What is Political in Sub-politics?: How Aristotle Might Help STS

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ABSTRACT Recent contributions by Collins, Evans, Jasanoff and Wynne to the discussion of how science and technology studies (STS) might contribute to understanding 'subpolitics' – the complex, expert knowledge-intensive and distributed political issues technological societies have to deal with – and involvement of STS scholars in experiments to extend public participation in decision-making about science and technology are shown to be based on an un-reflexive use of an off-the-shelf conception of politics. This conception, grafted on the old model of the sovereign, frames political actors as 'mini-kings': as subjects with preferences, interests, aims and plans that they want to be executed. To reveal the limitations of this conception of politics, I confront it with Aristotle's conception of politics. The conception of politics that has guided work in STS is shown to be based on too narrow a conception of political action that fails to properly account for the *object* of politics. I argue that Aristotle invites us to analyse the object of politics in ways that closely resemble the way in which STS has learned to analyse the object of experimental science. Although Latour comes close to the tasks that an Aristotelian conception of politics suggest, his *Politics of Nature* shares some of the limitations that trouble other work of STS in the political domain. Despite 25 centuries separating us from his conception of politics, Aristotle may help STS to understand the politics implied in subpolitics.

Keywords action, democracy, expertise, poiesis, politics, political philosophy, praxis, subpolitics

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How Aristotle Might Help STS

Gerard de Vries

Politics, Max Weber observed in the opening statements of his famous lecture 'Politics as a Vocation', is a concept with an extremely broad range. 'One speaks of the currency policy of the banks, of the discounting policy of the *Reichsbank*, of the policy of a trade union in a strike; one may speak of the educational policy of a municipality or a township, of the policy of the officers of a club, and, finally, even of the policy of a prudent wife who seeks to guide her husband' (Weber, 1988: 505). Given the wide scope of the term, Weber decided to limit his discussion and 'to understand by politics only the leadership, or the influencing of the leadership, of a political association, hence today, of a state' (p. 506).

In the almost a century that separates us from Weber, use of the term 'politics' has only proliferated: we carelessly speak of the politics of almost

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anything. Weber's easy way out is, however, no longer available to us. If we limit the concept of politics by fiat to matters of state, a new class of activities that requires attention is immediately opened up. Definitions of the common good, concrete policies and decisions that may affect large bodies of the population are debated and set outside state-related political institutions and arenas, for example in research laboratories and in conferences where experts from non-governmental organizations (NGOs), civil servants and elected politicians meet. Politics has been 'dispersed' or 'displaced'; there is a 'subpoliticization of society' (Beck, 1993: 157 ff.; Bovens, 1995). In contrast to what Weber supposed, the state is no longer the only political association that matters. If we limit ourselves to reading only the pages of newspapers that report what is going on in official national and international political institutions, we are likely to miss much, if not most, of the action.

Although it is possible to dispute when 'subpolitics' began to gain importance and what brought it about, there can be little doubt about the urgency of the problems it poses. Some of these problems should concern anybody working in STS. The most widely discussed one is the challenge subpolitics presents for democracy. The idea that decisions and actions that may have major impact on society remain outside any form of democratic control is hard to accept. How much subpolitics can a democratic society afford? Collins & Evans (2002) have recently argued that this is an issue that STS is now ready to face.

The problem, they claim, can be stated quite simply: 'Should the political legitimacy of technical decisions in the public domain be maximized by referring them to the widest democratic processes, or should such decisions be based on the best expert advice?' (p. 235). They suggested that a new 'Third Wave' in the sociology of scientific knowledge (SSK) will have to address this dilemma. However, as one critic was quick to point out, the dilemma is false when set up this way. As Jasanoff argued 'We need both strong democracy and good expertise to manage the demands of modernity, and we need them continuously. The question is how to integrate the two in disparate contexts so as to achieve a human and reasoned balance between power and knowledge, between deliberation and analysis' (Jasanoff, 2003: 398).

In fact, the world did not wait for a 'Third Wave' in SSK to come up with answers. In practical-political terms, Jasanoff's call for integration had already been met by two opposing reactions. A first reaction was to bring politics back to where it was supposed to belong. From the 1970s on, attempts have been made to reinforce existing democratic institutions. For example, the US Office of Technology Assessment (operational from 1972 to 1995) was established to bring necessary scientific and technological expertise within reach of the US Senate and House of Representatives. Similar institutions have been introduced in European countries. All modern governments are surrounded by official advisory bodies that help to infuse political decision-making processes with expert knowledge. A cynic may observe, however, that these institutions add to the problem, rather than solve it. By providing politicians with advice about how to deal with other advice, they just add another layer of expertise.

The second reaction proposed that we should rather go the other way round and try to bring democracy to the sites where subpolitical decisions are made. To achieve this goal, various procedures and practices for democratic participation, representation and accountability were suggested, and new types of forums where experts and non-experts could meet were established. STS scholars actively contributed to these efforts by involving themselves as organizers, moderators or contributors in experiments with citizen juries, consensus conferences and constructive technology assessment, all of which aim to extend public participation in science and technology decisions (Joss & Durant, 1995; Misa et al., 1995; Callon et al., 2001; Hamlett, 2003; Hagendijk, 2004; Rowe et al., 2004).

However, in the rush to close the gap between democratic ideals and subpolitical practice, we easily overlook the fact that so far we have failed to give 'subpolitics' a precise meaning. What is the extension, the scope of this concept? Where do we have to start in order to give an account of subpolitics? The formation of nation states in the 19th century was advanced by maps, museums, poems and novels (Anderson, 1991). The revolt of the Belgians against the Dutch in 1830 was inspired by a performance of Auber's opera *La Muette de Portici*. The revolution that finally brought down Haile Selassi was set off by a fashion show (Kapuscinski, 1989: 116). 'Subpolitics' is not only found in sites dear to the STS community. So, do we have to follow not only scientists and engineers, but also cartographers, curators, poets, opera-lovers, composers and baritones, and occasionally attend a fashion show? And what do we have to take into account when we want to trace subpolitics? Obviously, we need to consider the actions of a wide range of human actors. But what about non-humans? By now it is a commonplace that technical artefacts come with 'scripts' that embody morals and politics (Akrich, 1992; Akrich & Latour, 1992; Latour, 1992). But if 'subpolitics' refers not only to a wide range of human actors but also to non-human entities, it must be stronger than Atlas: it should be able to hold up not only the sky, but the entire universe. This conceptual problem has immediate political relevance. To re-install democracy, do we expect the actions of everyone and everything involved in subpolitics (from scientists and engineers to models on the catwalk, as well as all the non-humans that may be involved) to be put under democratic control? Apart from the fact that this greatly overstretches our imagination, the wisdom of such a move would be questionable. While trying to enhance democracy, we may end up setting up a police state.

The problem of the scope of subpolitics is therefore an issue that needs to be addressed urgently. When are we entitled to speak of 'political' facts and activities when discussing events that take place outside the official political structures and arenas? What qualifies activities of humans and, perhaps, non-humans as contributing to (sub-)politics? What *is* politics if we decide – for good reasons – not to follow Max Weber's suggestion to understand by politics only the leadership, or the influencing of the leadership, of a state?

The problem we have to face is not just a matter of words. Obviously, what 'politics' is depends on what is conceived as politics and is embodied as such in institutions and practices. Politics is not something outside human

desires and judgements. It requires concepts and institutions for its existence. Shifts in, for example, what is conceived and institutionalized as 'public' and 'private' may result in activities to be moved in or out of the political realm. However, we have to be careful. Although politics depends for its existence on concepts and institutions – an ontological matter – it is not obvious that either common-sense ideas or available theories adequately capture this dependency. The *ontological* question 'what is politics' (de re) should be carefully distinguished from the *epistemological* question 'to what extent assumptions embodied in current ideas and theories about politics (de dicto) adequately account for this dependency?'.[1] Misguided by assumptions about what politics is, that is by an inadequate conception, we may start looking in the wrong places, follow the wrong threads, and fail to raise appropriate questions (Dewey, 1927: Ch. 1; Beck, 1993: 157; Beck at al., 1994: 18).

In our attempts to contribute to the democratization of technological societies, we may be unaware that our efforts are based on a conception of politics that is less than adequate. But how would we know? Assumptions that shape our views of the world are seldom accessible to direct criticism. Usually, we are not even aware of them. We recognize their effects only when we encounter a totally different view. Prejudices are found through contrasts, not by analysis.

To clarify what we implicitly take for granted when we talk about politics, I will therefore discuss an alternative set of assumptions about what politics is, one that is separated from us by 23 centuries, namely Aristotle's conception of politics. In fact, the discussion will lead me to defend a stronger claim. I will argue that in spite of the centuries that separate us from antiquity, Aristotle may help us to make explicit what is the *political* that is implied in subpolitics, and that his work suggests how to trace subpolitics.

In addressing the conceptual issues that are the main subject of this paper, I will introduce a case I will redescribe in 'Aristotelian' terms later. I will finish this paper with a discussion of the consequences of the conceptual issues for current work in STS.

Maternal Blood Screening

In the 1980s, a cheap blood test became available that identifies pregnancies at risk of certain serious birth defects, namely neural tube defects – which may cause spina bifida ('open spine') – and (in later versions of the test) Down's syndrome.[2] The procedure, alternatively called maternal blood screening, the triple screen or the triple test, calculates a woman's individual risk on the basis of the level of three substances in the mother's blood, plus the woman's age, weight and ethnicity. Since only a small sample of maternal blood is required for the test, the procedure does not induce risks for mother and child. The triple screen, however, cannot diagnose a birth defect – it can only indicate an increased risk. An abnormal test result means that additional testing is needed. Diagnostic tests (that provide near certainty) are available, but they are invasive and come with a risk (0.5–1%) of inducing miscarriage. There is no prenatal therapy for neural

tube defects or Down's syndrome. Abortion is the only way to prevent a child being born with these defects.

In spite of the non-invasive nature of the test and the value widely attributed to preventing birth defects, the question of whether the triple screen should be routinely offered to pregnant women has been the subject of controversy in The Netherlands. Abortion is (under certain conditions) legal in The Netherlands, so that was not the issue. Doubts were raised for other reasons. Studies had suggested that, because of false negatives, maternal blood screening would probably cause the number of children actually born with Down's syndrome to actually increase rather than decrease. Having taken a triple screen and having received a (possibly false) negative result, women over 36 years old (who have an increased risk for giving birth to a child with Down's syndrome) would probably be discouraged from taking the invasive and therefore risky diagnostic tests. Other critics of the test emphasized that because of the test's relatively high rate of false-positives, many women would have to face unnecessary stress. It was also argued that routine introduction of the triple screen would lead to unnecessary medicalization of pregnancy.

As early as 1981, the Dutch government asked its official advisory board for healthcare issues, the Health Council of The Netherlands, for advice on the test. Because of internal disputes, the Council took a long time to write its report. In 1988, the Council advised the government not to introduce triple screening on a routine, unsolicited basis. The Council, however, considered it to be desirable to set up a pilot project, in which for a 2 to 3-year period 20,000–30,000 women would be screened. A minority report, however, also argued against the pilot study. In 1989, the Minister of Health decided to pursue the minority report. After reviews of new evidence, the Minister's decision was confirmed in 1991. Parliament approved the course the Minister followed.

However, in a project aimed at evaluating the efficacy of the test, researchers at Groningen University Hospital had already started to offer maternal blood screening to pregnant women in the Northern parts of Holland in the 1980s. The tests were free. They were paid for by research money and a variety of other sources. When other university hospitals began to follow the Groningen example in the 1990s, in spite of the government's policy, the triple screen was introduced de facto on almost a national scale. Formally, the tests were offered for scientific reasons and upon individual request, and not as part of a screening programme for which government approval would be required. However, because the triple screen was widely discussed in newspapers, in women's magazines and on television, there may be considerable doubt about the 'individual' nature of the requests. Reacting to this situation, the Health Council and the Dutch government both stressed that routine, unsolicited maternal blood screening would ultimately be a matter of public concern for which, under Dutch law, government approval is required, rather than a private issue between a pregnant woman and her gynaecologist or midwife.

In 2001, the Health Council reconsidered the situation. The performance of the triple screen had improved. Citing new scientific evidence, this

time the Council gave positive advice to introduce unsolicited screening of all pregnant women. To guarantee adequate training of the professionals involved and to set up a tight system of quality control, the Council advised the government to introduce maternal blood screening under the Population Screening Act. Facing an upcoming election, the Dutch Cabinet decided to leave the decision to the new government.

In November 2003 the new Cabinet announced that it disagreed with the Health Council's conclusion and that it continued to reject maternal blood screening as a standard test to be offered to all women during pregnancy. According to the Cabinet, routine offering of maternal blood screening would turn pregnancy, 'a normal and natural process that for most women causes little problems' (Tweede Kamer 29323, 2003:8), unnecessarily into a medical issue. The Cabinet ruled that gynaecologists and midwifes have the obligation to *inform* all pregnant women about pros and cons of prenatal screening, but that maternal blood screening will be *offered free* only to women who are known to be at increased risk, that is women over 36 years old and women who have certain disorders, such as diabetes. All other women who (after having been duly informed) choose to have the test, have to pay for the costs of the procedure (approximately €100). To guarantee a high standard of practice, maternal blood screening was put under the population screening law. Parliament has subsequently approved the Cabinet decision.

The democratic state thus regained primacy over a practice that had evolved over two decades of pilot projects, media involvement, official advice and discussions in government. But it was a Pyrrhic victory. In spite of the concern of the Dutch government that prenatal screening could lead to medicalization of pregnancy, maternal blood screening remains available upon individual request for every pregnant Dutch woman prepared to pay €100. In fact, the practice of maternal blood screening that had developed is likely for the most part to be unaffected.

This, I guess, is what run-of-the-mill politics in a knowledge-based society comprises today: a mishmash of cabinet decision-making, parliamentary debates, expert advice, projects run by professionals and some media involvement; a long ramble that involves a wide variety of actors, who in various places, in and beyond the established political arenas, and for a wide range of technical as well as normative reasons, establish a practice that is conceived as being of public concern. Clearly, policy is not only made by the Ministry, the Cabinet and Parliament, but in other places as well. The pilot projects, aimed to evaluate the triple screen for possible later introduction on a national scale, had created a fait accompli – and it seems reasonable to call it a *political* fait accompli. If a government decision to reject introduction of unsolicited maternal blood screening is considered as a clear-cut example of political action, it seems fair to use the same judgement for the opposite: the de facto introduction of the triple screen on a routine basis in The Netherlands.

To be sure, the Groningen researchers and their colleagues at other universities who had started pilot projects did not seek or claim any political privilege or role. They offered the test for scientific purposes and under the

authority of their medical licence. They administered the triple screen to large numbers of women, simply because the test required this: for significant results, population-specific normal values need to be determined (and periodically reassessed), which entails large numbers. However, the activities of the research groups effectively eroded ministerial decisions approved by Parliament, challenged the concept of population screening as laid down in the law by introducing a grey area between unsolicited (population) screening and medical tests on individual request, and repeatedly forced the Dutch Cabinet to reconsider its position. If that isn't 'politics', then what is? But it is not 'politics' in its usual – Weberian – sense. To distinguish this type of politics from the activities of government and parliament, we may call it 'subpolitics'. But with this semantic move, the question in what sense the research groups got involved in 'politics' is of course not answered.

The members of the research groups certainly did not *intend* to become political players. They wanted to scientifically evaluate a new way of prenatal screening and to submit their papers to medical journals, not to the *Staatscourant*, the official newspaper for Dutch government announcements and publications of law. So, if it's not a matter of intentions, did the research groups perhaps *unintentionally* get involved in politics? No doubt, but that again leaves unanswered the question in what sense their activities were 'political' ones. It only reconfirms that retrospectively we are inclined to think that – in a loose sense – their actions had political (in Weber's meaning of the word) effects. Moreover, this move opens up many puzzling questions. For example, because of the requirement to be administered in large numbers for significant results, the technical features of the triple screen also contributed to the later effects. To a large degree, the political fait accompli was instituted by the fact that thousands of women already had been tested. A pilot project that would have involved significantly fewer subjects would probably not have had this impact. So if we decide on retrospective grounds that the Groningen research group and their colleagues at other universities had become involved in politics because they created a situation that forced politicians to act, this should also apply to the test. But then, of course, the number of candidates we will have to consider rapidly increases. The same argument also applies to the media that spread the word about the test, to the journalists who wrote the stories and to the newspaper boys who dutifully distributed the papers before breakfast, and of course to the thousands of women who agreed to be tested – all of them contributed in one way or another to establishing maternal blood screening on a near-national scale. The number of actors that we have to consider is only limited by our imagination. By the time we have reached that point, however, we have effectively blown up the concept of 'subpolitics'.

So was there 'subpolitics' – politics outside the established state-related institutions? No doubt. But, thus far, we have failed to give the concept any precise meaning: we fell short of spelling out what is 'political' in subpolitics, and we lack any systematic idea of how to trace and describe what might be political in activities that occur outside the official institutions of the state such as Parliament and the Cabinet.

To address these issues, we first should consider a more basic one: What in fact *is* politics?

The Community of Mini-Kings

As far as we know, the first time the word 'politics' was used, it served as the title for a series of lecture notes by Aristotle.[3] The lectures discussed a special sort of human association, the *polis*, which is concerned with rule among a plurality of free men. Aristotle thought that it is natural for a man to live in a *polis* and to be engaged in politics. In his lectures, 'politics' refers to any form of government that explicitly takes the plurality of experiences, interests and opinions among men into account. This distinguishes politics from all other ways to establish social order; for example, enforcing order by force. A tyrant who uses violence to enforce order is therefore not involved in politics. In politics, we search for compromises or for common actions that reconcile conflicting views. Politics therefore requires creativity. As politicians, our job is to find reasonable solutions to problems that are believed to require collective action.

Politics takes place within the *polis*. So what is this *polis*? 'When are men, living in the same place, to be regarded as a single *polis* – what is the limit? Certainly not the wall of the city, for you might surround all Peloponneus with a wall' (Aristotle, 1984b: 1276a25–27). What makes an association stand out as a *polis* is that it aims at what Aristotle calls 'the highest good'. 'Every association is established with a view to some good; the *polis*, the state or the political community, which is the highest of all, and which embraces all the rest, aims at the highest good', he wrote (Aristotle, 1984b: 1252a1–6). A *polis* does not exist where each man cares only for his own business. In a *polis*, citizens are aware of the fact that they coexist and that they have to act in concert.

Much has changed since the 4th century BC. Politicians assemble in depressing meeting-rooms rather than on Athens' sun-drenched *agora*. The number of people considered to be free has been extended since the times of the Athenian slave-society. We have become reluctant to use grandiose terms like 'the highest good'. But putting historical worries aside for the moment, we may still recognize the idea of politics set out in Aristotle's famous text, for example in the way politicians, civil servants and medical professionals discuss healthcare issues. They operate under the understanding that a sensible policy will have to take into account a wide range of experience and interests and that public health can only be thought of in terms of the coexistence of men. Their aim is perhaps not 'the highest good', but it has to do with something we certainly value highly: public health.

However, by attaching ancient concepts to our current practices, we do much more than step over a few anachronisms. Without noticing, we have replaced antiquity's conceptual framework with a philosophy that takes as its lead other questions than the ones that concerned Aristotle. To appreciate the merits of the Aristotelian conception of politics for understanding politics in a technological society, we first need to understand this transformation.

For us, just as for Aristotle, politics involves deliberation about common courses of action, but that is almost as far as the similarity goes. The association that Aristotle called the *polis* was supposed to be in harmony with what human beings and the world really are like, or at least how they ought to be. The *polis* is both *phusei* (natural) and *nomôi* (conventional). It is at once due to man's will and the necessary and natural expression of his progress. The *polis* has for its object the highest and most commanding good. This object is not something accidental, suggested by the chance desires of individuals. It is nothing short of the final object of human life.

All of this is hard for modern minds to comprehend. Since the Enlightenment, few philosophers have a place or purpose for anything like the idea of a naturally given final object of human life (MacIntyre, 1984: Chs 1–6).[4] Rather than assuming the object of politics to be naturally given, we think that we make up common goals as we go on. In order to formulate our aims, we rely on sentiments and preferences, traditions, or that wonderful faculty we call rationality. We discuss – or choose representatives to discuss – these aims to find consensus or a majority view that guides a common course of action. In the modern mindset, by being linked to intentions, plans, and expressed desires and interests, political aims are definitively on the side of the mind, not of nature. Although *polis* is usually translated as 'state', the two are completely different concepts.

We continue to use words introduced by the Greeks, such as 'politics' and 'democracy', but we have a political philosophy that differs radically from that of our ancient predecessors. The core concepts of modern political philosophy are sovereignty – the right to be obeyed without challenge – and legitimacy. The central questions concern the legitimacy of government and the limits of the individual's obligation to obey the state. These questions are absent from Aristotle's agenda. For him, the *polis* is not something external to the individual, because a full human life is possible only by participating in a *polis*. Modern political thought, however, makes a clear distinction between the state and the individual. Following up on a tradition of Renaissance writing in which the state had come to be identified with a person (a king, for example), from the 17th century onwards the state came to be seen as a stable structure of government, distinct from the current incumbents of that government and from the territory and the citizens who inhabited it (Skinner, 1989). For Aristotle, it is natural (and necessary) for men to live in a *polis*. For modern political philosophy, it is accidental that individuals live in a state, and hence, it becomes urgent to question the relation between the two.

Although modern political philosophy no longer identifies the state with a particular human being (the sovereign), the idea of sovereignty was modelled on how an individual, a monarch, was thought to rule. A sovereign has the means and right to obtain the goods he/she wants, to have thier preferences or will executed; to be obeyed without challenge. In other words, a sovereign is someone who has the right to power because – as Hobbes wrote – 'The Power of a Man (to take it Universally,) is his present means to obtain some future apparent good' (Hobbes, 1967 [1651]: 150). The idea is echoed in

Max Weber's (1972: 28) famous definition of power as 'the probability that one actor in a social relationship will … carry out his own will', and in contemporary definitions such as 'the capacity of some persons to produce intended and foreseen effects on others' (Wrong, 1979: 2). Although the nature of power changed gradually from the 16th century onwards, the conception of power used in political thought remained grafted on to the idea that someone rules, is in power, to the extent that other people execute what he/she wants or says.[5]

The mystery left for political philosophy to explain was then: How can 'we the people' – a plurality of individuals, each with preferences and interests of their own – take the place of the monarch and do what monarchs do: legitimately rule? Under what conditions can decisions by a sovereign to impose some policy count as government by the people?

Hobbes provided one answer. He suggested that a legitimate political order may emerge from citizens instituting a sovereign and transferring by contract their powers to that sovereign. Locke provided another: aggregation of individual preferences. The currently dominant view follows both lines of reasoning. It is based on the idea that citizens, or their representatives, discuss options within given (already agreed upon) institutions and procedures, to decide about laws and policies. This view, of course, allows some – much debated – variance. For example, as Kymlicka observes, in much of the postwar period, democracy was understood almost exclusively in terms of voting:

> Citizens were assumed to have a set of preferences, fixed prior to and independent of the political process and the function of voting was simply to provide a fair decision-making procedure or aggregation mechanism for translating these pre-existing preferences into public decisions, either about who to elect (in standard elections) or about what laws to adopt (in issue-specific referenda). (Kymlicka, 2002: 290)

In contrast, the 1990s have seen a 'deliberative turn' in democratic theory, with citizens testing and discarding those assumptions or beliefs that were found in public debates to be wrong, short-sighted or otherwise indefensible. But whether or not the deliberative process prior to decisions is stressed, in both 'vote-centric' and 'talk-centric' conceptions of democracy, to use Kymlicka's terms, legitimate laws and policies are supposed to represent what the people want. The 'general will' is executed (like the monarch's will in the old days) whenever laws are enforced and policies executed. Now that the people rule themselves, they have become the sovereign. The question of why and to what extent individuals are obliged to obey the state has been answered in the same move. Policies and laws agreed upon through the democratic process are conceived to be binding for all members of the polity because that is what democratic procedures and institutions are for: the people rule themselves, take responsibility for their own laws, and – as rational beings – conform to the law or are held responsible when they fail to do so.

Of course, this brief summary of three centuries of political thought cannot do justice to subtleties of argument that have evolved in the course of the history of political philosophy. The main thrust, however, is clear. In

the common view of politics, the legitimacy of government is the key issue; and to answer this problem, the citizen is conceived, like the monarch of the old days, as someone with preferences, interests, aims and plans. The citizen is thus conceived as a kind of 'mini-king' and politics is conceived in terms of a community of mini-kings. Democratic procedures account for the remarkable fact that, by putting heads together, a plurality of mini-kings may achieve legitimate power over individuals; that is, they may achieve authority and sovereignty.

This conception of politics as a community of mini-kings – CMK for short – officially sets up policy-making in modern democratic societies. CMK also informs discussions about politics. For example, when newspapers report about politics, they describe who formulated which political goals, what were the intentions behind the proposals, how agreement was reached or failed to be achieved, which laws were adopted and, of course, how much remains to be done.

Discussing democracy in a technological age, raises questions that are also suggested by CMK. How do we include citizens in decision-making processes about key technologies? What should be the role of experts in establishing consensus in a democratic society? How do we integrate democracy and expertise? Can new procedures to aggregate and discuss preferences, such as consensus conferences or 'constructive technology assessment', help to bridge the gap between what goes on in engineering laboratories and the public domain? The conception of politics developed in modern political philosophy (that is CMK) shapes the questions. The role of experts in politics is singled out as a key problem, because experts introduce different notions of legitimacy than the one central to the political process. Displacement of politics to laboratories, university hospitals and backroom meetings of experts is perceived as a problem, because it endangers the sovereignty of 'we the people'. Copying the agenda from modern political philosophy, CMK is taken for granted as the conception of politics that guides key questions about science and technology policy. However, by copying the agenda we also copy the limitations of the CMK conception of politics. Another look at Aristotle may help us to place these limitations in view.

Aristotle's Conception of Politics

Under CMK, politics is modelled on a conception of human agency that identifies action with the execution of an individual's will or (in politics) with execution of the 'general will'. In spite of their political and philosophical differences, both 'vote-centric' and 'talk-centric' conceptions of the political process operate under the assumption that will formation and the execution of decisions are clearly separated, conceptually as well as temporally, with processes of will formation preceding execution of policies.

This conception is quite limited, however, as a general model of human agency. Although it covers many familiar situations – you want to wear red socks today, so you go to a cupboard to get your red socks; we prefer shelter

from the rain, so we discuss the situation and decide to build a house – important aspects of human action are not included. A distinction introduced by Aristotle reveals what is left out:

> Every art and every inquiry, and similarly every action and choice, is thought to aim at some good; … But a certain difference is found among ends; some are activities, others are products apart from the activities that produce them. (Aristotle, 1984a: 1094a1–5)

In this quotation, *praxis* – actions that aim at the activities themselves – is distinguished from *poiesis* – action undertaken with the intention to produce some external end.

The distinction is not easily rendered in English. *Poiesis* is the easiest to imagine. Building a house because we seek shelter from rain is an obvious example. *Poiesis* is also known as instrumental action. It is based on the idea that action follows a path consisting of making a plan, executing that plan and achieving the desired end, or failure. *Poiesis* comes with a clear distinction – both conceptually and in time – between ends and means.

However, consider the situation of people who have assembled to discuss an issue. In their meeting, they aim for a 'good discussion'. This aim, however, is not something that exists apart from the activities. The 'good discussion' is not what has been achieved *after* all the arguing is done. It is constituted *in* the meeting through reasonable discussion. It is *articulated* in the activities of the participants, in the way they behave. To participate in a good discussion is an example of *praxis*. Whereas in *poiesis* a plan is distinguished (both conceptually and in time) from its execution and its execution from the final result, nothing like this applies for *praxis*. In *praxis* the means–ends dichotomy collapses. To argue reasonably is both the means and the end for a good discussion. The aim of *praxis* is the activity itself; the point is in the act, not in the mind of the actor.

Not surprisingly, Aristotle's distinction has been the subject of much commentary (see, for example, Ackrill, 1978; Freeland, 1985). Modern philosophers have been taught to distinguish between the description of an action and the action itself. Once this is done, it is not difficult to find actions that, depending on their description, can be conceived as instances of either *praxis* or *poiesis*. The problem disappears, however, according to Freeland, when we realize that Aristotle regards actions as particulars, that is, as concrete individual events. The distinction between *poiesis* and *praxis* is between the *tokens* of action, rather than its *type*. By considering the specific agent, patient, instruments and context, we may decide whether *poiesis* or *praxis* applies.

Students of STS are vaguely familiar with the distinction Aristotle introduced, because Latour has made a similar distinction between 'intermediary action' and what he variously calls 'translation', 'mediation' or 'articulation' (Latour, 1999). For Latour, this division applies both to human action and non-human activity.[6] Whereas intermediary action can be completely described in terms of input–output and means–end relations, according to Latour, translation, mediation and articulation defy this scheme.

Given Aristotle's distinction, we may observe that by emphasizing will formation and execution of the will (preferences, plans, and so on), CMK frames political action exclusively as *poiesis*. In contrast, for Aristotle, politics is first and foremost a matter of *praxis*: *praxis* within a polis that aims for 'the highest good'. This has an immediate consequence. Like the 'good discussion' we may aim for in a meeting, the 'highest good', the aim of political *praxis*, should not be conceived as something that will be produced *after* all the political work is done. 'The highest good' is not what we intend to bring about when we engage in politics. It is what is articulated in political *praxis*.

Aristotle uses various phrases to refer to 'the highest good': the good life, the 'perfect and self-sufficing' life, a noble life, well-being and happiness (*eudaimonia*). We need to be careful, however, because this may easily be misunderstood. Within the modern mindset, we are accustomed to distinguish between on the one hand ideals, plans and desires, and on the other the realization of an ideal, the execution of a plan and the fulfilment of desire. For us, a 'good life' is an ideal to be realized. For Aristotle, however, the good life is not an ideal at all. It is, in the first place, a kind of *life*, namely, the life of those who act virtuously in the *polis*. In *Politics* – and its companion volume the *Nicomachean Ethics* – Aristotle tries to understand what a good life *is*. The point of these works is not to persuade us to be good or to show us how to behave well in life and to produce happiness. The aim of Aristotle's lectures is to provide understanding, not persuasion or advice. He wants to give people insight into the nature of their lives, an understanding of what is the point of *praxis* in the *polis*: to live a truly human life (Lear, 1988: Ch. 5).

Aristotle was, however, aware of the fact that the good life does not come easy. For most men, it is not enough to be taught by a philosopher what the good life is. In addition, virtues may not be enough. Laws are needed because many humans live as if they do not really want to be human. They help to channel and coordinate actions that aim at the good life. Their function is to provide a space for political *praxis*, and to incite citizens to live a good life. What kinds of laws, what kinds of constitution, suit the good life? Aristotle's reflections on this issue cover many pages in *Politics*. His lectures aim to help us understand what kind of constitution is fit for the good life; that is, what it takes to set up a *polis* that aims at the good life.

This way of thinking is both very remote and very familiar to us. Today, a project that formulates the aim of the *polis* in terms of 'the' highest good meets little enthusiasm. Max Weber, for instance, seems to explicitly reject the idea:

> Sociologically, the state cannot be defined in terms of its ends. There is scarcely any task that some political association has not taken in hand, and there is no task that one could say has always been exclusive and peculiar to those associations which are designated as political ones: today the state, or historically, those associations which have been the predecessors of the modern state. Ultimately, one can define the modern state sociologically only in terms of the specific means peculiar to it, as to every political association, namely, the use of physical force. (Weber, 1988: 506)

This, however, is beside the point that concerned Aristotle. What makes a *polis* stand out is not what it produces – its ends, the tasks it takes upon itself – but what it aims at, the kind of life the *polis* stands for, the good life, the life of free citizens who coexist.

To better understand Aristotle's view, we may limit the scope of our concerns and return first to the example used before: a 'good discussion'. To be engaged in a good discussion, we need first to have some understanding of what a good discussion is. We certainly also need certain virtues, for example a readiness to listen to what other people have to say and the patience to wait until our turn to address the meeting has come. That, however, may not be enough. When the number of people involved in the meeting increases, rules and provisions will be necessary. A chairperson, a meeting room that is quiet enough for the participants to understand each other and technical facilities, such as a public address system, may help to facilitate a good and orderly discussion. The availability of a wide range of social and material technologies – from virtues, rules, to a working microphone – thus helps to constitute a meeting that aims at a good discussion.

Consider, second, how Aristotle's scheme may help us to understand a *praxis* that aims at public health. Like *eudaimonia*, or 'a good discussion', 'public health' is not achieved when all the actions that aim for this good have been completed. Public health is constituted by living together in healthy ways; it is, we might say, what circulates in a *polis* that meets certain conditions. Again, this requires that certain conditions are met and that specific social and material technologies are present. To aim at public health, we will need to have some understanding of what public health is. Today, to gain this understanding we will consult physicians rather than philosophers. But again, understanding is probably not enough. Doctors also inform us that we have to follow certain rules of hygiene. Laws may be needed in this case too, because many people live as if they do not really want a healthy life. Moreover, modern medical science teaches us that 'public health' requires more than just rules and laws. The conditions for the existence of an association that aims at public health also include access to clean drinking water, safe food and basic medical care. A *polis* that aims at public health will therefore need a constitution that includes laws, sewage systems, primary healthcare, agencies for monitoring food safety, and so on.

The discussion thus far may help us to better understand what Aristotle meant when he called the *polis* an association that aims at 'the highest good'. The 'highest good' is neither an ideal to be realized, nor a set of preferences people have in mind when entering the political arena. It is what is articulated in political *praxis*, it is what circulates in a *polis*, an association of a plurality of men with a proper constitution. The 'highest good' is to politics what the object is in experimental science: neither something in the mind, nor anything out there that lies waiting to be discovered and described, but something that is constituted, articulated, and that circulates in a practice that meets certain conditions.

In Aristotle's philosophy, politics is not a matter of human subjects expressing themselves in a particular, 'political' way to help realize their

preferences. In his conception, political action is *praxis*, not *poiesis*, and the aim, the object, of politics is 'the highest good', the 'good life'. To understand politics is to understand how this object is brought about in *praxis* that aims at, and is based on, an understanding of this object and is set in a *polis*, an association of a plurality of men that has a proper constitution.

To sum up, we may contrast this conception of politics with our common understanding, that is, with CMK. Under the CMK conception of politics, we distinguish between plans, their execution and results, between goals and the means that are mobilized to realize the agreed-upon imagined end state; we separate political discussions aimed at reaching agreement about ends and means from execution of policies, and distinguish between the state and the activities of citizens 'in' that state. Under CMK, politics refers to the way preferences are processed and agreements on ends and means are reached. What Aristotle urged his readers to understand as the *object* of politics that is articulated in *praxis* in a *polis* with an appropriate constitution is thus confined to the shadowy existence of something that is imagined, desired, discussed and planned, as a goal to be realized in the future.

It is time to bring it back into full light.

The Politics of Prenatal Screening

Aristotle lived in a world conceived as essentially given, a closed world that we have left. Politics, for Aristotle, was a business for free citizens who leisurely met on the town square of a city with the size of a provincial town – at its apex, Athens counted 200,000 inhabitants, slaves included. Today, politics is an affair distributed over many sites. For Aristotle, the good life was naturally given, an object that a philosophical inquiry may bring into view. We live under the understanding that we may create new objects and we bring a far broader range of disciplines to this task than only philosophy. But important as they are, these differences are no reason to abandon the scheme of reasoning behind the conception of politics that Aristotle introduced. What we only have to concede and account for is that in the course of political practices new aims may emerge and that the business of politics is conducted in many places, some of them officially dedicated to the business of the state such as Cabinet meetings and Parliament, some of them not. The *polis* is a much more complicated kind of association than Aristotle imagined. If we allow ourselves these amendments, what lasts is Aristotle's lesson that to understand politics is to understand the *object* that is aimed at in *praxis* in an association of a plurality of men; that is, it is to understand that what circulates in a *polis* that is constituted by appropriate social and material technologies.

For anyone familiar with the course STS has taken in the past decades, the above formulation of the task ahead will ring a few bells. Indeed, my reading of Aristotle suggests that we can *look at politics in the way STS has learned to look at science*: as a practice in which an object can circulate because a constitution has been put in place that comprises social, literary and material technologies (see Shapin & Schaffer, 1985: Ch. 2). In science,

the object may comprise such strange entities as a vacuum; in politics, it is, among many other possible objects, for example 'public health', or the special part of public health known as 'prevention of severe birth defects'.

Consider again the history of maternal blood screening in the Netherlands. At the end of the 1970s it was reported in international medical journals that the levels of three substances in the mother's blood might be used as an indicator to determine the probability that a fetus suffered from neural tube defects. The idea of a test to determine this risk was born. A few years later, it was discovered that the same non-invasive test also predicted the probability of another severe birth defect: Down's syndrome. That prevention of severe birth defects is a public health good was beyond dispute. That availability of the new triple screen also contributes to this aim, however, is far from obvious. It depends first and foremost on numbers. If the test produces too many false negatives, it misses many cases that might have been detected by the (already available, but invasive and thus risky) diagnostic tests. If the test results in too many false positives, many women will unnecessarily receive very disturbing information and some of them may decide to have an abortion, even though the child they are carrying is in fact healthy, or some may decide to take a diagnostic test that provides near-certainty but comes with a risk of inducing miscarriage. The political question of whether prenatal screening contributes to public health or not depends in the first place on the sensitivity and specificity of the test. Only if maternal blood screening meets appropriate standards, can it help to facilitate a practice that aims for a common good, the prevention of severe birth defects. This was the political problem that emerged in the early 1980s. The problem was formulated both by the Dutch government, in its 1981 request for advice on this matter to the Health Council, and almost simultaneously by researchers in the Groningen University Hospital.

Taking the availability of diagnostic tests into account allowed for some refinements in the way the issue was framed. In the Netherlands, women over 36 years old, who are known to have a significantly higher risk of conceiving a child that would be born with Down's syndrome, were already offered invasive diagnostic tests for that syndrome in the 1980s. If the false negative rate of the triple screen can be brought down to a reasonably low level, for this group a fairly high rate of false positives may be judged acceptable. Women over 36 years old who test positively on the maternal blood test can then be offered a diagnostic test, to get practical certainty about the condition of their fetus. In this situation, the triple screen effectively serves as a filter to select those who are advised to take the (invasive) diagnostic test. For women under 36 years old, the situation is different. A fairly high rate of false positives for the triple screen implies that many of these women will unnecessarily be confronted with bad news, and moreover may take an invasive diagnostic test (taking the risk of inducing miscarriage). For this group, prenatal screening also has the negative effect of turning pregnancy (for this group in most cases unnecessarily) into a medical issue. What is a reasonable policy? Can the plurality of experiences,

views and interests that are at stake turn into a practice that aims for a common good? And what will this common good concretely comprise?

The key issue was the numbers involved: the rate of false positives and false negatives. By setting up pilot projects, the Groningen University Hospital researchers and their colleagues in other Dutch university hospitals contributed to the gradual improvement of the test. This was not only a matter of laboratory biochemistry, but also of instituting an appropriate organization. Because normal values had to be determined, women from various ethnic groups, and of different weights and ages, had to be approached to participate in the project. The collaboration of family doctors and midwifes was required. Both they and the pregnant women who came to their offices had to understand the nature of the test. Information material was written; in interviews with local newspapers, the researchers explained what they were after and what the procedure involved. More complicated issues soon emerged. At the end of the 1990s, for example, it became clear that the performance of the test could be improved by combining the maternal blood screening with echoscopic screening. The sequence in which both techniques are administered and the way in which results are communicated, however, turned out to significantly affect the false positive rate. Being based on an inexact science, echoscopic measurements turned out to depend on whether or not the nurse or doctor who performed the screening knows (and is therefore biased by) the result of the maternal blood screen. Carefully designed protocols and a system of quality control were therefore judged to be necessary to attain the required performance level. Only gradually the performance of the test reached the level that convinced the Health Council, in 2001, to advise offering the triple test (and later, in 2004, to advise a combination of maternal blood screening and echoscopy) as routine, unsolicited screening for all women, including those under 36 years old. The population screening law that provided for a system of licences and quality control would furnish adequate means to guarantee the quality of the screening. By that time, a new, and fairly complicated *object* had been constituted, namely, prevention of severe birth defects by prenatal screening; it was understood what the material and social conditions for the existence (circulation) of this object were, and – due to the spread of pilot projects – these conditions were in fact already to a large extent put in place. Hereafter, I will refer to this object as PBDPS, short for 'prevention of severe birth defects by prenatal screening'. Remember, for Aristotle, the common good is not an ideal, not something in our minds (although we have to understand the good to aim at it in our *praxis*); for Aristotle, the common good (such as 'the good life') refers to a way of *life*. Likewise, PBDPS is not a goal for public health politics, a future end; it is what circulates in an association with an appropriate constitution, it is what the people involved in prenatal screening (doctors, nurses, pregnant women, laboratory personal, quality supervisors, and so on) aim at when they engage in a practice that is constituted by appropriate techniques.

After we have redescribed the course of events in these terms, it becomes possible to state in what sense and to what extent the Groningen

University Hospital research staff and their colleagues elsewhere had become engaged in (sub-)politics, and to answer the puzzling questions about 'subpolitics' from the first section of this paper. The researchers were involved in politics because they had translated a wide range of conflicting views and interests into a common good (PBDPS) and had set up the constitution for a practice in which this object could circulate. For the simple reason that their political work took place outside the official institutions and arenas of state politics, we may qualify their role as a 'subpolitical' one.

But what about the journalists and the newspaper boys who spread the word about the test? Were they also involved in subpolitics, as the discussion in the first section suggested? Remember we have to account for the tokens of their actions, not their type, so we may have to differentiate. Most of the journalists who reported about the new developments in prenatal screening wrote for local papers; some of them published in women's magazines. In many cases, articles explicitly mentioned the fact that in the region, midwifes and hospitals had started to offer maternal blood screening to pregnant women. These publications no doubt helped to spread understanding of PBDPS and contributed to motivate women to discuss prenatal screening with their partners and their gynaecologist or midwife. The journalists' activities thus contributed to the social and material conditions for a *polis*, an association, in which PBDPS could circulate. But it seems fair to conclude that by writing about prenatal screening these journalists did not help to translate diverging views into a new common good, PBDPS. Writing up their stories, their actions were not aimed at PBDPS, but intended to produce an understanding of this object in their readers. The same conclusion trivially applies also to the boys who delivered the papers: although they helped to circulate PBDPS among women who might be interested in prenatal screening, their actions were not aimed at PBDPS. Their purpose was to earn 'a few bucks'. In specific cases, however, we may have to draw a different conclusion. When in 2003 the Dutch Cabinet ruled that maternal blood screening would be offered free only to women over 36 years old, the Cabinet's decision became a subject of public controversy. Several newspaper columnists and editorials took issue with this decision, arguing that the object of prenatal screening praxis, PBDPS, should include all women, not only those over 36 years old. The journalists who wrote these newspaper columns and editorials, of course, had become involved in politics. The reason for this, however, is not that editorials and columns are articulating value-based opinions, whereas the earlier-mentioned journalists only report about facts. Many reports about maternal blood screening in local newspapers enthusiastically advertised the merits of the new technology. What differentiates the editorials and columns from the local-press reports is that by explicitly addressing the Cabinet's decision the former aimed at the object, PBDPS, whereas the latter did not. To be in or out of politics is not a matter of the opinions that are aired, but depends on whether an actor is involved in a *praxis* that aims at a political object, or not.

What about the subpolitical role of the test itself? Does this artefact, the test, have politics? (Winner, 1986: Ch. 2). The test with its specific characteristics served as a material technology that was part of the constitution of the practice. The object that was created, PBDPS, depended crucially on the performance of the test (a complicated matter that involved, as we have seen, laboratory techniques and organizational matters). So we can specify in detail what the role of the test was. Whereas the analysis in the first section of this paper led to the situation in which almost everybody and everything seemed to vaguely contribute to 'subpolitics', due to the 'Aristotelian' reading of this case, we have a better view of what is political in subpolitics and we have the arguments to decide who, what, and in what way, was involved.

Meanwhile, the Dutch government had to face the fact that they had to decide how PBDPS, the new object that had started to circulate, fit into the *polis* for which they, as elected authorities, had special responsibilities. No one questioned their *legitimacy* to rule on this matter. But how to establish a reasonable policy? In the end, the terms in which the Cabinet and Parliament came to understand the issue were suggested by the features of PBDPS as it was created in the subpolitical practice of the medical researchers. For example, the distinction between women over 36 years old and those under that age, that became a crucial – and controversial – point in the Cabinet ruling, came right out of the characteristics of the object that had been created, as did the – uncontroversial – stress on a national system of quality control.

The 'Aristotelian' view on the politics of maternal blood screening in The Netherlands may also throw light on the ruling that eventually came out of the discussions in Parliament and the Cabinet in 2003. Faced with the new object, PBDPS, the government formulated a major concern: routine introduction of maternal blood screening would contribute to the medicalization of pregnancy. This issue had been discussed before in the Health Council, but had received little further practical attention. The problem had been noted, but nobody had taken any step to further address it. In 2003, in the letter to the House of Representatives in which it announced its ruling, the Dutch Cabinet presented this consideration as its main concern. The government, however, failed to translate this concern into a new object and an appropriate set of social and material technologies. The concern remained limited to words. In the end, the Cabinet ruled that women under 36 years who chose to have maternal blood screening would have to pay for the costs of the procedure themselves, a ruling that left the existing practice basically untouched. Considering the fact that the risk of Down's syndrome substantially increases at later age, the government also announced that it had ordered a study to investigate how Dutch women might be persuaded to have children at an earlier stage in their lives. Faced with PBDPS, an object that had been created in subpolitical practice, the Dutch government did not successfully reshape this object into a form that would meet its concerns. They aired a serious concern, but only in words, and thus far have not recreated the polis in a way that would facilitate *praxis* that would meet the Cabinet's concern.

Political Analysis in the Sociology of Scientific Knowledge and Actor Network Theory

If the analysis so far is not completely off the mark, it has important consequences for the way STS has to deal with (sub-)politics. To discuss these consequences, I will comment on current discussions in STS. Because of their diverging philosophical backgrounds, the two main current approaches in STS, commonly known as the 'sociology of scientific knowledge' (SSK) and 'actor network theory' (ANT), have to be discussed separately.

First, consider SSK. Collins and Evans have suggested that the time has come for STS to get engaged in political and normative questions. The problem they singled out to address was quoted above: 'Should the political legitimacy of technical decisions in the public domain be maximized by referring them to the widest democratic processes, or should such decisions be based on the best expert advice?' (Collins & Evans, 2002: 235). Their answer is formulated in two steps. First, the 'problem of legitimacy' is replaced by the 'problem of extension': the question 'How far should participation in technical decision-making extend?' (p. 237). Second, to answer this problem, Collins and Evans propose a 'normative theory of expertise'. Their theory consists of a typology of three types of expertise (interactional, contributory and referred), two kinds of abilities (translation and discrimination) and a classification of different types of science (normal, Golem, historical and reflexive historical science). This 'periodic table' of expertise, expert faculties and science, they claim, allows them to draw the line between appropriate and inappropriate inclusiveness in technical debates conducted in public domains.

The focus in Collins and Evans' paper is on expertise. The nature of politics and democracy remain undiscussed. An off-the-shelf, common-sense idea frames the argument: politics is about 'decision-making' in the 'public domain'. The normative theory of expertise is intended to answer the question of who may be reasonably expected to contribute to technical decision-making in the public domain. The problem that Collins and Evans address may, therefore, simply be rephrased thus: In a society where different types of science exist, and people have different types of expertise and expert faculties, which mini-kings should contribute to technical decision-making? The political philosophy Collins and Evans rely on is straightforward CMK.

Collins and Evans have been heavily criticized for failing to understand the complexities of politics (see especially Jasanoff, 2003; Wynne, 2003). The criticism has focused on two issues: the nature of the political process and the reasons why public participation in technical decision-making may have any purpose at all. However, I will argue, the critics also remain safely within the confines of the CMK conception of politics.

Jasanoff (2003: 394) accuses Collins and Evans of drawing a distinction between the scientific and political phases of decision-making that seems 'at best naive and at worst misguided'. She points to the long tradition of STS work showing that 'expertise is acquired, and deployed, within particular historical, political, and cultural contexts'. What counts as expertise

varies within and between nation states. Boundaries are drawn and redrawn by influences of power, history and culture. In short, what is expert knowledge, and hence who is an expert, are results of political processes. Along the same lines, Wynne observes that Collins and Evans 'entirely ignore that public policy processes, and public reactions to scientific discourses of intervention in, and attempted management of nature and society, are processes of (often implicit and oblique) negotiation of public meanings' (Wynne, 2003: 404).

Collins and Evans are also criticized by Jasanoff (2003: 397) for their 'exceedingly narrow formulation of the purposes of public participation in technically grounded decision-making'. She adds that, 'The most powerful argument for wider lay participation in expert decision-making is not that the public possesses some mysterious reservoir of lay expertise' (p. 397). More compelling reasons include the idea that 'public engagement is needed in order to test and contest the framing of the issues that experts are asked to resolve' (p. 397). Wynne adds detail to this argument. Referring to his much-cited case study of Cumbrian sheep farmers (Wynne, 1989), he observes that:

> whereas the scientists took for granted the dominant institutional commitment to prediction and control, the farmers took for granted a lack of control and the unpredictability of many important variables, and thus regarded any form of knowledge and practice based on prediction and control as suspect *ab initio*, regardless of which truth-claims it might make or deny. Moreover, they found such normative assumptions not only to be practically inadequate, but also morally unsound and having wayward meaning. (Wynne, 2003: 409)

In the picture Jasanoff and Wynne draw, both science and politics becomes a much more complicated affair than the one on which Collins and Evans implicitly rely. They recognize that science is invested with politics, that expertise is contestable or – if no longer contested – the outcome of contingent social–historical processes; that negotiations of meanings in the public arena are framed by political struggle and powerful traditions, and that there are other and better reasons for public participation than the supposed underrated expertise of laymen. In short, processes of issue formation and agenda setting take place in spaces that have many dimensions, and are more convoluted, than the simple one-dimensional space of Collins and Evans' 'problem of extension'.

However, in spite of the complexities they add, Jasanoff and Wynne too remain firmly within the confines of the CMK conception of politics. They show that the processes in which political issues are framed and the 'general will' is constituted are much more complicated than Collins and Evans – not to mention Locke and Hobbes – imagined. They remind us that STS has a track record of showing both that there is more politics in science than is commonly acknowledged and that scientific and technical experts have become part of the processes in which political agendas are set. However, merely acknowledging that the *subjects* that enter the political process are

more complicated and carry more weight of contingent history than originally imagined does not take us to the *object* of politics.

Consider, once again, the example of the Groningen medical researchers discussed above. Their expertise was not questioned. The science they relied on was uncontroversial 'normal science'. Expert knowledge about the test was carefully channelled into the political arena by the Health Council, a body rich in what Collins and Evans call interactional expertise and translation abilities. Government and Parliament were well informed about what was at stake. Until the new government took office in 2003, the main reasons for not introducing maternal blood screening were technical ones: the effects of the rates of false positives and false negatives of the test. The decision not to introduce unsolicited prenatal screening was therefore made by institutions with unchallenged democratic legitimacy on the basis of sound expert advice. All of this can be easily accounted for in terms introduced by Collins and Evans, with Jasanoff and Wynne adding detail.

But as we have seen above, this is only part of the story. In their pilot projects, the Groningen research group and their colleagues from other universities articulated a new *object* for public health, namely PBDPS, and simultaneously put in place the technologies for constituting an association in which this object could circulate. The space in which the Dutch government now had to act had changed, not because of powerful actors, such as medical researchers pushing their agenda, but because this new object, PBDPS, had started to circulate. Prenatal care had become a different matter. The government that took office in 2003 failed to translate this object into one that would meet its main concern about prenatal screening, namely medicalization of normal pregnancy. It simply ruled that women under 36 years old would have to pay for maternal blood screening themselves. This ruling had little effect in practice and was ridiculed and criticized in the press as a grave injustice to women, as an example of the tyranny of Christian-Democrats who had never accepted that in some cases abortion may be justified, and as a cold budgetary decision. Politicians who continued to oppose unsolicited maternal blood screening were now suspected of having hidden motives and interests: CMK not only informs STS analyses of politics; it also characterizes common-sense understandings of politics and incites press commentaries about good or bad intentions. What was at stake, however, was a different matter than the intentions of the subjects who were involved. In two decades of medical research, an object, PBDPS, had been created that had become an established aim for *praxis*. Thousands of pregnant women took the test, because they had come to understand that this was a way to aim at public health. The government's main response to this understanding, medicalization of pregnancy, had remained empty words, because it was not backed up by appropriate social and material technologies. Therefore, the issues that Jasanoff and Wynne stress, such as the complexities of the processes in which negotiations of meaning, authority and legitimacy take place, were not at stake. Instead, what was at stake was the emergence of PBDPS, and the failure to transform it in a way that might have met the government's concerns. To elucidate this, however, we must

look at the history from another angle than the (CMK-guided) conception of politics on which both Collins and Evans and their critics rely.

Consider now the second school in STS: ANT. As ANT comes in many flavours, I will concentrate on Latour's version. The prospects are promising. As I have indicated above, in some regards, and especially in his emphasis on the distinction between mediation and intermediary action, Latour seems to follow in Aristotle's footsteps.

Politics of Nature presents his political philosophy. In this book, he touches on problems that have been covered by Collins, Evans and their critics, problems such as the role of scientific experts in democracy (Latour, 2004). Its scope, however, is considerably larger. Its aim is no less than to outline 'due process' for 'cosmopolitics'. The key problem addressed is how to bring a collective of humans and non-humans together into a common world.

In spite of its name, ANT is not a theory, but a philosophical technique to describe what presents itself as a given, unproblematic 'object' – for example, a matter of fact – as the outcome of long chains of translations. The metaphysical programme that came out of Latour's work in science studies suggests the route to be travelled (Latour, 1999). His paradigmatic cases, of course, are drawn from the sciences. What a scientist may call his 'object', and what the epistemological tradition tried to account for in terms of reference and truth of statements, ANT describes in terms of the chains of mediations that align a scientific text to the world. Latour is famous for pointing out that humans and non-humans contribute to each step in that chain. Wherever we look, we find hybrids, 'gatherings' of humans and non-humans.

To characterize these hybrids, Latour uses in his later work the term proposition.[7] A proposition is any being that proposes itself to a collective. Propositions can become more or less articulated. A proposition that is instituted has become a full member of the collective. The problem how to build a common world can now be reformulated: how should propositions become articulated, which propositions are to become instituted and which have to be rejected, that is, 'externalized'? The problem of illegal immigration that has become a central issue in European and US politics has in a sense been reformulated on a cosmopolitical scale.

To provide 'due process' to propositions, Latour proposes a constitution for cosmopolitics. This constitution involves two separate powers. The first House of Parliament helps to articulate the proposition by establishing the nature of the entity that requires access to the collective; the second House assesses how this entity fits into the existing order of the collective, and decides whether the entity is included, or has to be externalized. The political question thus breaks into two: 'How many humans and non-humans are taken into account?' and 'Are you ready, and at the price of what sacrifice, to live the good life together?' (Latour, 1999: 297; Latour, 2004: 109). To address these two questions, Latour distinguishes four phases: perplexity and consultation (to address the first question), and hierarchy and institution (to answer the second one). *Perplexity* is the task of being attentive and sensitive to the existence of new propositions; in *consultation* trials are set up to articulate the proposition; in *hierarchy*, the future place of

an articulated proposition is at stake; in *institution*, the proposition is (or is not) finally given a place, and an essence, in the collective.

Latour points out that both scientists and politicians (as well as other roles, such as economists, moralists, diplomats and administrators) contribute to the work that has to be done. His constitution thus redistributes issues, skills and resources that traditionally have been covered by the worn-out distinction between facts and values. The roles of science and politics, however, differ. Scientists are in the business of enabling the articulation of propositions and to help institute accepted propositions as 'black boxes'. The role of politicians is to guarantee that propositions are properly represented – that they are heard rather than prematurely externalized – and, if necessary, to invent compromises when it is time to decide whether a proposition should be assigned a place in the collective or not.

To assess Latour's political philosophy, we may confront it, again, with the example that served us well so far. The task of the Groningen research group was, in Latour's terms, to help articulate a new perplexing proposition, in this case the triple screen. To this end, they set up an experimental programme. Results of their work were discussed in the scientific press and in the Health Council. The Council's advice was properly fed into the official political process of Cabinet decision-making and extensively discussed in Parliament, with the result that a formal decision was made not to offer unsolicited maternal blood screening to women under 36 years old. Each of the parties involved did what Latour suggests that they should. In fact, the procedure that evolved seems to be exemplary for what Latour proposes as a 'due process'. Three cheers for Dutch democracy. However, as we have seen, events took another turn. Maternal blood screening was introduced de facto. In spite of having fulfilled their role in an exemplary way, the Groningen research group had become involved in 'subpolitics'. Their programme not only articulated maternal blood screening scientifically, but had introduced a political *object*.

By distinguishing the roles of scientists and politicians, Latour misses the opportunity to analyse the subpolitical role of scientists. To further analyse this role, his political philosophy leaves us empty handed. It is ironic to note why this is the case. In spite of the 'non-modern' emphasis on hybrid collectives of humans and non-humans and the new roles attributed to science, in *Politics of Nature* Latour follows a familiar and we may say 'modern' format. Latour copies the problematic that is central to political philosophy since Hobbes, and applies it to a new collective. The question that is addressed is what the relation should be between a collective (one that has sovereignty – the right to rule without challenge) and the entities that make up this collective. What Latour's constitution tries to introduce is a *legitimate* procedure ('due process') to establish *sovereignty*. The sovereignty sought after is the sovereignty of a collective, rather than (as in Hobbes' case) a state, and the 'citizens' of this collective are 'gatherings' of humans and non-humans, rather than human individuals.

Turning his attention to political philosophy, Latour seems to have forgotten the main methodological rule of STS: to follow the actors. The constitution he proposes is *his* design. It is an imagined constitution, not a

constitution that evolved in some history in which scientists and politicians had become involved. The result is a curious mix of non-modern philosophical thinking (in many regards akin to Aristotle's), ideas from empirical studies of science, and a problematic that comes straight out of modernist political philosophy. The net effect, however, is that in Latour's political philosophy the object of politics disappears from view.

We may substantiate this claim by reconsidering for the last time the history of maternal blood screening. What was the *political* object that proposed itself? It depends on the time we arrive. In the early 1980s, maternal blood screening was at best a potential option for preventing severe birth defects. Only by substantially improving the performance of the test, a process that required the inclusion of the experiences and interests of many, gradually maternal blood screening was turned into a technique that was conceived by the Health Council as being ready to be introduced as unsolicited screening. But this involved not only articulation and instituting a technique. It meant that a new object (PBDPS) was introduced – an object at which *praxis* may aim, assuming that an appropriate constitution is in place. In 2003, the Dutch government tried to change this object but, as we have seen, to no avail.

Latour is right that in this history, the contributions of science and politics cannot be accounted for in terms of facts versus values. The interactions between medical scientists and politicians indeed followed in broad lines the 'due process' that Latour has outlined. *Looking back* on this history, we may observe that the two questions Latour has singled out – 'How many humans and non-humans are taken into account?' and 'Are you ready, and at the price of what sacrifice, to live the good life together?' – were indeed raised. But they were raised in various forms, by various actors, at different times and at different sites, and in answering these questions divergent types of reasoning were used. In this complicated process, the object (PBDPS) and the constitution of the association in which this object can circulate, became simultaneously instituted. Latour's neat constitution for cosmopolitics thus turns out to be a matter of 'ready made politics', rather than of 'politics in action'.

To understand politics, Aristotle taught, we have to understand the *object* of politics and the way it is brought about. Mixing a problematic that derives from modernist political philosophy with many elements that are commensurable with the Aristotelian conception, Latour's search for a legitimate procedure to establish sovereignty in *Politics of Nature* effectively closes off the quest for the object of politics. If anyone wants proof of how difficult it is to escape from the CMK conception of politics that deeply informs our common sense, it can be found here.

Conclusions

I will summarize my argument with five points.

1. Collins and Evans are right in claiming that for STS the time has come to get engaged in political issues. But, thus far, STS efforts to analyse

'subpolitics' – the complex, expert knowledge-intensive and distributed political issues technological societies deal with outside official political institutions and arenas – are troubled. In the rush to close the gap between democratic ideals and subpolitical practice, questions about what is political in subpolitics and what is the extension or scope of the concept are left unanswered. The reason that STS, in both its SSK-variant and (despite its diverging philosophical background) in Latour's ANT, has so far failed to address this question is that it has based its analyses on an off-the-shelf conception of politics.

2. The conception of politics that has guided STS places questions about legitimacy at centre stage and frames political actors as 'mini-kings': as subjects with preferences, interests and plans that they want to be executed. Contrasting this conception of politics with Aristotle's conception reveals the limitations of the former.
3. Being based on a more subtle conception of action that distinguishes *poiesis* from *praxis*, in Aristotle's conception of politics the focus is on the *object* of politics, rather than on the intentions of political subjects. I argued that his conception invites analysis of the object of political *praxis* in ways that closely resemble the way STS has learned to analyse the object of experimental science. The object of politics, then, is not a goal that is in the minds of subjects – not a matter of preferences, interests and plans – but what circulates in an association that has an appropriate constitution and is understood as an aim for *praxis*. The example I have discussed shows that under an 'Aristotelian' conception we can analyse subpolitics by following the processes in which, by arising from a plurality of views, experiences and interests, a common object emerges together with the appropriate technologies that establish the constitution of an association in which this object can circulate and in which it may serve as an aim for *praxis*. The analysis enables us to specify in detail in what sense and to what extent actors who operate outside official state-related institutions have become involved in politics, thus showing what is political in subpolitics.
4. If these conceptual exercises cut ice, they entail important consequences for the problematic that Collins and Evans, in concert with many other scholars in STS, have chosen as their key political concern – the role of experts in public decision-making. The solutions that have been forwarded to cope with the democratic deficit that looms where subpolitics emerges should be viewed with scepticism. If the above analysis is correct, proposals for Constructive Technology Assessment, citizen juries and the like will fail to deliver the expected goods because they are based on an unreflexive notion of subpolitics. Subpolitics introduces new political objects, and this is a more complicated process than discussions in, for example, citizen juries that focus on means and ends, on the promises of technological innovations and the challenges for society they present, can cope with. Such discussions either will come too late – the object is already instituted and debates will remain empty words unless a new object is created – or too early – nobody understands yet what the innovation means and how it may function as an *object* of politics.

5. An 'Aristotelian' conception of politics therefore poses major questions both for our conception of democracy and for the way STS-style analyses may contribute to democracy. The very idea of citizen involvement is in need of reconsideration. Rather than answering problems of democracy in terms of procedures that regulate the contributions of subjects ('mini-kings'), a theory of democracy will have to address the question of how in a democracy political *objects* can be constituted.

Notes

1. A simple analogy may help to make the point clear. The fact that euros *exist*, that is, that the coins I have in my wallet are euros and not just pieces of some alloy, depends on the concept of a European currency embodied in international agreements and monetary institutions such as the Central European Bank and financial markets. I may, however, have completely inadequate ideas about this dependency (for example, I may think that the value of the euro is based on some amount of gold hidden in the coins). Nevertheless, in spite of my inadequate ideas about money, my euros are as good as anybody's. The euro depends for its *existence* as a currency on concepts and institutions, but not necessarily on the concepts and institutions that I *think* are involved.
2. For details of the history of the Dutch involvement with prenatal screening cf. Toom & Van Berkel (2003) and Popkema and Harbers (2005), De Vries (2006).
3. Aristotle, 1984. Although as far as known it was not used before Aristotle, the word 'politics' (*politikê*), developed naturally out of meanings already embodied in the Greek language, such as *polis*, *politês* (citizen), *politeume* (governing class), *politeia* (constitution). It is unknown whether the title of the lectures was chosen by Aristotle, or by later editors.
4. I exclude here current attempts to revive natural law and political philosophies based on religious thinking. However important they may be for current discussions about politics in the USA, the intellectually dominant paradigm for understanding political institutions and processes still remains liberal democracy.
5. In the 20th century, a number of writers have questioned the Hobbesian–Weberian concept of power, including Parsons, Arendt and especially Foucault.
6. In Aristotle's philosophy, the distinction between *poiesis* and *praxis* parallels a broader metaphysical distinction between movement (*kinesis*) and activity (*energeia*) (Lear, 1988: 158; Cassin, 2004: 989).
7. Proposition is therefore not used in the ordinary sense (as a statement that can be true or false). Proposition is introduced as a metaphysical term for anything that makes a proposal to have a place in the collective, that is, to exist. 'Proposition' has replaced the term 'actant'.

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