

## Openness and Stability

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**Abstract** Humanity's desire for change but not instability is explored. In this context it is proposed that a key 'balancing aid' of society is openness. Converse attributes, such as secrecy, reserve and tact, are also discussed, following the ideas of Sissela Bok. A particular interest in openness can be traced to the thought and advocacy of Niels Bohr, at the beginning of the nuclear age, when the problems were thought about mainly in terms of *security*. His ideas and efforts to promote an Open World are reviewed in the light of subsequent developments. These developments are not restricted to nuclear matters. The qualitative proliferation of kinds of instability (perhaps combining into John Beddington's 'perfect storm') is relevant. This proliferation justifies extension of Bohr's concerns with security to the wider realm of stability. It is also proposed in this paper that Bohr's use of the term *confidence*, which was an important element of his argument for an open world, requires refinement, with a distinction between confidence in others (trust) and self-confidence (necessary for openness). The paper ends with a section on 'improving our prospects'.

**Keywords** openness; stability; Niels Bohr; Sissela Bok; self-confidence; trust

## 1 Introduction

We live in times much concerned with stability. On an evolutionary scale, the conditions of life on earth are changing extremely rapidly. The changes of human social conditions are also rapid, in relation to what we can cope with. This paper addresses problems of stability and instability, first by discussing technical and normative meanings of these terms, and then by considering the connection with openness.

An abrupt change of social conditions occurred in the period 1939-1945, with the discovery and application of nuclear fission, a radical challenge to stability. Niels Bohr was at the time a world leading figure in physics, in intellectual life generally and still at the cutting edge of research in the new subject. Using his unique position, he alerted leading politicians, diplomats, etc, to the radically new conditions and the need for 'adjustment'. His deep thinking about these matters led him to emphasise the need for an 'open world' in respect of nuclear knowledge.

This paper reconsiders Bohr's concept of "openness as a primary condition for the progress and protection of civilization" (Bohr 1945) in the light of developments since that time. It considers - the influence of Bohr's ideas; why that influence was limited, despite the fundamental soundness of the ideas; how openness is relevant to today's conditions; and how openness can be an element of efforts to improve humanity's prospects.

## 2. Stability

There are many subtly different technical usages of the word *stability* but one broad distinction is essential for the present discussion - that between an objective sense generally used in mathematical and physical sciences and engineering, and a normative sense used in cultural and social affairs. The first of these senses is, broadly, that a dynamical system is stable if the effect of a small perturbation of its initial conditions or parameters or environment is to add only small oscillations about the system's unperturbed evolution. Likewise, the system is unstable if the

effect is an increasing divergence from the unperturbed evolution. Often the divergence increases exponentially or approximately exponentially. Sometimes it increases very rapidly and in some mathematical models the change is infinitely abrupt - a step function or a catastrophe (this word used in such contexts being stripped of its usual normative implication). The various models involving stability and instability are of practical as well as theoretical importance, for they often have approximate counterparts in real world examples (Thom 1975). In the mathematical modelling and analysis there is no fundamental place for a distinction between system behaviours that may, in human culture, be considered desirable or undesirable.

In contrast, usage of *stability* in a normative sense in cultural and social affairs does not seek the precision of the mathematical concepts. Rather 'stable' embraces whatever kind, degree and rate of change is considered acceptable in a culture. And 'unstable' means any change that is far more rapid and radical than society or life can adjust to. Such change is disruptive and chaotic.

Awareness of these two meanings can undo some tangles. For example, in current discourse a much-discussed kind of change is economic growth. The aphorism 'anyone who believes that exponential growth can go on forever in a finite world is either a madman or an economist' (attributed to Kenneth Boulding) is amusing but does not get us far. To my knowledge, no economists assert 'exponential growth can go on forever in a finite world'. It seems extremely unlikely that any would clearly express such a manifestly absurd idea. Nevertheless, orthodox economists are wedded to growth. But they can easily respond that growth is a current and needed stage but will not go on forever; and they may add that qualitative changes occur and may be expected. In a more constructive tenor, we may say that the real differences between orthodox economists and their critics lie in the fields of ideology (neoliberal, or communitarian), attention (focus on 'wealth', or on wellbeing) and motivation (serving state and commerce, or society). These differences lead to:

- different conclusions about what is desirable and acceptable
- different time frames

- different conclusions about growth and stability.

### 3 Openness and stability

Stability, in the social sense discussed in the Introduction, is rightly a matter of concern. Major instabilities are a present reality in many places. Numerous global instabilities are already in prospect (Beddington 2009) and many indeed already underway. There has been recent interest in the connection between stability and openness in several contexts, for example systems theory (Huet and Deffuant 2010), psychology (Mieg et al. 2012), philosophy (Roberts 2011), banking (Rehm 2012).

In this article I propose that openness is a key element in our efforts to create a culture that is more stable, in the normative sense given in Section 2. A particular interest in openness can be traced to the beginning of the nuclear age, which heralded a radical threat to cultural stability. In a later section I will discuss Niels Bohr's ideas and efforts to promote an Open World and review them in the light of subsequent developments.

#### 3.1 A spectrum from openness to secrecy

Usually a person, group, institution or society that lacks self-confidence feels the need for protective armour. They are not open. An example is provided by a notorious fraud in physics research, committed by Jan Hendrik Schoen. In the interpretation of Eugenie Samuel Reich (2009), Schoen lacked the confidence to present his actual experimental results and substituted them with results that fitted desires and expectations. Naturally, such fraud requires secrecy and is wholly incompatible with openness. (In this paper, I will use the word secrecy in the sense given on pp 5-9 of *Secrets* by the philosopher Sissela Bok (1982), namely *intentional concealment*.)

Conversely, self-confidence makes openness psychologically possible. In the last few decades, it has become something of a mantra to advocate openness, especially in science. Useful correctives to simplistic calls for unqualified openness may be

found in *Secrets ...*

A degree of concealment or openness accompanies all that human beings do or say. We must determine what is and is not discreditable by examining particular practices of secrecy

(p 9 of Bok 1982)

In different parts of human culture there are different possibilities for openness. There is greater scope for openness in science than in politics or in economics. For an example from the political domain, demonstrating the tension between openness and secrecy, see *Open secrets: Wikileaks, war and American diplomacy* (Star 2011). The relative openness of science is important not simply for science itself. It is instructive to other areas by example (p 192 of Cottey 2010).

### 3.2 Feedback loops

If the conditions exist such that a person, a corporation, a nation-state or any other social unit is secretive, there is the possibility, in some circumstances, of a self-reinforcing effect:

*Secrecy --> Fear of exposure --> Scandal (on exposure) --> Defensiveness --> Secrecy.*

Features associated with the cycle of secrecy (possibly as causes or consequences) include:

*ignorance, speculations, gossip, intrigue, fantasies, prurience, shame, inattention, distraction, deviousness, denial, mistrust, anger, aggression and guilt.*

This is the conventional, negative representation of secrecy and, while it is in itself valid, it is not complete, as the earlier quotation from Bok indicated. Weaker variants of secrecy include:

*tact, reserve, circumspection, wariness, closeness, concealment.*

Of these, tact is generally viewed positively and the others are generally seen as necessary responses in an imperfect world. Any self-reinforcing character of the cycle in these weaker cases is likely to be correspondingly weaker, because strong amplifying effects such as scandal and shame are absent, or else nearly so. In either case (weak or strong) the cycle may be described as a positive feedback loop, that is, the initial stage (secrecy) is

amplified by the feedback. Such a loop is characteristic of instability.

Secrecy is not invariably unstable. It is possible for a society to achieve "a degree of concealment or openness" that suits its various needs (tact, etc) and is stable, or robust, against minor or gradual changes. Such a situation could exist if Bok's philosophy were accepted, so that exposure of a secret would not create an excessive scandal and the prospect of exposure would not instil excessive fear. (For an example, see the discussion of the recent opening up of the academic peer review process, in the section on *Open, comprehensive, inclusive and ongoing review* in Cottey 2014.)

Similar remarks can be made about openness. A cycle of openness could be:

*Openness --> Public influence and respect --> Reputation --> Self-confidence --> Openness.*

Other features associated with the cycle of openness (possibly as causes or consequences) include

*knowledge, respect for evidence, communication, realism, maturity, awareness, attention, straightforwardness, truthfulness, trust, calmness, peacefulness and clear conscience.*

If in some area of culture the conditions exist for an increase of openness there is the possibility, in some circumstances, of a similar self-reinforcing effect. This leads us immediately into an apparent paradox, for such a loop is, in a mathematical approach, characteristic of instability, whereas in social affairs a cycle of openness leading to more openness would often be regarded normatively as a virtuous cycle and as having the attributes here listed that contribute to social stability. This shows that some care is needed with the concept of stability. In order to take the discussion forward from this point, we need to consider *change* in relation to stability.

### 3.3 Change

I propose that, in the world of society and culture, some general views on change are widely held, with rare exceptions:

- changes of many profound kinds have occurred on the long time-scales of the development of civilisation and of the evolution of life
- change is inevitable (even conservatives and conservationists accept and advocate changes of many kinds and reject only certain kinds of change)
- it is easier to destroy than to build, so that excessively rapid change (whether from natural disasters or from human agency) is considered harmful and is generally, and normatively, classed as instability
- although the Enlightenment to mid-twentieth century enthusiasm for 'progress' has been damped and modified, there are still widespread (often conflicting) views about the desirability of certain kinds of change, as witnessed by pervasive rhetoric
- the present state of society falls short of what may be possible and progress should be pursued as fast as is consistent with stability (that is, avoiding undue risk of severely negative consequences).

A useful approach to achieving changes that are generally considered positive, without instability caused by over-reaching ourselves, is provided by Joseph Agassi, who wrote

I recommend that we make our standards as realistic as possible, ie just comfortably above current usage. This would enable people to relax, be undefensive, learn to raise the level of their conduct to the standard, and permit the raising of the standard again by just a little so as to cause further improvement with no excessive tension.

(p 493 of Agassi 1981)

Perhaps this passage does emphasise comfort too much. In all parts of the world some individuals, groups, institutions and societies face severe, or even appalling, conditions of hardship and oppression. In such cases, the language of comfort and relaxation sounds a jarring note. Nevertheless, it is possible to accept Agassi's principle. Long-term, stable progress against severe

problems is achieved by pushing hard but also realistically. An example is provided by the history of the overthrow of apartheid in South Africa. Nelson Mandela and others pushed hard and courageously in this struggle. They worked for standards much higher than 'just comfortably above' the prevailing ones. Yet when apartheid crumbled they did not advocate a purist policy of retributive justice. Instead, they established a Truth and Reconciliation Commission (Frost 1998). The TRC elicited a level of openness and truth that would not have been possible under a punitive policy of establishing guilt and meting out punishment. South Africa in the post-apartheid years and to the present time is hardly the best model of stability to be found. Yet it is highly stable compared with the bloodbath that had been expected and feared before the collapse of apartheid. In this example, excessive tension would be created by an attempt to apply and enforce a rigid, idealistic interpretation of justice.

#### **4 Bohr's Open World**

The struggle between openness and secrecy, which is no doubt as old as human culture, has become strongly contested in recent times. One important change was the scientific revolution with its bold challenge to dogmatic authority, expressed in the motto *nullius in verba* (take no-one's word for it) of the Royal Society. This ideology became strongly internalised in scientists, and translated, imperfectly but still very significantly, into practice. Sissela Bok was moved to assert "Denunciation of secrecy is ritualistic in science" (p 153 of Bok 1982). This ideology of openness gradually expanded its domain, in step with the ideology of democracy.

##### 4.1 The origin of Bohr's *Open World* idea

A major development of thinking about openness was initiated by Niels Bohr, starting in the early 1940s and motivated by his profound foresight of the danger of nuclear proliferation if the construction of nuclear weapons should become possible. At the time, 1938-1939, of the discovery of nuclear fission Bohr was a revered sage for physicists. He was ahead of all others in

appreciation of the prospect of a radical transformation of the conditions within which international affairs would be conducted. While the second world war was in progress he discreetly lobbied scientists, diplomats and leaders in the USA and Britain, advocating that the USSR be informed of the existence of the Manhattan project (but not of technical details) in order to ward off the risk of post-war distrust and a nuclear arms race.

Bohr's ideas, radical by the standards of power politics, gained no *direct* traction with political leaders. He nevertheless persisted, lobbying those close to political power (p 303 of Courant 1964). In consequence, his thinking affected the late and limited post-war development of arms control (p 319 of Sherwin 1988). This influence was indirect, notably via J Robert Oppenheimer and the Acheson-Lilienthal report. Sherwin advises us, at the end of his essay *Niels Bohr and the first principles of arms control*, to remember two principles that he attributes to Bohr -

With respect to weapons of mass destruction, short-range advantage is the deadliest enemy of long-term security.

When the opportunity for an initiative presents itself, timing is more critical than detail.

(p 328 of Sherwin 1988)

Bohr did indeed take timing very seriously, as witnessed especially by the urgency of his efforts in 1944 to persuade Roosevelt and Churchill to approach the Soviet Union without delay about preliminary considerations of a post-war international order on nuclear affairs. And only a few days after the atomic bombings of Hiroshima and Nagasaki, Bohr made his concerns and general proposals public in an article in the 11 August edition of *The Times* (Bohr 1945). Today, a reader with knowledge of Bohr's central concern, from the early '40s and for the rest of his life, can identify the key points, which do indeed relate to the need for openness. Thus

Against the new destructive powers no defence may be possible, and the issue centres on world-wide cooperation ... no control can be effective without free access to full scientific information and the granting of the opportunity of international supervision of all undertakings which, unless

regulated, might become a source of disaster.

(Bohr 1945)

On 11 August 1945, however, the article must have been a challenge for most readers. The central message of the article was probably not apparent to most readers, many of whom may have found the style and content unfeeling at this particular time. The article stands in stark contrast with the passionate letter from J A F Watson (1945) on the same page.

Bohr continued his efforts, speaking with scientists, making public speeches and lobbying those with influence in government (p 259 of Moore 1985a). His next major project was the Open Letter to the United Nations. This long Letter, over 5000 words, is available online (Bohr 1950) and there are print versions in various places, for example Boserup et al (1986), Rozental (1967) and French and Kennedy (1985). The last of these is an abridged version which "seeks to make the flow of Bohr's argument as clear as possible" (p 288). Overall the Letter had a poor reception (p 277 of Gowing 1985). The UN did essentially nothing with it and the media and public reaction was, overall, discouraging. Concerning timing, an issue mentioned above, Bohr had done his best by early lobbying of scientists, diplomats and political leaders and by going public at the earliest possible time (11 August 1945). He presumably wrote his Letter to the UN when he judged that other options, tried with great persistence, had led nowhere. He must have known that the times were not propitious but decided that action was better than delay. The Korean war broke out sixteen days later. Nevertheless, as editor French writes in a brief introduction (p 288) to the reprint in French and Kennedy (1985), the Letter "represents Bohr's most complete and important statement on the problems engendered by man's discovery and exploitation of nuclear energy."

#### 4.2 The relevance of Bohr's *Open World* today

I will use Bohr's Letter to the United Nations as a means of examining the relevance of his open world ideas in the conditions of today, conditions that are changed in some ways but also fundamentally similar. Since the present article is about openness

and stability, it is noteworthy that Bohr's Letter never uses the words 'stability' or 'stable', although 'stabilize' does occur once, in the context 'stabilize world affairs'. On the other hand, the word 'security' occurs fifteen times. This points to an important difference between 1950 and now. At that time all people with even a minimal awareness of nuclear realities, and their politicians, were, with good cause, oppressed with a deep insecurity. In January 1953 a civil defense film for children *Bert the Turtle* was released in the USA. This was part of a training program, *Duck and Cover*, for all, aimed at producing an instant reaction if an atomic flash should be seen.

There was a turtle by the name of Bert  
and Bert the turtle was very alert;  
when danger threatened him he never got hurt  
he knew just what to do...

(Mauer and Rizzo 1951)

A sense of those strange times may be obtained from *The imaginary war: civil defense and American cold war culture* by G. Oakes (1994). Since then, security has not ceased to be an issue even if the intense fear of that period has been 'normalised' by the passage of time. The term security is, I suggest, much used in a rhetorical way. Behind the usage lies the exploitation of people's perfectly natural desire for security but the rhetoric often has little connection with real security.

Since 1950, stability has been added as a major political and cultural concern. What is new is the widespread recognition, albeit with a generous admixture of inattention, confusion, obfuscation and fatalism, that the earth's ecology has become unstable or else is near to instability. The many stresses that we humans are placing on ourselves, other species and the planet add up to a danger (Beddington 2009) no less than that of the early atomic era.

Another term in Bohr's Letter requires discussion. 'Confidence', in the sense of 'trust', occurs thirteen times. A typical example is "consultations between the governments with the primary purpose of inspiring confidence and relieving disquietude". Bohr does not seem to have noticed that 'confidence' has also another meaning, namely

self-confidence, nor that this meaning is deeply connected with openness. For a person, group, institution or nation-state that is not self-confident lacks a psychological foundation for openness. With a privileged background, brilliant intellect and warm social manner, Bohr appears to have missed the insecurities of other persons, groups, institutions or nation-states as an obstruction to be dealt with on the way to an open world.

Bohr's estimable qualities inspired admiration in those who knew him and continue to do so among those who know his contributions well. Indeed, from the numerous celebratory and biographical volumes (including Boserup, Christensen and Nathan 1986, Feshbach, Matsui and Oleson 1985, French and Kennedy 1985, Moore 1985b, Pais 1991, Rozental 1967) one may detect a degree of reverence which might be questioned. It is significant that in the volume *The challenge of nuclear armaments*, edited by Boserup, Christensen and Nathan (1986), such a tone is broken only by two university students who were also active in the local students peace group.

Scientists as well as popular peace movements must learn that it is not always enough to have right ideas. You must also build a majority on your side.

(p 311 of Ernø and Bang 1986)

That Bohr did not do enough to build a majority on his side may be seen from the following two remarks

(i) he lobbied selected scientists, diplomats etc, but guarded the purity of his open world proposal. He did not, for example, sign the Einstein-Russell manifesto (Born et al. 1955).

Bohr himself remained dedicated to his main theme of openness, so much so that he would not weaken it by joining other 'peace' moves and appeals from men such as Einstein and Bertrand Russell.

(p 277 of Gowing 1985)

(ii) He ends his Letter to the United Nations with an appeal.

The efforts of all supporters of international co-operation, individuals as well as nations, will be needed to create in all countries an opinion to voice, with ever increasing clarity and strength, the demand for an open world.

(Bohr 1950)

In the context of the entire Letter the call to 'all supporters' and 'individuals as well as nations' reads like an add-on. In the Letter, and in his other efforts in this matter, Bohr correctly emphasises confidence (in the sense of trust, which we may take to mean 'judicious trust' and not 'naive trust'). Yet the Letter as a whole suggests a lack of a certain aspect (trust in others' political views) of a quality (mutual confidence) that, in the abstract, he deemed most necessary.

## **5 Improving our prospects**

In his Open Letter to the UN Bohr declared "openness as a primary condition for the progress and protection of civilization". For reasons discussed in this paper and in the commemorative and biographical volumes referenced, the top-level reaction to his ideas was too little and too late, especially in comparison with what Bohr considered necessary. Nevertheless, there has been a shift in the conduct of international relations over the decades and in some ways it has been in the direction Bohr advocated (see for example p 327 of Sherwin 1988). The situation is complicated however by more recent developments in other areas, notably information and communication technology (ICT). These have in some cases been used to promote openness (see for example the section *Technologies of openness and scientific communication*, on pp 12-16 of Peters 2009).

The developments have, however, also been used to collect, concentrate and corral information. On p 3 of *Open networks, closed regimes: the impact of the internet on authoritarian rule* (Kalathil and Boas 2003) the authors write "Based on a systematic examination of evidence from eight cases - China, Cuba, Singapore, Vietnam, Burma, the United Arab Emirates, Saudi Arabia, and Egypt - we argue that the Internet is not necessarily a threat to authoritarian regimes."

There have also been mixed trends in science. On the one hand scientific knowledge has been treated increasingly as a commodity (Gibbons and Wittrock 1985). Such a shift mounts a challenge to the

primary ideal of scientific practice, namely openness to the testing of truth claims. This has been eroded in favour of the primacy of commercial value, which shifts the balance between commercial confidentiality and openness to critical evaluation. And in *Trading the Genome*, Parry (2004) writes (p. xx) "the questions of who 'owns' genetic and biochemical materials and information and who should profit from their exploitation remain unresolved."

On the other hand there has been a flowering of ideas and experiments making the funding and publication review processes more open (Peters 2013). Ford (2013) has described "eight common characteristics of open peer review: signed review, disclosed review, editor-mediated review, transparent review, crowd-sourced review, pre-publication review, synchronous review, and post-publication review."

As mentioned earlier, Martin J Sherwin (1988) states (p 328) two *first principles of arms control* that we learn from Bohr. Here I paraphrase:

- if a new opportunity for an initiative presents itself, timing is critical
- short-range advantage is the enemy of long-term security.

Now, with three more decades of history to draw on, I offer the following thoughts for the present and the future.

1. We may expand Sherwin's conclusions from arms control to dealing with our present interconnected problems. The needed step here is expansion from a focus on security (conceived mainly as security against military catastrophes) to a focus on stability (not absolute but embracing whatever kind, degree and rate of change is considered acceptable in a culture).

2. It is useful to expand Bohr's usage of *confidence*. In the context of international negotiations on the control of nuclear energy Bohr meant: being sufficiently confident in the general recognition of a common interest, and confident in a sincere and verifiable negotiating process, to permit such negotiations to make progress. I suggest that it will be helpful to make a distinction between *confidence in others*

(trust, albeit subject to verification) and *self-confidence* (a necessary condition for openness). Neither kind of confidence can be introduced quickly. Each must be built up gradually, in small steps.

3. The window of opportunity that Bohr recognised in the early 1940's and tried hard to exploit was of a kind that arises rarely. Bohr is rightly celebrated for his vision and practical action in pursuing it. However, there do also occur less dramatic opportunities for progress towards stability, less radical but also less rare than the very special opportunity spotted by Bohr.

Perhaps a route to an open and stable world may be found, no doubt after many tribulations, by holding on to the best of Bohr's thought, improving what with hindsight is seen to be inadequate, and developing every modest opportunity for progress as soon as it presents.

### **Acknowledgment**

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