II. SUGGESTED QUESTIONS

Chapter 1

WHAT EXPLAINS THAT SOME KINDS OF KNOWLEDGE ARE WIDELY ACCEPTED WHEREAS OTHER KINDS OF KNOWLEDGE ARE REJECTED?

The question

What is at stake in this chapter is my desire to understand and systematise the conditions for the spread and acceptance as well as the rejection of knowledge. The notion of knowledge is here taken in its broad and classical Platonian sense as justified true belief, still a workable definition. This implies a rejection of the relativist idea that conflicting truth holdings of the same phenomenon could coexist as different 'knowledges'. Witchcraft cannot have both existed and not existed. It was as false an idea in the seventeenth century, when most people believed that it was real, as it is in retrospect today – or will remain from any vantage point in the future.[1] Thus, knowledge is not just 'whatever is taken to be knowledge in a given milieu or culture'.[2]

The societal as well as the scientific significance of the question is obvious. Resistance to knowledge is as ever present in humankind as its restless quest for knowledge. To overcome such resistance is as pivotal for all science that intends to have an impact on society as it is for the destiny of humankind itself. Rejected or ignored knowledge, whatever its importance and quality, is of little use, and people making decisions on false grounds are potentially behaving contrary to their own interests and sometimes also contrary to the interests of humankind as a whole.

Is it possible to discern dissimilar or even contrasting intrinsic traits of knowledge that generally either invite its adoption or trigger its repulsion per se (i.e. irrespective of its specific cultural or historical context)? Self-evidently, counterintuitive knowledge is more difficult to assimilate than knowledge which suits people's preconceptions or ideological leanings. This is well known and may be covered by the psychological mechanism conventionally called

'confirmation bias'.[3] But could other such traits of knowledge be identified that affect its varying reception or impact? In addition, what is the significance in this respect of certain pivotal situations, such as certain societal atmospheres, certain human experiences or attitudes? In sum, what are the general cognitive, emotional and ideological factors that may help explain the adoption of knowledge as well as the repulsion of knowledge?

One obviously relevant circumstance is that the growth of the total stock of knowledge is far more rapid than the growth of what an individual human being has the capacity to incorporate. This means that the gap inexorably widens between the former and the latter. It might also speed up the incessantly ongoing process of specialisation, in its wake more than ever forcing people to select what knowledge to adopt and what to neglect or even reject. Moreover, there is a risk that it will reduce or block people's readiness to encompass an increasingly vast mass of information, or, even worse, alienate people from gathering knowledge altogether.

Below I will go into detail about the background to the questions at stake in this chapter.

A knowledge society – what is one and are we in one?

Over the last fifty or sixty years it has been repeatedly and frequently claimed that we live in a knowledge society, sometimes more narrowly labelled *a knowledge economy*.[4] In the 1960s, a growing number of social scientists, such as Robert Lane, Alain Tourraine and Peter Drucker, began to characterise contemporary society in this way.[5] Sociologist Daniel Bell is perhaps the most well-known exponent of this line of thought. In his seminal work on post-industrial society from 1972, he attempted to show that knowledge and the knowledge sector were growing exponentially in his time.[6] Although Bell's primary case was the United States, his ideas were rapidly and widely adopted as an accurate description of many other parts of the world.[7]

However, traces of similar ways of reasoning can be discerned among scholars far earlier than that, for instance in the writings of nineteenth century sociologist August Comte or as expressed by the mathematician and philosopher Alfred Whitehead in a little book published in the 1920s. But it was in the 1960s that this characterisation was made explicit. Gradually it became commonplace.[8]

In the modern twentieth-century discourse on the knowledge society, the 'we' who are supposed to live in such a society seem to mostly be citizens of the Western world, however, accompanied by culturally adjacent societies, whether geographically located near the Western world or not: Israel, Japan, Singapore and others. The fact that societies outside this domain are about

to catch up is as feared as it is officially welcomed. Although societies of all times draw on knowledge of some kind, reliance on real and systematically advanced knowledge is claimed to be particularly characteristic of our time.

However, the meaning of *knowledge society* is as unclear as its pretended omnipresence has been distinctly and repeatedly claimed, disregarding the present fashion to replace it with the equally bold but equally poorly proven claim that we now live in a *post*-knowledge society.[9] How *knowledge society* should be understood has varied over the years and continues to vary between scholars. How has it been defined and how should it be defined?[10]

One defining trait that has been frequently applied is simply that the stock of knowledge is exceptionally large in our time (≈ from the mid-twentieth century) as well as expanding at a previously unforeseen pace. It is almost a matter of exponential growth, as stated by Bell and others. Knowledge is stored in various media outside the human brain, and the incessant introduction of new such media may indeed facilitate and speed up further knowledge expansion. But it is also claimed that due to the plasticity of the human brain, we have improved our ability to store and digest more and more knowledge within that brain. Among other things, this is indicated by the so-called Flynn effect, which signifies that IQ has improved considerably over the last seventy or eighty years.[11] And this has happened without any substantial change of the human genome. It is, thus, a matter of cultural evolution.

Measured by this simple, or even simplistic, definition, it appears indisputable that we do live in a knowledge society – or at least do so more than preceding generations. This is the case despite the fact that new findings are not only incessantly brought in but also continuously subtracted or lost from the overall stock of knowledge. It seems more than likely that the inflows far outdo the leakages and, furthermore, that some of the knowledge that has been abandoned or thrown into oblivion can be rescued from the darkness and reutilised, most often in new ways.

According to a different approach, it is the spread and distribution of knowledge, rather than its quantity or rate of growth, that are the decisive criteria. The more widespread and evenly distributed knowledge becomes the more society deserves being designated a knowledge society. This becomes even more the case to the extent that the authorities refrain from interfering with the streams of information by imposing this and banning that.

According to the second of the two definitions of *knowledge society* given above, it would be reasonable to conclude that ours is a knowledge society, although not entirely so. On the one hand, it would indeed be hard to deny that knowledge is today more widely and evenly distributed than ever before due to the explosive growth of mass education over the last century, as well as the rich repertoire of bottom-up initiatives taken by various popular movements and

NGOs over a corresponding number of years.[12] Moreover, the wide-ranging freedom of the press and other media has contributed substantially to an even wider dissemination of knowledge.

On the other hand, as the total stock of knowledge gets incessantly larger, its advancement has become more and more specialised, which, ceteris paribus, appears as an increasing obstacle to its digestion. More and more often in everyday life, the citizens of modern society have to rely on experts rather than on their first-hand or personally acquired knowledge. The experts themselves are no exception to this predicament – to be an expert means being a non-expert in most things. By providing shortcuts to knowledge, the experts enable us to utilise it without really understanding it. Moreover, as pointed out over and over, today's media – like the media of other ages – produces lots of misinformation, not only true knowledge. And despite obvious progress in the spread of knowledge, it is still unevenly distributed globally as well as between social classes and sexes.[13] So, in view of these simultaneously ongoing processes, what is the answer? Do we live in a knowledge society or in an expert society, or neither? Finally, there is presently a worrying global trend towards autocratisation in some formally democratic countries where the freedom of expression is put under increasing pressure and even about to get squeezed.[14]

A third definition is the stress on the necessity to know – and to know a lot – as an essential requirement for the citizens of modern society. Analytically, although not in real life, this criterion should be distinguished from the stress on mass of knowledge and from its diffusion. A high level of knowledge is considered not only an asset that enables people to get along in society but also a stepping stone to a good career, good health and a long life. Rising knowledge demands from the workforce, and the gradual decline of unqualified jobs are held to be the outcomes of the rapid technological development of industry and also of the growth of the service sector at the expense of a declining industrial sector. Here, the quality rather than quantity of knowledge is crucial, yet it is motivated more by business needs than by a quest for enlightenment and the democratic empowerment of the population.

Again, also according to the third definition, it could be held as true, yet again only conditionally true, that today we live in a knowledge society more than ever before. Certainly, as industry has become more and more technologised and the service sector more intellectualised, a growing majority of the workforce are expected to acquire matching, high-level skills. Even in Turkey, in this sense the least demanding country in Europe, no more than 15 per cent of the work force can dispense with the need to possess the high skills typical of modern life.[15] It has also been shown beyond reasonable doubt that the better people are at meeting this demand – that is, the demand for

a higher level of education – the more they will be prosperous, healthy and long-lived.[16]

However, it is not clear to me whether these steadily increasing demands on the workforce are as demand driven as has been frequently and unanimously claimed to date. Could they not be output driven as well to a substantial degree? Is it really the complexity of working life that conditions these demands, or is it as much, or even more, the abundant supply of highly educated people that triggers employers to ask for them? If so, could it be the case that people in many occupations are overqualified – at least in this narrow sense? One indication of this is that politicians have recently begun to raise the need to offer simple jobs to badly educated people migrating to Europe in exceptionally large numbers – refugees and others – from countries not considered to have knowledge societies, facing them with hitherto unforeseen problems of integration. As if the pressure from the inflow of all these poor people leads to a rapid dissolution of the knowledge society, once considered so solidly established. A more robust finding pointing in this direction is the fact that the proportion of citizens with a low level of education has declined substantially more than the proportion of jobs requiring only a low level of qualifications – at least from the 1970s to the beginning of the present millennium.[17]

I do not know the answers to these questions. That is why they deserve being asked. However, I would not consider an answer to these particular questions decisive for the overarching question of whether we live in a knowledge society – whatever the answers might be. The reason is obvious: this is just one possible angle from which to approach the matter, and, as I see it, not even the most fruitful one.

According to quite another view, none of the three aforementioned definitions would qualify as sufficient to settle the issue. Basically, a society does not deserve the designation *knowledge* unless it is characterised by a widespread knowledge-affirming attitude among its citizens. According to such a view, it is the last-mentioned definition that should count as the defining trait of a knowledge society, whatever the amount or spread of knowledge. Rationally, knowledge-affirming people take steps to optimise rather than maximise their knowledge about the phenomenal world. They try to base their actions on true knowledge, not on wishful thinking. Ideally, they would behave as everyday Popperians in the sense that they would spend as much intellectual energy on critically examining their own beliefs as they do on examining other people's beliefs.

Although the four definitions discussed above are all interlinked, it is specifically the last one that brings me to the core of this chapter. It is closest to the question of what explains why some pieces of knowledge get appropriated or accepted whereas other pieces are met with repulsion or rejection. In this

particular context I am primarily concerned with the attitude towards knowledge: how and through what mechanisms it takes shape and is sustained, modified and even refuted. This is regardless of what would be the most adequate general litmus test of a knowledge society.

The decisive criterion: A knowledge-affirming attitude

Do human societies looked upon this way match these criteria? From a macro-historical perspective and measured on the population level, the answer it is unequivocally *yes*. People today know substantially more about the phenomenal world than they did in the past, and they also possess a larger repertoire of cognitive tools with which to continue extending their sphere of knowledge in the future. For example, in the High Middle Ages it took about thirty to forty years to master the mathematics that today's high school students incorporate ten times faster.[18] Not to mention negative numbers, which not even the most eloquent mathematicians operated with in the sixteenth century but which contemporary schoolchildren almost unexceptionally just take for granted from the age of 10 (or earlier).[19] It is also likely that a knowledge-affirming attitude has moved forward alongside the steady progress of knowledge. This is the most important step forward against the backdrop of the specific discussion in this chapter.

However, by applying such a macro perspective, one may give the impression that humans of all ages have always had a straightforward and open-minded craving for all new knowledge, that they have unconditionally been ready to adopt it once they have managed to cognitively grasp the novelties of their times. This is of course basically false. Generally, humans do not only seek knowledge, they also seek to avoid it or just deny it. So, each stage of the overall long-term progress of knowledge and a knowledge-affirming attitude are interleaved with resistance to new knowledge but also to certain pieces of old knowledge. How come?

Normally, new ideas are born in the minds of peculiar individuals or as the offspring of the efforts of tiny minorities – discoveries no less than ideological ideas or innovations of fashion. No wonder then that new-born ideas are often met with suspicion or even outright hostility by their intended recipients, more so the more counterintuitive they appear, and even more so to the extent that they challenge people's most profoundly cherished and often culturally inherited beliefs. Nevertheless, solid discoveries tend to gradually break through the resistance, bringing people to eventually accept them – reluctantly and with certain delays. Moreover, in everyday life most people unhesitatingly make use of many things that are based on essential scientific findings of which they may be completely ignorant. The smart

phone is an obvious example, a device that would not have been possible without Maxwell's discovery of electromagnetism. How many users are aware of that?

Altogether, this means that the majorities of today embrace much of what past minorities failed to get their contemporary majorities to adopt, such as heliocentrism (from Yajnavalkya to Galileo), seeing the bloodstream as a closed system (Harvey), electromagnetism (Maxwell), the fact that we have been through an ice age (Agassiz), the equally well-established fact that we are an intrinsic part of evolution (Darwin) and so on. These are some of the materialisations of the never-ending, conflict-ridden dynamics of knowledge advancement through the years. How this mainstreaming of new ideas comes about, we only have a limited understanding of as yet.

I know perfectly well that the so-called trickle-down perspective applied here has been heavily attacked by today's leading science historians, who, as a matter of fact, prefer to be called *knowledge historians*.[20] One after the other of these historians have questioned whether it is ever possible to identify the specific intellectual and geographical space where a certain piece of knowledge was produced by a certain ingenious individual at a certain time. They also state that it is impossible to distinguish the production of knowledge from its communication. Thus, they state, rather than being spread, knowledge circulates.[21]

As with many scientific 'turns', many important new findings have emanated from this 'circulation turn' in the history of science, in German described as a shift from *Wissenschaftsgeschichte* to *Wissensgeschichte*.[22] Perhaps, the most important ingredient of this shift is the identification of a lot of non-Western nodes of knowledge that have been advanced in interaction with the Western world wherein no node was subservient to the other.[23] It has also been observed many times that knowledge is not just received in a straightforward way but most often actively appropriated and, thus, adjusted to the needs and wants of the 'recipient'.[24]

Still, I think that the circulation perspective is overdone. For example, it is certainly true that cartographic knowledge in the seventeenth century was exchanged in a reasonably equal way between Chinese and French stakeholders. They were interdependent. However, it is as true that those who interacted in these matters were tiny elites, possessing and developing knowledge that only gradually spread outside the numerus clausus. In this case, knowledge historians have confused an outdated Eurocentric perspective on knowledge communication with a still adequate elite perspective.[25] This applies elsewhere too. For example, on the one hand it is now an established fact that Isaac Newton relied on a high number of rapporteurs worldwide for the development and establishment of his theory of gravitation.[26] On the

other hand, it is as clear that it was Newton and not the rapporteurs who developed the theory in question, soon to spread all over the world. Thus, here it is possible to precisely identify a certain intellectual and geographical space where new knowledge was produced although that certain other intellectual processes had to take place before Newton's ideas were ripe. Such events are possible to identify in countless other cases too.[27]

In passing, it could be added that the history of science clearly shows that scientists of all ages have been aware of the need to carefully think through how to present their groundbreaking discoveries in order to make them attractive or at least acceptable to their contemporaries. Convinced as they were, they knew perfectly well that they had to be convincing too. Some applied a low-key approach, trying to tone down the novelty of their novelties in order to come across. Others applied the opposite strategy, declaring upfront to the world that their findings, pretended to be solid, really meant something radically new. Still others used a targeting approach, addressing only the most promising and open-minded people around them while saving intellectual energy by circumventing the stubborn conservatives of their time. Last, some were just nakedly honest, telling the truth about their achievements without concealing the probabilistic nature of their findings or any weakness that might be associated with them.

Copernicus and Galileo may be seen as examples of the low-key approach – Galileo, though, only at some stages in his troublesome career. Copernicus referred to 'Philolaus the Pythagorian (*c.* 470–385 BCE)' at least 'as an important precursor in proposing a moving earth […] Even Galileo […] repeatedly coupled Copernicus' name with that of Aristarchus of Samoa […], to whom he (mistakenly) attributed the invention of heliocentrism'.[28]

Perhaps Joseph Lister could be seen as an exponent of a targeting approach. In opposition to most of his older fellow surgeons he introduced carbolic acid as prophylactic antiseptic treatment in surgery. My impression is that he directed his efforts mainly to younger surgeons who he considered relatively unprejudiced, finding it rather hopeless to change the minds among his older colleagues.[29] Finally, Charles Darwin may be regarded as an exponent of the honest approach, at least according to his own words in retrospect. In his autobiography he explains the almost immediate success of *The Origin of Species* by referring to his unusual habit to be as meticulous in considering counter-instances to his theory as observations which harmonised with it. Thanks to that, he anticipated many objections, which he responded to in advance, why he faced very few objections when his theory was made public.[30]

The state of the art and suggested steps forward

Over the last fifty years quite a few studies have been carried out on knowledge resistance, and some of them have also addressed ways to overcome it, not to mention a long tradition of intellectual history that maps minor and major steps forward in the scientific knowledge domain.[31] Thus, the research field is certainly no virgin land. In addition, in the over-crowded field of conformity and non-conformity research, there are also some relevant studies (see Chapter 3). In the 1970s psychologist Charles Lord and others demonstrated the presence of what they called 'confirmation bias', denoting people's aversion to change their early established beliefs, even when confronted with strong counter-instances. Today the concept is well established among social psychologists and other social scientists in the field.[32] Later on, a so-called disconfirmation bias was added. It signifies another impediment to knowledge acquisition, the empirically demonstrated tendency to put more effort into refuting other people's beliefs than one puts into scrutinizing one's own beliefs.[33] People seem to be as liberal towards themselves as they are tough towards others. Another discouraging but still provisional finding is the so-called backfire effect, whereby people tend to stick even more resolutely to their beliefs after having been informed that they are incorrect. Moreover, sometimes intellectually well-equipped individuals are better at sticking to false beliefs than their less well-equipped fellow travellers. However, recent studies seem to show that people who are intellectually well-trained have better chances, not only to distinguish false from true information, but also that they are more willing to accept what is true even if it runs counter to their ideological inclinations.[34] Obviously, more research is needed to settle the issue.

This is still not all. As has been shown quite recently, even when people are ready to adjust their perceptions when faced with correcting information (i.e. when the plan does not backfire in the narrow sense), it does not necessarily follow that they change their values and actions accordingly. Supporters of Marine Le Pen adhered to her even more strongly after having accepted that she was utterly wrong on a number of core issues. The same roughly applies to Americans intending to vote for Trump. Corrections succeeded, but the support for the Trump continued nevertheless.[35] Within this field, a number of experiments have also been carried out in order to explore ways to overcome knowledge resistance.[36] It should be added that not only emotional but also cognitive barriers to true knowledge have been addressed.[37]

Thus, over the years, a lot of scientific activities have taken place that aimed at gaining a deeper understanding of people's attitudes to knowledge, and a

lot of insights have been gained too. Yet, there are still huge gaps to be filled in our knowledge on knowledge.

First, most studies on the matter are still rather small scale, and to date, they mostly concern conditions in the United States. In passing, over the last couple of years American researchers in the field have been almost obsessed with issues related to Donald Trump. It is however likely that they soon will recover from such a Trump bias – fully understandable as it is.

Second, almost no one applies a systematically comparative approach, which I find indispensable given that the mission is to reach a general understanding of the mechanisms at work that favour or disfavour the appropriation of true knowledge and not only a local understanding of these mechanisms.

Third, almost all researchers on knowledge resistance are basically oriented towards the present. If the past appears at all, it is the very recent past. So far, I have not come across any researcher applying a truly long-term perspective. That is why quite a few otherwise empirically serious scholars sometimes present-mindedly and carelessly state that our time is more knowledge resistant than other times. This is as poorly substantiated as the opposite view: that we live in a knowledge society. We neither know this nor possess the tools by which to get to know it. How are we to measure and compare levels of ignorance and enlightenment between the present and the past? Ideally an operational yardstick could be constructed so that we would be able to prospectively follow the destiny of knowledge, enabling future historians to study its trajectory in retrospect.

Altogether, social scientists and historians should make concerted efforts to move forward in our quest for a deeper understanding of the historically and culturally varying conditions by which knowledge is either appropriated or rejected and to move forward in our search for general patterns permeating variation. This means that historical investigations and observational studies should be combined with experimental studies of different sorts.

Among the profound questions to address are those mentioned in the introduction to this chapter. Are there certain types of knowledge that condition either its acceptance or its rejection due to either emotional or cognitive reasons? Emotional motivations could, of course, be of different kinds: ideological or personal and the like. The same applies to cognitive factors, ranging from the complexity of a certain bit of knowledge to the fatigue one may feel in face of information overload, irrespective of the complexity of each bit of knowledge. Many other circumstances may be relevant, such as the types of situations and cultural contexts wherein knowledge is to take root, the types of personalities addressed and so on. Last, the destiny of new knowledge may be closely related to the strategy applied by those individuals or minorities who represent it, depending on how counterintuitive and thought-provoking their

message is, as well as on how much it challenges people's ways of living to a larger or lesser degree. A lot of other questions could of course be imagined, but these may suffice to give an idea of the nature of the contributions I would like to see.

Now, as I am writing these lines, the state of the art is about to improve considerably. Recently, a large-scale international research programme started researching knowledge resistance: its causes, consequences and possible cures.[38] However, this very promising and basically interdisciplinary programme, built around work packages on philosophy, psychology, political science and media studies, will not involve historical studies on the matter. I think that the inclusion of such studies would make the programme even better. Furthermore, since knowledge tend to progress through times, despite all kinds of resistance, the question should also be turned around: What explains knowledge breakthroughs among the citizens, and how do such transformations turn into knowledge-informed action? The investigation could be organised around an envisioned ideal trajectory, such as this:

- the knowledge gained
- knowledge resistance: cognitive resistance as well as resistance in practical life
- the cognitive breakthrough (i.e. when a significant proportion of the population accepts the new knowledge but still resists adjusting their actions accordingly)
- the practical breakthrough (i.e. when the internalised knowledge gains transform into real action on a large scale)
- a stage when these new action lines feed back as openness to another wave of knowledge gains.

As discussed earlier on in this chapter, such an approach could only be pursued by those who do not exclude the idea that at least some knowledge has an identifiable origin and that this knowledge, once produced, may spread to wider circles of people (although not unmodified).