

To be reconsidered.

There are those who take nothing for granted. Some of them are called "scientists", others, more plainly, "suspicious people". To give a famous example for such an attitude which proposes to reconsider everything, even if it is accepted to be obvious by most other people: Almost everybody took it for granted, ever since people began to think about it, that the world of objects is composed of four elements (earth, water, air, fire). And all of a sudden Galilei and the like started an entirely different approach to this problem. This paper proposes to reconsider this attitude which takes nothing for granted. It proposes to reconsider reconsideration.

Reconsider the famous example just given. The fact that the world is composed of the four elements may be observed everywhere. Moreover, it may be observed everywhere how those four elements relate to each other. Earth, being the heaviest, lies at the center of the world, it is covered by water, which again is covered by air, which again is covered by fire. On the basis of this obvious observation Aristotle has constructed a system which explains the world of objects. The system says, in short, that if a body leaves the place it belongs to according to the order of the elements, it must of necessity return to it. Thus, if a stone is thrown into the air it must fall back to earth where it belongs to. If some water should penetrate the earth, it must rise towards its proper level, (fountains), and if it should penetrate the air, it must fall again, (rain). And flames rise always, because the proper place for fire is the sky, (or, if you prefer, heaven). Now this system is not only true to observation, it is also logically sound, and possesses a great explanatory power. It says that bodies move either because they were moved from their just place, or because they try to find their way back to it. The motive of motion is either "crime", (disturbance of order), or "punishment", (restoration of justice). Now this agrees with religious experience, (be it pre-Christian or Christian), and it shows a beautiful, harmonious universe composed of four concentric spheres, where order and harmony prevails over futile and criminal disorder. When Galilei challenged it, it was sanctified by tradition, by official religious authorities, by philosophy, and even by everyday experience of ordinary people.

Now why should Galilei have proposed to reconsider the whole of evidence, of theory, of philosophical and religious tradition, and indeed of the social order which rests on all this? We know the answer, of course: because he did not believe that stones fall, in order to find their just place on earth, but because they are being attracted by it. This seems to be a very unsatisfactory answer. Why should he have made such a fuss about so little? Is it not more or less the same thing if I say that a stone is being attracted by earth, or that it falls because earth is its just place? We know now, (but Galilei did not know it during his life), that there is indeed a big difference between those two statements. Galilei's statement may be mathematically expressed, those formulae may be used to build machines, and those machines may eventually change the world and man, whereas nothing of the kind may be done with Aristotle's statement. But since Galilei himself could not have known this he must have had a different reason for his courageous, even heroic, challenge.

His reason was this: Aristotle supposes that there is an intention somewhere behind the world of objects which has the objects move, he supposed that motions have motives. I, Galilei, prefer to look at the objects without any supposition, and I can discover no motive. I must therefore take motion, (inertia), for something which is out there, and which I cannot explain. Aristotle must be reconsidered, because he is prejudiced: he professes to know something which cannot be known, but only believed, (motives). Thus the difference between the Aristotelian system and the systems built on Galilei, (like the Newtonian one), is that the new systems profess ignorance where Aristotle professes knowledge. Which may be put the following way: the Aristotelian system is "closed", the following ones are more "open" to the unknown.

Now let us reconsider this apparent modesty of Galilei's, if compared to Aristotle. Galilei seems to say: "I know that there are things which I do not know, (like motives), and Aristotle does not know this". Of course, this sounds as if Galilei had been wiser than Aristotle. Did not Socrates say: "I know that I do not know", and is not this considered to be a sign of wisdom? But if we look closer, we find that there is nothing modest about Galilei. Science is the opposite of wisdom: it wants to know ever more, and it is insatiable. If Galilei confesses to ignorance, he does so in order to investigate this ignorance and thus gain more knowledge. What he says in effect is this: "Aristotle has asked bad questions, those that begin with "what for?", and this is why he gave all the wrong answers. I am going to ask good questions, those which begin with "why?", and I shall put those questions in the open hole of ignorance which was covered by the wrong answers given by Aristotle".

Now let us reconsider this distinction between good and bad questions. It looks of course ridiculous to ask nowadays: "why does the sun shine?", and to answer: "in order to illuminate our streets", although this might not have looked ridiculous before Galilei. By the way: our children's children might consider equally ridiculous to ask any question which begins with "why?", and they will possibly have to be contented with "how?"-questions only. There is a tendency to eliminate "final questions", (what for?), and "causal" questions, (why?), from scientific discourse, because both rest on suppositions, (that there is an intention, and that there is causality behind the world). But why should it be ridiculous to ask those questions? Are not motives and causes precisely those things we are interested in, and is it not scientific knowledge meaningless, if it eliminates those questions?

The answer of course is this: If you ask "what does it rain for?", and if you answer "in order to irrigate our fields", you will never be able to produce artificial rain, (unless you have recourse to magic). The good question to ask, if you want to make rain, is: "how does it rain?", and to ask this with ever more exact formulation. And is not, after all, the purpose of knowledge to make artificial rain, (to change the world)? But there is a curious contradiction hidden in this answer. It says, in effect, that the good questions are good for two opposite reasons. One is that they are unprejudiced, and the other is that they provide practical answers. "Pure" theory leading to "unpure" practice?

Now let us reconsider the whole thing from a different angle: Galilei says that he knows that he does not know anything about motives, whereas Aristotle does not know that he does not know this. This might give the impression that Galilei knows less than Aristotle. In fact, of course, it is Galilei who knows more, (for instance he knows that there are mountains on the Moon), and it is precisely his greater knowledge which enables him to know that he does not know other things. Now this suggests the following image: the more we know, the better we know how many things we do not know. Progress of knowledge implies accumulation of known data, but even more so it implies the opening up of unknown spaces. The relation between the known and the unknown shifts progressively toward the unknown. We know absolutely ever more, and ever less relatively to the unknown. If we compare our own edifice of knowledge to the one our grandfathers had, we find that ours is much wider. It is wider because it contains more known data, of course, indeed so many that they no longer fit in our brains, but that is not the true reason why ours is wider. The true reason is that our edifice of knowledge contains so many open spaces, so many holes about which we do not know the first thing. Now this may sound ~~adventurous~~, but if we reconsider it, it is a rather sad thing.

Let us reconsider the comparison between our own edifice of knowledge and the one our grandfathers had at their disposal. There are two enormous holes gaping in our edifice, namely the one that concerns the origin of life, and the other concerning mental processes. Those holes did not exist in our grandfathers' edifice, because they were there covered by answers like "life originated by an act of creation" and "mental processes have to do with spirit". Now we know that we know nothing about "creation" and "spirit", whereas our grandfathers did not know this. Just like Galilei knew that he knew nothing about motives. Let us look a little bit closer at these gaping holes, to see what they do to our edifice of knowledge.

In the 19th century, it was a beautiful building. It consisted of various storeys, each of them occupied by specific tenants. To simplify this structure somewhat ~~more~~ "positivistically": the ground floor was occupied by physicists, the first floor by biologists, the second floor by psychologists, and the third floor by sociologists, and if a biologist went downstairs to visit the physicists, it was to see his own floor from below, as a ceiling of physics. Of course: each floor had its windows, which opened toward the world, and each floor had its own view of the world. Now this structure is very similar to the Aristotelian one, with its harmony of spheres, only there were more windows to it. The edifice of knowledge had opened itself up, but it kept its structure. The newly gaping holes have changed this. Those holes now traverse all the floors, from bottom to top, and the tenants fall into them, colliding with each other while they do so. This is called "interdisciplinarity", and it menaces the entire structure of knowledge.

To reconsider interdisciplinarity, let us have recourse to a metaphor: Suppose that simultaneous expeditions were sent out, in 1492, from Spain, from China and from Polynesia to investigate the gaping hole now filled with "America". The Spanish Columbus would have informed the Catholic kings that it was inhabited

by Chinese, (a thing he had suspected all along), and the Chinese Columbus would have informed they Great Khan that the gaping hole was inhabited by Spaniards, (a thing which, from the Chinese point of view, was to be expected). Of course, both the Spanish and the Chinese Columbusses would have come up against Polynesians and Aztecs, (a thing which none of them had expected), but those unexpected people out there would appear to the Spaniards as being curious Chinese, and to the Chinese as curious Spaniards. Thus the expeditions which at present advance into the gaping hole "origin of life", coming in from genetics, come up against curious molecules, and the expeditions which advance from molecular physics come up against curious genes, (a thing which both of them had expected). And the expeditions which at present advance into the gaping hole "mental processes", coming in from neurophysiology, come up against curious particle jumps, and those coming in from electronics come up against curious nerve structures.

It thus may be held that interdisciplinarity transforms gaping holes into gray zones where various disciplines meet and overlap, and that this mutual overlap prevents the hole from being investigated for its own sake. If the Spaniards had met the Chinese, and if they had overlapped, "America" would never have been discovered, but only an intermediary zone between Europe and China. This is an exaggeration, of course: the meeting of disciplines within the hole "origin of life" result in things like artificial bacteria, and within the hole "mental processes" in things like artificial intelligences, which is a proof that something new is happening in those holes. Still: are those new things the result of a new knowledge, or are they not the result of a synthesis of previous knowledge? Do we know more about the origin of life due to artificial bacteria, and have we gained knowledge about mental processes if we produce computers? This question has no easy answer.

This reconsideration of admission of ignorance as a method to gain new knowledge suggests the following reflexion: With each new knowledge we discover vast regions of ignorance which hide behind that knowledge, so that with each new discovery the realm of the known becomes smaller relative to the realm of the unknown. Now this works very well for a time: we accumulate ever more knowledge. But once a critical point is reached, the disproportion between the known and the unknown becomes so intolerable that any further increase of knowledge will become a futile endeavor: it will only show our ignorance the better. We have advanced very far on the way to that critical point, and we may be about to reach it. This may be the true reason why our edifice of knowledge is beginning to implode, why the very structure of knowledge is beginning to tumble.

What has been reconsidered in this paper are a few aspects of what is known as "our epistemological crisis". Which of course has many other aspects not here reconsidered, and which cannot be grasped without taking into consideration all the other crises we are in, (for instance our moral and aesthetic crisis). Still one may resume this argument in the following rather melancholy manner: In the beginning of the history of knowledge, we knew a few things. Then we knew that there are things which we do not know. Then we began not to know whether there is anything we really know. And we are fast approaching a point where we do not even

know whether we really do not know that we know nothing. This is, in short, the history of knowledge, (of science and of philosophy of science).

What strikes us, when we read that history, is the fact that it mirrors the history of faith, (taken both as an individual experience, and as a social factor): In the beginning, we believe some things. Then we believe that there are unbelievable things. Then we begin not to believe that we believe anything at all. And we are fast approaching a point where we do not even believe that we do not believe anything. Which suggests the following: "In the beginning", (long before Aristotle), knowledge began to separate itself from belief, but the separation was not very neat: much knowledge penetrated belief, and much belief adhered to knowledge. As knowledge was being progressively reconsidered, the separation became ever neater. At the height of that process a dialectical opposition between belief and knowledge is established: knowledge denies belief, and belief tries to survive by withdrawing into the holes within knowledge. And now we are approaching a point where those holes become so big that knowledge merges into belief, which however has itself been exhausted by knowledge.

If we now reconsider the example "Galilei versus Aristotle" in the light of this reflexion, we may come to the following conclusion: Galilei reconsidered the Aristotelian system, in order to clean it from believes which still adhered to it. And this cleansing process was continued by subsequent scientists and philosophers of science. Until a point was reached, where both belief and knowledge became exhausted. Such a conclusion is an invitation to reconsider the whole of Modern, (indeed of Western), civilisation.

We may observe, in fact, that there are people around who are ready to draw that ^{conclusion} ~~conclusion~~, (without having necessarily followed the argument which lead to it). Those people try to break out from a civilisation which has led to such a sorry state, and they flee toward India, toward Tibet, toward various sects, toward drugs, toward the greenery of ecological movements, in the hope to find there some things they may really know and they may really believe in. But of course: if one decided to reconsider our civilisation, one must also decide to reconsider the attempts to get rid of it. And it is not difficult to show that those attempts are based, to a great extent, on bad faith and bad knowledge. This double reconsideration is the challenge of the immediate future.