
Email accounts and in-game digital assets	
Email accounts	No
In-game digital assets	No
Domain names	No
Carbon emissions schemes	
Statutory carbon emission allowances	No
Voluntary carbon credits	No
Crypto-tokens	Yes

Crypto-tokens were the only digital asset deemed by the U.K.L.C. to meet the three criteria for data objects. An understanding of how

37. *See id.* at 80. The U.K.L.C. acknowledged, however, that some tangible things may inadvertently satisfy this criterion. *See id.* at 79–80.

38. *See Digital Assets, supra* note 3, at 82.

39. *Id.* at 87.

40. *Id.* at 88. The criterion naturally inhibits pure information from qualifying as a data object, which would run contrary to the law’s “general reluctance to treat pure information as an object of property right.” *Id.* at 87–88.

41. *See id.* at 109, 124, 139, 146, 156.

they do so is essential to conceptualizing the proposed third category of personal property. As to the first criterion, recognizing crypto-tokens as objects composed of data represented in an “electronic medium” was said to be a “simple” exercise.⁴² This is because “a crypto-token is, in general, composed of a particular, individuated data structure which is instantiated within a crypto-token system (normally through the use of one or more distributed ledgers or structured records).”⁴³ It mattered not, the U.K.L.C. noted, that the relevant distributed ledgers or structured records might be distributed across a range of different nodes.⁴⁴ As was held in *AA v. Persons Unknown*,⁴⁵ crypto-tokens could be capably defined and identified within their decentralized ecosystem.

As to the second criterion, that the thing exist independently of persons and the legal system, crypto-tokens were described as discrete data structures existing independently within their own blockchain systems.⁴⁶ Despite the fact that they are “manifested or reali[z]ed by the operation of software code and not physical particles,” such things are still functional objects operating apart from persons and the legal system.⁴⁷ Though the legal system can inform and support their operation, crypto-tokens are not inherently dependent upon this system.⁴⁸ Moreover, crypto-tokens “do not consist of rights (legal positions between persons vis-à-vis each other and things).”⁴⁹ In sum, the U.K.L.C. concluded, they satisfied the second criterion.

As to the third and final criterion—rivalrousness—the U.K.L.C. was satisfied that crypto-tokens, unlike pure information or data, were rivalrous in nature.⁵⁰ This criterion was arguably the most difficult for a crypto-token to satisfy. The U.K.L.C. conceded that “crypto-tokens consist, at their most basic technical level viewed in isolation, of some data recorded on some form of distributed ledger or structured

42. *See id.* at 170.

43. *Id.*

44. *See id.* at 170–71. A node is a computer or server forming part of a blockchain network. Nodes broadcast the relevant transaction information across the network. Whereas “full nodes” store a copy of the entire blockchain ledger history and enforce the rules of the network, “lightweight nodes” connect to full nodes purely to broadcast new transactions or read existing transactions. *See* JONATHAN MORLEY, *THAT BOOK ON BLOCKCHAIN: A ONE-HOUR INTRO* 24 (2017); XIWEI XU, INGO WEBER & MARK STAPLES, *ARCHITECTURE FOR BLOCKCHAIN APPLICATIONS* 6 (2019).

45. *See Digital Assets*, *supra* note 3, at 171 (citing *AA v. Persons Unknown*, *Re Bitcoin* [2019] E.W.H.C. (Comm) 3556 [59] (Eng.)).

46. *See id.*

47. *See id.*

48. *See id.* at 169, 175–76.

49. *Id.* at 172.

50. *See id.* at 177.

record.”⁵¹ Mere data or information, *Digital Assets* noted earlier,⁵² is not rivalrous and is not regarded as something capable of attracting property rights. Yet at the same time, the U.K.L.C. suggested, rivalrous objects can be generated from non-rivalrous data.⁵³ The capacity for participants in a blockchain to specifically locate and exclusively control a particular crypto-token, and the fact that blockchains can impose conditions upon the use or transfer of crypto-tokens, was said to render such tokens rivalrous.⁵⁴

Other features of crypto-tokens consolidated the U.K.L.C.’s view that crypto-tokens were rivalrous. For example, attempts to duplicate a crypto-token, or to “reuse” it (spend it twice after it has been exchanged), would be futile because the blockchain infrastructure prevents this.⁵⁵ A blockchain is a “computer-generated, public record of all [cryptocurrency] transactions,” and assigns each transaction with a unique timestamp to ensure that any one coin is not used more than once.⁵⁶ Moreover, the data underlying a crypto-token is different than the token itself. Even assuming a person was able to infiltrate and amend a copy of a blockchain ledger, this manipulation of the data would not increase the quantity of crypto-assets associated with that data.⁵⁷ Any transaction on the ledger must be validated through a series of cryptographic screening procedures and be approved by a consensus of the network’s miners (users).⁵⁸ As such, “the data representing a crypto[-]asset is only capable of being used as the basis for an effective transaction when agreement is reached within the network that this is permitted by the rules of the protocol.”⁵⁹ In sum, having satisfied the three criteria for “data objects,” the U.K.L.C. deemed crypto-tokens capable of classification as such. So, if we accept the justification for its existence, and its legal content, are we satisfied that, as a matter of the theoretical nature of the concept of property, crypto-tokens ought to be added to the existing forms of personal property? And, if so, what branch of government ought to be responsible for effecting that change? We consider the first of these questions—the “property question”—in the next Part.

51. *Id.* In the same paragraph, the U.K.L.C. added: “[i]n other words, the basic building block of crypto-tokens is data.” *Id.*

52. *See id.* at 87–88. *See generally id.* at 35–50.

53. *Id.* at 177.

54. *Id.* at 177–79.

55. *See Digital Assets, supra* note 3, at 179–80.

56. *See Vesna Harasic, Note, It’s Not Just About the Money: A Comparative Analysis of the Regulatory Status of Bitcoin Under Various Domestic Securities Laws*, 3 AM. U. BUS. L. REV. 487, 490 (2014).

57. *See Alex Taylor & Micheál Ó Floinn, Bitcoin Burglaries and the Theft Act 1968*, 3 CRIM. L. REV. 163, 171 (2021); *Digital Assets, supra* note 3, at 179–80.

58. *See Mark Giancaspro, Is a “Smart Contract” Really a Smart Idea? Insights from a Legal Perspective*, 33 COMPUT. L. & SEC. REV. 825, 826 (2017).

59. Taylor & Ó Floinn, *supra* note 57, at 171.

III. THEORETICAL LEGAL CONSIDERATIONS⁶⁰

While property plays many roles in contemporary life, new forms of it can really only enter a legal system in one of two ways, both of which the U.K.L.C. identifies: (i) “incremental common law development” by the judiciary; or (ii) “precise and limited technical legislation.”⁶¹ Of course, there is a third way—that which occurs through synergies that may develop between the first two approaches. Thus, legislation introducing a new form of property requires judicial interpretation and application in order to refine what is found in the relevant statutes. Similarly, legislation may leave intact and merely modify, rather than abolish, forms of property introduced by the common law. The U.K.L.C. did not express a preference for either of the two means of innovation that it identified; instead, it invites input from interested parties.⁶²

Whatever the means by which property comes into existence, though, there is always a logically prior “property question” which first emerges. Indeed, that is precisely what has happened in the case of data objects. There would be no need for any form of new property if the emergent technology had not driven this property question: should existing forms of property be adapted and modified to fit the new technology, or should an entirely new form be created to fit that need? The need to answer this question only emerges, as common vernacular might suggest, when it emerges—when people, either natural or legal, seek to protect a relationship with others in respect of a thing. Those things, as we have seen, may be tangible (actual chattels) or intangible (data). What one seeks to protect is encroachment or infringement of the right to use, exclude others from, and make decisions about the disposition of the thing. When a person seeks that protection, a court, a legislature, or both must face the “property question.” This usually involves the resolution of a dispute over the thing, and an answer must be given.⁶³

The answer which the law provides, through a court or a legislature, “depends on whether the law will recognize and enforce entitlements (and non-property on the refusal to do so), [and so] it follows that novel claims of property may be validated or rejected by the courts and the legislatures.”⁶⁴ And no answer settles the issue for all time. Instead, any answer given by any legal system only lasts as long as the circumstances which gave rise to the initial property question remain extant. Once those conditions change, so too will the tactic assumed by property to deal with them. Thus, “[p]roperty is not

60. This Part draws on Babie, Brown, Catterwell & Giancaspro, *supra* note 8.

61. *Digital Assets*, *supra* note 3, at 100.

62. *See id.* at 108.

63. *See* BRUCE ZIFF, *PRINCIPLES OF PROPERTY LAW 57–67* (7th ed. 2018).

64. *Id.* at 59.

a static concept, but rather is in a constant state of flux. This fluidity is apparent when disputes over new forms of property erupt.”⁶⁵ As the values and socio-economic-political conditions of a society change, so too will its law, and with it, the meaning and content of property. We are perhaps witnessing this very shift and transformation of values and conditions in the case of digital technologies such as cryptocurrency, crypto-tokens, and other crypto-assets.

The law—as we say, acting either through the agency of the judiciary, the legislature, or both—may take one of two approaches in responding to the property question. In relation to the first, an “attributes” approach, Bruce Ziff writes that the focus of “the [i]nquiry hinges on whether the right being asserted looks like property: one searches for a strong family resemblance.”⁶⁶ The second approach, meanwhile, either eschews or puts to one side attributes and looks instead at the “function” or “role” that property serves in a society to determine whether a new technology ought to have such protection, given the implications of treating it as the subject-matter of property. Because property is about relationships among people—use, exclusion, and disposition all involve relationships with others, not with things⁶⁷—what matters is whether a relationship exists that can be said to be proprietary. Ziff writes that this “functional” approach involves “[l]ook[ing] . . . at the policy factors at play.’ It takes account of how property, as a tool of social life, should be used. This approach recognizes that property is not an acontextual entity that demands conceptual purity, but a purposive concept, to be used to meet social needs.”⁶⁸

One’s response to the U.K.L.C.’s proposal to treat crypto-assets as a new form of property ultimately depends upon how one views the property question, and how it should be answered. There is little doubt that crypto-assets raise the property question. But in responding to it, should existing forms of personal property dictate the answer to the question—an attributes answer—or, rather than try to force this new technology into existing categories, with a somewhat less-than-perfect fit, should we seek to identify the function that the technology aims to achieve and tailor a form of property to fit that role? At first glance, it may appear that the U.K.L.C. opts for the former approach. But sometimes, as we will see, appearances can be deceiving.

The answer to the property question can differ depending on whether one chooses an attributes or a functional approach. The difference stems from a longstanding misunderstanding about the

65. *Id.*

66. *Id.* at 60 (citations omitted).

67. For a full explication, see Paul Babie, *Sovereignty as Governance: An Organising Theme for Australian Property Law*, 36 U.N.S.W. L.J. 1075, 1075–78 (2013); Paul Babie, *The Spatial: A Forgotten Dimension of Property*, 50 SAN DIEGO L. REV. 323, 343–46 (2013).

68. ZIFF, *supra* note 63, at 61.

theoretical nature of property, exemplified in the High Court of Australia's decision of *Yanner v. Eaton*, often cited by courts in many jurisdictions, in which the court wrote that "'property' is a comprehensive term [which] can be used to describe all or any of very many different kinds of relationship between a person and a subject matter."⁶⁹ But can that be so? If property, as a concept, is shorthand for describing legal relationships, then it is an impossibility for a person to have a relationship with an inanimate thing, whatever it might be. Consider the three main rights said to constitute the core of ownership (the "liberal triad"⁷⁰): use (of a rivalrous or scarce resource), exclusivity, and alienability. Each of those rights—legal relationships—is exercisable against other *people*, not things. One does not protect one's use as against another thing, or seek exclusion as against other things, or seek to alienate whatever is the subject-matter of property to another thing. Rather, one seeks to enforce one's use (decision-making authority⁷¹) as against others who attempt to interfere with it; one seeks to enforce one's right to exclude other people from the use of a thing said to be the object of one's property (think of cases in which landowners have attempted to prevent others from viewing what is taking place there, and in which the courts have found that there is no legal means of preventing others viewing what one is doing on one's own land⁷²); and one alienates the object of one's property to other persons, not things. This is summarized, succinctly, by Joseph William Singer and Nestor M. Davidson: "[p]roperty concerns legal relations among people regarding control and disposition of valued resources. Note well: [p]roperty concerns relations *among people*, not relations between people and things."⁷³

The attributes approach tends to be associated with property as a relationship between persons and things,⁷⁴ while the functional approach sees property as a relationship between persons in respect of things. And this matters when a court is faced with resolving the property question. The difficulty is that an attributes approach holds any new asset hostage to those things that have come before it which the courts have recognized as property—the court attempts to

69. *Yanner v. Eaton* (1999) 201 C.L.R. 351 [20] (Austl.).

70. See Margaret Jane Radin, *The Liberal Conception of Property: Cross Currents in the Jurisprudence of Takings*, 88 COLUM. L. REV. 1667, 1668–69 (1988).

71. See C. Edwin Baker, *Property and Its Relation to Constitutionally Protected Liberty*, 134 U. PA. L. REV. 741, 742–43 (1986).

72. See *Detroit Base-Ball Club v. Deppert*, 27 N.W. 856, 858 (Mich. 1886); *Vict. Park Racing & Recreation Grounds Co. Ltd. v. Taylor* (1937) 58 C.L.R. 479, 482–83 (Austl.).

73. JOSEPH WILLIAM SINGER & NESTOR M. DAVIDSON, *PROPERTY 2* (6th ed. 2022).

74. A more conservative, restrictive view of property is often found in the work of scholars like Henry E Smith. See, e.g., Henry E. Smith, *Restating the Architecture of Property*, in 10 ABOUT MODERN STUDIES IN PROPERTY LAW 19–36 (Ben McFarlane & Sinéad Agnew eds., 2019).

analogize the new thing to those that have gone before, and that means that growth in what constitutes property becomes restricted, if not impossible. The reasoning is tautological: a court might say “this thing, whatever it is, cannot be property because those things like it that have come before were also not property, and so, only those things that are like those that have gone before and that have been recognized as property can now become the object of property.” The reasoning simply leads in circles. The attributes approach, then, focuses on the idea that what matters in novel property claims is whether the thing, whatever it is, looks like other things that have already been treated as property—the property as a relationship between a person-and-thing view of property. The flaw in the attributes approach is that it allows for nothing new to be recognized as property unless a court is willing to step outside the existing framework. And *that* calls for a court to take a functional approach.

Consider the difference if a court takes the functional approach, informed by the property as relationships between persons-in-respect-of-things view. If a court looks at the functions that property is intended to serve and whether those functions are evident in a given novel relationship between persons, a very different outcome can follow, one not tied to analogizing things to one another. The property question focuses on what matters: the legal relationship between persons, and not the thing. Clearly some courts have been willing to follow this route historically; otherwise, property would long ago have ossified into a rigid system in which innovation was incapable of protection by property.

In novel claims, looking at relations between persons in respect of things, it is entirely possible that a given novel relationship may constitute property, quite irrespective of whether the object of that relationship, a thing, looks like other things recognized as property in the past. In other words, if we look at the functions that a given set of relationships serve in respect of a given thing (an asset), what we might see is that those functions constitute property even if the thing itself may not satisfy some arbitrary list of attributes drawn from previously decided cases or legislation reified and applied to the thing before the court.⁷⁵ Or, put another way, when we focus on the thing, we lose sight of what property is: a relationship between persons in respect of that thing. It is the relationship—use, excludability, alienability—that matters, not the thing that is the object of those relations (rights). The perspective changes everything, meaning that the difference between the two positions is absolutely fundamental, and can lead to drastically different outcomes.

75. The *Ainsworth* indicia, so beloved by courts in cryptocurrency cases, are just that sort of arbitrary list. See *Nat'l Provincial Bank v. Ainsworth* [1965] A.C. 1175, 1247–48 (Eng.).

Yet, whichever approach is taken, there will inevitably be untidy loose ends. First among these is the rapidly-changing nature of the technology itself. Blockchain, the platform upon which crypto-assets are based, has already undergone massive changes throughout its short history.⁷⁶ Can the digital object keep pace with this change? Need it keep pace? Taking an attributes approach presents more difficulty in reconciling itself to rapid change; instead, that approach, by its very nature, requires that every form of property look like every other form of property already recognized by a legal system. But that leads to an inevitable chicken-and-egg problem—how can we recognize a form of property without having already recognized a form of property? As an approach, looking for family resemblances may lend itself more readily to those conditions in which certainty must be prized above flexibility. Land, of course, requires greater certainty: there is little change over time in the ways in which land can be put to use, and fragmentation of proprietary interests may result in any efficient use being made impossible. The *numerus clausus* of estates and interests in land has solidified, and so provides certainty, over at least 1,000 years—very few changes have been countenanced, either judicial or legislative, to the basic structure now well-known to any common lawyer.⁷⁷

On the other hand, in the case of personal property, excessive fragmentation may lead to an inability of any one user to make effective use of a new technology. This may occur, for instance, in the development of new pharmaceutical products where many parties hold fragments of the technology necessary to produce a new medication, meaning that no one can develop it, and no one can benefit from it.⁷⁸ Taking too strong an attributes approach, then, may fail to understand the fluid nature of property, and constrain its ability to adapt to changing values and conditions.

76. See Robert Sheldon, *A Timeline and History of Blockchain Technology*, TECHTARGET (Aug. 9, 2021), <https://bit.ly/3GRMjO4>.

77. The classic treatment of the *numerus clausus* is Bernard Rudden, *Economic Theory v. Property Law: The Numerus Clausus Problem*, in 3 OXFORD ESSAYS IN JURISPRUDENCE 239 (John Eekelaar & John Bell eds., 1987). More recently, see generally Thomas W. Merrill & Henry E. Smith, *Optimal Standardization in the Law of Property: The Numerus Clausus Principle*, 110 YALE L.J. 1 (2000); Henry Hansmann & Reinier Kraakman, *Property, Contract, and Verification: The Numerus Clausus Problem and the Divisibility of Rights*, 31 J. LEGAL STUD. 373 (2002); Yunchien Chang & Henry E. Smith, *The Numerus Clausus Principle, Property Customs, and the Emergence of New Property Forms*, 100 IOWA L. REV. 2275 (2015). Some “border” disputes between contract and property exist in respect of the licence. See *Ashburn Anstalt v. Arnold* [1988] E.W.C.A. (Civ) 14 (Eng.); Jonathan Hill, *Leases, Licences and Third Parties*, 51 MOD. L. REV. 226, 226–28 (1988).

78. This is the tragedy of the anti-commons, first identified in Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621, 623–24 (1998), and fully developed in MICHAEL HELLER, *THE GRIDLOCK ECONOMY: HOW TOO MUCH OWNERSHIP WRECKS MARKETS, STOPS INNOVATION, AND COSTS LIVES* (2010).

If, though, we understand the subtlety of property as a concept, that the property question is never answered for all time, but only for the moment, then we can accept a new form of property and the need to adapt it as values and conditions change. What suits needs now may not suit needs tomorrow, and if we understand that both courts and legislatures, often working in concert, can adapt property over time to meet those changes, then a new form need cause us little concern. In short, property is not a constitution, and so it need not answer every question for all time; indeed, it ought not attempt to answer property questions not yet asked.⁷⁹ How, for instance, could an understanding of personal property even 50 years ago have answered the property question about cultural artifacts,⁸⁰ university degrees,⁸¹ government-issued licences to fish,⁸² domain names,⁸³ one's personality or celebrity status,⁸⁴ patents over such things as mice,⁸⁵ genetically-modified plant cells,⁸⁶ isolated human genes⁸⁷ or other genetic material such as human sperm,⁸⁸ human pre-embryos,⁸⁹ cells extracted from a spleen,⁹⁰ a human brain in paraffin,⁹¹ the distinctive sound of a singer's voice,⁹² an entertainment spectacle,⁹³ or "know how?"⁹⁴ It seems obvious that the property question to things such as these cannot be answered in advance and for all time. Rather, asking the property question about these things goes hand in glove with the functional approach to resolving the property question.

The property question clearly arises in relation to cryptocurrency. So long as cryptocurrency continues to meet some perceived socio-economic need in the financial sector, it may equally require the

79. Parts of the following list (with case citations) are drawn from ZIFF, *supra* note 63, at 59–66 nn.286–326.

80. *See id.* at 62–66. *See generally* BORROWED POWER: ESSAYS ON CULTURAL APPROPRIATION (Bruce Ziff & Pratima V. Rao eds., 1997); MICHAEL F. BROWN, WHO OWNS NATIVE CULTURE? (2003).

81. *See In re Marriage of Graham*, 574 P.2d 75, 77 (Colo. 1978).

82. *See Saulnier v. Royal Bank of Can.*, [2008] 3 S.C.R. 166, para. 50 (Can.).

83. *See Tucows.Com Co. v. Lojas Renner S.A.*, [2011] O.N.C.A. 548, para. 50 (Can.).

84. *See Athans v. Can. Adventure Camps Ltd.* (1977), 17 O.R. (2d) 425 (Can.).

85. *See Harvard Coll. v. Canada (Comm'r of Pats.)*, [2002] 4 S.C.R. 45, para. 115 (Can.).

86. *See Monsanto Can. Inc. v. Schmeiser*, [2004] 1 S.C.R. 902, para. 97 (Can.).

87. *See Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 580 (2013); *D'Arcy v. Myriad Genetics Inc.* (2015) 258 C.L.R. 334 [282] (Austl.).

88. *See Re Patteson* [2016] Q.S.C. 104 [11] (Austl.); *Chapman v. Se. Sydney Local Health Dist.* [2018] N.S.W.S.C. 1231 (Austl.); *Re Cresswell* [2018] Q.S.C. 142 [163] (Austl.). *See generally* Paul Babie, *The Human Body and Private Property: Sperm Harvesting*, 7 PROP. L. REV. 207 (2018).

89. *See Davis v. Davis*, 842 S.W.2d 588, 597 (Tenn. 1992).

90. *See Moore v. Regents of Univ. of Cal.*, 793 P.2d 479, 489 (Cal. 1990).

91. *See Dobson v. N. Tyneside Health Auth.* (1996) 4 All E.R. 474 at [4] (Eng.).

92. *See Midler v. Ford Motor Co.*, 849 F.2d 460, 463 (9th Cir. 1988).

93. *See Vict. Park Racing & Recreation Grounds Co. Ltd. v. Taylor* (1937) 58 C.L.R. 479, 482–83 (Austl.).

94. *See Roth v. The Queen*, [2007] F.C.R. 38, para. 16 (Can.).

stability and certainty that only property can provide.⁹⁵ But how can property provide that certainty? Through attributes alone, looking for family resemblances? That seems too narrow. But does the functional approach, one that attempts to understand the values and conditions that gave rise to cryptocurrency and to protect it using a novel form of property, go too far? Or may it require, at the very least, a combination of an attributes and a functional approach? The U.K.L.C. appears to have opted for a hybrid approach. But are there pragmatic difficulties that this will create? We turn to that in our concluding reflections.

IV. CONCLUDING REFLECTIONS: PRAGMATIC LEGAL CONSIDERATIONS

The data object seems unabashedly designed to accommodate a limited range of crypto-assets. Indeed, in our analysis of *Digital Assets*, it appears as though cryptocurrency alone satisfies the necessary characteristics of the data object, and thus recognition as this new form of personal property. For that reason, it seems very likely that this proposed reform may be the result of successful lobbying on the part of the cryptocurrency sector, willing to push the envelope with legal reform as far as possible. There may be justification for this reform. But in considering any property reform, we suggest that this involves examining what such reform will mean for the concept of property, and how that reform is to be achieved.

In the case of the data object, the property question seems to raise significant issues relevant to any legal system's adoption of it as a form of property. These concerns seem to coalesce around certainty, a central theme in examining the concept of property. Property, perhaps above all other values it might seek to protect, places the greatest store in the certainty that its existence provides those who are said to have it in a given resource, whatever it might be. Land law represents the paradigmatic example of the importance of certainty in the recognition of a *numerus clausus* of proprietary interests enforceable against third parties. But while one might see the need for certainty in protecting crypto-assets, one might also wonder how much certainty the data object provides its holder. Instead, it is possible that the data object might inject as much uncertainty in an already uncertain field as not. Simply applying the property label to a new asset may simply add complexity, which the courts will ultimately be forced to resolve, if resolution of the complexity is even possible.

If one agrees that reform is necessary, a second issue arises: which branch of government ought to take responsibility for effecting it? There is no question that the legislature may act to protect the holders

95. This finds support in THE LAW OF BITCOIN II.1.1.4 (Stuart Hoegner ed., 2015).

of crypto-assets through the creation of a new form of personal property. But simply because the legislature can act does not mean that it should act. Is this the right time to act? Or ought the courts work these issues out using existing categories, which will provide more guidance to the legislature in an attempt to achieve comprehensive reform? Or, more likely, might any reform be, as we have suggested, only for the time being, with both the legislature and the courts remaining ready to step in again to resolve new conflicts as they arise, perhaps as a consequence of either branch having already acted? Whether the legislature acts now or later, it seems certain that this resolution will not provide the final answer concerning crypto-assets. That is the nature of the property question: it is never resolved for long before it arises again in a fresh dispute over how power in respect of a given asset ought to be allocated and exercised.