‘Atomism and Holism’ with special reference to a key issue in social-political philosophy

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Introductory remarks
Since Democritus introduced his atomistic philosophy of nature this term was used in a rather restricted and in a broader sense. In the former sense it indicated the attempt to explain the material world in terms of last indivisible elements (‘atoms’). In the latter (ontological) sense it was also employed to designate different forms of pluralism, or ways of understanding reality from its supposed last units, building blocks or – in the case of human society – individuals. Since 1825 Saint-Simon and his followers (among them Agusté Comte) employed the term individualism in order to capture the social philosophy of the 18th century as a whole – the view in which society was broken apart in isolated individuals.1

In opposition both to mechanistic monism and vitalistic dualism as biological theories the term holism was introduced by J.C. Smuts in 1926. In this narrow sense it aimed at a dialectical synthesis which can do justice to the supposedly highest concrete totality (in the case of Adolf Meyer: Gesamtheit). An expanded connotation is given to holism when it is used in the sense of a universalism which, in opposition to (sociological) individualism, wants to account for the meaningful coherence and mutuality within societal institutions, i.e. for wholeseness/totality as an essential trait of societal collectivities (as introduced by the German philosopher, sociologist, and economist, Othmar Spann, in the 1920s).2

In this article we will restrict ourselves to some issues entailed in the field of social and political philosophy. The classical example of a thorough but still unsuccessful struggle with the inherently dialectical implications of atomism (individualism) and holism (universalism) is given in the thought of Rousseau who tried to combine both these perspectives in his (hypothetical) account of the genesis of a post-contractual society.

Some preliminary remarks
When the terms atomism and holism are substituted by those of individualism and universalism, it should be kept in mind that the latter two terms are also sometimes used to designate the opposing emphases on universality and individuality – the key issue in the controversy between realism and nominalism.

In this presentation the terms atomism and holism will first of all be used in a broad sense in order to capture the rich history of philosophical conceptions as well as contemporary stances within the various academic disciplines.

Without entering into a detailed account, it is worth mentioning that the scope of this broad understanding rests upon the following background considerations:

1. There is no single epoch or period in the history of philosophy that escapes from the grip both of atomistic and holistic views;
2. The various academic disciplines (the natural sciences and the humanities) manifest the same fate – both with regard to the way in which they developed and with respect to the current state of theoretical reflection at work within each one of these disciplines; and
3. The relative merit of atomistic approaches (such as mathematical set theory – arithmetic, atomism; atomistic theories in physics, biology, psychology, history, sociology, economics, legal science) requires an assessment of the relative merit of holistic approaches (such as the holistic affinities of mathematical intuitionism; holistic theories in physics, biology, psychology, history, sociology, economics, legal science – compare systems theory). By looking at political philosophy in particular the impasse and shortcomings of the radical opposition of these two stances will be subjected to a critical evaluation in terms of the ideas of Rousseau.

The position of the State and its relation to the individual
Some historical perspectives
The Greek atomists were superseded by the philosophies of Plato and Aristotle which were predominantly holistic. Their immense influence dominated most of medieval philosophy until it was challenged by the atomistic affinities of late scholastic nominalism (John the Scot, William of Ockham and their followers).

The new spirit of the Renaissance accomplished the important Copernican revolution in epistemology by ascribing supremacy no longer to the ‘object’ but to the creative powers of the thinking subject. Thus the acceptance of an objective metaphysical order was replaced by the creative power supposedly seated in subjective human reason. Modernism is a fruit of this transitional period – although in passing we have to emphasise that nominalism as the all-pervasive current undergirding this transition provides modernism with a more complex face than is normally portrayed by recent ‘postmodern’ descriptions of it.

The motive of logical creation indeed characterises the autonomy-ideal and the first manifestations of the modern natural science-ideal.3 The effect of this motive of logical creation on our theme is direct. Atomism in this context entails a total demolition or break-down of our given world in order to reconstruct it from thought-elements. Since the Renaissance modern thought explored various options in this regard – varying from ‘moving body’, ‘to perceive’ (Berkeley), ‘sensations’ (Kant) and ‘sense-data’ (Ayer) – to mention just a few philosophers.

Social philosophy during this phase at first pursued the avenue of an atomistic reconstruction of society. The initial social contract theories wanted to reconstruct human society in terms of its ‘atoms’ – the individuals. Habermas captures this practice when he remarks:

Hobbes wants to reconstruct the classical theory of the state after the example of modern science. In doing this he wants to provide social philosophy with a foundation in the contemporary physics (Habermas 1971:88).
This does not imply that modern social philosophy merely explored the atomistic option in its reflection on human society. Once we move to a person like Rousseau it becomes clear that the situation is more complex.

The simultaneous and contradicting role of atomism and holism in the thought of Rousseau

Rousseau lived in the 'Enlightenment' – a period in the development of modern philosophy generally seen as characterised by a shameless glorification of the capacities of conceptions in human thought. Rousseau is not at all fully absorbed by this rationalistic 'Zeitgeist'. In important respects he anticipated romanticism – the new movement that reached its zenith at the turn of the 18th and beginning of the 19th century.

Perhaps Rousseau is best known for his reflection on radical democracy. In this regard, however, he also demonstrates his indebtedness to the preceding development of modern thought. The central freedom-motive, that became prominent during the Renaissance period, wanted to emphasize human freedom and autonomy. Rousseau captures this basic humanistic attitude with his statement: 'freedom is obedience to a law which we prescribe to ourselves' (Rousseau, 1975:247).

Rousseau's dependence on the mentioned science-ideal is particularly clear from the fact that he advanced his own theory of the social contract. Social contract theory did not undertake to give a historical account of the emergence of an ordered society (with a state), but is solely intended to give a hypothetical rational explanation of its existence. Rousseau's theory of the state demonstrates a strange mixture of atomism and holism, intertwined with the underlying struggle between the science-ideal and the ideal of a free and autonomous personality. Rousseau indeed values human freedom very high - as could be seen from his opening statement in Chapter 1 of Book I: 'Man is born free but everywhere he finds himself in chains' (1975:236). Taking away the freedom of the human will amounts to eliminating all morality from human actions (1975:240). Even the difference between human beings and animals is no longer sought, as Enlightenment rationalism did, in the human understanding, but in the ability to act freely. In his treatise on the origin and inequality between human beings, Rousseau writes:

Nature commands every animal, and the brute obeys. The human being experiences the same impulse, but recognize his freedom to acquiesce or to resist; and particularly in the awareness of this freedom the spirituality of humankind manifests itself. But in the capacity to will, or much rather to choose, and the experience of this power, one encounters nothing but purely spiritual acts which are totally inexplicable through mechanical laws (1975:47).

An important implication of this ideal of autonomous freedom is that all forms of force are rejected in principle. Force does not create law (1975:238). Although the human being is born in a state of equality and freedom, it may happen that humans are alienated from their freedom – to their own benefit (1975:236). This implies that anyone is obliged only to obey a legitimate authority (1975:238). Naturally no human being possesses any power over any other human being – which implies for Rousseau that all relations of authority and subordination are based on conventions (1975:239). In the first and most basic convention, the social contract, the confusing interaction of atomism and holism surfaces.

The predominant contract theories postulated a hypothetical first contract in order to provide a rational explanation for the existence of a political society. This trait at once gives expression to the requirement of the science-ideal, namely to reconstruct society from its simplest elements, the individuals (the 'atoms' of society). Thomas Hobbes holds the opinion that in establishing the first contract (he calls it a covenant) no unanimity is required (Hobbes 1651:228–229).

Rousseau realises that such a supposition would threaten the freedom of the minority not agreeing with the majority. He asks the question how many people, having the desire to be subjected to a master, could have the right to impose that on ten people not wanting to be in that predicament. Consequently, he states that the majority vote itself is a product of convention, requiring unanimity at least once (1975:243, 310).

Nature provides the human being with force and freedom as the primary instruments in service of self-maintenance. The threat to the continued existence of the individual in the state of nature could only be met if, through the formation of an aggregate, a sum of forces is brought together big enough to overcome the threat. Everyone participating in the establishment of the contract has to transfer all rights to the community as a whole. Since everyone gives himself/herself fully, the condition is equal for all (1975:243–244).

Here Rousseau clearly deviates from a crucial point in the contract theory of John Locke. Locke sees the state of nature, just as Rousseau does, as a natural condition where everyone is free and independent (Locke 1966:164). The rights of the individual on life, liberty, and property are, according to Locke, however absolute and inalienable. Consequently, they can never be given up or transferred by means of the social contract. Governed by reason as the law of nature (Locke 1966:119) the individuals may (i) do what they find fit in service of their survival; and (ii) may exercise the power to punish crimes against the law of nature (Locke 1966:181). Only these two 'rights' are sacrificed when the social contract is established (Locke 1966:181–182). All other natural human rights are simply continued. Individuals enter into the contract with the aim of the 'mutual preservation of their lives, liberties and estates' (Locke 1966:180).

These ideas certainly influenced Rousseau. However, when, in his Contrat social, he explicitly mentions that, within the state, the social contract forms the basis of all rights, it is clear that he expressly deviates from the contract theory of Locke. This deviation is ultimately motivated by the humanistic science-ideal. The state of nature is something of the past, and therefore the individual should give up his/her original rights in order to, on the basis of the social contract, receive it back in the higher form of equality which is morally sanctioned through convention and law (1975:249).

The physical and independent existence allocated by nature to all is replaced by a partial and moral existence. Along this line the capacities of the human being are taken away and then given back in such a way that he/she cannot use them without the help of other human beings (1975:261).

Participating in the contract is completely voluntary. Since everyone is born free as his/her own lord and master, no one could be subjected without his or her consent. If, at the
moment of accepting the contract, there are opponents present who are not willing to conform, it does not terminate the contract, but it simply means that they are excluded from it (1975:310). Opponents are foreigners and not citizens.

Through the contract everyone gives himself/herself to all. At the same time he/she gives him/her to no one, for there is no participant in the contract who does not acquire the same right as the one given to others over himself/herself (1975:244).

The social contract finally boils down to:

Everyone of us places collectively his/her person and all his/her power under the final guidance of the general will (volonté générale), and we receive each member as an inseparable part of the whole (1975:244).

The public person emerging from this uniting of all individuals is known as the republic or the body politic. If it is passive, its members call it the state, and when it is active, it is the sovereign. A collective name for those united in it is people (peuple), while everyone in particular is known as citizen (as a part of the sovereign power). Subject to the laws of the state is designated with the name sujets (1975:244–245).

Different from Thomasius, Pufendorf and others advocating the idea of the social contract, and in accordance with the conceptions of Hobbes, Rousseau does not accept a second contract, a so-called contract of subjection through which the relation between government and subjects is ordered (1975:304). By virtue of the nature of the contract every act of the sovereign (i.e., of the general will) at once is binding or beneficial to all citizens. Such an act of the sovereign is not an agreement between someone more important and someone less important, but a convention of the whole body with everyone of its members (1975:255). It is clear that the whole-parts relation serves as a substitute for the relation of super and subordination (the relation between government and subjects). Precisely for this reason Rousseau considers an agreement of subjection an impossibility. Everyone erecting similar institutions has, as it were, to change the human nature: every individual, who is, taken separately, a complete and lonesome whole, has to be transformed into a part of a larger whole to which the individual, in a certain sense, owes its life and existence (1975:261).

Höfßing discerns in this transition a basic trait in the thought of Rousseau:

The basic type in the thought of Rousseau is given in the opposition between the immediate, original, closed-off, total, free and simple on the one hand, and the derivative, relative (relation-determined), divided, dependent and coherent on the other hand (1923:101).

The opposition, which, for Rousseau, coincides with that between nature and culture, is introduced in order to provide a yardstick enabling one to distinguish between true and false culture (cf. Höfßing 1923:114).

The contract is reached between isolated and autonomously free individuals – each person is to be seen as a separate unity. From this collection of individuals (atomistically construed) a super-individual whole emerges (holistically) replacing the separated individuality of each person and which, as a moral person, possesses its own unity, identity, life and will:

Immediately the association produces, in the place of the particular person of every participant, a moral and collective body, composed out of just as many members as the voices of the gathering, which derives from this act its unity, communal self, life and will (1975:244).

This remarkable result of the social contract anticipates the transpersonalist trait of romanticism – where the superindividual 'people' is put in the center of attention (compare the thought of Schelling, Fichte and Hegel). 10

What appears here is the fundamental tension in Rousseau's conception of the state, that between individualism/atominism versus universalism/holism. But before we analyze the fundamental antinomy in Rousseau’s thought, we need to reflect on the underlying perspectival issues at stake here.

Ontological and epistemological considerations

Every form of theoretical thought is always confronted with the basic question: how do we conceive of the coherent diversity within reality? The many one-sidedisms known throughout the history of philosophy, including atomism and holism, are all examples of distorted answers to this basic question. Whenever a particular aspect of reality is elevated (absolutised, deified) it functions as the final point of orientation from which everything else is explained. A consistent atomistic or individualistic approach, for example, wants to explain all complexities within reality from the perspective of a discrete multiplicity of entities. In the case of human society, atomism proceeds either from autonomous and self-contained individuals (compare Rousseau's conception of the state of nature), or from individuals in interaction.

In order to understand properly what is at stake in ismic positions we have to realize that concept formation in a theoretical context explore certain modes of explanation, that theoretical reflection inevitably explains reality through the point-of-entry of diverse modes of relatedness. The numerical mode (aspect) is the first and most basic facet of experiential reality. It provides us with the intuition (insight) of discrete quantity and this modal point of entry was already noticed by the Pythagoreans in their (reductionistic) claim: everything is number. The discovery of incommensurability (in 450 B.C. by Hip- pasos of Metapont) altered the choice of a basic denominator by translating their problems into spatial terms (the geometrization of Greek mathematics). Our spatial intuition provides us with a basic awareness of continuous extension. The concepts whole, coherence and totality appear to this original and irreducible meaning of the spatial aspect. 11

Atomism (individualism) thus represents a mode of thought 'over-exploring' the unique meaning of a numerical multiplicity. Its counter-pole is found in the holistic or universalistic perspective. The latter over-emphasizes the spatial whole-parts relation (mostly within the context of a biotic whole with its parts). 12  That the whole-parts relation inherently belongs to our spatial intuition follows from the following considerations. Something continuously extended (such as a one-dimensional line) is connected in all its parts, these parts 'hang-together', they cohere without any interruptions. Clearly, these terms are actually all synonyms for our basic awareness of continuity: being-connected,
coherence. But if all the parts are connected their sum-total constitutes a genuine whole – explaining why also the whole-parts relation merely serves as a synonym for our intuition of continuity as its expresses itself within the meaning of the spatial aspect.

A holistic view of human society always attempts to elevate some or other societal collectivity, or even society as such, to the highest and all-encompassing societal whole, containing all other societal spheres as subordinate and indivisible parts of this whole (in terms of systems theory: as subsystems).

Misunderstanding the simultaneous presence of atomism and holism in Rousseau’s thought.

In this universalistic (holistic) sense Rousseau envisages a new supra-personal totality emerging from the social contract, in spite of the fact that his construction of the social contract is done on the basis of an atomistic (individualistic) conception of the state of nature! In his penetrating Ph.D. dissertation, Mekkes unfortunately over-emphasizes the atomistic element in Rousseau’s thinking where he writes:

But the construction of this ‘personne publique’ remains purely mathematical individualistic. Genuine universalism could never conceive of the ‘collective person’ as the product of a contract between naturally autonomous individuals. It much rather starts with the whole, with the totality (1940:278).

Mekkes did not realise that the social contract represents, in Rousseau’s thought, the transition from atomism (individualism) to holism (universalism). As soon as the contractual agreement is reached, Rousseau indeed initiates a new holistic conception which only accepts a whole fully encompassing the former individuals as indivisible parts of this new totality (the volonté générale).

The continuity between the state of nature and the post-contractual state is provided by the theme of autonomy. This theme can assume both an individualistic and a universalistic form. In spite of the fact that the individualistic construction of the state contradicts the universalistic result of the social contract, the underlying theme of autonomy provides the (misguided) impression that the individual remains subject to his or her own will alone. As we shall presently argue, however, the holistic outcome of the social contract inevitably harbours a severe threat for the freedom of the individual.

How far does the power of the general will stretch?

The first striking feature of the sovereign concerns the following: although public consultation is competent to bind all the citizens to the sovereign, it can never bind the sovereign to itself (1975:245). It would flatly deny the nature of the body politic to assume that the sovereign could make a law which it cannot transgress.14 With regard to that which is external to the sovereign, it becomes an individual. Nonetheless, Rousseau does not ask himself how the supposed transgression of a self-imposed law could be reconciled with his equally basic autonomy-ideal: freedom, after all, is described by him as the obedience to (and not: transgression of) a law imposed by an individual upon himself/herself!

The principle of the majority, which, similar to the sovereign collective moral body, finds its ground in the social contract, in the final analysis should act as the binding power. This presupposes that all qualities of the general will should be present in the majority (1975:311). Therefore, the voice of the majority binds all.15 The question one may ask is whether there does not exist a private domain (be it of a personal or collective nature) which in principle falls outside the jurisdiction the binding general will? One cannot make an appeal to the state of nature, since Rousseau considers all rights in the post-contractual state to be based upon the social contract. The sentence preceding the last utterance is significant:

for the state, with regard to its members, is master of all their goods through the social contract (1975:347).

The implication of this statement becomes clearer where Rousseau pays attention to the limits of the sovereign power. If the state is a moral person which lives by uniting all its members, and if the most important task is to preserve itself, then it follows for Rousseau that it should possess a universal compulsory force enabling it to have power over every part thereof to the greater benefit of the whole:

Just as nature gives to every human being an absolute power over all its members, so the social contract endows the body politic with an absolute power over all its members; and it is this power which, directed by the general will, as I have said, bears the name of sovereignty (1975:253).

At this point the all-powerful consequences of the holistic result of the social contract openly emerges: through the contract the sovereign (the body politic) is empowered to do anything, since, by virtue of the social contract, it possesses an absolute power over all its members! These members, after all, are nothing but inseparable parts of the whole - which implies that the sovereign only disposes over itself. The question is: can one find, in this self-determination, any guarantee for the ideal of freedom and autonomy in Rousseau? The answer is: not at all, for the cardinal subsequent question is: what happens to the minority when it does not agree with the majority? Let us investigate Rousseau’s approach to this problem still further.

We have seen that Rousseau considers the voice of the greatest number – the voice of the majority – as the embodiment of the qualities of the general will. On the one hand it is seen as infallible and on the other hand as an expression of the own will of everyone (1975:310). If no particular groupings are formed and every citizen exercised his or her voice, then, for Rousseau, one always gather from this the pure and correct general will – supposed to be at once also each one’s own will. Only when people obey their own will are they free. Those, therefore – alongside other persons, as long as they form the minority – who do not obey the general (majority) will, are actually disobedient to their own will – and consequently unfree. Rousseau does not hesitate for one moment to draw the absolutist and totalitarian conclusion from these premises: the social contract contains the implicit undertaking that ‘whoever refuses to obey the general will would be compelled to do so by the whole body’!

This means nothing less than that such a person would be forced to be free.16 Although the political philosophy of Rousseau pretends to guarantee public freedom and equality in the post-contractual state, the ultimate result in principle therefore does not
materially differ from the conception of the state found in the political philosophy of Thomas Hobbes.  

Because the major part hath by consenting voices declared a Sovereign; he that dissented must now consent with the rest; that is, be contended to avow all the actions he shall do, or else justly be destroyed by the rest (1651:231).

One may phrase the similarity and the difference between the conceptions of Hobbes and Rousseau as follows: though Rousseau presents his theory in a form of a theory of the constitutional state under the rule of law (German: Rechtsstaat), materially (i.e., concerning the true nature of the state) he advocates an absolutist and totalitarian state (German: Machtsstaat). Hobbes, on the contrary, straightforwardly defends a theory of a ‘Machtsstaat’ as a ‘Machtsstaat’.

In the final analysis, therefore, Rousseau’s revolutionary democratic construction of freedom inevitably ends with Machtsstaat consequences. If law is merely seen as something flowing from the general will that can manifest itself within the state only, then it stands to reason that in principle the distinction between state-law and non-state-law (i.e., law that is distinct from state-law) is cancelled. The implication is that the internal law of every non-political societal life-form – such as the internal law of the school, the firm, marriage, the family, the church, and so on – is then reduced to being subjected to the general will. The conception of the state advanced by Rousseau does not have any guarantee that could safeguard anyone of these legal domains which are distinct from that of the state. Law remains state-law.

Remark

In this context we leave aside the fact that this legacy already surfaced in the 13th century. In their polemical Defensor Pacis, presented to the Emperor in 1326, Jean of Jandun and Marsilius of Padua declared that all forms of authority come from the people. The implication is the same: then law could also be only an expression of the general will. Only the majority making a law, could change it, terminate it or interpret it (Kates 1928:37). Kates furthermore points out that the influence of the authors of Defensor Pacis was particularly prominent in England. Thomas Cromwell, for that matter, arranged for the translation of this writing and made sure that it was distributed in the Royal Court:

‘The whole history of the English Reformation is a chronicle of the attempt of the State to assert its right to determine for its subjects the form and substance of religious practice and belief’ (1928:42).

The implications of the conceptions of Marsilius of Padua for the medieval view of the church – which, as a supra-natural institution of grace was denatured to a mere (atomistic – DFMS!) collection of believers in subjection to the state – caused the excommunication of Jean of Jandun in 1327 by Pope John XXII.

The way in which Rousseau assigned an absolute authority to the (holistic) general will on the basis of his social contract indeed gave birth to the state-Leviathan, i.e., the state as all-destructive mythical monster (compare the Book Job in the Old Testament), ultimately the outcome of the contractual construction of human society according to the requirements of the classical science-ideal. In the final analysis Rousseau could not any longer avoid drawing the antinomic conclusions entailed in his ultimate starting point – by saying that those who are not willing to submit themselves to the general will, should be forced to be free. We are therefore fully justified in the approval of the assessment given by mekkes in 1940: with the culmination point of the humanistic democratic ideal at once its deepest down-fall is given (1940:315).

Concluding remarks

The further development of political philosophy during the last two centuries continued to fluctuate between the two extremes of atomism and holism – although it should be emphasized that the rather young legacy of reformational philosophy effectively moved beyond this dilemma by introducing a structural analysis of the state in its relation to the rest of society that in principle transcends the inherent shortcomings present in these two isms. The acknowledgement of the principle of sphere sovereignty opens up new and fresh ways to understand both the uniqueness and the interlacement of diverse societal collectivities. However, a more articulated account of this contribution falls outside the scope of our present considerations. It will also take us too far to reflect on the amazing widespread effect these two isms accomplished in practically all academic disciplines – disciplines such as mathematics, physics, chemistry, biology and even the science of history, linguistics, sociology, economics, and legal science. A thorough understanding of the nominalistic roots of postmodernism, with its emphasis on fragmentation, may also benefit from an analysis of the opposition between atomism and holism (cf. Strauss, 1993 – some relevant sources are mentioned in the bibliography).

Notes

2. This article is based on an excerpt from the Paper presented at the mentioned Philosophy Conference.
3. The rise of logical atomism (a term introduced by Russell in 1920) ought to be mentioned in this context too. Just like the empiricist tradition since Locke, Berkeley and Hume proceeded from the ‘atoms’ of sensation called perceptions, logical atomism considered elementary propositions to be basic and not further analyzable – they are the logical atoms of the world.
4. Methodological individualism eventually emerged as its negative counterpart.
5. Hobbes is a key-figure in this regard.
6. The basic denominator chosen by Hobbes.
7. Subsequently, references to this work will be given merely by mentioning the date and the page number.
9. Cf. 1975:281. In other words, an entity that obeys the law which it posits for itself.
10. Popper, in this regard, speaks about the romantic collectivism containing ‘the germ of nationalism’ with its characteristic doctrine that the ‘various nations must be conceived as personalities’ (1966–II:52).
11. The apparently ‘purely arithmetical’ definitions of both Dedekind and Cantor deal with the
idea of sets of numbers as infinite totalities, implying that the unique character of the
spatial aspect is essential in the attempt to reduce space to number – an obviously circular
argument! Paul Bernays says this in another context with regard to the totality character of
continuity: ‘[i]t undeniably belongs to the geometric idea of the continuum. And it is this
characteristic of the continuum which would resist perfect arithmetization’ (Bernays
12. The classical position is already given in Aristotle’s Politica (1253 a19–20 - cf. Hicks
1894:149). However, it is also possible to accentuate the numerical element in the structure
of the biotical aspect, as in the case of Spencer’s organicistic atomism
14. ‘... il cest contre la nature du corps politique que le souverain s’impose une loi qu’il ne
puisse enfreindre’ (1975:245).
15. ‘... la voix du plus grand nombre oblige toujours tous les autres’ (1975:310).
16. ‘... ce qui ne signifie autre chose sinon qu’on le forcera tre libre’ (1975:246!)
17. Note that although Hobbes does not connect his conception with any form of holism, the
outcome of his atomistic approach is still exactly the same as in the case of Rousseau.
18. The dominant trend in modern mathematics (axiomatic formalism) proceeds from an
atomistic starting point, aiming at an arithmetic understanding of continuity
(Weierstrass, Dedekind, Cantor, Hilbert). Intuitionism, on the contrary, wants to
honour the integral coherence of continuity (its holism) by proceeding from the
intuition of a whole preceding its parts (Brouwer, Weyl). The ironical outcome of
these differences is that while axiomatic formalism pretends to be atomistic
(arithmeticistic), by trying to reduce all notions of continuity completely to notions of
number, it finally turns out to be fully dependent upon the use of the actual infinite
(the at once infinite as I prefer to call it) – showing that they had to borrow a key-
element of set theory from the (supposedly reducible) spatial aspect of reality, namely,
its time order of simultaneity. The correlate of this time order is given in
spatial figures which ought to be present at once in order to constitute coherent
wholes/totalities. Paul Bernays, the well-known co-worker of David Hilbert (foremost
mathematician of the 20th century), once remarked that it is exactly the totality
character of continuity that would resist a perfect arithmetization of the continuum
[‘Und es ist auch dieser Charakter, der einer vollkommenen Arithmetisierung des
Kontinuums entgegensteht’] (1976:74). He also correctly writes: the idea of the
continuum is a geometrical idea which analysis expresses in terms of arithmetic
(1976:74). In one of his last presentations he unambiguously rejects mathematical
atomism: ‘The arithmetizing monism in mathematics is an arbitrary thesis. The claim
that the field of investigation of mathematics purely emerges from the representation
of number is not at all shown. Much rather, it is presumably the case that concepts
such as a continuous curve and an area, and in particular the concepts used in
topology, are not reducible to notions of number (Zahlvorstellungen)” (1976:188).
Intuitionism, on the other hand, embark on a seemingly purely holistic path with its
emphasis on the basic intuition of wholeness but ends up with a restricted
arithmeticism that does not allow for the employment of the actual infinite and even
rejects the universal validity of the principle of the excluded middle.
19. In reaction to the dominant machine model (already introduced by Descartes) the
later neo-vitalist, E.W. Sinnott writes that form ‘is a continuous entity and cannot be
divided into pieces’ (The problem of organic form, London 1963:199). However,
when no part is separated, the original entity will mature normally without, by itself,
developing into more than one individual. Thus living entities display an internal
order and harmony which keep the ‘equal potential’ of each part in its proper place
when the organism is not disturbed, and when it is divided at an early stage, each part
will explore its full regenerative potential. Consequently, Driesch calls a living entity
a ‘harmonic equipotential system’ (1920:135 ff.). No machine possesses parts that
have this capability (1920:132–133, 410, 512). In a different context M. Polanyi
explains that it is not even possible to account for the nature of a machine as a
machine purely in physical or chemical terms: ‘The complete knowledge of a
machine as an object tells us nothing about it as a machine’ (1969:330). In Polanyi
1967 and 1968 we find more extensive arguments in favour of the irreducibility of
‘life’. Driesch accounts for the internal order and harmony displayed by living entities
by introducing his notion of an immaterial vital force, an enteleche (Philosophie des
Organischen, Leipzig 1920:139 ff.). This vital force is capable of ‘suspending’
physical laws, such as the second main law of thermodynamics (the law of non-decreasing
entropy) (1920:434 ff.).
20. Antal advances a completely atomistic understanding of the meaning nuances of a
word. He emphasizes the word as a unit of signification to such an extent that the
multiplicity of possible meaning nuances of a word is denied and transposed to the
Representatives of the semantic field theory [Coseriu, Geckeler, Trier, cf. Schmidt,
L.: Wortfeldforschung (Ed.), Wege der Forschung, Darmstadt 1973], on the other
hand, consider the meaning nuances of a word to be integral parts of a genuine whole
(Ganzheit).]
and A. Schutz – compare the representative statement of Max Weber: Concepts such as
‘state,’ ‘club’... signifies specific kinds communal human actions..., that could be
reduced to ‘understandable’ (‘verständliches’) actions, and that means that it can,
without an exception, be reduced to the actions of the individual human beings
(Einzelmenschen) concerned (Weber, 1973:439) – and so-called methodological
individualism (Popper, Hayek and Watkins) tend to think atomistically about society,
whereas functional approaches (system theory – Parsons, Buckley, Luhmann,
Alexander, Münch) are more inclined to think about society in terms of a whole with
parts.
22. Classical and neoclassical economic theory is straight-forwards individualistic
(atomistic) while the economic orientation of Othmar Spann, a prominent German economist and sociologist from the first half of the 20th century, is a full-blown universalism (holism).

23. The fiction theory of a legal personality is individualistic (von Savigny); the organ theory of von Gierke is holistic.

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