



**V.I. Vernadsky**

## ***Thoughts on Today's Significance of the History of Knowledge\****

Report at the meeting of the USSR Academy of Sciences  
Commission on the History of Knowledge, October 14, 1926

### **I**

The time we experience is an amazing time in the history of humanity. One has to look similar to it in the distant centuries of the past. This is a time of intense realignment of our scientific worldview, a profound change in the picture of the world.

The ideas about the world around that humanity of the West has entered into the 20<sup>th</sup> century, despite all the achievements of natural science, mathematics, historical sciences, technologies, which can characterize so vividly the 19<sup>th</sup> century, were essentially a result of a gradual and steady development of the principles and constructions of a new era, being prepared in the 16<sup>th</sup> and clearly spilled over into the 17<sup>th</sup> century, when even earlier achievements of Copernicus and the path made by Columbus, new mathematics, new philosophy, radical breaking of ideas about organization and position of human in the world told finally on the scientific efforts.

The 20<sup>th</sup> century brings with ever-increasing intensity already fundamental changes in the understanding of the world of the new time. This is a change of another magnitude than those created in the last century. They are similar to those which were contributed by philosophy, science and technology in the early 17<sup>th</sup> century to the worldview of the Middle Ages.

It is possible that we are experiencing an even more change. Perhaps, such experiencing turn of scientific thinking is more

*\* The report is reprinted from:  
V.I. Vernadsky. Works on the  
Universal History of Science.  
M.: Nauka, 1988 p. 213*

like the old crisis of spiritual life, the one that occurred two and a half thousand years ago, in the 6<sup>th</sup> and the nearest centuries B. C., when the great Hellenic science was created, technology flourished and for the first time a philosophical thought took familiar forms close to us in the Mediterranean cultural center, and in the religious quest, in the mysteries, the utmost deep intuition took place, the search for the meaning of existence.

The rise, sudden and bright, of the Hellenic genius appeared not once in the 19<sup>th</sup> century and in the earlier centuries, as a great miracle until it has been identified the movement of thought of the preceding time.

In the distance of the centuries other the same drastic realignments of spiritual consciousness of human, expanding his horizons and grasping of the world around by his thought, are opened up before us. In the ever-growing depth of the centuries with a high probability we should assume a many time repetition of the same creative constructive rises, turns in the beating of the mind, in the growth of understanding of ourselves and the world around us.

Before the duration of humanity life those two and a half thousand years are inconsiderable — eighty — ninety generations in which we can now trace three sharp rises of scientific consciousness. We can already now scientifically research into several — at least seven or eight thousands of generations, and we know about the existence of a thinking human being for hundreds of thousands of years.

In this distance of times the same process of growing of human mind was going. It went according to the same laws it goes now, as we see everywhere that the pres-

ent is a logical manifestation of the past regardless of how far it is from us. We recognize the past through the present.

The existence in the past of the same great turns in thinking, which now unfolds before us, is undoubtful. It is enough to imagine the consequences of such great discoveries of human genius as the discovery of fire, agriculture or metals as instruments of life.

We are witnessing now the evolving phenomenon, only occasionally observed in the history of humanity, once encountered in hundreds of years, but not the only, but one of many that have already occurred.

For the historian of knowledge the modern moment is of the same interest and has the same meaning as a celestial phenomenon for an astronomer that repeats once in hundreds of years; it has even a greater significance because in the short — in terms of cosmos — humanity life, human can not observe evolution of the cosmos, he can only restore it with a greater or lesser success in his cosmogonies. The humanity lives in one of the stages of a changing cosmos; it observes the repetition of astronomical phenomena only to the extent of one stage: only a small part of the cycle of changing phenomenon is available to him. On the contrary, in the evolution of scientific thought of humanity the changing stages may be observed, cover empirically the whole area of changing phenomena entirely.

## II

For the naturalist, when he covers any natural phenomenon, it inevitably takes the form of laws. To think scientifically means introducing a complex natural phenomenon within these forms. The

repetition of phenomena in time is one of the most striking manifestations of the regularity.

In those cases where, as in the historical sciences, such repetition is independent of human will, the observation of the cycle of events coming again to the historical arena, acquires a particular, absolutely exclusive significance.

I hardly make a mistake if I accept as inevitable and not requiring any evidence for a naturalist-empiricist position as inextricably linked with all his worldview and his way of work the belief that everything in the world around us, to which only he can come up with a scientific analysis or scientific synthesis, all equally fits into the framework of regularity. A naturalist-empiricist can not make any distinction between any natural phenomenon to which he is an observer whether it happens on the earth or in the heavens, in the material medium or in the manifestations of energy, i.e. in the transfer of states, in negligible volume of a molecule, atom, electron or proton, in the vast space of the nebula, which is alien to our world, or inside the human himself, in the creation of his spiritual manifestations thinkable out of space. His approach to all these phenomena will be essentially the same.

They will inevitably be natural phenomena for him.

While there are fundamental differences from other natural phenomena in the phenomena of the spiritual life of humanity, he will not see such difference as long as they obey his empirical generalizations. They will reveal, if the remainder will remain not obeying the laws of empirical knowledge. No other scientific approach to the study of natural processes for the naturalist exists

Without solving thus the issue of the identity or the difference in essence of spiritual manifestations of human life and other natural phenomena covered by sure scientific knowledge, a research scientist into the progress of scientific thought can still state that much of the spiritual work of humanity fits into the same unshakable «laws of nature», which he is seeking for and finds in his research work; and it can be reduced to his usual accuracies.

This is revealed by enormous influence of the development of scientific human thought on the phenomena of animated or dead nature, independent of human. Scientific human thought powerfully changes the nature. Nowhere seems it is seen as dramatically as in the history of chemical elements in the crust, as in the structure of the biosphere. Established throughout the geological time, set in its equilibrium biosphere begins to change ever stronger and deeper under the influence of scientific thought of humanity. The newly emerged geological factor — scientific thought — changes the phenomena of life, geological processes, energy of the planet. Obviously, this aspect of the scientific thought of human is a natural phenomenon. As such, it can not appear randomness to a naturalist-empiricist, it necessarily appears in his mental vision an integral part of the whole, which, as he adamantly knows, everything is subject to number and measure, covered by his empirical generalizations. In this picture of nature, scientifically built, the work of scientific thought should also have its manifestation in the same form and the same way as all other natural phenomena are included in it, small and grandiose. However, the scientific thought is included in natural

phenomena not only by such its reflected manifestation.

It has the features in itself peculiar to natural phenomena only.

First of all, it is seen in that certain *speed of movement* is characteristic of the course of scientific thought, that it changes conforming to the laws of nature over time, and it is observed a change of periods of its fading and periods of strengthening.

### III

It is this period of strengthening of the scientific creativity we observe in our time, the third time in the last three millennia.

During all these periods there are common or typical features associated with extraordinary rapidity of scientific creativity, opening the fields of study untouched by earlier scientific thought. Scientific efforts of these periods have a vivid creative rather than destructive nature. The new is constructed and created; it often uses the old processed to the end for its creation. Usually it turns out unexpectedly to the contemporaries, that the new elements have already been concealed and prepared in the old. Often once and suddenly this old appears in a new guise, the old is illuminated at once. This is the usual vivid expression of our impressions of what is happening. It is very characteristic. This is the image of creation, but not destruction, the image unseen to us before, but apparently naturally going process, waited for its manifestation its completion.

Such a course of scientific consciousness is always observed throughout the history of thought. It is a more intense and covers a large area in the watershed periods. It is always typical of it the creation of new and maintaining previously achieved.

We the other day have experienced this by a particular example when in the picture of our world ideas about the disintegration of atom and destruction of matter in the processes of nature has penetrated as a shooting flow.

Yet none of the old was destroyed: Everything is illuminated by new understanding.

And now, when the area of new phenomena and new achievements of scientific creativity embraced our scientific efforts on a larger scale, we do not feel the chaos and destruction, at least temporarily. We live in times of arduous, continuous creation, the pace of which is increasing.

The main and decisive factor in this creation is the discovery of new and new phenomena, new areas of observation and experience accompanied by a huge influx of new empirical facts, previously unknown shape. A rapid growth of new in new areas extinguishes in our mind's eye the significance of the old.

This torrent of new, faster progress in scientific achievements when in a few decades it is achieved something that is usually created in centuries or millennia is obviously a manifestation of a force associated with the spiritual creative energy of human. If any analogy is required for our mind between this natural process, by which millions of people usually pass by not noticing it, this analogy may be an explosion.

You can talk about the *explosion of scientific creativity*, going in strong and persistent, not destroying framework previously created.

In order to make it more convenient to study these explosions of scientific creativity in the ordinary course of natural processes for naturalist, it is necessary to express them differently, reduce them to

common phenomena of material environment or energy inherent to them. Spiritual creative energy of human is not included here. Scientific thought in itself does not exist; it is created by a human living individual; it is his manifestation. In the world only individuals really exist who create and express a scientific thought, express a scientific creativity — spiritual energy. Weightlessness values created by them — scientific thought and scientific discovery — in the future change the way previously mentioned the course of processes of biosphere, the nature surrounding us.

Explosions of scientific creativity, repeated through centuries, indicate therefore, that through the centuries periods are repeated when it is accumulated in one or a few generations, in one or many countries richly endowed individuals, those whose minds create a force that changes the biosphere. Their nascence is a real fact that is the utmost closely associated with the structure of human as expressed in the aspect of natural phenomena. Social and political conditions that allow expression of their spiritual content get significance only subject to its existence.

These conditions can not cause the nascence of such persons themselves. For we know that such persons in the general mass of humanity are always a rare occurrence, not always taking place. Almost more than centuries should be waited after the deceased ones the new people emerge who are able to catch the thread left by the deceased.

It is very possible that in order to identify the periods themselves of scientific creativity it is necessary the concurrence of the two phenomena: the nascence of richly endowed people, their concentration in closer generations, and social, po-

litical and living conditions favorable for their manifestation.

However, the principal is the nascence of talented people and generations. In essence, this fact causes the possibility of the explosion of scientific creativity; nothing can be, failing it. Even if there were such concentrations of talents in a few generations in the interim periods, but not spilled over into the explosions of scientific creativity due to adverse conditions, the existence of such fluctuations of talent levels in the generations change should, however, be primarily to ensure that there will be explosions of creativity.

I can not dwell on here on somehow full analysis of these phenomena. I just want to mention all the known facts. Everywhere and always in the history of all sciences, we see a period when throughout of one, two, three generations talented people appear at the same time, raise to great heights a given area of the spiritual life of humanity, and then do not have their replacements. Sometimes we must wait long for the reappearance of minds of their peers or talents of their peers, sometimes they do not appear. We see it, for example, in ancient Greece in the history of art, literature, philosophy, where the greatest geniuses of all historical Hellenic life were concentrated within the space of a few decades; we see such empty periods, for example, in the 18<sup>th</sup> century in the French polite literature after the blossom in the 16<sup>th</sup> – 17<sup>th</sup> and the 19<sup>th</sup> centuries; we see the accumulation of the great French mathematicians in the late 18<sup>th</sup> and early 19<sup>th</sup> century and the break in generation earlier and later. We experienced the creation of the great Russian literature with a concurrent advent of the first-class writers.

Such temporary concentration of talented personalities in a few generations,

and their absence in many intermediate times — sometimes centuries — is a common characteristic phenomenon of the spiritual manifestations of humanity. It is sharp and pronounced in the history of scientific thought.

We still do not know why, how and what makes the nascence of talented people, the instruments of scientific thought, and their accumulation in close generations, and a lack in others. We must take them for a property of our race, a manifestation of its nature.

This is the same natural process, subject to a scientific investigation of a naturalist as what is the impact of scientific thought on the surrounding animated and dead nature, its change of energy biosphere.

In both cases, the scientific creative thought both in the mechanism causing it — the nascence of its talented creators and its manifestations — its change of energy of the planet, enters into an indissoluble connection, entirely in the complex processes of biosphere, sciences about nature, in the area of their research methods.

For the naturalist-empiricist it is an axiom, inseparably linked with his whole thought and with the form of his scientific work, that such manifestations can not be accidental, but just as subject to weight and measure as the movement of celestial bodies or the course of chemical reactions.

In his efforts he can not but finding a mechanism that connects them with the others.

#### IV

In essence, this task is just for that scientific discipline, which is the object of our work. This is a task of the history of

knowledge, research into progress in time of scientific thinking and scientific quest.

The importance of this discipline becomes crucial, when a grandiose natural phenomenon evolves in front of us, involving us too and which is part of its domain.

It appears to me that it is a phenomenon we are destined to experience now that we live in a special era, are on the crest of a blast wave of scientific creativity. Peering into it and studying it, we can not but enter with thought into the future, can not but think about further identification of the phenomenon in human life that we observe. We see that we have entered into a special period of scientific creativity.

It is distinguished by the fact that concurrently all basic features of the picture of space scientifically built are fundamentally changing by all lines of science.

A feature of our time is not that such changes are taking place — a historian of science may find their individual manifestations, usually deafened by further course of scientific thought, many times in the past decades — it is important that they all appear at once, simultaneously. This causes the out-of-the-ordinary effect that they begin to produce both in our thinking, and its reflection in the world around us.

In essence, it is now, by its inevitable future implications for human life, probably the biggest phenomenon that occurs on our planet — the one that would have to draw our special attention and should direct all our will to clearing of its progress.

Our ideas about matter, energy, time, space radically change, completely new concepts of the same basic significance are created -concepts totally absent in all

previous scientific world views. We often do not find direct analogies in the past to these new concepts. These are electrons different from atoms building matter, but not the atoms of energy; these are quanta. The history of penetration of quanta in our scientific buildings is a curious phenomenon in the history of thought, because neither the creator of this idea, Max Planck, nor ever-increasing number of accepting quantum scientists could and can give it a clear expression in the images of our understanding of the world. Creation of a symbol of quanta without the possibility to express it in a clear, logically incontestable geometric image, and, especially, its triumphant march in the modern scientific creative work, is one of the most interesting events in the history of scientific thought, the study of which, perhaps, will allow coming closer to identifying the laws of the so-called scientific intuition.

Now, apparently, we are approaching new darings, perhaps, not less radically changing our thinking. We come to build a world without matter. And so our matter which is for us a set of atoms, completely and essentially different from that which was thought about by for example Galileo, Descartes, Newton. For the atoms of matter of our ideas, almost not include material particles, «empty» spaces in which insignificant centers of influence float, different from the emptiness — and we know nothing about the «emptiness» of the atom — are fundamentally different from those atoms, which the great minds had the idea about and who created the world outlook of our time. Logical analysis of new concepts leads to the irreducible to the whole controversies. They will become even greater if it proves impossible to express by the language and concepts

of classical mechanics and even at all in the general form of moving particles the structure of atoms, if indeed the way first so successfully laid by D. Thomson, E. Rutherford,

N. Bohr (the analogy of the atom, admittedly, is obviously in outward appearance, with the planetary system) will be completely inadequate to explain the phenomena revealed by our experience and our observation. Replacing the geometric image of the atom with a new symbol, like a quantum, will put even more sharply on the brink of a new outlook on the future from ideas about the world since young people of my generation.

Such conception would be the more important that our thoughts irresistibly and consistently will use the atoms as a prototype, irreducible to movement, to identify all the other fine patterns, which will require us to build a picture of physical and chemical phenomena.

At the same time in our scientific worldview, in its very essence, another irreducible representation of the movement has already entered — the doctrine of symmetry. It is in it as an extraneous inclusion, not associated with other models of the world and matter created by physicists and mathematicians. Meanwhile, the empirical basis of the study of symmetry is one of the most solid achievements of science. Its profound significance was foreseen by Louis Pasteur and Pierre Curie, a theory of the solid state of matter — crystallography — is based on it, it irresistibly seizes chemistry and mineralogy, but it stands now not only outside the sphere of our world picture, it is not affected by philosophical thought, and no those consequences and the applications are identified that follow from it and that will inevi-

tably lead to the scientific picture of the universe alien to the past centuries.

Much more attention excites a theory of relativity, which leads to a completely new picture of the world, drastically changing the prevailing its Newtonian construction until now. A radical change in the scientific concept of time and disappearance of the universal gravitation as a special force or forms of energy from the world picture — if they finally enter into the general consciousness, and they do — will put the same impassable boundary between our understanding of the structure of cosmos and ideas of the 19th century, which was put by this generalization of Isaac Newton at his time between scientific new and ancient or medieval world view. It has to hear very often that the victory of the theory of relativity will not introduce big changes in the scientific activity than were made by other major scientific achievements of the 19th century, such as for example, the doctrine of energy.

One can hardly agree with this. Those discoveries did not violate the framework of our basic physical concepts, but the theory of relativity, fundamentally changing the Newtonian models of the world, introduces us in the new world of ideas; all the consequences of this step, we can not even imagine now. We know that Newton's ideas about force, acting «instantaneously» at a distance, broke all the world view of scientists of the 17th and 18th centuries. It took several, about three, generations so that they are finally entered into the general consciousness, and a great role in this victory of the Newtonian ideas was played not by their logical force, but an element of a public nature — their introduction to school, raising a child in the spirit

of these incomprehensible to empirical knowledge representations. Also, the generation grew accustomed from childhood to account for the fact that for people, whose thought was more independent, seemed absurd. Now, in a quarter of a millennium, we are so accustomed to them that it is difficult for us to move away from them into the world of ideas of Albert Einstein. I think, however, that Einstein's ideas could be easier understood vitally by the opponents of Isaac Newton; in fact they are less distant from them than from us. A refusal from the Newtonian ideas is no less sharp turn in the course of scientific thinking than their adoption was. It puts a line between the two world views as the victory of Isaac Newton put such line for the world view of new centuries and the Middle Ages.

To some extent this is a return to the threads of seeking truth, left at this turn in the 17th century.

Against the background of profound changes in ideas not less radical change of the foundations of chemistry associated with the identification of the atom and the chemical element and with an introduction to the scientific outlook of concepts about the dependence of the existence of chemical element on the time and the presence of isotopes in its medium, is going on. And here we grab the threads of ancient quests left in the 17th — 18th centuries and belonging to scientific world-view of the Middle Ages alien to the 17th -19th centuries. Enormous creative efforts of this run of life of humanity separated from us by centuries tell brightly on such particulars, the significance of which is only now become clear to us due to the achievements of the history of art and history of philosophy.



Not only chemistry changes, but thanks to new ideas about a chemical element the observed picture of the starry heaven begins to open to us phenomena unsuspected before. It is enough now to remember only the existence of the gaseous mass in the world, the density of which are ten thousand times greater than the density of water, whereas the terrestrial matter in the heaviest of its representatives, in platinum or iridium, only 20–22 times heavier than water. Astronomy is undergoing the fermentation of ideas which, in its multi-millennial history recalls, and could be compared by scale only with it, to the change that was made in its content when Galileo directed at the beginning of the 17th century in Padua and in Florence the first telescope in the solar system. But now the area of changing concepts covers not less deeply the entire Cosmos accessible to our mind's eye rather than one system of the Sun and the Earth.

## V

The turning point in the scientific world view, now specified, has involved the area of physical-chemical sciences. In contrast to what had been observed in the 17<sup>th</sup> and 18<sup>th</sup> centuries, sciences mathematical and biological under the tremendous growth in the 19<sup>th</sup> century do not contribute to our scientific world view changes causing a radical reversal compared to the world outlook of the last century.

But in other areas of knowledge — in the understanding of the position of human in the structure of the world being scientifically created — it is observed now a huge leap of scientific creativity, while going concurrently with the growth of physical-chemical sciences.

In vain human would try to build scientifically the world, renouncing himself, and trying to find some, regardless of the nature, understanding of the world. This task is beyond his powers; it is also essentially an illusion and can be compared with classical examples of such illusions as the quests for perpetuum mobile, the philosopher's stone, and squaring of the circle. Science does not exist separately from human and it is his creation the same as it is his creation a word, without which there can be no science. Finding the accuracies and laws in the world around him, human inevitably brings them to himself, to his word and to his mind. In truth scientifically expressed there is always a reflection of — may be extremely large — spiritual personality of human, his mind.

The naturalist-empiricist must always reckon with this; for him, with his methods of seeking truth, another world that is not associated with the reflection of the human mind, even if it exists, is not available. In philosophy, in connection with this a naturalist is necessarily a realist, for him, his scientific picture of the world is something really existing.

He might admit the possibility that such a reflection of the human mind, and consequently, the human personality, in the world being scientifically built, in general is not a chance; and is inevitably so far not a coincidence a more accessibility to his scientific creative efforts closer to the source of mind, natural phenomena, which are all the phenomena connected with human life. Always the human sciences are closer moved to him; the human personality can penetrate into them deeper than into scientific disciplines studying Cosmos.

Changes occurring in this part of the picture of the world, so even deeper and stronger tell on human life.

Two large new developments of scientific thought are observed in the 20<sup>th</sup> century in this field of knowledge.

First, for the first time the human consciousness becomes aware of *an extreme ancience of human culture*, in particular, ancient manifestation of scientific thought on our planet.

The age of the earth, under its climate conditions, not different from modern is measured by a billion or billions of years; in the last ten-thousandths parts of this planetary time a scientific human thought had undoubtedly already existed.

Second, for the first time all the flows of spiritual creativity of human merge into a single whole before that going in the low dependence on each other, and sometimes quite independently.

The turning point in the scientific understanding of Cosmos, indicated earlier, thus coincides with concurrently going the utmost profound changes in human sciences. On the one hand, these sciences are aligned with the natural sciences, on the other, their object completely changes.

With each passing day a more and more ancience of material remainders of the past of humanity opens up, which portrays its spiritual life in such periods, the researchers of the last century had not thought of; in that time and in manifestations of spiritual creativity preserved and survived to our time — in language, in the ancient legends in particular — realities are opened that seemed improbable in the historical criticism of the recent past.

A phenomenon occurs unexpected for a rationalist-scientist of humanities who relied on the mind as something completely

self-sufficient, but an ordinary phenomenon for a naturalistempiricist. Logically probable conclusion often turns unrealistic, and vice versa a phenomenon taken place in reality, turns more complicated than it seemed to mind. Ideal constructions of the mind fall to pieces and logically unbelievable become an empirical fact.

One of the most powerful instruments of growth of historical knowledge, the creation of the 17<sup>th</sup> — 19<sup>th</sup> centuries — historical criticism and the veracity of its findings require amendments based on empirical data the mind can not foresee; the natural process may, as it turns out, fundamentally alter the achievement of historical criticism.

At the same time the history is aligned with the biological sciences. At every step the biological basis of the historical process begins to reveal itself, the effect of pre-human past of humanity not suspected before and apparently not taken into account adequately until now; in language and thought, in all its system and its every day life the utmost close threads that connect him with his utmost remote ancestors appears to us.

The community of laws for different manifestations of knowledge — historical ideological sciences — comes forward brighter and brighter. For instance, it is strongly felt and is sought for in the fact that we now have to deal — in one of the historical sciences, the history of knowledge and scientific thought. The appearance in bunches and concentration in certain generations of minds that can create a revolution in scientific quests of humanity, and consequently, in the energy of the biosphere, is not a coincidence and probably is associated with the deepest biological features of Homo sapiens.

The unified history of humanity shaped in the new form in the 20<sup>th</sup> century may be viewed as the manifestation of the same unexpectedly ancient and complex history in the modern manifestation of human, the world history in an unprecedented coverage, synthesizing into the integral whole the work of all human civilizations. Previously, concepts and ideas about the past of humanity were concentrated in the European history closely connected with the Mediterranean center of culture. This European history seemed universal. Already throughout the 19<sup>th</sup> century the continuing efforts to realign these ideas not meeting the real phenomenon were pursued. It can be considered now that such limited study of the past is over. The historical process is recognized as uniform for all *Homo sapiens*, and therefore, on the one hand, connection of historical knowledge with the biological knowledge is taken roots, and on the other — the reversal is going on in the structure of historical knowledge, unprecedented in strength and consequences in their past existence.

Thus, in the physical-chemical sciences and human sciences, historical, the reversal of creativity is going concurrently, exceptional by its force and magnitude. It is in the very beginning.

It seems to a naturalist-empiricist a spontaneous and naturally historical, nonrandom and can not be stopped by any disaster. Its roots are hidden deep in the system of nature incomprehensible to our mind, in its unchanging order.

We do not see anywhere in this system, as far as we study the evolution of the living over the geological time, turns and returns to the old, do not see any stops. Human emerged not accidentally, connected with the previous creatures before

him and he performs not accidental work in the chemical processes of the biosphere not by chance.

The turn in the history of thought, now running, is independent of human will and can not be changed either by his desires or by any of his manifestations of life, public and social. It certainly is rooted in his past.

A new run of explosion of scientific creativity must inevitably reach its natural limit, as inevitable as the comet moves toward it.

## VI

These greatest movements of scientific thought inevitably already tell on all spiritual structure of humanity. They are also told on his life, his ideals, and his everyday life. A new growth of philosophical thought is inevitably connected with it, which some have already indicated as started, and a new rise of religious art.

The historian of thought, the historian of science should look closely with deepest attention in such times to what is going on. He can learn this way to understand the past and, perhaps, foresee the future.

But this does not end his activities.

At such moments of explosion of scientific creativity scientific study into the past of scientific thought acquires another, more topical significance.

We notice now a huge revival in the history of knowledge, growing efforts in this area. It is revealed in a rapid increase in the scientific literature on the history of science, in the creation of special centers of its study — special institutions, scientific societies and journals devoted to it. In ordinary scientific work the historical point of view may be manifested more frequently than before.

This is partly due to the importance that the present moment has for the historian of scientific thought, involuntarily exciting a thought of each scientist idea in the said direction.

But this growth is also explained by the other: that in radical reversal of concepts and understandings of what is happening, in a mass creation of new ideas and pursuits, the aspiration to link them with the past is inevitable. Often such historical study is the only opportunity of their rapid penetration into the scientific thought and the only form of critical evaluation allowing distinguishing valuable and permanent in the vast material of this kind created by human thought. A significant part of this material is of a transient value and will disappear quickly. The sooner you can understand it, the faster the movement of our thought will be, the growth of a new scientific outlook. Such selection of scientific and significant can be made more accurately and rapidly in its historical study.

The scientific organization has not yet applied to new stages of science. But we

can already see the sprouts of its future in the physical-chemical sciences. They are weak yet, but it is the beginning. At the symposiums of the American scientists, in international discussions of the Faraday Society in London, in the reviews of scientific journals a historical aspect appears more and more brighter in discussions of the most burning, *les derniers cris*, scientific issues.

The history of science is, and such moments, a tool of achieving new.

This is its meaning, however, as always incidental to it. The scientific study of the past, including scientific thought, always leads to the introduction of new in human consciousness. But in moments of the reversal in scientific consciousness of humanity thus and only thus the new opened can be a tremendous spiritual value in human life.

This burning interest in the history of science, in addition to its significance, as search for truth, we can not and should not forget in our Commission, the only center of this scientific discipline in our country.