THE PHILOSOPHY OF ALEXANDER BOGDANOV

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The Philosophy of Living Experience

Contents

CHAPTER 1

What is Materialism?

Nature is what people call the endlessly unfolding field of their labour-experience.

Nature, labour: these are simple ideas familiar to everyone, are they not? Yes, but only for the everyday, homemade philosophy that is satisfied with the conventional and does not investigate it.

When the word 'labour' is uttered, one conceives of effort directed at some kind of goal – the work of a metalworker, a peasant, a cobbler, a teacher, and so on. The average person does not think beyond such separate, individual aspects of labour. The question of labour *as a whole* does not enter one's consciousness.

Labour, as a whole, is the activity of all humanity in the historical interconnectedness of all its generations. Is it possible to speak of a *goal* of this labour? It might seem impossible. Each concrete human activity has its own goal, and all these goals are different. The goal of a worker differs from that of a farmer, a cobbler's differs from that of a teacher. Sometimes types of work are so different from one another that it would seem strange to even compare them. However, behind all subjective, dissimilar goals is concealed one objective task, one common direction of labour.

All aspects of labour boil down to this: that human beings *change the correlation of certain elements of nature*, moving them, establishing new interactions among them, etc. If we investigate each concrete act of work, we find this and nothing else. Objects and methods may be different, but the essence of the matter remains the same.

One can go further. Human beings change the correlation of the elements of nature so that they conform to their needs and desires, so that they serve their interests. In other words, they *organise* these correlations to conform to their will to live and to progress. Thus, *all in all, labour organises the world for humanity*.

Such is the objective meaning of labour as it exists for the collective, even if it usually eludes individual consciousness, the narrow, separate thinking of a contemporary individual. Most often this idea is expressed in the model of the authoritarian relationship: humanity *subordinates* nature to itself. This is a metaphor, however, since subordination presupposes not only an organising will but also an implementing will, while, in regard to machines, for example, the very concept of 'will' is not appropriate.

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Labour is *effort* – i.e. it necessarily entails overcoming some kind of *resistance* – otherwise it would not be labour. Nature, as the object of all the efforts of humanity, is the world of resistance or, what is the same thing, *the kingdom of matter*.

Countless philosophers of bourgeois society have argued about matter without keeping in mind the basic, elementary fact that 'matter' correlates with labour, and that these two concepts are inseparably related and are incomprehensible apart from one another. And this is not, by the way, at all difficult to understand.

Look at what people have called and now call 'material' and what they call 'non-material'. For a long time air was considered not to be material because under normal conditions it did not appear to resist human movement. (One of the earliest proofs of its materiality was experience with an inflated and tied bladder – to be precise, how such a bladder resisted pressure by the hands). From the same point of view, we all are accustomed to applying the term 'immaterial' to shadows, mirages, and optical images seen in a mirror or in a camera obscura.[1] Psychical images, forms of memories, phantoms in dreams, and so forth, are usually treated as non-material since no resistance is to be found in them.

If we found ourselves in a world where everything was arranged according to our wishes, without requiring any effort on our part, then we would perceive that world as non-material.

For clarity it is useful to note that the idea of 'matter' is correlated precisely with *social* labour and expresses resistance encountered *not* merely by individual activity but by social activity. Images in dreams may seem to provide the greatest possible resistance to my individual efforts to struggle against them, but they do not present any kind of opposition from the perspective of the collective, and they are therefore characterised as non-material. Toothache can be ignored only by the greatest effort of will by the person who suffers from it, but that individual alone experiences this resistance. On the other hand, the nerve in someone's tooth is definitely material on which other people – a dentist, for example – can direct their activity. In general, matter is *socially valid* opposition to human efforts, an object of *collective* labour.[2]

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1 If we were able to feel the very weak pressure – less than 2 milligrams ['about 4 milligrams', 1913 edition] per square metre – that the rays of the sun exert on the body, then the light of the sun when it shines on us would not seem 'non-material'.

2 When we acknowledge that some distant star, which probably will never become the field of human labour, is material, we simply express the belief that in the event that labour was applied to this object, then opposition would be present. Once people thought this about the

In physics, matter is characterised by its 'inertia', i.e. its resistance to the action of *force*. But it is easy to see that the very idea of 'force' is the result of a basic metaphor that transfers the model of human effort to nature. Consequently, the scientific conception of matter, when its actual content is revealed, is completely consistent with the general philosophical concept that we have presented.

But Marx alone among the nineteenth-century philosophers was able to understand clearly that matter is the object of production – its essence. This is why Marx used the term 'materialism' to refer to his social-philosophical doctrine which found production to be the basis and cause of social development.

Thus, in the process of organising the world for its own purposes, humanity comes up against the materiality of nature, i.e. with nature's resistance to organising activity or labour. In this universal fact lies the foundation of one of the two principal lines of philosophical thought, so-called *materialism*.

In order to struggle with matter, in order to overcome the resistance of nature, labour must proceed systematically; in order to organise the world, labour must itself be organised. Even the simplest process of production – let us suppose the felling of a large tree – requires the *unification* of workers' forces and *leadership* based on *knowledge*. The people involved would need to know the properties of wood and tools, to have a thought-out plan obligatory for everyone involved in the job, and, of course, to be in close communication to adjust the activity of each worker to the activity of them all. These conditions – knowledge, a plan, mandatory relationships known in advance, and communication by means of speech, gestures and other symbols – are the *ideological elements* by means of which the implementation of technological tasks is organised.

Accordingly, 'ideology' is elevated above 'technology'. But ideology does not represent anything essentially different from the very labour that it organises. We have already seen how the first stages of ideology – embryonic human speech, primitive word-ideas – arose directly from labour. At a later date, it is true, there appeared a special realm of *ideological work*, but this is also labour – investigation, thought, the expression of experience in symbols of speech and art, the elaboration of norms, etc. Its essence also consists in rational effort; it overcomes resistance – only different kinds of resistance from those involved in the basic technological process.

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vault of the heavens, which they imagined to be the field of activity of the gods – that is, their old powerful collaborators. 'Non-material' properly signifies that there are no conceivable conditions in which a thing could become an object of labour.

What kinds of resistance exactly? Quite often very large ones: we have already seen that the work of thinking, calculating, etc. is very difficult for people with an undeveloped culture. This resistance lies in the very nature of social-labour existence. Psychical images and concepts do not easily submit to the organising labour of thought. Words and images resist being put together into literary works. The same is true of quantities in a model of mathematical calculation, etc. Physiological psychology has proven that 'volitional attention' – i.e. effort that constitutes the basis of any ideological work – is a nervous-muscular process, just like ordinary 'physical' labour.[3]

Since 'materiality' is the resistance to effort, it is obvious that thinking – the so-called 'spiritual side' of a human being – is not devoid of a material character under certain conditions. People struggle with the realm of matter, but they belong to that realm, as well. Human 'spirit' is material in regard to the labour that is directed toward it, that changes and organises it.

Philosophy arose in the era when to organise meant to rule over. It was natural that 'ideas', i.e. concepts and norms that organise human nature, were seen as something higher, ruling over people, and not as simple tools of labour struggling with the elements. From this sprang up a second line of philosophical development – *idealism*.

Let us try to conceive, as simply and clearly as possible, the logic and the general course of thought which would have led either to materialism or to idealism.

At first glance, it is very simple. Suppose that all of one's thought, all of one's attention is absorbed by one side of experience, and in everything that one knows and thinks about and sees are only inert resistances to the living activity of labour and thinking. One would then come to the conclusion that 'everything

3 In the act of volitional attention there are involved, on the one hand, the muscles of blood vessels that govern the distribution of nourishment to various parts of the brain through the flow of blood, and, on the other hand, the various voluntary muscles whose function is connected with the subjects being thought about. For example, when a person thinks up a plan for some kind of physical work, a nerve impulse travels from the motor centres to those very muscles which must flex to carry out this work, but the flow is weak and insufficient to cause noticeable movement. Abstract thought is accompanied by a nerve impulse to the muscles of the tongue, mouth, and larynx that participate in the process of speech. When a melody is recalled, a nerve impulse goes to those vocal ligaments whose contraction would cause the melody to be reproduced orally. Etc. In general, the thought of any action is the incomplete, weak reproduction of that thought in the organism – in its nerve centres, in the conductors that lead to the corresponding muscles, and, in part, in the muscles themselves. Thought is attenuated action.

is material'. One-sidedness in the other direction, by the same means, produces the generalisation 'everything is idea' or 'everything is spirit'. But is this in reality any kind of philosophy?

The task of philosophy consists in harmoniously systematising experience, adding up its totals, and clarifying its interconnectedness. Suppose that you, as the head of a business or household, decided to inventory and organise your property, and that in order to do so, you began by throwing half of your things out of the window? What would people say about you? That you obviously have lost your mind. One individual person might do this kind of thing. But it would be very strange, would it not, if such an image could be applied to philosophical movements that developed through the efforts of many thousands of people?

Meanwhile, this is just what appears in the naïve models we have depicted. To see *only* matter, *only* resistance in the world, would mean simply to throw out all the rest, and first of all labour itself – that living activity, both practical and cognitive, of which matter is the object. This would be not only wrong but simply inconceivable. All resistance presupposes something that experiences its resistance, and a world in which there is nothing but matter would be no better than a walking stick with only one end. It is clear that the actual logic of materialism – and also, of course, idealism – cannot be reduced to such patently incomplete and one-sided thinking, although some *opponents* of materialism understand it approximately in that way.

However, pure and consistent materialism assumes, in fact, that 'everything is matter', just as pure, complete idealism believes that 'everything is spirit'. So, we still need to find the method of thought which allowed philosophers naturally and to legitimately arrive at such conclusions, whether or not they ultimately turn out to be true for us, ourselves.

Imagine that you observe phenomena that are commonly understood to be non-material – your own will, for example – that is known to you in the form of activity and not in the form of resistance. A materialist arrives – let us say the Greek philosopher Democritus – who says to you: 'but your will is material *in its essence*'. You are surprised. He then explains to you that a person's soul consists of atoms of a special form: smooth, round, and completely invisible. The movements of these atoms produce all the phenomena of life, your will among them. If you begin to object that you know your own mind very well and could not find any atoms in it, he would answer roughly so: 'You are mistaken; it only seems to you that you know. You do not see what, in fact, your mind is. People in general do not see what is hidden in the depths of phenomena. Here you see me conversing with you, but if you were to cut me up into the tiniest pieces, you would not find my thoughts. Does that mean that they do not exist in me?' Whether or not Democritus

was correct in his hypothesis regarding atoms of the soul, you still must deal with the logic of his thinking, which was typical not only of him but in one way or another of all the people of eras that have elaborated philosophical world-views.

The theory of Democritus is a particular *explanation* of psychical processes. In what does the meaning and power of this explanation consist? That in the place of wishes, senses, perceptions, and so on, Democritus *substituted* a special kind of matter, something completely unlike those phenomena, but, in the opinion of Democritus, constituting their essence. And to know this essence means to understand phenomena, to explain them fundamentally. But is it really possible to substitute one thing for another in cognition? Obviously it is, otherwise Democritus would not have done it, or at least no one would have listened to him and considered his theory. The philosopher applied to this question a method (whether it was successful or not is another question) that is legitimate from the point of view of other people – the method of *substitution*.

So let us investigate substitution. On the formal side it appears quite strange – to take the object being investigated and replace it with something different, while simultaneously announcing that a study of the other thing will be the means by which the object in question will be explained and understood. Nevertheless, the method of substitution is very widespread in both everyday and scientific thinking; it is so usual that for the most part you do not even notice it.

For example, someone says to you, 'take such and such a book; it is brilliantly written and full of wise and profound thoughts'. Neither you nor the person you are conversing with notice that in the first of these propositions the book itself is spoken of, and, in the second proposition, a completely different thing is substituted for the book. A book is a material complex. It is made from paper, typographical ink, glue, and so on. In all these things you will not find either wisdom or deep thoughts, neither by precise chemical analysis nor with the help of a microscope, even the most up-to-date ultramicroscope. The characteristics in question are related to the intellectual complex associated with the writing and the reading of the book, but you calmly substitute the material complex for the intellectual complex, or, conversely, you accept that it 'is the same thing'. In physics one can read that 'heat is the vibration of particles of matter'. This is a theory that *explains* the phenomenon of heat. But everyone knows very well through experience what heat is, and it is obvious to everyone that it doesn't have the slightest similarity to the vibration of any particles. Nonetheless, the identity is accepted.

On what basis are replacements like these made? Because they are cognitively useful. Substituting a material book for the intellectual experiences which

are caused by reading it can predict its social consequences. Substituting the vibrations of the molecules of matter for indeterminable elements of temperature results in explaining the conformity to the regularity of thermal processes. And if the atomic theory of the soul proposed by Democritus were true, then it would aid the scientific acquisition of facts about the psyche, just as current psycho-physiology helps the acquisition of knowledge by substituting not round atoms but nerve cells with ramifying branches and fibres.

But in order to completely understand the method of substitution and evaluate its significance, it is necessary to know where it comes from. Humanity did not invent its methods of cognition; it obtained them from life. And the method of substitution is also one of those cases. It arose along with the beginning of ideology itself, when communication among people took on the form of speech.

In the process of speech, people mutually explain to one another their actions, feelings, and sensations, and mutually 'understand' one another. And this is achieved through a process in which the words that are pronounced are substituted for a certain 'meaning', a certain *content* with which the words themselves, as sounds or complexes of the movements of vocal muscles, have nothing in common. What is there in common between the word 'axe' and a real axe or the living form of an axe in one's consciousness? Such is the usual property of 'symbols', of which a word is the most typical form. When human thought succeeded in distinguishing a symbol from its content, then 'substitution' arrived on the scene.[4]

In this initial substitution, a word – and subsequently of a gesture and any other symbol – was considered as an 'external display', something that, in itself, *is not the essential thing*, but that contains the meaning of it, as something

4 It need not be thought that this was simple and easy. For primitive, concrete thinking, such discrimination was quite impossible. The word and the thought were inseparable, permanently accompanying one another, and there was no occasion to meditate on abstract questions about their differences. What made people think about this question? I cannot answer with certainty, but I can propose one answer. War and exchange brought people speaking different languages into contact with one another. Hearing unfamiliar speech and observing the actions of foreigners, one would note that the words of these people had meanings that were the same as certain words of their own native tongue. That is, that exactly the same content could be expressed by different symbols – 'father' *pater*, etc. By this means, both of the symbols are distinguished from their content. Furthermore, it was often of great practical importance for people hearing unknown words of foreigners to guess at their meaning. In other words, they were already consciously seeking what was appropriate to 'substitute' for these words.

'internal' – hidden inside it – that is *essential*, i.e. the precise thing that must be taken into account in practice. This distinction between symbol and meaning is always present, to various degrees and gradations, in other, subsequent, and more complex sorts of substitution. A material book can be thick or thin and printed in one or another typeface, but this is only the 'surface'. The physical thing is not what is 'essential'. The 'essence' of the book consists in its contents. In exactly the same way, the 'essence' of the phenomenon of heat consists in the movement of molecules, and it is necessary to investigate this 'essence' in order to *explain* its observed 'manifestation', to decode its symbolism, as it were.

The development of substitution is often confused with the development of conceptions of 'soul', 'psyche', or 'consciousness'. But in fact this is just one particular instance of substitution, albeit a very important and typical one that is frequently given in order to explain it.

In original animism, the spirit of a person appeared as a simple reiteration – a naïve duplication – of that person, just like the spirits of other objects. But it was already conceived of as the *essential* body; it was an *explanation* of the body's actions, their *inner cause*. Therefore, to the extent that symbols were separated from the content that they expressed in communication among people, the external sides of communication – words, gestures, etc. – were related to the external, less essential side of people, to their *bodies*. And the inner essence of communication – the forms of things, feelings, desires – was attributed to their *souls*. By this means, spirit was reduced, little by little, entirely to the content that was expressed by symbols in people's communication. It lost its physical characteristics and became what is signified by the word 'psyche'. This process took place gradually over a long series of transitional stages. The physical character of the soul grew dim, paled, and became like air. The organic functions that had previously been attributed to the soul were taken away from it one after another. So the need for food was for a long time attributed to the soul. It was obvious how essential it is for the organism and takes precedence over other needs, and this meant it was especially associated with the organisational principle. In the words of the religious thinker and evangelist, 'is not the soul more important than food and the body than clothing?'[5] Descartes also searched for a special organ in human beings that specifically connected the soul with the body. He found it in one of the appendices of the brain, a cone-shaped gland[6]

5 Matthew 6:25 [Trans.].

6 The pineal gland [Trans.].

representing in reality only the innocuous remainder of a third eye of our distant animal ancestors. Even now conceptions of the soul are much more varied and the majority of people are much more materialist than is usually noted.

In any event, the 'soul' is not created by substitution but is only transformed by substitution from a physical thing to a purely psychical complex. Moreover, its organisational role in life ceased to be immediately understandable, and the difficult question arose of how a non-material power governs a material organism. This question has produced quite a number of different explanations, the majority of them reducible to a new application of the usual method of substitution. Ancient materialism and most of the successive systems of materialism in modern times substitute one or another atomistic system for psychical processes. The path of substitution is drawn out and seems to turn back on itself. If a non-material psyche is concealed in a physical body, or, more precisely, if it expresses itself by means of a physical body, then, in its turn, there is hidden beneath it or expressed within it the movement of special, physical atoms.

This is an illustration of how materialism unified and explained the entire world of experience by the conception of 'matter', not by discarding those phenomena which did not fit it, but by replacing them with material elements by means of substitution. Idealism acted analogously, but in the other direction; it substituted elements of spiritual, ideal being for material processes. Both attained a cognitively unified worldview.

But all the same, the means by which this was achieved was reconciled very poorly with other methods of thinking that humanity had worked out – the so-called laws of logic. The basic law of logic denies that *different* things can be accepted as 'the same thing', and substitution violates, whether one likes it or not, this very simple and wise rule. To say that 'psychical' is 'material', or that 'matter' is 'spiritual', means to call things 'identical' that are *a priori* different. To say of Aesop, 'this *wise man* was a hunchback', means to give physical characteristics to a psychical complex. What is to be done with contradictions like these? To condemn and reject them is not helpful, since one would not want to force humanity to reject a necessary and useful method. Various attempts have been and are being made to reconcile logic with the method of substitution.

The most usual means for doing this, practiced by many of the most modern philosophers, consists in transforming substitution into simple adding together. For example, they put it this way: when observing the gesture of another person and hearing that person's voice, we mentally add the physical complex – the body – together with the psychical experiences – sensations,

feelings, will. Accordingly, the body and the psyche are two parts of one whole, called a 'person'. And if we simultaneously attribute psychical and physical characteristics to this whole, there is no contradiction; they apply to different parts or sides of the whole. But can we in fact extricate ourselves from this difficulty in this way?

The difference between physical and psychical phenomena, generally speaking, is the greatest kind of difference that we come across in our experience; their very interconnectedness and regularity are absolutely dissimilar. Physical bodies are subject to *objective laws*; their interconnectedness in space and time are notable for their strict continuity. Psychical processes are subject to what is called *association*, i.e. variable, reciprocal cohesion. Things that are incompatible physically – water and fire, heat and cold, life and death, for example – can be very easily and closely connected by psychical association. Now what does the term 'add together' mean when it relates to such different combinations as physical and psychical? The more differently two systems are organised, the more difficult it is to unite them into one whole, and the more muddled the results of adding them together will be. If you read the phrase 'rain and two students walked down the street', you immediately feel that it is nonsense. And, by the way, rain and a student, as *physical* complexes, are a lot more similar than body and psyche. To add sensations together with the brain is not a bit easier or more logical than to add a steam hammer together with youthful flippancy, or to add a battleship together with devout reflections. There are no logical contradictions here, but this does not at all diminish the cognitive worthlessness of such grouping.

Pre-civilised animists could 'add together' 'soul' and 'body' in their thought without speaking nonsense, because they conceived of them both as equally material. This is impossible for us, because they appear not in one field but in two different fields of our thought. And if we attentively observe how the processes of substitution are accomplished in consciousness, then we see that we do not add the psychical together with the physical or the physical with the psychical, but continually *go back and forth* from one to the other. When we conceive of people as bodies among other bodies, we unconsciously try to suppress thought about their minds, but the moment the form of those people's minds is summoned up in our consciousness, we just as involuntarily try to suppress the memory of their bodies. Going back and forth from one to the other often occurs with great rapidity, sometimes several times in a second. But each time one or another eliminating tendency is displayed. Each time the effort of thinking is directed toward *substitution* and not *unification* of two complexes. It follows that when they are recognised as 'the same thing', it is not at all in the sense that they form one whole together, but

in another sense that is less offensive to logic – to be precise, that they are *identical* despite their clear *difference*.

Even more obvious is the illogicality – or, more accurately, the extra-logicality – of substitution in other cases that philosophers have muddled up less than their beloved question about soul and body. When a physicist says that the colour white is the combination of all the colours of the spectrum, or that it 'decomposes' into all the colours of the spectrum, this is also a case of substitution. The white ray of light going into a prism is treated as identical with the whole series of coloured rays that come out of it. But no one says that all the other colours are 'added together' in white light, because wherever there is white light there is no spectrum and vice versa. When doctors look at a drop of blood in a microscope and find an optical form that is completely different from that drop of blood, being a million times bigger, it does not occur to them to say that this is 'the very same drop', and they certainly do not say that the microscope 'adds' a new interesting picture 'together' with the real drop of blood. It is simply impossible, yet again, to conceive of the drop of blood and the magnified image of it as existing side by side in one field of experience.

What follows from all this? Only that the laws of logic do not exhaust the methods of thinking and do not have absolute meaning. They are tools for processing experience, for organising it. In some situations they are very valuable. In other situations they are not suitable and must be replaced by other tools, just as a knife is not suitable when a smelting furnace is necessary. Each method – logical or extra-logical – must be applied when it is useful and judged according to its results.

Thus, materialism – and idealism, as well – achieve unity of experience by means of substitution. This alone allows such universal conclusions as 'everything is matter – including soul' or 'everything is soul – including matter'. If we are materialists, this does not interfere with our investigation of spiritual processes; we merely substitute the movement of round atoms or the activity of the brain, etc. in place of those processes. If we are idealists, this does not interfere with our making sense of matter; we merely substitute some sort of 'objectification of the idea' or simply 'another form of being of the soul', etc. in place of matter. We have overcome one difficulty, but the situation is still not satisfactory.

Let us recall what matter represents, in its origin, and what thought represents. Matter is resistance to activity; thought is the organising form of activity. Both originally relate to human, collective, labouring activity. And now let us transform the corresponding form of the universal formulas of idealism and materialism. 'Everything is resistance to activity'; 'everything is the organised

form of activity'. It all ends up the same. If everything is resistance, then activity itself and effort itself are also no more than resistance, but resistance to what and to whom? Resistance either to other activity, i.e. other resistance, or to itself. Resistance to resistance! The formulation is not only strange, but patently incoherent. Because resistance correlates with force, once one begins, the other also begins. If we consider something as resistance to a certain force, then we cannot *at the very same time* consider the second thing as resistance. Of course, we often see, for example, two people energetically 'resisting' one another, but we cannot *at the same time* see precisely resistance in both of their actions. When we take the point of view of the effort of one, then the other would be the 'object' or 'matter' resisting their force, and vice versa. To simultaneously take the two opposing points of view is impossible, as it is impossible simultaneously to fight for two opposing armies or live on two different planets; it would not be the systematisation of experience but the real disorganisation of it.

With idealism the result must obviously not be better, but even worse. An idealist would say that 'everything is an organising form', but what is organised cannot at the same time be an organising form in relation to what is organising it. What is organised must be the object of the organising form – 'matter'. An idea that is organised only by itself, or two ideas, each of which 'organises' the other, and neither one, by the way, is itself organised, are combinations that are completely inconceivable and useless to anyone.

However, one must not ascribe obviously absurd views to entire philosophical trends. How do we get out of this difficulty? Let us turn to a pure materialist or a pure idealist. If they would have cared to speak with us – which at the present time rarely happens – then their answer would be firm and exact. 'All this nonsense', they would tell us with disdain, 'applies exclusively to you and has no bearing on us at all. You, yourselves, have invented the idea that matter is resistance to some kind of activity and that spirit is an organisational form. In reality, it is nothing like that; matter is matter and spirit is spirit, and that is all. If you do not understand this, and you keep looking for an explanation of what lies at the basis of all philosophical explanations, then you simply do not know philosophy and you should not discuss it'.

I must mention that I did not make this rebuke up myself. In Russia there are several materialists of the most moderate character who form something of a school, with Plekhanov at their head. Once, or more accurately, several times, I requested an explanation of what exactly matter is – the thing that they call the fundamental principle of everything that exists. After repeated failures, I secured precisely the answer I just mentioned: matter is matter and,

being the fundamental principle, is not subject to further analysis. When I expressed doubt that thoughtful people could be satisfied by an explanation like that, in view of the absence from it of any kind of idea or content, my interlocutors added to their answer a long string of epithets that are not socially acceptable and that were aimed, moreover, only at my modest person and not at the question that I had posed.

All the same, impartiality requires us to admit that concealed in the phrase 'matter is matter and spirit is spirit' – not very comforting at first glance – can be found not exactly an answer but an indication of a path that leads to the resolution of the question that interests us. We want to know how matter, which correlates with effort and labour, can become *everything* to materialist philosophers, so that labour itself is transformed into a simple manifestation of that same matter – that the object of activity includes the activity itself. Now they say to us, 'matter is matter and that is all!' In other words, it correlates with nothing at all, it is entirely a thing-in-itself, it is *absolute*, which is why it is not subject to further analysis.

The development of scientific cognition has led to the conclusion that in experience there is not and there cannot be anything absolute – that everything is relative, that everything depends on conditions, and that everything is determined by something else. Therefore scientific philosophy takes the concept of 'absolute' to be one of the so-called *fetishes of knowledge*.

The word 'fetishism' has many different meanings. The original meaning comes from religion: the worship of inanimate objects. Subsequently, in many fields of theoretical and applied knowledge the term began to be used to designate those cases when the correlation of objects is perverted and, in addition, that someone becomes, to one degree or another, the slave of an object. This corresponds, obviously, with the original meaning of the term. The worship of a black rock in Mecca is precisely the perversion of the role of a person in relation to objects like that, and it is connected with the enslavement of people's thoughts and feelings. But, in general, all worship of real objects or of the creations of collective fantasy – various deities, for example – are justly referred to as fetishism. In regard to cognition, ideas appear here as fetishes that depict relations of experience upside down and at the same time forbid further investigation.

Marx showed in *Capital* how the fetishism of the idea of exchange value arose in the minds of commodity producers. It seemed to them that this value is inherent in the commodity itself, that it *is* its value, that it does not depend on people, and that it gives the commodity the capability of being exchanged. In this way, exchange – which in fact is the distribution of crystallised social labour among members of society, i.e. a *relationship between people* – is instead

conceived of as a relationship between commodities – *things*. At the same time, when going on to explain the processes of exchange, they express it this way: 'value is value, and commodities are exchanged in a certain proportion due precisely to the value of each and for no other reason'. Enslaved in practice to exchange relations, forced into subordination to the factual value of commodities as they are found in the market, a person cognitively worships that value, accepting the idea of it as something final, unconditional, further than which it is impossible to go.

Ernst Mach, a philosopher-naturalist, taking a different approach, revealed – specifically in the realm of physics – the fetishistic character of many generally accepted ideas in science, including the old idea of *matter*. But Mach's methods are inadequate for us, since he was not able to uncover the exact origin of fetishism. We, therefore, must now take up the broadest philosophical conception of matter.

Thus we are told that 'matter is matter', that it is a thing-in-itself, and that it is not determined by anything else. Matter is taken by the extreme materialists to be all that exists and by the moderate materialists to be the primary basis of all that exists. The presence of fetishism in these formulas is immediately evident; both of its elements are present. The relationship of activity and matter is completely distorted. Activity appears as an inner quality of matter, when in reality we know that matter is external resistance which meets activity. The idea of labour is subordinated to the idea of matter, while in reality matter is subordinated to labour. Further investigation – regarding what matter is and where its basis in experience is to be found – is not only made impossible but is explicitly forbidden. One naïve materialist recently wrote that to ask for an explanation of matter is as absurd as to ask theologians for the cause of their god. Cognitional worship of the idea of matter can, as we see, take on a religious hue.

How did such a 'fetishisation' of matter occur? The answer must be sought where the answer of many ideological mysteries lies – in social relationships among people. In this case, it is obviously found in people's relationships to matter in *labour*.

Let us recall that matter is nothing other than *socially valid* resistance to human efforts. To an individual, the spectres of one's dreams (if one is sleeping) or the enemies in one's hallucinations (if one is mentally ill) can present tremendous resistance. But they are still not material. People deal with matter as members of a collective, as participants in a general system of experience shared with other people. Therefore, if we want to present the basic interconnectedness of our being in the form of one simple proposition, then it must be formulated thus:

the *subject* or *podlezhashchee*[7] = the collective, humanity;
the *predicate* = effort, activity, labour;
the *object* or *dopolnenie*[8] = matter.

For example, 'humanity struggles with matter', or 'in the process of labour, society acts upon matter', and so forth.

In this model, everything is indivisible and inseparable; if it is expressed in the form of three parts of a sentence, then that is only because that is the peculiarity of the symbolics of our speech, which does not allow one word to embody the entire meaning of a living fact. The subject of the sentence designates the *character* of activity (collective); the object of the sentence points out its direction (toward external nature). Clearly, without them both – without a definite character and a definite direction – it is impossible to think about activity at all.

If people lived in collectives – and were always *being conscious of* themselves as members of them – then no kind of fetishism could penetrate into their idea of matter. But in reality that is not what has turned out. This idea had only begun to emerge in the era when people lived in organised labouring communes and were directly conscious of their social interconnectedness. Subsequently, the power of exchange penetrated into these communes and broke them up into individual households. The labour collective formally broke apart. Individuals, entering into the market independently and entering into economic struggle with other individuals, lost consciousness of the labouring unity of social organisation. Although commodity producers objectively formed a single system of social collaboration, and the exchange of goods was an expression of the division of labour among members of the community, the evident contradictions among their personal interests obscured this interrelatedness and made it inaccessible to their thought. Individuals were torn from the social whole, and they no longer saw it as bigger than themselves. Individuals were *people in themselves*, separate owners both of their own property and of their own individual experience. They became a special little world of their own – separate, autonomous 'I's – set in opposition to other people and to the whole universe. The opposition of interests among people in practice was transformed into a model for their thinking. It created a habit of cognitively isolating one person from another and therefore also of isolating individuals from the system of labour and from the object of labour, infinite nature.

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7 The Russian grammatical term for the subject of a sentence [Trans.].

8 The Russian grammatical term for the object of a verb [Trans.].

What has now become of our proposition of what defines matter? The subject – collective humanity – was broken up into its elements and ceased to exist as a whole in people's consciousness. This means that the predicate – activity, labour – was also broken up. Instead of a system of social labour, the individualist perceives only the independent activities of separate human individuals. But *matter* correlates precisely to a social system of labour and not to individual activities. This means that for the individualist, the object *is torn away* from the subject and predicate; matter ceases to be understood as the resistance to social activity. Thus it remains *matter in itself*.

All individuals in their private business and in their personal experience deal only with an extremely small part of the kingdom of matter. They are distinguished from the social whole only in their consciousness but not in fact. They remain in an economic interconnectedness with other people that is expressed in the exchange of the products of labour, and they remain in an experiential interconnectedness with other people that is expressed in speech and knowledge. Consequently, they know about the existence of a great many things with which they have never come into contact in any way. Peasants who have never left their village know about the existence of cities with stone houses, factories with extraordinary machines, and foreign countries with peculiar animals and plants. Economists can know about bacteria that cause diseases in people and about nebula in the universe that might produce new worlds. But those peasants do not apply their labour to the machines in the factories or to the soil of foreign countries, and those economists do not expend energy in the fight against bacteria or in the search for and study of nebulas. And the activity of other people in regard to these things is not in the field of vision of either peasants or economists. This activity does not occupy their attention, and it is not juxtaposed in their minds with their own activity, as elements of a single system of effort. What is the result? Objects that are not connected with one's own activity, matter that is not correlated with one's own labour, matter that is torn from labour and is independent of labour in individual consciousness – matter that is *absolute*.

So we have arrived at a resolution of the mystery of the fetishism of matter. It is clear that once matter attains a 'remote' (the exact translation of the word 'absolute') character, once it is removed, 'abstracted', from its relationship with the social-labour process, then there is no place for any attempt to explain it, for any investigation into its essence, meaning, and origin. 'Matter is matter' – and cognition stops here. We can now also understand how matter, being entirely *a thing-in-itself*, can, by the method of substitution, become *everything* to a philosopher. We can understand how any reality, including human labour itself, can

be reduced to matter in a philosopher's thinking without apparent absurdity. It is along this path that full and consistent materialism as a philosophical worldview becomes possible.

Such a worldview that tears matter away from activity and that subordinates activity as one of the manifestations of matter cannot, of course, have an active character, and inevitably is distinguished by a *contemplative* quality. This fundamental defect in materialism was pointed out by Marx in his famous eleven critical comments on Feuerbach,[9] which contain a briefly sketched programme of a new scientific philosophy. Here is the beginning of the first of these theses:

'The main defect of materialism up to and including Feuerbach, consisted heretofore in viewing reality – the objective world as apprehended by the external senses – only in the form of an *object* or in the form of *contemplation*, and not in the form of *concrete human activity*, not in the form of *practice*, not subjectively'. In theses eight, nine, and ten, Marx explains that he speaks precisely about the *social* activity of people, about *social-labour* practice. In passing, he points out the connection between the old materialism and the individualistic point of view which is characteristic of exchange society.

'Contemplative materialism', i.e. materialism which does not regard the world of concrete phenomena as activity, rises only to the level of contemplation of separate individuals in 'civil' society (i.e. bourgeois, individualistic society).

As we see, although Marx did not complete a full investigation of the fetishism of matter, he foresaw and blazed the trail for the exposure of this fetishism. If this investigation has not been completed by anyone before us, it is because, to a significant degree, Marx's philosophical programme was too far ahead of its time and was not fully understood even by his followers.

Certain philosophers – non-materialists, of course – did notice the correlation of matter with activity, but they did not succeed in understanding with exactly what kind of activity it correlated. This was true of Aristotle, for example. For him, matter, *hyle*, was correlative with 'form', *eidos*, by which he had in mind not an outer shell and not the appearance of an object, but a formative activity. An object which has already been formed by the determinative *eidos* can then again become *hyle*, matter, for a new *eidos*. A brick, i.e. clay that has taken on this well-known form, becomes 'matter' for building a home and so forth. Contemporary speech still uses the word 'material' in this sense, the

9 The reference is to 'Theses on Feuerbach' [Trans.].

meaning of which, nevertheless, is considerably wider than the philosophical conception of matter. But it goes without saying that the *eidos* of Aristotle is only the abstract formative force in general and not 'concrete human practical activity'. Fetishism remains, except that the greatest part of it is transferred from 'matter' to 'form'.

The idea of matter which was employed by Mach in his *Mechanics* is much more profound than Aristotle's and is much closer to our outlook. Mechanics has to do specifically with a quantity of matter which is also called 'mass'. This definition, 'mass is a quantity of matter', was given by Isaac Newton. Mach pointed out that such a definition is barren, since for mechanics – being a quantifying, exact science – 'matter' is no more intelligible than 'mass'. There is no way directly to determine the quantity of matter in bodies, and in reality all that can be done is to measure *the relationship of masses*. This is closer to living experience and, from a scientific point of view, is more intelligible. Mach compared various methods of measuring the relationship of masses and came to the conclusion that they are essentially the same. Masses are determined by their *counteraction*, their resistance to the mechanical activity that is applied to them. If one mass is twice as big as another, then it exerts twice as much resistance to action as the other, i.e. the action of the smaller on the larger would produce half as much acceleration. If the mass is ten times less, then the action of the larger on the smaller would produce ten times greater acceleration, etc. In a word, the conception of mass contains in itself nothing other than resistance to action. This is the true meaning of 'matter' in mechanics.[10]

But Mach's analysis of the fetishism of matter does not go further than this. Mach, it is true, had in mind that the idea of mechanistic action or work has *human effort* at its foundation, but he did not see the relationship of this idea to *collective* work, to *social* activity. He is a representative of the contemporary scientific world which has still not escaped from the framework of individualism.

We now are able to investigate the fetishism of 'spirit' or 'idea', in order to explain how – just as with materialist substitution – it was possible for an idealist substitution to appear. For this we must follow a path completely analogous to the one we followed in our critique of matter. But philosophical

10 Resistance to action, of course, is itself also action. Since the concept of action is expressed in physics in terms of energy, then mass also must ultimately be reducible to energy. Modern physics has indeed arrived at this; it considers mass to be a particular form of crystallised energy – mass and energy transform into one another. [Added in 1923].

idealism is not a part of the subject of this book, and so we limit ourselves here to the most cursory and brief survey of it.

Concept, thought, norm – in general those things which a philosopher terms 'ideas' and relates to the realm of the 'spirit' – are conceived, as we already know, as an organisational form for collective practice. But in exchange society, this collective practice is shattered; its unity is inaccessible to the psyche of the individual. It is hidden by economic struggle, screened by private enterprise and private interests. The social role of an idea appears outside the field of vision of the individual, and the living meaning of the idea is distorted at its very root.

So people study various sciences to a greater or lesser extent, but in their individual practice they are unable to see how those sciences govern social activity or co-ordinate and rationally connect the activities of people on a social scale. They do not see, for example, how simple arithmetic regulates the entire distribution of crystallised labour in society, organising the relations of the exchange of goods, which is entirely built on mathematical correlations and calculations. Nor do they see how that same arithmetic supports the systematic adaptation of the sum total of work to the sum total of needs in every private business. They do not know how higher mathematics, through the laborious calculations of engineers, governs the organisation of labour in construction, in mechanical matters, and in all fields of heavy industry where projects must be precisely worked out in advance. They do not suspect how astronomy, because of the way it has divided time and provides for the continual verification of clocks in observatories, directs both the allocation of workers' time in all enterprises and of people's time in all socially executed activities in the most varied realms of life.[11]

In their own private businesses, of course, producers of goods in practice apply one or another of the scientific propositions – one or another 'truth' – they are familiar with. But by far the greater part of science remains outside of their practical concerns and therefore seems to them to be 'pure theory'.

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11 The clock is an astronomical instrument both by its purpose and even by its structure: the movement of its hands is an imitation of the movement of heavenly bodies in the sky. Only the use of clocks makes possible the exact and simultaneous assembly of workers in a factory, the scheduling of trains and all social gatherings, and so on. But for this it is necessary that individual clocks be continually regulated according to socially established time. From observatories the verification of clocks goes out to railroad stations, postal and public institutions, and finally to ordinary people. Without this verification, all clocks would long ago have shown completely different times, and the co-ordination of individual activities in all kinds of common undertakings on the scale that now exists would be impossible.

Suppose that a cobbler is interested in geometry. It is possible that in cutting leather and preparing lasts the cobbler will apply some of the conclusions of that science. But this would seem to be more a happy coincidence than an indication that this is the point of geometry. All the countless applications of geometry in other spheres of labour – its organisational role in the partitioning of the surface of the earth as a field of human activity (surveying, topography, boundaries of private holdings, borders of states) and its guidance in all means of communication and transportation – all this lies if not beyond the confines of the experience of individual people in exchange society, then beyond the confines of their attention. Individual cobblers, for example, are able to connect and coherently unite their experience within the confines of their individual workshops and domestic economy, but beyond those boundaries they lose that ability, since that territory is little known and *alien*. Out there are competition, contradictions, strangers, and hostile interests. This means that geometry, which serves as a tool *for the collective* that is organised in a definite relationship with its practice must be conceived by the *individual* as something independent from practice, as pure or *absolute* knowledge, as truth 'in itself'.

In the opinion of the fetishist, truth would exist as truth even if there were no humanity and no kind of sentient organisms. 'Do you really think that after death of all the worlds, the square of the hypotenuse will not remain equal to the sum of the squares of the other two sides?', victoriously cries one of my opponents (N. Berdiaev).[12] He does not notice that this theorem necessarily presupposes the *measurement* of lines and angles with fixed, exact *units of measure*, and that there cannot be measurement without people who do the measuring or exact units of measure without people who work them out. None of this can be done without collective agreement on one or another example of the Pythagorean Theorem.[13]

The exact same thing obtains with norms – morals, laws, etc. Individualists, whose thought is tied to private wealth and personal interests, cannot understand this elevated perspective – that these norms are in essence collectively constructed tools for the organisation of relationships among people in society. The individualist seeks sources of morals and laws in detached individuality, in their individual 'I's, which they adopt as the private owners of their own

12 Nikolai Berdiaev (1874–1948) was a philosopher who turned from Marxism to Neo-Kantian idealism. He was not named in the text in the 1913 edition [Trans.].

13 The contemporary theory of relativity has found that when in motion or in gravitational fields, measures, themselves, must change in a certain way just as other bodies change, thus revealing the *factual inaccuracy* of this theorem in its old form and giving it a new, complex form. [Added in 1923].

experiences. Clearly, no kind of explanation of norms is obtainable in this way, and it all boils down to the brilliant formulation: 'obligation is obligation and demands obedience because it is an obligation'. Or 'right is right', etc., just as previously we had 'matter is matter'.

The nature of fetishism is clear, and it is fetishism all the same, whether abstract or absolute. An idea which is objectively the result of past social activity and a tool for further activity is conceived of as something independent of and aloof from that activity, and this blocks the path to actual cognition of it. The correlation of an idea with the practice that it organises turns out to be inaccessible to people's thinking.

This is what makes unlimited idealist substitution, or the philosophy of idealism, possible. 'Everything is idea' means that both living labour and its object, matter, are accepted only as the manifestations of ideas. An idea is substituted for them, as their essence.

As we see, neither materialism nor idealism can be considered to be a philosophy of living experience in the strict meaning of the term. Both of them are based on the rupture of this experience, on the fetishistic cutting-off of 'matter' (by the former) and 'idea' (by the latter) from social-labour activity, from the experience with which it correlates. But materialism is nevertheless *closer* to living experience. The world of resistance, the kingdom of matter – this is all external nature toward which all collective practice is directed. On the other hand, the world of organising forms, the realm of ideas, can only incompletely and imperfectly embrace collective practice. An idea is always the product of a certain *abstraction*, i.e. the attenuation and schematisation of experience, the distancing of itself from the living concreteness of experience. As the great German poet said, 'Ideas coexist harmoniously, but bodies collide harshly in space'. It is unquestionable that the universe in its infinite, awesome spontaneity is far more a world of material bodies that resist labour and cognition than it is a world of 'non-material' ideas that coexist harmoniously.

Let us sum up what has been accomplished in this section.

The system of experience is a system of labour; all its content lies within the confines of the collective practice of humankind. The point of this practice is that it organises nature in the interests of humanity; this is the direction of social activity taken as a whole.

Labour is effort; effort presupposes resistance. Nature, as the object of all human efforts, is the world of resistance or the realm of matter. Accordingly, there cannot be activity without matter to be overcome. It is impossible to think of matter without activity directed toward it; they correlate to one another. When two forms of activity collide, each of them appears as matter from the

point of view of the other. So, in the conflict of two armies, each perceives the other exclusively as a material obstacle which must be overcome.

In this entire characterisation, effort is to be understood as socially valid effort, and resistance is to be understood as socially valid resistance. The world of individual experience, to the extent that it is not accessible to the human collective, is considered to be 'non-material' – the world of daydreams, dreams, hallucinations, etc.

Social-labour activity – in all of its complexity and diversity and the frequent conflict of its elements – requires organisational forms, and it produces them. Those forms include concepts, thoughts, norms, everything called 'ideas' in the widest meaning of the word – the realm of the 'soul'. The process of producing these ideas differs from the process of immediate labour, which has to do with external nature, in the same way that the ideological process differs from the technological process, but in principle there is no difference between them. The efforts of people in their intellectual work also deal with resistance, only with the resistance that resides in human nature. As the object of these intellectual efforts, the very labouring nature of humanity presents itself as 'material', in the sense that, in general, one activity appears as matter in relation to another activity that acts upon it.

In its striving toward monism – toward a unified worldview – pre-Marxist philosophy travelled along two principal paths. One concentrated its attention on the object of collective practice, attempting to represent the whole world of experience as 'matter'. The other dwelled on the forms that governed that practice, that organised it, and that strove to understand all being as 'spirit'. These two philosophical tendencies unfolded to the greatest extent in materialism and idealism. They, however, are not based on simple attenuation of experience, on the elimination of one or the other sides of the field of thought. On the contrary, both materialism and idealism are based on a distinctive method of supplementing experience, on *substitution*.

The origin of substitution lies in the symbolics of human communication. In place first of other people's words and gestures, and later of various artistic symbols, written signs, etc., people substitute, as the 'content' of those things, various forms of consciousness, feelings, desires, and thoughts that are completely dissimilar to those forms of expression but with which they have become connected in life. In this way, people 'understand' one another, mutually 'explain' the meaning and correlation of their actions, and anticipate to a degree other people's actions – something that has practical importance for everyone. Subsequently, people transfer this accustomed method to various other facts of experience with the goal of achieving an 'explanation' of them that provides 'understanding' and anticipation.

As it developed, substitution underwent various complications and variations, but its basis remains the same. That complex which is subject to explanation is understood to be a manifestation or an expression of a certain other complex, more or less significantly dissimilar to the first, just as a symbol is a manifestation or expression dissimilar to its content. 'What is substituted' is chosen in this way because it is more 'understandable', more suitable for intellectual investigation, than 'what is explained'. The greatest successes of cognition – in particular all explanatory scientific theories – are based on successful substitution.

The essence of materialism consists in that it considers all facts of experience to be manifestations of matter, i.e. it substitutes matter everywhere. In the same way, idealism substitutes 'spirit' or 'idea' everywhere.

Neither substitution would be possible, however, if there were an awareness that spirit and matter correlate with human activity, i.e. that the concepts of 'spirit' and 'matter' are not complete and self-contained. Their real nature eludes people's thinking because of the *abstract fetishism* that is generated by the organisation of exchange society.

The cause of abstract fetishism lies in social fragmentation, in the formal independence of private enterprise, in market competition, and, in general, in the economic struggle that is inseparable from exchange relations. The individual, private owner, remaining objectively a member of the collective, is subjectively torn from it and loses the comprehension of social-labour unity. For this private owner, social activity as a whole – dispersed as it is into atoms of individual activity – ceases to exist. But matter and spirit correlate to social activity, the first as its necessary object, the second as its organising form. Accordingly, for individualist thought – the thought of those brought up in an exchange economy – matter and spirit seem to be non-relative or 'absolute'; they exist for themselves and by themselves. This removes the possibility of investigating their real meaning and the possibility of fundamentally explaining them. But on the other hand, there arises the philosophical possibility of substituting matter or spirit for the entire content of experience, for the whole of collective practice.

Although materialism, just like idealism, is based on fetishistic substitution, it is still closer to the worldview of labour, to the philosophy of living experience.

CHAPTER 2

Materialism of the Ancient World

The birthplace of ancient philosophy was a Greek colony in Asia Minor, and this was not accidental. We know that philosophy became distinguished from the religious worldview due to conditions created by the power of exchange relations and the acceleration of technical progress. We saw how, due to both these means, people attained knowledge through trade and other avenues that did not have a traditional or, what is the same thing, sacred character. The western part of Asia Minor with its contiguous islands was a place where, very early on, trade ties developed with a number of other countries. This trade undermined the conservatism of the means of production.

Ancient trade routes ran through Asia Minor on their way from the cultured countries of the East – India, Iran, Phoenicia, and Syria – to southern Europe. This region was also connected with Egypt by land routes through Syria and Palestine and by sea routes through Crete and the small islands. In the prehistoric era, powerful colonising waves of the Greek nation poured into Asia Minor, as reflected poetically in Homer's *Iliad*. In this region, the most varied tribes of Europe, southwest Asia, and northern Africa came into contact. Their most enterprising representatives – travellers and traders – exchanged their various products, and, along with those products, their labour experience as well. It was here that the earliest Greek trading centres arose. The Ionic city of Miletus was for a long time the wealthiest of these centres; it was also the cradle of Greek philosophy. The Milesian, 'naturalistic' school (sixth century BCE) – whose main representatives were Thales, Anaximander, and Anaximenes – was the point of origin of the development of ancient philosophical thought.

We note that in the beginning, before a clear distinction appeared between separate *special* sciences, the idea of 'philosophy' embraced the whole sum of extra-religious knowledge. Philosophy included the germs of all sciences, which were insufficiently formed for independent existence. Naïvely bold generalisations tied this material into a more or less coherent system. But it contained only *extra-religious* knowledge. It did not contain other important knowledge that is also scientific and practical to our way of thinking, but that was still kept in the preserve of religious tradition. This was especially true of medicine, which had built up experience over millennia but which was still kept in the priestly colleges as a sacred secret.

In light of our earlier conclusions, there is nothing strange in this. Those fields of experience that advance most quickly cannot escape people's notice

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and cannot remain within the framework of the sacred precepts of distant forefathers, and they entered the sphere of scientific-philosophical thought. Medicine, having to do with such a complicated object as the human body, proceeded by trial and error for a long time and was unable to work out any kind of exact and definite methods. Therefore its progress was slow, and it did not break out of the framework of tradition. Later on, when Hippocrates, the great physician, brought new methods and a spirit of inquiry to it, medicine naturally began to move forward from age-old conservatism and to cross over to the sphere of scientific-philosophical thought – though this process still took centuries to be completed.

Thus, the foundation of the new system of thought had to be provided by those fields of knowledge which developed the most quickly. Which in particular? Since the exchange of goods produced the first 'secular' knowledge, naturally that knowledge was connected with trade. This knowledge summed up the experience that had accumulated in, and served as the organising forms for, the practice of trade. Geography and astronomy were used in guiding people on trading journeys. Geometry, as a means to determine distance and direction, was a necessary method for both fields. Arithmetic and methods of accounting were also continually applied in buying and selling. Elementary physics relating to the weight of bodies, due to the role of weighing in trade, obviously developed. A certain amount of experience was subsequently gained in the realm of atmospheric phenomena, due to its importance for the fate of seafarers. To this were added fragments of experience from all branches of production, since trade, to a greater or lesser extent, brings such experience into close contact in the market, either directly through producers who bring their goods to the market or indirectly through merchants who go and buy from producers where they live.

It was on just this material that the Milesian school's 'investigation of nature' was based. Very little has been preserved from them, and that which has is in the form of chance excerpts, citations by later writers, and brief indications of the general ideas of the leaders of the school. But even this little allows us to determine both the character of the knowledge this school gathered together and also its philosophical method – the means by which it attempted to bring together its experience into a unified worldview.

Regarding the origin of this school in 'exchange', it is characteristic that its earliest leader, *Thales*, came from an old merchant family. There is reason to believe that he visited Egypt in his trading journeys. There he could have attained by the way certain astronomical knowledge that was unknown to the Greeks – knowledge that was a part of the religious tradition of Egyptian priests. Legend has it that Thales predicted the solar eclipse

of 585 BCE. Egyptian priests might have taught him this, since they had long known the cycle of eclipses.

As for Thales's philosophical theory, it was very closely related to materialism and was based on an original universal substitution. In those times, the concept of matter had not been worked out in its general, abstract form, and if Thales wanted to represent the world according to the proposition 'everything is matter', then he had to ask himself – *what kind of* matter? Thales's answer was that everything – in its various transformations and manifestations – is *water*. He 'substituted' a specific form of matter – water – for all the varied facts of experience; for him, water was the *explanation* of all of being. Such an original answer to the mystery of the world had, of course, its own rationale, which it is possible to capture in part.

The huge significance of water in the economy of nature and labour is obvious without explanation. The presence of water is necessary for all processes of life, and also for quite a number of formidable natural phenomena. The fate of agriculture, the most important field of production, depends on good weather. Moreover, the surface of the planet earth is predominantly water. All this must have powerfully attracted the attention of the first natural philosophers to the facts of experience relating to water and its transformations. In addition, they were inhabitants of a major seaport, who were brought up among merchant seafarers, and they themselves certainly often travelled by sea. And, since water was at the centre of their attention, it would have seemed more applicable for the method of substitution than any other object in external nature.

As a matter of fact, under normal conditions, water undergoes the most striking transformations. Because of its convertibility, it is natural for us to accept it completely and involuntarily as 'the same thing' even in its most dissimilar forms. We say that snow, ice, steam, mist, and clouds, are all 'water' in its various 'states'. The very means of expression already contains a clear substitution: the recognition of the identity of objects of different kinds and the cognitive substitution of one for the other. Water is recognised as the 'essence' of steam, mist, snow, ice. Why might it not be the 'essence' of everything else? Youthful thinking, striving to make its difficult work easier and simpler, has a strong inclination to generalise its methods and conclusions from particular fields to all experience, and from broad generalisations it makes universal ones.

Was this haste, this naïve audacity of thought, a mere delusion? Not in the least. It was of the greatest importance for emerging scientific-philosophical thought to organise itself into a system as quickly as possible. Otherwise it was threatened to be devoured from all sides by the ossified, time-proof religious thinking that had been forged over millennia. Given the dearth of available experience, if science had postponed creating a system because of self-

criticism, cautious indecision, and wise hesitation, how much knowledge in general could it have affirmed? And, compared with faith, which, based on past revelations, affirmed all its beliefs firmly and definitely and without doubts and qualifications, how could science have been adopted to lead people on their life path ...?

Anaximander was a follower of Thales who did not simply stick with Thales's 'water' monism but who made an important new step forward in the development of substitution, in particular, and of abstract thinking, in general. Water – as a particular, concrete body – did not seem to him sufficient to explain being in all its boundless breadth and variety. Anaximander proposed that *arche*, the origin and essence of all things, could not be anything but *apeiron* – the 'endless'. The word *apeiron*, as one might think, signified for him not only boundlessness in the sense of quantity but also *indeterminacy* in the sense of quality. Such a meaning was fully possible philologically. Boundless, indeterminate matter represented that initial chaos, from which, step by step, the various elements of our world separated out. First of all, in Anaximander's opinion, heat and cold arose from '*apeiron*'. Then the combination of heat and cold produced water, which, in turn – consistent with the doctrine of Thales – provided the origin of all other things.

Here we already have not one substitution but a whole chain of them. As before, water was taken, in its immediate form, as the essence of other things, but the essence of water turned out to be heat and cold, and hidden even deeper behind them all is the boundless-indeterminate.

Anaximenes, who lived in the second half of the sixth century BCE, returned to a more concrete substitution, but he asserted that the basis of things was not water but air. Apparently he proposed that air possessed exactly the characteristics of that '*apeiron*' which Anaximander considered impossible to determine more precisely. Under the naïve but – considering the level of knowledge at that time – legitimate explanation of such phenomena as clouds, rain, etc., the idea that water came from air did not present anything strange. The nature of air seemed extremely indeterminate and its prevalence in nature seemed boundless. In any event, there was no great step forward here.

But if we place all three resolutions of the mystery of the world that were given by the Milesian school – water, the boundless-indeterminate, air – side by side, then are we not struck by the living connection with practical merchant seafarers? After all, these are the basic features of the natural environment that they dealt with, the basic impressions of their labouring life – impressions of sea voyages.

Can we consider the Milesian doctrine to be materialism? The question of terminology, of course, is not important, but their method was, without doubt,

the materialist substitution. One need only keep in mind that their idea of matter is very far from that of later materialists; they still had not achieved the soulless abstraction, the inner inertness that is characteristic of the matter of the atomists.

For the Milesian sages, matter was still full of life and activity. Unquestionably, matter was already detached from collective human practice in their consciousness. Fetishism of the absolute was already evident; it had already been born even prior to philosophy on the basis of exchange relations. But the earliest point of view regarding nature – the 'primordial dialectic' in which nature is a world of *activity* – had not completely disappeared. The authoritarian understanding of causation – according to which each cause must be active in itself, matter included – also had not disappeared.

For Thales and his students, *arche*, the primal matter – whatever it was – produced all the variety of being by the power of its inherent urge, which was understood to be the natural characteristic of '*arche*'. That inherent urge was always assumed and did not need any proof. *Arche* was the living, initiating first cause, i.e. it was an almost completely authoritarian first cause. Anaximander called it '*to theon*', divine reality, a religious term ascribing an organising-creative character to the first cause.

Such a type of materialism is generally called hylozoism (from *hyle*, matter, and *zaó*, I live).

In order to create materialism in the more narrow and usual meaning of the word, a complete elaboration of a new form of causality was required in which cause and effect were connected by impersonal, abstract necessity. Cause and effect were transformed into equally passive links in the chain of events, subordinated to the obscure force of causation.

Since no reliable information has been preserved about Leucippus, the founder of materialism, we will proceed directly to the theory of *Democritus*, the greatest representative of this philosophical line in the ancient world (at the turn of the fourth century BCE).

Democritus came from the town of Abdera in Thrace, an Ionic trading colony like Miletus. Here, as well, colonies naturally played a predominant role in the further development of ancient philosophy. The new conditions of life weakened the hold that age-old traditions had over people and forced them to revise their customary technical methods in order to adapt them to local conditions of production. The colonisers also came into contact with foreign peoples, from whom there was always something new to learn. These circumstances simultaneously undermined the previously indivisible rule of religious thinking and promoted scientific-philosophical thinking. The rapid development of the colony's trade accelerated the elaboration of the ideology of exchange, with

its abstract fetishism and idea of causal necessity, reflecting the power that economic relations have over people. The philosophy of Democritus was perhaps the most perfect product of this development.

For Democritus, himself, materialism was the summing up of his huge – for his times – knowledge of natural science, which he gathered from everywhere he could in a number of major journeys. Unfortunately, the works in which he gave an account of this knowledge and the conclusions he drew have not been preserved, but it has been suggested that a significant part of the overwhelming scholarship of the works of Aristotle – the great systematiser of antiquity – came directly from the work of Democritus. Not all naturalists, whether of antiquity or of modern times, are materialists, but there is no doubt that materialism always originates from the study of nature. From our point of view, this close connection is completely understandable. The study of nature organises the technological experience of people, serves as the ideology of the immediate struggle with nature, and in this struggle humankind treats nature as the object of its activity, as resistance, as *matter*.

The connection of materialism with technical-labour experience enables us to explain the origin of the *atomists*.

We have already seen several times how methods of thought are obtained from the methods of practice, which serve as a kind of model for them. Here we are obliged to observe yet one more of these cases.

What are the basic methods of human labour in relation to the objects of labour? There are two: *division* and *combination*. What people find joined in nature they first divide in one way or another, depending on their needs. They apply effort to separate it, break it down, and subdivide it. They then, with further effort, take the elements they have obtained and create a new combination, combining them into the desired product. All technology boils down to this model. A mason breaks up rock in order to use its parts to assemble a roadway or wall. A farmer separates seeds from straw by means of threshing in order later on to combine some of those seeds with elements of the soil. Even the simple moving of objects – their transportation – is nothing other than isolating them from a given setting in order subsequently to put them together with the objects of another setting. Practical *analysis* and *synthesis* – this is the essence of all labour, of all organising activity in general.

People are also organised in this way. For example, in order to create an army, individual people are taken out from their accustomed circumstances and accustomed groupings – family, economic, and so forth – and subsequently gathered into platoons, companies, battalions, and other systematic combinations.

Thinking is also an organising activity. It arose out of production and deals with complexes of experience by the very same methods. This applies, of course, not only to materialism. Atomism is only a particular case of intellectually breaking the world down into elements and then systematically combining them in order to reconstruct a cognitive picture of the world. In order to explain the origin of atomism further and more deeply, it is necessary to examine the distinctive features of the analysis of nature that it introduced.

Anaxagoras, a philosopher of the middle of the fifth century BCE, also intellectually broke the world down into elements. He did not, however, arrive at the idea of atoms. He thought that a body could be divided into an endless number of pieces, whereas the very term for the 'atoms' of Leucippus and Democritus reveals that they are not subject to any further division (literally *atomon* means indivisible). Subsequently, according to Anaxagoras, the elements of different bodies differed in quality – according to shape, colour, taste, and so on – as the bodies themselves differed. He thought that particles of water possessed their own characteristics and were dissimilar to particles of stone, wood, air, whereas the atoms of Democritus were distinguished only by size and form and had no other characteristics. Lastly, according to Anaxagoras, elements filled all of space completely, while the atomists asserted the existence of empty space in which atoms moved around.[1]

The conceptions of Anaxagoras seem far closer to living reality than those of the atomists. Of course, when workers break down objects, subdividing them into pieces, there is a certain limit beyond which it is usually impossible to go. But all it takes is to improve the tools, and that limit is extended. In practice it is impossible to find an absolute, immutable limit to the process of dividing. In exactly the same way, it is impossible to find particles, no matter how small, which possess only size and form and have no other characteristics. And once experience revealed the material nature of air, the existence of empty space inevitably became – at the very least – debatable.

Regardless of all this, atomism not only had historically much greater success than Anaxagoras's doctrine of homoeomeria, but it exerted a much greater influence on the whole course of development of philosophical and even sci-

1 Anaxagoras called the elements of objective reality '*homoeomeria*' from the words *hómoios* (like, similar) and *meros* (part) – groups of mutually similar particles. Not only was Anaxagoras not an atomist, he was also not a materialist at all. For him, the sum total of the elements of nature and all the world of life was directed by a special power that flowed into nature and which he called *nous*, 'reason'. This 'reason' was the organising foundation of objective reality, the world soul, which breathed life into matter and of which the soul of humans was composed.

entific thought proper. This influence is far from over even at the present time. The question arises of what can explain the particular role and fate of the theory of atomism?

In order to answer this question, we begin by singling out the central, fundamental idea of atomism – the idea that there are *indivisible elements of being* which are situated only in *external* relations among themselves. The rest is made up of simple conclusions drawn from this idea. The supposition of absolutely empty space between atoms is necessary in order that they can act on one another while remaining strictly indivisible and mutually external. If atoms filled all space they would not be capable of movement. For Anaxagoras, particles of matter move around compressing one another, but compressibility is possible only for complex compounds which consist of parts which mutually change their position. For the atomists, atoms are not composed of still tinier elements which can draw closer or move apart. Atoms would therefore not be compressible, and in order to move they would need empty space. The atomists' denial that atoms have sensuous qualities, such as colour or smell, is a consequence of the idea of that time that such qualities had the same complexity and divisibility as physical bodies. The Greeks believed that it is possible to see an object only because of tiny material images – although imperceptibly fine – which separated from them, were emitted in all directions, and thereby hit the eyes of people and animals. The smell of bodies was also considered – more accurately – to be a material outflow from them. In a word, indivisibility and utter impenetrability are the principles of atomism, which explained a number of derivative characteristics, the origin of which we shall now explain.

Here again we see the unconscious application of one of the models of thinking that people take from the common source of that thinking – their own relationships in social practice.

The word 'atom' in Greek is translated to Latin as, literally, 'individual' (undividable). Exchange society is appropriately and completely justifiably called individualistic. In it, individual producers of goods stand, in economic terms, as isolated units in opposition to other individuals, *indivisible* and situated only in *external relations* to the others, who are just like them. This is living social atomism. We will briefly dwell on its particulars – on its distinctive logic – before explaining the connection between exchange society and the abstract philosophy of atomism.

The basic contradiction of exchange society consists in the social division of labour, i.e. the objective social collaboration of the collective takes on the appearance of economic struggle among individuals. One of the contradictions that proceed from this is the radical misrepresentation of the nature and meaning of human speech as a means of communication among people. We know

that speech is essentially a tool by means of which people unify and mutually accommodate their actions and organise their social activity in general. The market makes speech a weapon in the war of interests. The whole process of 'trade' between buyers and sellers is a distinctive kind of duel. At the early stages of an exchange economy, the duel can be extremely protracted and stubborn, sometimes becoming a genuine fight with weapons in hands. The highest forms of capitalism significantly soften and reduce this literal war – without, however, changing the essence of the matter. In order to get a living sense of the tendency that exchange relations cultivates in people from the very beginning, one need only to listen to a Rom bargain with a peasant over a horse, or Yaroslav hawkers advertise their wares to a rural crowd. Exaggerating the value of one's merchandise, diverting attention away from its deficiencies, making a false representation regarding its value, concealing its deficiencies – these are wholly tactics of combat, in which the purpose of utterances is not mutual understanding between people, but the direct opposite.

The attitudes instilled in people by the market are manifested far beyond the boundaries of the market, deeply penetrating into all corners of people's lives, imprinting all their communication. Listen to the most everyday conversations of the petty-bourgeois world. In almost every one, you find 'commercial' elements – self-advertising competition, the enticing cajolery of conscious or semi-conscious mercenary deception. People come to the point of commercial *self*-deception – attempting 'to sell their personas like merchandise' to their own selves, trafficking in their own consciousness and consciences. The lie is the sovereign ruler of bourgeois society, as many poets have plainly and vividly revealed.

Of course, this does not mean that truth has disappeared from the face of the earth; nor can it be said that lies quantitatively predominate. But confidence in the direct meaning of human utterances has been lost. Hearing the speech of another, no one can confidently know the extent to which it is truthful or lying, or what thoughts and feelings are actually behind it. Here substitution not only turns out to be a hypothesis, it frequently turns out to be a mistaken hypothesis. Individuals are so spiritually isolated that they feel absolutely cut off from other individuals. Each 'I' is so fenced in by impenetrable walls that even the very reality of other minds is only a hypothesis, which – not without reason – can be disputed.

By this process the human individual began to think of itself as a 'monad' – a philosophical term signifying a unity that is absolutely isolated and self-contained. However, to take such a point of view – to completely embrace it and limit oneself to it – is impossible, even for the most extreme individualism of the exchange economy. One would end up with a contradiction between idea

and practice. A monad-individual sets off to the market, and, regardless of its isolation, enters into *communication* with other monads that are real and indisputable according to economic evidence. The average producers of goods never doubt the reality of other people's minds, because in business they come up against other interests. But philosopher-specialists, the ideologists of commodity production – in the quiet of their own professional workshops or studies where the hubbub of the market does not penetrate – are able to go further, to express the individualist tendency more completely, and to work out a genuine 'solipsism' or genuine 'monadology'.[2]

Monadology is the intermediate link that helps us understand the connection between practical atomistic society and the theoretical atomistic world, but we are unaware of any clear and perfected system of monadology in ancient philosophy. Perhaps this was prevented by the Greeks' strongly developed political life, so obviously built on living communication among citizens and on their uniting together for one or another economic advantage. The philosophers of antiquity were practical people and did not lock themselves up in their studies. Therefore, we must take a representative of monadology from another era – from modern times – when a more profound development of exchange gave rise to, among other things, more complete philosophical specialisation. The German philosopher Leibniz, who wrote at the end of the seventeenth and the beginning of the eighteenth centuries, was such a philosopher.

Leibniz conceived of the universe as the sum total of monads, each of which lived a completely self-contained life and was completely separate from others. The human monad can serve as a *type*. Its essence consists in a certain spiritual, ideal force – Leibniz was a pure idealist – which, in manifesting itself, formed the whole life of the monad, as if unfolding out from its own self. The monad 'does not have windows', it is 'metaphysically impenetrable', it cannot undergo the influence of other monads, and it cannot have an influence on them. Everything that a person thinks of as an external impression is produced entirely by the force that is the substance of the monad, just as its psychical images, senses, and desires are produced. All these are states of the monad that arise out of its own functioning. Even the body of the monad is the result of a disposition to fill up space – a force inherent in the monad.

But, at the same time, each monad is a microcosm; it reproduces the entire world in its own experiences. It 'represents' the universe in itself, and that

2 Monadology concedes the existence of other minds but rejects the possibility of looking inside them. Solipsism (which literally means to recognise the existence only of the self) concludes that, since it is impossible to look into other minds, the very reality of other minds must be doubted as something that cannot be substantiated.

means that it also represents other monads. How is this possible, since it is closed off from them and does not have any means of communicating with them? Logically one cannot avoid solipsism – a monad is isolated from the others, it can know nothing about them, and they do not exist for it. But Leibniz escapes from this necessary chain of conclusions by his doctrine of 'predetermined harmony' among monads.

All monads, according to Leibniz, are created by one central monad, or God, which is infinite, pure activity and which represents the universe in all its fullness and distinctiveness. The finite monads are essentially the lowest level of activity. Being the production and the reflection of the supreme monad, they represent the very same universe but with infinitely less exactness and clarity. Accordingly, monads' psychical images contain the very same content as the supreme monad. They are distinguished only by the degree of exactness of their content, and, in this regard, they form a grandiose, uninterrupted staircase. The lowest steps are 'simple' monads, the psychical images of which are murky and vague. Such monads make up inorganic nature. Plant, animal, and human monads stand higher still, in a series in which the distinctness and clarity of psychical images increases with each step.

Since all the finite monads – simultaneously and in parallel, although with various degrees of exactness – unwind the very same content of the world in their psychical images of it, it follows that at each moment their experiences are mutually commensurable and fully harmonised with one another. For example, if two people, Ivan and Peter, meet and converse as, let us say, buyer and seller in the market, then, according to Leibniz, it must be understood in the following way. In the development of the spiritual monad 'Ivan', a moment arrived when it, unwinding its internal content, had the psychical image of itself as being at the market and had the psychical image of another monad, 'Peter', in a commercial dialogue regarding the psychical image of certain merchandise – a horse. But at the same time, the monad 'Peter' correspondingly has a psychical image of himself as selling a horse and a psychical image of Ivan as offering five gold coins for it. In parallel, the monad of the horse sees itself – only with less distinctness – as being brought to the market and standing between two people who are emitting some kind of sounds. In the end, the lowest monads which make up the gold coins – i.e. particles of gold – 'represent' something that corresponds to the same correlations with extreme vagueness and indeterminacy. As a result, although each monad lives exclusively in its own self, things still work out as if real communication were going on. As they go forward on their path of self-development, the predetermined harmony is such that their absolutely and separately flowing psychical images are invariably consistent with the primordial will of the supreme monad.

If some ideal clockmaker constructed and immediately put in motion a multitude of absolutely accurate clocks – but some of them had only the hour hand, others also had the minute and second hands, and a third group perhaps showed the days of the month and phases of the moon in addition, etc. – then all these clocks at each given moment would show the same time with only various degrees of distinctness. Such a comparison is usually used to explain the idea of 'predetermined harmony'.

It is easy to see how unprovable, artificial, and fruitless this whole construction is. If the sensation of a monad arises entirely from its own spiritual activity, without the least action of other monads, then it could never be convinced of the existence of these others. If all other monads did not exist or if they suddenly were destroyed by the will of the Supreme Being, then the single remaining monad would continue its chain of experiences all the same, as if the world existed as it had before and nothing in it had been changed. However, monadology is interesting to us from a completely different point of view.

In Leibniz's doctrine, it is easy to see how models that are worked out by social practice and by relationships among people are transferred by philosophical thought – without any verbal metaphor – to other realms of being, to external nature or 'matter'. There can be no doubt that the pattern for the 'monad' – its original type for Leibniz – was a human being and, moreover, an individualist and consequently a member of exchange society. The figure of the human monad then became the starting point for the construction of other monads: animal, plant, and inorganic; they are all variations of the same model. The monad of a material atom is the philosopher's abbreviated, simplified imagination of a human monad with psychical images that are 'murky and vague' instead of 'distinct and clear', the lowest step on the same staircase. This conception of the universe again turns out to be an extension of the conception of society. It was impossible even for such a brilliant philosopher as Leibniz, with so huge a capacity for creative constructions, to escape from the power of this law.

Leibniz was an idealist. He 'substituted' the element of spirit or thought for everything, right down to the crudest matter. Materialists, on the contrary, substitute matter for everything, right down to the most subtle spiritual processes. But both the one and the other are the offspring of exchange society, which is bound up with the *model of individualism* by life itself. If Leibniz, thanks to this model, arrived at monadology, then the materialists would necessarily arrive at atomism. And that is how it in fact turned out.

However, atomism is not simply an inverted monadology, even if Leibniz himself sometimes called monads 'formal atoms'. The basic character of matter gives rise to other differences between materialism and monadology.

First of all, for Leibniz, the highest monads (humans, for example) are just as indivisible as the very smallest. For materialists, on the other hand, matter is precisely what living activity divides and combines, forming the complex out of the simple. Therefore, for atomists, a person is not just an atom, but is a complex combination of simple atoms. In the case of monadology, the model of indivisibility is applied initially to thinking, spiritual beings, and subsequently is extended to elements of external nature. In the case of atomism, the model of indivisibility is applied to elements of matter, and spiritual beings appear as complex, materially divisible combinations of these elements.

Second, a monad, being spiritual, lives an internal life and is not in need even of external relations with other monads. Matter, however, is *external resistance* to living activity; therefore an atom does not live an internal life, but is continually situated *in external relations* to other atoms, i.e. it gives jolts, hits, and pressures to other atoms, just as it receives them in return.

Nevertheless, the common origin of both systems is revealed in the idea of absolute indivisibility and separateness of the elements. The model of individualism is applied in both cases equally resolutely and consistently, and equally unconsciously.

If any doubt remained regarding the kinship of atoms with monads – and, it would seem, also with practical social individualism – then it would be eliminated by the existence of transitional forms that connect inanimate atoms with living individuals.

There is a special variety of atomism which acknowledges that *atoms are alive* – that they have the capability of elementary sensation. We find representatives of this doctrine not in the ancient world but among philosophers of modern times. Giordano Bruno, earlier than Leibniz, brought the idea of monads into philosophy in a less complete but poetically beautiful form. He identified the atom as a physical quantity resembling a monad – a physical monad. In the middle of the seventeenth century, i.e. a half-century after Bruno, Pierre-Louis Maupertuis and Jean-Baptiste Robinet stepped forward as advocates of the idea that atoms are alive. They were atomists in a stricter meaning of the word; for them, atoms and not monads were now the basic concept of philosophy. However, the transitional character of their views was so clearly apparent that the materialist Robinet was considered by some to be simply a divergent advocate of Leibniz's monadology.

It should be noted that one need not be surprised or consider it a chronological inconsistency if some of the links necessary for understanding the ancient system cannot be found in the remnants of ancient philosophy that are known to us. It is worth remembering how small a quantity of classical literature has come down to us. There was no book publishing in the ancient

world, and its manuscripts had to go through the natural censorship of a thousand years of feudal barbarism. It was easy under such conditions, of course, for mere transitional forms to perish. Because they were less definitive, such forms were unable to produce a deep and a dramatic influence on the psyche and were unable to create strong and lasting schools. We know Greek atomism only in the refined, finished, and clear form that it was given by Democritus and Epicurus, but we do not know the doctrine of the very founder of atomism, Leucippus, if it is indeed true that he was its founder.

The doctrine that regards atoms as having the ability of sensation thinks of each atom as possessing a kind of an elementary soul, a kind of minimal, indefinite sensation, and it is the combination of these elementary souls that explains the complex psyche of animals – humans among them. It is clear that such an atom is a genuine copy – although extremely reduced and extremely simplified – of the human individual, possessing a body and soul as everyday consciousness conceives of these things. And nature, consisting of such isolated atoms, can, by the same token, when opportunity offers, unite their elementary souls in more complex psychical processes and reproduce the individualistic picture of the world, i.e. exchange society.[3]

The atomism of Democritus applied the individualistic model in a still more abstract form, and therefore a number of intermediate links is necessary in order to recognise in its picture of the world the social model of thinking according to which it was constructed. On the other hand, when we ultimately figure out this model, we realise that the attraction that Democritus's doctrine held for the most progressive minds of antiquity – and even more so for those of modern times – was not at all mysterious. People who are the most fully and deeply imbued with the vital tendencies of developing exchange society found in Democritus's atomism something vaguely familiar and natural, a kind of symbolism that excites an echo in the living strings of their souls. And other highly important traits of the system strengthened and intensified its harmony with atomism – to be even more precise, its direct kinship with the everyday methods of exchange thinking.[4]

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3 The most important representative of this theory was Diderot, one of the creators of the Great Encyclopaedia. There are belated adherents of this view in Russia even today, for example Plekhanov.

The doctrine of animate matter *without atomism* was spread considerably more widely not only in modern but also in ancient philosophy. We have already dealt with it, however – the 'hylozoism' of the Ionian school. What is interesting for us here is only the atomistic form of hylozoism, since we are investigating the origin of atomism.

4 I remind the reader that ancient society was an exchange society *in its upper levels* where

If atoms are the elements of the world, then according to what laws are they tied together and united into a whole? Here again philosophy reproduces the motifs of life. Individuals in exchange organisations are ruled over by *economic necessity* that they cannot understand other than in abstract terms. Atoms in the world system are ruled over by *natural necessity* – a copy of that same economic fate, formed according to the image and likeness of the causal relationship of exchange society.

Of all the features of Democritus's materialism, it is this which most imparts its scientific-philosophical progressive character to it. By making the elements of the world absolutely inert, Democritus decisively broke with authoritarian causation, which recognised a living will in causes and effects – an actively organisational will in causes and a passively implementational will in effects. Naked, abstract necessity appears as a fetish from our point of view, but it was a fetish that was progressive in its day. It freed investigating thought from the old anthropomorphism. It would no longer do to come to a stop and settle for imaginary, commanding causes operating arbitrarily. Democritus unwound the chain of causal relationships to infinity and thereby opened up the prospect of infinite cognition. It was precisely on this point that materialism sharply collided with religious worldviews, smashing their conservative tendency. That is why Democritus was the soul of natural science for so long and, moreover, to an even greater degree than natural scientists themselves realised. A great many of them, probably even a significant majority of them, did not consider themselves materialists in their general worldview, but in their scientific investigations they acted as if they marched under the banner of materialism.

Thus, the movements of atoms, their interactions, and their combinations are subject to the law of necessity; this means that they always have a necessary cause. But what kind of cause exactly? In one case it would be one cause; in another case it would be another cause. For philosophy, the question advances on a universal scale: is it possible to find a necessary *general* cause for all the movement of atoms, taken as a whole? It is in the attempt to find such a cause that the very weakest point of ancient materialism lies. Democritus, perhaps, did not seek it at all; it has been suggested that he considered the movement of atoms – disordered and diverse – to be a primordial fact. But the more popular understanding of atomism was different. It took one of the particular causes of movement – familiar to everyone's experience – and gave it an absolute

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its philosophy was created. Only slaves, standing outside of culture, lived predominantly in conditions of a natural economy. And modern times are characterised by the headlong development of exchange relations in the process of the transition from feudalism to capitalism.

character. This cause is the gravity or weight of a body, and the origin of the world on the basis of gravity is conceived in the following form.

A countless swarm of atoms continually falls through the endless, empty space of the universe. They differ according to size and form; some are coarser and some are finer; some are round atoms, some have many sides, some are elongated, some are hook-shaped, etc. Since the matter they are made of is essentially the same, the bigger ones are heavier than the small ones and fall faster; they overtake them, hit them, cling to them, and the direction of both of them changes. Lateral and rotational motion springs up, which gives rise to new collisions, new adhesions, and so on. Paths and combinations of atoms become more and more complicated. In this way, over countless centuries, atoms came to form a variety of combinations, which we perceive in the form of bodies. The mechanism of the universe was born when atoms first began to fall. Worlds are created and again destroyed, and indestructible atoms provide their eternal material.

From such views came the world system – with slight changes – of *Epicurus* of Samos (341–270 BCE), the great populariser of atomism, who lived a century after Democritus. His views are especially interesting for us because, although he didn't have such an independently creative mind as Democritus, he nevertheless created a large school of followers. We can therefore presume that he was considerably closer to the everyday attitudes and the ways of thinking of the era.

Epicurus took the falling of atoms to be the first cause of movement in the universe. Apparently, like many other atomists, he thought that in the space of the universe there is one particular direction – from above to below – in which all bodies that have weight must move. This reveals that for the ancient Greeks, space itself was not completely uniform in all directions, as it appears to us. The idea of 'pure' or 'geometric' space had not yet been fully worked out; it is the result of a long development. When modern materialists, including even Engels, consider this 'pure' space absolutely real and not dependent on any kind of human experience, they are forgetting the history of the materialism.[5]

Epicurus, however, rejected the idea that in empty space the bigger atoms must fall faster than others; he took the point of view that, since there is no kind of resistance in empty space, all bodies must fall at the same speed. Two

5 Epicurus at least admitted that space is endless, which for us is also its basic characteristic. Another great philosopher, Aristotle, who reflected the philosophical tendencies of the ancient world much more completely, considered space to be *bounded* and the universe to be finite. This is another example of how mistaken it is to impart an absolute character to our conception of space.

thousand years later, this idea was proved to be true by investigations in physics. But this would mean that the simple and convenient explanation of why atoms collide and adhere to one another disappeared. If they all travel at the same speed, one could not catch up with another. Here Epicurus had to admit some kind of accidental deviation of atoms from a strict, straight line of descent. No matter how tiny these deviations were at the beginning, after a long period of time the magnitude that was building up would become sufficient so that the paths of several atoms would intersect. They would meet one another with mutual jolts, and further complexity clearly would then happen of itself.

But from where, nevertheless, did these mysterious deviations come? It must be obvious to us that an element of *arbitrariness* has been introduced into a system of *necessity*. The Roman poet *Lucretius*, a follower of Epicurus, expounded this point of the theory in his poem *On the Nature of Things*. In giving an account of these deviations, Lucretius made direct reference to the wilful movements of people and animals. But it is clear that this perverts the whole logic of materialism. He strove to explain will and life by the movement of atoms, but, suddenly, in order to understand these movements, he had to resort to an analogy with living beings. What is going on here? Where is the root of this obvious illogic?

That illogic lies in the very search for a first cause of the world process. No matter where such a cause is found, it is always a *first cause*. We know already that the search for it indicates the *authoritarian* way of thinking, since only the authoritarian chain of causality can have a first link. No matter how dissimilar to creative will the weight of atoms appears, nonetheless in reality it plays the role of such a will in creating the world. Weight already contains in itself a hidden wilfulness because it has no cause itself. As soon as the thinking of the philosopher started down this path, he thought nothing of going a little further and of supplementing the hidden wilfulness of the universe with something fairly evident – that is, supplementing the uncaused falling of atoms with the uncaused deflection of them from the straight path of their fall.

It was especially difficult for classical philosophy to be done with authoritarian methods of thinking, because beneath the façade of the exchange economy that stood at the heights of classical society there lay hidden the authoritarian system of slavery. Two cognitive principles were mixed together, sometimes producing what now seems to us to be naïve illogic.

Nevertheless, the materialists of antiquity sincerely tried to break through the old ways of understanding the world, even if they unintentionally lapsed back into them in certain cases. The very greatest difficulty that the atomists ran up against was how to explain the *purposefulness* of nature. Every living organism forms an unusually complicated complex of purposeful adaptations.

And to speak of a goal is involuntarily to imply some sort of will possessing its own motives. If life is formed consistent with certain goals, if every organ of every body fulfils its particular task, then it is natural to conclude that all of this is the result of some kind of planned work thought up and deliberated upon in advance and then carried out. For a long time this was the strongest argument against a worldview that was based on abstract necessity and in favour of an understanding of the world based on authoritarian causality. It was the most convincing proof of the existence of a personal creator and ruler of the universe. The ancient materialists did not succeed in overcoming this difficulty independently and completely, but they did adopt the brilliant – although very approximate – resolution of the question as it was proposed by Empedocles.

Empedocles was from Agrigentum, a Greek port on the coast of Sicily, and was one of the first philosophers – he lived between 490 and 430 BCE. Empedocles was remarkable in many respects. The famous doctrine of the four 'elements' is attributed to him; he considered that the elements of existence were earth, water, air, and fire. This doctrine predominated as accepted knowledge for two thousand years, right down to the emergence of chemistry as a science. Empedocles also developed an original and profound theory regarding the world's origin, development, death, and rebirth.

In the opinion of Empedocles, the elements are unchangeable and eternal but are, in themselves, inert and lifeless. Life in the world was created by two universal forces that are at war with one another – 'love' and 'hate'. The first causes elements to come together and mix; the second causes them to separate and disperse into space. In this conception, love and hate are understood to be impersonal and abstract – as pure tendencies. In the language of contemporary philosophy, one might translate the idea of Empedocles more accurately as simply 'attraction' and 'repulsion'. When love completely and indivisibly holds dominion over the elements, then there is no kind of life; everything is combined and blended together into one solid mass, one compact sphere. When hate achieves complete victory, life is also impossible; atoms of all elements are scattered to infinity. In the intermediate phase between the two extremes – when both forces operate and mutually limit one another – they form the world process, which goes from complete unity to complete disunity and back again. In both cases the reciprocal action of the opposing forces generates various forms of things out of the atoms of the elements – atoms that are sufficiently cohesive and sufficiently separate for at least some protracted existence.

It is precisely here that we find the idea of Empedocles that is most interesting to us. For him, both love and hate acted completely spontaneously. Consequently, there is no kind of plan, no kind of goal in the generation of forms. An infinite number of the most varied combinations appear. But the majority of

them are insubstantial, unstable, *not purposeful*, and they perish. For example, when separate organs were randomly formed without appropriate bodies, or were joined in unsuccessful constructions, they perished, while only those that were harmonious, orderly, and *purposeful* survived. So, nature – without any intention or deliberateness – produced forms adapted for life.

This is the first germ of the idea of natural selection – the idea that constitutes the essence of Darwinism and all of contemporary biology and that in the future will surely find a much wider application in the theory of the origin of matter. The power of this idea consists in that it removes anthropomorphism from the picture of world development. It replaces a personal creative will with impersonal necessity.

Historians of philosophy express doubt that this was the exact idea of Empedocles; his original works are unknown. In any event, this is indeed how his views were understood by the atomists who took this idea from him and made it into the basis of their worldview. Those atomists were Epicurus and the poet Lucretius Carus, of the first century BCE, a follower of Epicurus who wrote the poem on natural philosophy that we referred to above.

The principle of selection plays such an important role in the development of scientific-progressive thought that it is impossible to avoid the question of its social origin. Models that are so general and so capable of satisfying the human psyche are always based on a serious and broad foundation in social practice. In the present case, the analysis is made easier for us by one fortunate historical coincidence.

Darwin brought the principle of selection into biology, giving it a rather narrow character – the survival of the fittest by means of competition for the means of existence. And Darwin himself *almost* grasped the social origin of this formula; he did not conceal the fact that the social-economic model of Robert Malthus had a decisive impact on its elaboration. Malthus had applied to society the idea of a struggle for existence in its fully precise meaning. He idealised *capitalist, market competition*, which he considered a God-given, immutable law of life and progress. The victory of the economically and technologically strongest enterprises in the struggle of the marketplace, the perishing of petty capitalists, the survival and consolidation of the big capitalists – this social practice is the basis of the cognitive model which Malthus attempted to employ as a theory of society. Darwin transferred this model, in a purified and abstract form, to the whole realm of life, and Crookes[6] afterwards tried to apply it to the development of the chemical elements.

6 Sir William Crookes (1832–1919), a British chemist and physicist [Trans.].

But, as we have said, by applying the idea of selection to struggle and competition, Darwin narrowed its content somewhat. Competition is only a particular case of selection, although it is especially important for biology. Creatures that are unfit die, quite apart from whether or not they are displaced by the more fit. For example, when the ice age arrived in Europe, many species of animals and plants disappeared not because other species were stronger but simply because they could not adapt to the cold climate. They were killed by the low temperature of their environment, and not by competition. The most general form of selection is this: what is not adapted to its environment perishes; what is adapted to it survives. This is approximately how Empedocles understood it. What was there in his era – in his historical setting – that could have given rise to this model? The answer cannot be given with complete certainty. However, in Empedocles' views themselves, to the extent that they are known, there are clues that allow us to provide at least a probable explanation.

What do those two forces that determine the organisation of the universe in his system represent? 'Love' and 'hate' originally acted between people, bringing them together or separating them. And, by the way, for Empedocles 'love' did not have any sexual overtones; it strives to unite all elements without distinction. Nor does 'hate' (it would be more precise to translate it as 'discord') have any kind of narrowly specialised character; it strives to separate everything, and that is all. It is clear that what lies at the basis of both conceptions are the *social* forces of both the interconnectedness and the struggle among people. In the era of exchange, there is both an impersonal instinct for gathering together and a tendency toward individualism that determines the form of society. All the same, the method unconsciously applied by Empedocles is very familiar to us. The model of social relationships is transferred to the relationships of the universe; social practice is taken as a pattern for understanding the world. This is sociomorphism, i.e. the conception of the world according to the form and likeness of the social environment.

But if this is so, then it is obvious that the model for the creation of forms by the forces of love and discord must have originally been taken from social complexes – but not, of course, from capitalist enterprises, as Darwin's model of competition of organisms did.

In their colonies the Greeks came into conflict – as traders or robbers and, more often than not, as both at the same time – with native communities and tribes of a considerably lower culture than their own. The Greeks did not understand the primitive clan organisation of these tribes, since they themselves had long ago left that stage behind. Most of all, they were interested in 'barbarians' as easy plunder and as a source of slave labour power. The Greeks would have been struck by how ill adapted the 'barbarian' communes were for military

and economic struggle with the Greek colonial organisations. Primitive tribes would disperse and disappear, just as in later centuries 'savages' dispersed and disappeared before European colonisers in all the corners of the earth. Empedocles's unconscious symbolism could arise from just such a picture: nature by means of its unifying and disintegrating forces creates multivariate forms, but some of those forms are imperfect and nonviable in struggle, like 'hands without a head' (the comparison, from the point of view of the Greeks, was completely appropriate to the 'barbarians' whom they enslaved) while other of those forms are harmonious and stable. The first perish, the second survive, and the universe gains from it, as humanity gained from the displacement of the 'barbarians' by the Greeks (again, from the point of view of the Greeks).

This is the most probable way in which the idea of natural selection originated. What appears unquestionable from our method is the following. First, ideas of a universal scale were not 'dreamt up' by an individual psyche but were formed by social practice. Second, the theory of Empedocles, by making the sociomorphic forces of sympathy and discord the foundation of the way the universe works, also inevitably gave such a sociomorphic picture of the development of the universe.

We have traced the basic models and methods of ancient materialism, and this would seem to be sufficient for our purposes. There existed, however, a philosophical trend that was closely related to materialism – if not simply a variant of it – but which was far from confined within the framework of materialism's models and methods. This is *sensualism*, of which the famous Sophist *Protagoras* was the most brilliant representative. Protagoras, like Democritus, was born in Abdera, although Protagoras was somewhat older (480–410 BCE).

In order to establish the real correlation between sensualism and materialism, we must return to the starting point of all philosophical currents. This starting point is *human social activity, as fetishistically understood by people in a society that had been atomised by the forces of exchange and private property*. We saw that, thanks to fetishism, matter – which is nothing other than resistance to collectively labouring effort – attained an independent, absolute existence in peoples' minds, and, by way of substitution, became the foundation of the materialist worldview. In exactly the same way, 'idea' – which in reality is the organising form of social activity – was made into the foundation of idealist systems. But if idea and matter were torn from activity, then, obviously, activity was torn from them and remained as a 'thing-in-itself', as something aloof or absolute. In this form, activity became the central point of a *third type* of worldview, the chief characteristics of which we will now attempt to establish.

First of all, it is clear that human activity in an uncoordinated social organisation must be thought of in no other way than in the form of purely individual

activity. Here the model of individualism finds the most direct and simple application. But at the same time, the *scope and meaning* of activity is profoundly changed.

In its collective, pan-human scale, human activity correlates to all of nature. It 'changes the world'; it organises the world for humanity. On an individual scale, activity is far from that; it embraces an insignificant part of nature and organises an imperceptibly small portion of it. It is not conscious of itself as a living part of the collective practice that transforms the world. So what kind of form does it take?

Being incommensurably weak in comparison with the world that it resists, individual activity stands in a contemplative, 'apprehending' – i.e. a predominantly *passive* – relationship to the world. This sounds very strange: activity passively relating to its object. But it is no stranger than matter existing in itself – in other words, resistance without any dependency on or interconnectedness with *what* it 'resists'. Such distortions are a distinctive characteristic of abstract fetishism. Taken within the confines of the individual person, human activity is vaguely denoted by the words 'psyche' or 'personal experiences' or 'personal consciousness' – concepts that keep its active character completely in the background. In so doing – consistent with the principle of individualism – human activity is considered to be something isolated and closed, something separate from the rest of being.

Thus, the foundation of the worldview of sensualism is the sum total of the psychical experience of the individual. These experiences are considered to be what is known the best by a person and even as the only thing that a person has direct knowledge of. Each thing in one's experience is given directly to one only by one's individual experiences – so says the first formulation of such sensualist worldviews. Subsequently, proceeding from this, they attempt to provide a universal picture of being. This is achieved through various substitutions.

The simplest method is when thinkers substitute their own individual psychical experience – and nothing more – for an 'explanation' of the world as a whole. The following formula is obtained: 'external objects are, in effect, no more than my psychical images; other people are also only my psychical images; the whole world is nothing more than my psychical image'. This resolution of the philosophical task produces solipsism. Solipsism, however, presents a rare and even exceptional case. No matter how powerful individualism is in exchange society, in practice people cannot consider one another to be merely their own psychical images. To substitute one's own psychical images for other people when concluding exchange agreements, entering into economic struggle, coming into ideological – and sometimes physical – conflict, etc. is not only inadequate, it is extremely disadvantageous and almost impossible.

One modern philosopher, Schubert-Soldern,[7] proposes that solipsism is irrefutable in theory but cannot be sustained in practice. Solipsism is a characteristic example of abstract fetishism, which presents the theory that thought is independent of all practice, existing absolutely in a special world of logic. Only 'absolute' theoreticians, i.e. people who are cut off from all real labour and struggle – something that is thoroughly characteristic of exchange society – are capable of arriving at solipsism. Any practical matter that brought such theoreticians together with other people and things would palpably convince them that those people and things are not confined to the interconnectedness and regularity of simple 'psychical images'; they could not remain solipsists.[8]

Another form of psychical substitution – broader and less naïve – is *panpsychism*. For panpsychists the starting point is the same: 'people have direct cognition only of their own minds', but panpsychists propose that other people and things – and not just the panpsychist's own psychical images alone – exist in themselves; moreover, in themselves they are *psychical complexes* of various levels of complexity. Humans are the most complex minds, various animals are simpler, plants are even simpler, and inorganic bodies are the most elementary psychical combinations.

Of all the individualistic worldviews, panpsychism is, without doubt, the most consistent and logical. If what is psychical is the only thing that can be known directly, then we can obviously judge everything that is known indirectly, either through inference or substitution, exclusively according to its psychical nature, and we cannot really imagine anything that is non-psychical. To say that non-psychical 'matter' existed would be an empty phrase; there would be no content for it in our living experience. But for all its logicality and consistency, panpsychism is a very rare worldview. It is the fate of individualism that it can never sustain its logic to the end.

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7 Richard Ritter von Schubert-Soldern (1852–1935), a Czech-born German philosopher [Trans.].

8 We have said that solipsism is a special kind of *substitution*. A great number of philosophers of the most varied hues – including several modern materialists – completely disagree with this. Proposing that 'what is immediately given to us in experience are only our own psychical images', they see the difference between solipsism and their position to be precisely that it is completely limited by these 'immediate facts' and does not make any kind of substitution for 'their' psychical images. This again is an example of 'philosophical' perversion of reality. They forget a very simple thing: *before* they had philosophised themselves to the idea that 'only psychical images are directly given', they had recognised in practice and in thought that other people and objects are real bodies, and only after long training did they learn to think that 'what is given' are not bodies but psychical images – that is, in essence their own psychical images are substituted in place of their bodies. [The final clause of the last sentence, beginning with 'that is' is new in the 1923 edition. Trans.].

The weakness of 'panpsychic' substitution is that it must subordinate all nature to *psychical laws*; it must reduce all interconnectedness among phenomena to *the regularity of the psyche*. But such a point of view is useless for science, and the panpsychists themselves usually do not try to apply it to scientific knowledge. So far, the application of psychological methods to plants – and especially to minerals – has given people no predictive powers whatsoever.

For the most part, this philosophy, having taken the individual psyche as its starting point, subsequently diverges from this position and, in the spirit of materialism or idealism, supplements it with a substitution of one kind or another. We have already seen one example of this in Leibniz's monadology. The life of each monad is an individual psychical process of greater or lesser complexity; the whole world exists for a monad only in that monad's psychical images. But at the foundation of the chain of the monad's psychical images lies the ideal or spiritual essence of the monad. Thus, psychical substitution gives way to a deeper idealist substitution.[9]

In other cases substitution becomes more or less materialist. This results in *sensualism* in its various forms. Such was the doctrine of Protagoras.

Investigating the psychical experience of the individual, Protagoras found that its basis consisted in sensations, from which all other psychical facts were formed – psychical images, feelings (emotions), and so forth. Where do these sensations come from?

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9 Philosopher-individualists of all shades continually confuse thinking with consciousness, ideas with psychical images, and, in general, philosophy with psychology. Such confusion occurs among them because they do not grasp the *social nature* of thinking, which, as we saw, arose from communication of people while working and served as the organisational form for their collective experience. For the individualist, all experience is only individual, and there is no way to distinguish the social symbolics of thought – 'inner speech' – from simple forms of consciousness, sensation, or perception. The form of this or that person in my memory is a completely individual matter, while the concept or idea of 'human' serves as a general symbol for a great number of forms in my, your, or anyone's psyche. Thanks to the accumulation of these concepts, we are all able to mutually communicate, verify, supplement, and co-ordinate our conceptions about people. The idea *socially organises* the representations or psychical images that we have. Individualists do not see this, and for them the idea is as individual as sensation. Leibniz expressed the difference between ideas and psychical images unconsciously, but, thanks to his genius, very accurately. According to him, an idea – in the form of force – is substance; it is the general *organising foundation* of all the psychical images of a given monad, and, at the same time – precisely because of the co-ordination of this idea-force with other idea-forces – the psychical images of monads are mutually co-ordinated, that is, in essence, they are 'socially organised'.

For sensation to occur, an object that is being perceived and a subject which perceives or senses it must be present. For Protagoras, both of these were more material than not, but it was a very indefinite matter, and the essence of his views cannot be definitely known. We can only be sure that for him matter is found in a fluid state, in some sort of motion. Sensation is the result of *reciprocal action* between subject and object, the result of a twofold movement flowing between them. For example, a certain optical or light impulse issues from the external object and meets with another movement issuing from the eye, the sensing organ. Both movements unite, mutually influencing one another, and a change results from this. The change is once again of a dual character: visual perception of the object appears in the eye, and the subject itself takes on an optical image, corresponding to the perception.

Here we encounter an interesting peculiarity of Protagorean sensualism, which distinguishes him from later sensualists such as Locke, Condillac, and many moderate materialists. To be specific, for Protagoras the subject or the subject's sensory organ plays a much more active role. The sensory organ not only undergoes an action from the object from which the sensation is actually produced, but it also acts on the object, generating in it 'what is sensed'. So, a tree cannot be known in itself and has no optical image, but when you look at it, not only do you obtain a visual sensation, but the tree itself attains a visual form in relation to you – its optical appearance. Both fully correspond to one another, therefore sensation is always true and always truly conveys what is sensed. But what is sensed, itself, exists in the subject only in that moment and only for that given subject; the object in itself is not accessible to a person.

This is a transitional point of view, the result of a situation in which theory is still not sufficiently removed from practice – not sufficiently specialised – to be able to live a completely separate, independent life. Practical people will always be 'naïve realists', i.e. they accept that objects are precisely as they are seen, perceived, and, in general, apprehended. The fetishism of naïve realism consists in that it considers the object to exist in such a form completely independently of any human practice. The naïve realist supposes that the object *in itself* is, for example, 'quadrangular', 'two yards long', 'weighing three pounds', and does not understand that all these 'properties' can in no way belong to the object 'in itself'. Humanity, in its labour experience over millennia, had to work out methods of comparing and defining forms, measurement, and weight, in order to make 'quadrangles', 'yards', 'pounds', etc. possible. In nature itself – in the instances of elemental resistance which labouring effort comes up against – there are no such things, nor can there be. They are the result of the activity of humanity in overcoming, changing, forming, and organising these resistances. In the hands of fetishists – theoreticians who lock themselves

up in their studies and whose narrow specialties have almost nothing to do with the resistance of material objects – this distortion develops further. Their sense of isolation from material objects and their sense of the 'independence' of material objects are considerably deeper. They believe that such objects not only exist independently from themselves but that they are so independent as to be completely inaccessible to their minds; only their 'outward appearance' is accessible – masks which they put on before the observer. And a feeling of their individual powerlessness – their personal passivity in relation to the external world – reinforces in them the conviction that this 'outward appearance' is entirely the result of *the object's* action on them, that they themselves only 'apprehend' that action.

Protagoras moved toward such a point of view, but still did not reach it perhaps because he was not only a theoretician but also a man of life and struggle. Protagoras did not feel isolated from the world, and he did not relate passively to the world. Sensation, for him, still had a passively active character – sensation not only 'experienced' the object but also made an imprint on it, if only for a moment.

It is from this that Protagoras took his famous, fundamental proposition: 'a human is the measure of all things: of what exists – in its being, of what does not exist – in its non-being'.[10] The word 'human' here signifies the individual – each person taken separately – as a special world of experience. And the entire formula should be understood in this way: for each given person, each given thing exists precisely as that person apprehends it at that given moment. If you do not apprehend something, it does not exist for you.

For Protagoras, sensation or perception depends on two movements taking place between a person and an object. The movement that issues from the organs of sensation of two different people can simultaneously seem to be different, and then their sensations will be different. 'What is sensed', which originates in the object as a result of the two movements, will also be different. Under such circumstances both people will disagree about the object and may even make contradictory assertions about it. Nonetheless, both assertions would naturally be true, each for its own author. This is the meaning of another of the fundamental propositions of Protagoras: contradictory judgements can be equally correct.

The first proposition of Protagoras – that humans are the measure of things – can be further translated as: 'all things are correlative to human beings'. This is

10 The usual English translation of this passage is 'of things which are, that they are, and of things which are not, that they are not' [Trans.].

the formula of pure *relativism* (the doctrine of the relativity of all that exists). His second proposition can be rendered in the following form: there is no truth that is universally obligatory (or 'socially valid') for all people. This is the formula of *scepticism* (the denial of objectivity in cognition). The doctrine of the Sophists was built on these two models, and they subsequently had a huge impact on the entire course of development of ancient and modern philosophy. The essence of both models is *the individualistic understanding of people's experience*, and this understanding, in its turn, reflects the *practical individualism* that develops as a result of *exchange society*.

Since our task is not to examine the history of philosophy but to explain its basic methods and their objective origin, we shall not proceed any further in the examination of ancient materialism.

Materialism was born together with philosophy at a time when separate specialised sciences had not yet been differentiated, and it merged with them and, as it were, subsumed them. Naïve materialism – the hylozoism of the Ionic school – was the first kind of 'secular' worldview that we know of, in opposition to the religious worldview, which had been universal up to that time.

The very emergence of extra-religious thinking was, as we know, the result of exchange and the acceleration of technological progress because of it. This development completely corresponds to the fact that the trading colonies of the Greeks were the birthplace of materialism and of philosophy in general. It was there that, together with the power of exchange, the necessity of adapting to new natural conditions caused technological progress to accelerate. The religious tradition was also comparatively weaker than on mainland Greece.

Milesian hylozoism was predominantly the philosophy of commercial seafarers, which is reflected in its basic patterns. The idea of 'matter' of that time was not yet completely abstract, and the materialist substitution had a concrete character. Those particular aspects of matter which played a special role in the life of the social group – water, air – were substituted for all phenomena, as proposed by the first philosophers. But in Anaximander one can already notice a striving toward a more abstract understanding of the essence of being. His 'boundless-indeterminate' presented the basis for *abstract* substitution. In addition, there was no fully worked out abstract model of causality, or idea of necessity. Therefore, for the first philosophers, matter – the first cause – appeared to be active and possessing initiative, thereby corresponding to the authoritarian understanding of causality. Each of the varied forms of being of primal matter was generated by virtue of its own *vital striving*, which was accepted as its natural characteristic. Here we see how close, historically, ancient philosophy was to the religious worldview. In this active understanding

of matter we can perhaps see, in part, echoes of that 'primitive dialectic' for which nature was a world of actions.

The greatest representative of materialism in the proper sense of the term was Democritus. His outlook was based on a much richer stock of natural-scientific knowledge. With him the conception of 'matter' attained a highly abstract elaboration and took the form of atomism. He also developed the model of causality-necessity to a high degree of perfection. This was a very progressive type of worldview for an exchange society in which not even the germ of a new collectivism existed.

All the main characteristics of materialism were unconscious applications of models taken from social practice.

Thus, it is possible to distinguish two such applications in atomism. On the one hand, atomism created a picture of the world by intellectually breaking the world down into elements and then intellectually combining them into a systematic whole. This method, common to all cognitive systems, is a copy of two basic methods of labour technology and, in general, of any organising activity – that is, the division of complexes that are at hand into parts and then the systematic combination of those parts into a new interconnectedness. On the other hand, in atomism elements are distinguished by their indivisibility and their purely external relationships with one another. This is the application to elements of the model of individualism, the organising form of exchange society. In this case the model is seriously altered by extreme simplification and extreme abstraction, but the similarity can easily be revealed by comparing it with other, non-materialist types of atomism, which can be found in modern philosophy, such as the monadology of Leibniz. Leibniz took the human individual in its most extreme opposition to other individuals to be the basic type of the 'formal atom', and he conceived of all other elements of the world according to this pattern. Subsequently, the 'animate atomism' of Robinet, Diderot, and others was the intermediary link between monadology and the pure mechanical atomism of materialism.

One might think that it was just this hidden symbolism of individualism that at various times has caused the advanced minds of emerging exchange society to be particularly attracted to the philosophical ideas of the atomists. What was really most progressive was another characteristic of materialism – using atomism to reduce the interconnectedness of all the events of the world process to abstract necessity. The social model for this idea was the economic necessity of exchange systems, i.e. people being governed by their social relationships.

Abstract causality-necessity, even though it contained fetishism, was cognitively progressive because, by extending the chain of cause-and-effect to infinity, it pushed investigating thought to continually broaden and deepen its work

and to keep striving without limit. On the contrary, the old authoritarian causality had a tendency to bring cognition to a halt, to stifle it under the arbitrary rule of various first causes, both general and particular.

It must be noted that the majority of ancient materialists did not consistently adhere to the principle of abstract, eternal causality, and sometimes they got off track in searching for universal first causes. They were consequently forced to bring elements of arbitrary causality into their constructs. An example is Epicurus's hypothesis about the origin of the world in the random deviation of falling atoms from a straight line. Strict consistency of method is generally rare in philosophical systems and especially in non-materialist ones. The structure of society to this point had not become sufficiently uniform, and it contained heterogeneous relationships that provided patterns for mutually contradictory methods and models of thought, and that structure predisposed systematisers to unconscious eclecticism.

One of the most important points in the working out of a worldview completely free from authoritarian causality was the elimination of teleology, or, more accurately, the explanation of the real teleology of life on the basis of causality-necessity. The natural selection of forms serves as the principle of such an explanation. This idea, scientifically formulated only in the nineteenth century by Charles Darwin, was not foreign to ancient materialism, which adopted it – in a primitive form, of course – from Empedocles. The sociomorphic character of the model for natural selection in Darwinism is unquestionable; capitalist competition served as its prototype. For Empedocles, the prototype for the idea of selection was probably the image of the relations between Greek colonies and 'barbarian' communities in both economic exchange and military struggle – the unfitness and demise of the former and the survival and progress of the latter.

Ancient sensualism, of which the Sophist Protagoras is thought to be the originator, appeared alongside the birth of materialism. Protagoras did not begin by adhering to either materialism or idealism but instead followed a third line, taking individual psychical experience as the foundation for his construction. This was the result of the fragmentation of collectively labouring experience because of the social struggle of the market and because of private property. Social activity in its individualistic guise loses even its potent, world-transforming character, and experience is understood contemplatively as the sum total of sensations and psychical images – they are understood to be 'primary data'. In its logical development, this point of view led either to solipsism or to panpsychism – two forms of universal psychical substitution, which, however, are poorly suited to the economic and technical practice of exchange society. Sensualism supplements this with an ambiguous material-

ist substitution. It accepts psychical experience as the result of mutual action between subject and object. According to Protagoras, two movements issuing from both subject and object meet one another. Since these movements differ with the individual, different people can obtain different sensations from the very same objects and express contradictory judgements regarding them. Moreover, in such a case those sensations must be considered equally valid for each author. Accordingly, truth correlates with the individual (this is relativism); the object itself lies outside sensation and, as such, cannot be known. Equally, there can be no 'objective', i.e. socially valid, judgement regarding truth (this is scepticism).

In the philosophy of sensualism, the model of individualism takes the most unmediated form; its basic position is the individualistic understanding of experience. Materialism – and any worldview, in general, that is imbued with forms of thinking characteristic of exchange society – gravitates toward such an individualistic understanding, but sensualism is distinguished in that its understanding of experience is made the basis of all constructions. It was precisely because of this that sensualism became the theory of the most sharply individualistic trend in the ancient world – the so-called Sophists. In general, all forms of ancient materialism had the individualistic development of society at their core.

CHAPTER 3

Modern Materialism

Two millennia lie between ancient and modern blossoming of materialism.

The fate of classical culture is an episode of unequalled tragedy in the history of humanity. Over the course of centuries, that culture was built up under magnificent circumstances; in some fields it achieved heights that down to our own times have not been achieved. And then it perished in a long and agonising collapse, along with the entire social organisation which had generated it.

At its highest levels, ancient society was an exchange society, and the basic character of its culture corresponded to this. But it was not entirely individualistic, i.e. it was not a fully developed exchange society. It had a dual structure. Its productive basis was slave labour, and this was the reason for its fall.

Every society grows and develops as long as it increases its labour activity, increases its power in the struggle with nature. The system of slavery, taken to an extreme, makes such progress in increasing power impossible; it turns the ruling class into flabby parasites and the subject class into beasts of burden. Production then begins to weaken, technology declines, social ties become less solid, and enemies, if they appear, will not be forcefully resisted. But even if the Roman Empire had not been overrun by German feudal barbarism, its economic decline and cultural disintegration would only have been prolonged over a greater number of centuries.

Toward the end of the ancient world – due to the exploitation of slaves and the acquisition of plunder – a huge amount of capital had accumulated. There were also millions of proletarians who were 'free as birds'. In modern times, the combination of these two elements produced industrial capitalism, with its headlong economic and cultural progress. Why was something like this not created in the Roman Empire? Precisely because the system of slavery undermined technological development at its root, and without technological development industrial capitalism is impossible.

Industrial capitalism was preceded by commercial capitalism, the essence of which consists in merchant capital subordinating small-scale industry – taking charge of directing the labour of peasants and artisans and organising the mass sale of their products in the market. Significant commerce developed in the ancient world, but there was no commercial capitalism. Commercial capital was unable to control and organise petty producers. There was neither a self-sufficient peasantry nor a free and economically powerful artisan class which could provide the appropriate material for commercial capitalism. Such

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producers were ruined and suppressed by usury, by the competition of large-scale slave-owning enterprises that mercilessly exploited their slaves, and by never-ending wars for obtaining fresh slaves to replace those that had been 'used up'. And without the kind of preparation provided by commercial capitalism, there are neither suitable organisers to create industrial enterprises nor any suitable workers. A merchant, concerned only with accommodating the tastes of a wealthy and powerful parasitic class, could not take the initiative to organise mass production. And the proletariat was parasitic on state and private resources, which led to its ever-greater degeneration, forever eliminating the possibility of returning to labour.

Thus the body of ancient society – its economic structure – was doomed to perish, and, in due course, it died. It seemed that its soul – classical culture – also died, but after the passage of a thousand years, it turned out that, in reality, its soul was immortal.

Between the twelfth and sixteenth centuries – earlier in some countries, later in others – the relationships of the natural economy of feudalism began to decay. Within those relationships a new exchange society began to form on a wider and – more importantly – on a healthier foundation than before. In order to rationally organise its life, it needed a corresponding culture. Did this culture have to be entirely worked out from scratch?

If this had been the case, then one would have to admit that the ancient world had existed in vain, that its thought and creativity had not been of use to humanity. The gigantic weight of this additional work and struggle would have fallen on the shoulders of the new social forces that were being born, and the amount of labour and effort that would have been required in order to create an entire culture is unimaginable.

But that did not happen. From the distant past, by both direct and roundabout routes, the fragments and remains of classical antiquity – its science, art, philosophy, laws, and morals – came down to new generations. These were ready-made cultural-organisational forms for an exchange society that was being born a second time. The foremost minds enthusiastically flung themselves on the riches that had been hidden for so long in the grave of the ancient world. Its Renaissance began.

Ancient science supported youthful thinking in its quests – in its struggle with external nature and with the old society. Ancient philosophy offered the most perfected general models for individualistic consciousness. Classical art and morals helped to form and to express individualistic feelings and sentiments. Roman law was the ideal system of norms for private property, and it was accepted in one country after another, preparing the way for the rule of capital.

And, despite all this, the obsolete feudal-priestly organisation, as it slowly receded, managed to defeat the new social forces many times, preventing them from achieving their goals and sometimes mercilessly destroying them. Many times the forces of reaction, from positions that seemed already to have been defeated, threw whole countries backward by centuries. Spain, after a brief blossoming, was completely stifled by the Inquisition and the feudal bureaucracy, and the same was done to Italy by the Papacy and the wars of petty feudal lords. The Thirty Years' War between Catholicism and the Reformation transformed Germany overnight from a leading country into a backward one. France was harmed somewhat less by the St. Bartholomew's Day Massacre and the revocation of the Edict of Nantes. And what rivers of blood, what a waste of the best vital forces! 'Religious' wars between the two cultures devastated huge regions, and countless people died. And even the 'peaceful' Inquisition – understood as 'bloodless' by the deluded representatives of the new spirit of the times – in Spain alone burned 340,000 people and indirectly destroyed many millions.

These facts serve as a grim reminder of the price paid by humanity for contemporary, individualistic culture. How could it have been managed if, at its first and most difficult stages, the great corpse of classicism had not come to the aid of their young descendants against the vampire of the Middle Ages, if it had not placed in their still weak hands the tools of a culture forged over a millennium? If this had not been, our generation would still be facing other tasks now long since resolved, and we would not be witnessing the dawn of the approaching beginning of the *genuine history* of humanity.

Even though the ancient world choked to death on the blood of slaves and the filth of parasitism, its later redemption was as grandiose as its death was tragic.

Ancient culture was not taken in passively by the new European thinking. In the beginning, the enthusiasm for the wisdom and beauty found in the past often turned into uncritical worship and imitation, but later on, the inheritance of the past became the basis of energetic, independent work. The new content of life was so huge that, in order to cope with it and organise it systematically, it was necessary to develop the old methods further and to supplement them with new ones. It was necessary to broaden and deepen old models to bring them closer to life. The ground the students stood upon was very different from the ground upon which their distant teachers had accomplished their thinking and creative work.

The main difference was not that there was no slave-owning core in the new individualistic system. Various forms of serf exploitation, developed by feudalism under the influence of the intensifying greed of exchange, were

sometimes nearly indistinguishable from the slavery of the past. But these bottommost, enfeebling elements did not take up a large enough place in life to determine the development of life as a whole or to interfere with its continuing, intense progress. The new society was above all *technologically progressive*. It broadened its productive system – the field of its experience, and it perfected the techniques and organisation of labour – the sources of its methods and models of thinking.

It was an era of great discoveries and inventions. At the same time, whereas the ancient cultural world remained for centuries limited to the same 'arc of lands' clinging to the Mediterranean Sea, now commercial capital, in search of gold and profit, overcame – by the work of brave seafarers – unprecedented distances. They discovered, one after another, large and wealthy countries and began to rule them. They developed a type of ship suitable for the ocean, and they began to make use of the compass and later on precise astronomical instruments for orientation on distant voyages. Those who waged war against the crude physical forces of the Middle Ages found a powerful weapon in gunpowder; those who waged war against its spiritual forces found such a tool in writing paper and book printing. New industries sprang up, and in old industries tools and the disposition of human forces were changed. The material energy of society grew and developed in new directions, winning victories over nature everywhere. And competition and the thirst for accumulation, continually intensifying, did not allow this to stop and pushed it on to further victories.

A spirit of *practical endeavour* was the basic mood of the times. The new science set itself a broad and brave task: to investigate the secrets of nature in order to master it in practice. And that is why in philosophy, as it regenerated, the question of the *method* of cognition came ever more definitely to the fore. Such was the new materialism.

In ancient materialism, on the contrary, the question of *system* predominated – i.e. the striving to directly give a complete picture of the world and an explanation of the essence of things in order to achieve full satisfaction of cognitive needs. This is especially notable in the materialism of Epicurus and Lucretius, for whom the philosophy of nature served mainly as the support for the moral doctrine of how an individual can achieve happiness – understood in the sense of joyful, blessed tranquillity. Their materialism was not a philosophy of struggle and impetuousness. But, from the very beginning, that is exactly what the new materialism was like, even when it appeared in the form of simple assimilation of ancient knowledge. Life itself inspired it with the spirit of struggle – its unrelenting opposition to the surrounding gloom and the savagery of the forces that still ruled the Middle Ages.

We are reviewing not the history of materialism, but its tendencies, its methods, and its models of thinking. Therefore we leave aside those thinkers and scholars who prepared the path toward it, but who were, for the most part, not supporters of materialism in a formal sense. We pass directly over to the figures who were typical of the new materialism in the time when it blossomed in England in the seventeenth century and then in France in the eighteenth century.

Francis Bacon, an Englishman whose philosophical works appeared at the very beginning of the seventeenth century, was distinguished by a deep and true understanding of the *practical value* of knowledge. For him the goal of all science and philosophy was the winning of real power over nature by humanity. For Bacon, precise and accurate knowledge was a tool that could conquer the world and that would begin – in his expression – the genuine 'dominion of humanity'.

Such a view of cognition is considered narrow and petty by 'pure theoreticians'. They feel that one must not enslave truth to practice; this would lower science and would also harm practice itself. They say that, in its pursuits, thought must be free from any concern regarding the useful application of its results. Thus, great truths were discovered which only afterwards made a huge impact in reality. When Newton invented the differential calculus, he probably was not thinking about how useful it might be to engineers, builders, and all subsequent industry. And, these 'pure theoreticians' continue, if he had in reality tried to find truth that was practically useful, then of course he would not have come up with the differential calculus. All that his genius would have produced would have been, at most, some trivial or perhaps even major technical results, but in any event they would have been incomparably less than what he created in the striving for *pure knowledge*. Considerations like this, based superficially on a certain psychological truth, can seem very convincing, but, in reality, they are a harmful misunderstanding.

The psychological truth is that if you search for truth you must concentrate all your attention and energy of thought on it alone; you must not be distracted at that moment by any collateral considerations – about what the truth is that one is seeking, where it objectively comes from, the practical tasks that it must help resolve, etc. But this applies generally to all intense and complicated human activity. When turning any delicate part of a machine on a lathe, a mechanic of course should not at that moment be thinking either about the usefulness of this part in the machine or about the usefulness of the machine in production; the mechanic should be thinking only about how to achieve the necessary form. When performing a difficult operation, a surgeon should not think about the benefit of that operation for the patient, one's personal

reputation as a surgeon, or even about the scientific results which can be obtained from findings connected with it; the surgeon should think solely about the means of successfully accomplishing the operation. However, this is not a reason why the tasks of the turner or the tasks of the surgeon must be self-contained, 'pure' tasks. It is not harmful for either of them to know what they are doing, i.e. to have an idea of those needs that are objectively served by their work. The same can be said about cognition as a means of satisfying the practical needs of society.

There is no doubt that Newton was only seeking a method for determining mutually dependent variables. But if he had kept in mind the idea that people, in their labour technology, would continually have to deal with complexes that were variable in size and connected by various kinds of reciprocal dependencies, and if, on the basis of this, he had been convinced that the method he sought would serve as a powerful means of systematisation and precise calculation in production, would this have prevented him from discovering the differential calculus? It would more likely have been the opposite; these thoughts would have excited his creative enthusiasm even further and heightened the energy of his work. It would also have prevented him from doing what he did do – using the method that he discovered by himself for a fairly long time without publishing it to make it widely known. No one has ever proven that work is completed better and faster when the worker does not understand its objective meaning.

There is no doubt that the desire for pure truth – the idealism of 'pure' cognition – played, and partly now also continues to play, an important role in the development of science and philosophy. The fetishism of self-sufficient knowledge was a necessary weapon against the fetishism of the authoritarian tradition with its elemental conservatism. But the motive forces of creativity change in all fields from one era to the next. The striving to understand and express the will of God inspired the organisational activity of the thought of Zarathustra, Moses, and Muhammad no less strongly than the striving to master pure truth inspired Galileo, Spinoza, and Darwin. And now, since the times of Marx, a new type of theoretician has been born, for whom perhaps an even stronger stimulus appears – that is, the consciousness that through their scientific and philosophical work they are participating in the great collective work of transforming all social being.

Thinkers like Bacon, of course, were still far away from perspectives and attitudes like these. While understanding knowledge as a practical force, they nonetheless did not entirely escape from the framework of abstract fetishism, and they conceived of the nature of cognition in a distorted way. For them, the practical power of knowledge depended on whether it was 'true', i.e. that

it 'corresponded to things' – in other words, that it boiled down to the relation between things: spiritual things (ideas) and real things (objects). But, in reality, truth expresses the relationship of the *human collective* to the things of its experience. The power or value of truth derives from the fact that it is crystallised social experience. The greater the sum of the experience that is concentrated in it and the more systematically that experience is organised and unified, the greater is the practical power of truth. For the materialist, as also for the idealist, truth must be 'found' or 'uncovered' by people, as something existing independently from it, temporarily hidden from them. But, objectively, truth, just like all other tools, is *produced* – created in the struggle of humanity with the objects of nature. The fetishist always attributes an absolute quality to truth. For the fetishist, an obsolete idea is a pure delusion that is contradicted by the absolute correctness of the new idea. In reality, obsolete truth is related to the new truth; the new truth replaces the old truth in the same way that an improved tool replaces an outdated one.

We will explain this with a comparison. A stone axe was useful and necessary for our distant ancestors; for them it was a practical force in the struggle for existence. But if contemporary humanity had to return to stone implements, nine tenths of them would die out in a very short time. The unsophisticated geography of Herodotus was satisfactory for Greeks of the fifth century BCE, but if we tried to use it as a guide today, our journeys would end very badly. Ancient tools became technological 'delusions'; ancient truths became theoretically unsuitable tools. The same is true of abstract fetishism itself. It is characteristic of exchange society and is not simply and absolutely a delusion; it is only a form of thinking that is obsolete in our era.

Bacon understood the practical meaning of cognition only as fully and deeply as was allowed by that fetishism to which all individualist thinkers are necessarily subordinated. The basic task which he set himself naturally proceeded from here, and it was this: to find the path of true cognition, i.e. of cognition that would correspond to things and give power over them. The main content of Bacon's work consisted in the 'art of discovering truth', i.e. scientific methodology.

Bacon recognised the sole source of knowledge to be *experience* and the basic method of knowledge to be *induction* – the systematic processing of living experience which begins with particular facts of experience and goes on to broader and broader generalisations. This was completely logical. It is necessary to find knowledge that corresponds – is applicable – to reality, and this knowledge, being concrete, is made up of particular facts. At the same time, this was a most decisive denial of the prevailing Scholasticism for which deduction – 'inference' from earlier accepted general truths – was

the main means of investigation. Scholasticism expressed the stage of the new thinking when it had awakened but had still not found independent support in life and remained subordinated to the authoritarian tradition. In Scholasticism, the highest and most general truths were accepted as already given in that tradition, and it was considered impossible to obtain any other such important and universal truths outside tradition. One could derive new truth only from truths already to hand. Empirical methodology, on the other hand, expressed the phase of the new consciousness when consciousness – based on the material of life attained outside tradition in technology and experience – declared itself to be independent in the search for truth and capable of discovering the secrets of nature independently of the wisdom of the past. This is the point of view, understandably enough, taken by materialism, or – to put it more accurately – it was only because of this point of view that materialism became possible. And Bacon, its representative in the theory of method, was the bitterest enemy of Scholasticism.[1]

Everyday experience is full of contradictions; observations are entangled with many illusions. The scientific method must first of all liberate cognition from such elements; otherwise induction would not be able to lead to truth. This is the idea of 'pure experience', which plays a very large role in all further development of philosophical ideas; we will meet it many times in our account. Bacon gave it form in his doctrine about 'idols' – a word that can be translated both as 'fetish' and 'illusion'. Its meaning is so broad that it contains both of these connotations. Bacon's classification of these 'idols' is interesting because it so clearly sets forth the revolutionary mood of the new thinking against the entire traditional and conventional system of ideas.

'*Idola tribus*' – idols of the tribe, i.e. delusions associated with the general conditions of the life of humankind, means, for the most part, anthropomorphism and anthropocentrism: the tendency to understand the phenomena of nature as having human characteristics and the tendency to assume that nature is concerned about the interests of people – for example, when thunderstorms

1 The word 'Scholasticism' signifies, properly, school knowledge. It was taught in the universities that appeared during the transition from medieval to modern times. Scholasticism was based on the works of Aristotle, who had worked out formal logic with great completeness and depth, and specifically the theory of deduction by means of the syllogism. Scholasticism was not at all the product of religious thinking; in fact, it was just the opposite. It strove to infer some truths from certain other truths, hoping thereby to add something new that did not come directly from religion, and making the Aristotelian tradition almost a religion for Scholasticism. Moreover, at first Scholasticism often clashed with sacred authorities; only later would it become its ally against superior methods of cognition.

and gales are combined with the psychical image of the anger of the elements or when it is suggested that various things are 'made for the use of people'. '*Idola specus*' – the idols of the cave in the figurative language of Bacon – signifies delusions that proceed from the individual limitedness of experience. Individuals live withdrawn into themselves, as if in a cave, and this isolation narrows and distorts their perceptions. For example, to specialists, things that are closely related to their specialty seem important and essential, while what is not connected to it seems unworthy of attention and observation. Or, to take another example, people often misunderstand the actions of other people, because they judge them by their own individual standards. '*Idola fori*' – the idols of the marketplace – are mistakes that originate in communication between people. They are mainly commonplace formulas and ideas that are accepted without proof. Finally, '*idola theatric*' – idols of the theatre – are illusions that arise thanks to a disguise – as if in a theatre – to which reality is subjected at the hands of historians and philosophers.

This classification is not exactly perfect, but it is obvious that the idols of habit, authority, and tradition make up the greatest part of it. The majority of religious concepts must appear among '*idola tribus*' and '*idola fori*'.

With regard to the explanation of the inductive method, it is here that the powerful influence of Scholasticism – against which he fought but in which he was to a significant degree educated – on Bacon's formulations is so telling. In order to accurately evaluate his understanding of method, we first must delineate the chief characteristics of induction as we conceive of it today.

Like any systematic human activity, in general, scientific investigation boils down to the process of organising its material, i.e. to precisely those facts of experience with which it is concerned. When we reviewed the development of the idea of causation and also the origin of certain philosophical models, we saw that human thinking took its model of organisation from living social practice. And there is nothing strange about this. Before they learn how to organise their experience[2] theoretically, people first organise themselves in practice. Techniques first created in one field are ready to hand and necessarily gravitate toward other fields. Applying them in a second field saves an enormous expense of energy, compared with people having themselves to *invent* completely new methods of cognition from scratch – something which is completely impossible, in any event. The same principle applies to such methods of investigation as the various forms of induction. It is not necessary for us to examine the entire course of their origin in social labour, but our characterisa-

2 In the 1913 edition, Bogdanov wrote 'thought', not 'experience' [Trans.].

tion of them is significantly simplified and they become easier to visualise if we simply compare them – not for explanation but only for clarification – with the ordinary methods of the organisation of people. We can take any social class that initially appears to be disunited and uncoordinated just as we take disunited and uncoordinated facts of experience at the beginning of investigation, and we can see how in both cases the transition to a coherent unity is accomplished.

In general, only those elements that are similar – that have something in common with one another – are capable of being organised together. So people first of all form groups *according to their similarity* – according to one or another of their general attributes. For example, in professional clubs, people group themselves according to their common profession and in political clubs according to their common political ambitions and inclinations. But as long as the entire joining together does not go further than a community like this, it remains indeterminate and vague; it can even join together many elements that are heterogeneous and often even contradictory. An example of this is when the working class comes together in various '*lose Organisationen*',[3] organisations that are not closely bound together or formally organised, and that do not, on their own, provide deep cohesion and powerful unification of forces.

The data of experience were originally united in this way – *by similarity* – that is, *the method of simple generalisation*. The very formation of ideas, with their initial indeterminacy of meaning, was based on this method. The same sound was wrung from primordial, pre-civilised individuals when they dug the land with their primitive tools, when they saw an animal burrowing a lair, and then when they found a natural cave. All this was 'generalised' for them in one word-idea, because something similar is found in them all that elicits the same vocal reaction. At a later date, a more complex *generalising description* of facts which expresses their ordinary connection was formed by the same method. For example, thousands of similar observations were grouped into formulas: the sun shines in the daytime while the moon and stars shine at night, carnivorous animals are frightened of a bonfire, rubbing dry sticks together produces fire, etc.

This is the first stage of induction. It provides only a superficial unification of experience; its generalisations are not strict, exact, or firmly settled. Often things that were at first associated together as being similar turned out after-

3 In the Social-Democratic movement of that time, *lose Organisation*, 'loose organisation', was a term that referred to a broad non-partisan organisation of working-class people as opposed to an organised Social-Democratic political or revolutionary party [Trans.].

wards to be extremely heterogeneous, and they are broken down into new groupings. For example, whale, pike, and cuttlefish were once brought together under the general idea of 'fish'. Science now sees them as very dissimilar beings. Thunder was once thought to be the kind of sound that comes from the collision of heavy objects – a generalisation according to similarity which later on had to be simply thrown out. Everyday thinking is full of such imperfect groupings. The great majority of them are *approximately* true, i.e. sufficiently suitable for ordinary practice. They are the necessary material for further stages of induction.

If an organisation of people, in the course of its development, needs to gather its forces for a common activity, then it must go through a formal procedure to determine more exactly its common content or common tasks. This is done by means of *enumeration* or voting. Let us suppose that a professional club – at a certain point in the course of events – decides to go on strike. It would then be necessary to numerically ascertain the correlation and the tendency of forces in the organisation. The line of the majority either is accepted by all or leads to the withdrawal of the minority, who form a separate organisation. In both cases, an indefinite human complex is replaced by one or more complexes that are more definite, and the possibility arises both for more coherent activity and for better calculation of its results. The organisation ceases to be diffuse and gains sharp – although perhaps temporary – contours.

This corresponds to the *statistical* method of organising the facts of experience – the second stage of induction. It brings specificity and exactness to the picture of experience, appearing as if 'elected' by the facts themselves. The statistical method has a propensity for numbers but is far from always embodied in genuine, exact numbers. When the naïve generalisation 'bodies that are deprived of support fall' is replaced by the more rigorous proposition 'in the majority of cases, bodies that are deprived of support fall', we see the application of the statistical method. In the development of science, one encounters such unconscious and approximate statistics much more often than conscious and exact statistics, but 'election by the facts' is always present in both cases. However, it is for the most part impossible to really and completely master the facts even under present day numeration of them. An apparent majority can result from a random selection of observations or from a limited and transient timeframe in which the selection is performed – such as the way in which a temporary majority can be formed in a human organisation on the basis of very particular and temporary circumstances that subsequently turns out to be insecure and not durable. For example, a huge majority of apparent facts speak to the immutability of animal and plant species, but this conclusion depends entirely on the brief timeframe of scientific observations. Human memory goes

back only a few millennia – too insignificant an interval in the history of the development of biological forms.

Thus, a higher type of organisation is necessary, one which would remain viable and coherent, *independently* of changing particular and accidental conditions. With regard to the organisation of people, this is achieved when its human elements are united by a general tendency of life that is far superior in breadth and depth to all temporary moods and situations. An example would be the class tendency toward the total reorganisation of society that is expressed in the maximum-programme of a political party, a federation of trade unions, or a federation of co-operatives. Regardless of disagreements on practical questions, of differences of opinions or nuances, the collective does not lose its solidarity and unity of action. Disagreements are subordinated to the fundamental goal. If this solidarity is temporarily forgotten in one case or another – masked, as it were, by transitory and particular tendencies – it will subsequently advance anew on its original plan and overcome those temporary tendencies with continuity and stability. This is the organising force of the collective – its 'soul', according to the old terminology. The more this force rules over the individual, living elements of the whole, the more tightly each element is tied to the whole, the more fully the whole lives its life and the more truly it reflects that force.

Now, even if one deals with elements of another sort – the data of experience – the method of organisation is still exactly the same. Facts are grouped solidly and rationally when it is possible to find *one general tendency* in them all and to make it the basis of their interconnectedness. So, the falling of various bodies at different speeds, the movement of warm air upward carrying away particles of smoke, the circular paths of planets around the sun – all these are basically very different facts in no way mutually connected in cognition. But Isaac Newton united them coherently, having accurately established and expressed their general tendency, which he called gravity. He showed that the tendency in all of them was identical, and if this was not obvious, it was only because it was concealed behind incidental, particular tendencies that arose from special conditions. All falling bodies are attracted to the earth at the same speed, but, as Galileo had already explained, the resistance of the air lessened that speed in various degrees – more strongly for light bodies, which therefore fall more slowly, and more weakly for heavy bodies, which fall faster. Warm air would fall with the same speed, but the pressure of cold, heavier air surrounding it not only stops that speed but also makes the warm air move upward in the opposite direction. Planets constantly fall toward the sun and the moon falls toward the earth, but they are also moving sideways, and both movements combined together form a curved line, which goes around the cen-

tral body and forms a closed orbit. Quite a number of facts that appear to be most heterogeneous turn out to be fundamentally identical, understandable, and susceptible of prediction. The model of their general tendency, discovered by Newton, is their *abstract law*, and the method applied to them is called the *abstract method*.

The word 'abstract' here signifies the following. In order to determine the basic tendency of a series of phenomena, it is necessary to 'abstract' – i.e. to detach from them, in practice or intellectually – all incidental tendencies connected with their specific variable conditions. For this it is necessary cognitively to *break down* phenomena, to distinguish their general from their particular conditions, and to 'analyse' them. In consequence, this method is also called the '*analytic*' method.

How is abstract analysis carried out? The very best and most reliable path is *precise experiment*. In such an experiment, all the complicating, incidental conditions are either completely removed or are equalised so as not to have an effect on the observation of the facts. For example, if we are convinced that the speed of falling bodies is affected by the resistance of air, then it is necessary in an experiment to try to remove air from the place in which the falling occurs. This is done by means of an air pump which sucks air from a tube. In that tube, a piece of lead and a scrap of paper then fall with equal speed.

In other cases, however, performance of an experiment like this is difficult or simply impossible – as happens, for example, when one investigates the laws of human social life. In such a case, the investigation must be content with simple *observation* of the facts as they are given by life itself and with *intellectual abstractions* than are based on them.

It was by this route, for example, that Marx established the abstract laws of capitalism, or, what is the same thing, the tendency of its development. It is not only impossible artificially to reproduce pure capitalism according to the wishes of economists, but it is also impossible to observe it in even one country of the world. Capitalism is everywhere mixed with remnants of preceding formations – both feudal and petty bourgeois – and as time goes on it also begins to become complicated with the seeds of the social system that is to come. Let us suppose that statistical calculations reveal that the concentration of capital is occurring in the majority of countries. As long as this is our only evidence, we still cannot say whether that concentration presents a genuine law of development or whether it is only the result of temporary and particular conditions. But suppose we additionally find that this concentration is accomplished more vigorously and consistently in those countries where the remnants of past social forms are reflected more weakly, and that it proceeds at a slower and more vacillating pace in countries where such remnants are par-

ticularly significant. We pursue this chain of facts intellectually and arrive at the ideal case – in which there is no complicating mixing of past social forms – and we can envision pure capitalism. Obviously, then, the concentration of capital would grow even more rapidly and steadily. It follows that the concentration of capital is in fact the general tendency of capitalism; this expresses its abstract law. In other words, where capitalism exists the tendency of concentration of capital must be assumed. If it is not evident, then this means that the general tendency of capitalism is halted and concealed by some other, more particular tendencies that depend on special conditions – which it would then be necessary to explain by further investigation.

Only the abstract method can determine the laws of ideological life, which are the most complicated group of phenomena. So, observing different classes in various eras, we determine that religious and dualistic characteristics are more prominent in the worldviews of those cases when the authoritarian relationship prevails in their practical organisation, and they are less prominent when other social relationships prevail. Having compared a sufficient number of observations like these, we become convinced that wherever religious dualism appears more distinctly and is less complicated by mixing with other ideological characteristics, the authoritarian form of social collaboration in life is to the same extent less mixed with elements that are foreign to it, and we arrive at this abstract law: the ideology of the authoritarian relationship is religious dualism. We saw another example of the application of this method when we became acquainted with Noiré's theory of the origin of speech.

Whether we 'abstract' complicated conditions in practice – as is done in a precise experiment – or whether we do it only intellectually, the method essentially remains the same. And in the so-called exact sciences it continually happens that one of these means of abstraction changes into the other, and returns again. Experiment has a huge advantage in that it usually permits one not only to establish the tendency of the facts being studied but also to quantify that tendency – to express the abstract law in numbers, something very rarely achieved with the intellectual analysis of complex phenomena.

Now we can return to Bacon. How did he understand induction, which he acknowledged as the basic tool of human thought? As we have said, the influence of scholasticism is very evident in Bacon's method of exposition. The old form significantly obscures his concept of method. If we discard it, then it seems that, in effect, he arrived at an approximate formulation of the abstract method, which represents the highest level of induction.

Here is the method which Bacon proposed for finding the 'formal cause' – the term he used to signify the *general foundation*, the 'nature' – of any series of phenomena. On one table, we must list as many cases as possible where

we observe the particular feature we are studying. On another table, we must indicate those cases where it is not present. Then, on a third table, we must arrange cases of the various degrees in which it occurs – when it is evident in the greatest degree and when in the least degree. Comparing these tables and excluding those conditions which do not seem to be constantly associated with the phenomenon being studied, we find its 'formal cause' – that is, whatever it is that is always present to the greatest degree when the feature being studied is present and that is present in the least degree where that feature is least present. It is obvious that all this presents – although not quite clearly or fully – the formulation of the means by which the 'abstract laws' of phenomena are worked out. A true genius was necessary for such an understanding of method at a time – more than three centuries ago – when the natural sciences were still in their childhood and the social sciences were in an embryonic form.

It is true that Bacon did not sufficiently appreciate the significance of precise experiment for induction, which Galileo, at that very time, put at the basis of his methodology. And the role of mathematics, which provides exact and rigorous conclusions at all levels of induction, also eluded Bacon. But what we see here is the beginning of the specialisation of knowledge. For all his encyclopaedic erudition, Bacon was quite a poor physicist, and he was not a mathematician at all. In any event, Bacon outlined with the greatest boldness and breadth a programme of work for the most varied realms of knowledge which at that time were for the most part only being born. In this regard, one historian of philosophy facetiously remarks that if one considers the results of this programme, then all contemporary natural science can be found in Bacon. If one accepts an evaluation like this – certainly somewhat exaggerated – then one must ascribe to Bacon truly prophetical genius.

Especially remarkable in Bacon was the desire to apply the same methods *to humanity and to society* as to the study of external nature – objective investigation by means of induction. In his era, this was still only a premonition of what would not be realised to any extent until the nineteenth century.

It is here that the materialist spirit of Bacon's methodology vividly comes out. In order to study humanity and society by the same means as the world of matter was studied, it was necessary to accept them as essentially pertaining to that world, and, in that era when the ideas of 'matter' and 'spirit' still could not be explained, such a point of view was achieved only by the materialist substitution.

However, for Bacon this substitution did not have the finished, completely abstract nature that is characteristic of typical materialism. It was not eternal, inert matter, possessing only form and mechanical movement. It was full of internal activity with all its own specific sensuous characteristics. It was not

philosophically colourless and simplistic, but it was such as it appears to us directly in living experience. It was a worldview related to ancient hylozoism.

By the way, various '*spiritus*', spirits – the remains of medieval and scholastic theories – played a large role in Bacon's explanations of nature. Here, of course, they were recognised as material and not understood anthropomorphically, according to a human form. But, all the same, they were active and not inert; they embodied a certain organising activity and not mechanical passivity. They are taken to be proof of the unscientific nature of Bacon's views – as if the scientific nature of the sixteenth and twentieth centuries were the same. On this point Bacon was not as far ahead of his times as some – very few – of his contemporaries. This is all that can be said against him, if we do not forget that history governs truth.

The next step in the development of the new materialism was presented by *Thomas Hobbes* (1588–1679). A full three decades separate him from Bacon, but that was the time of Galileo and Johannes Kepler, a time of unprecedented successes of the mathematical method in physics and astronomy. They left a deep imprint on Hobbes's philosophy and determined the nature of his materialism.

For Hobbes, mathematics in effect took over all knowledge. In general, he reduced scientific investigation to the use of logical inferences to determine effects through their causes and to discover causes through their effects. In his opinion, to come to a conclusion meant to count or calculate, and any process of such a kind could be broken up into elements of addition and subtraction.

It goes without saying that in various modes of inductive investigation, it is easy to find well-known analogies with mathematical addition and subtraction, but being analogous is far from being identical. Hobbes's view was an exaggeration, although historically understandable, and perhaps even useful in those times when new technology, based on exact quantitative calculation, was born. It is not irrelevant that it was precisely the seventeenth century that brought great revolutions in mathematics. Hobbes was the philosophical exponent of that rush of intellects toward mathematics which, in the last years of his life, produced the great discoveries of Isaac Newton and, specifically, 'fluxional' (differential) calculus.

The sixteenth and seventeenth centuries were the era of the worldwide development of commercial capitalism and the development of manufacturing in the most advanced countries of Europe, especially in the Netherlands and subsequently in England. Commercial capital, which previously had given the push toward great geographical discoveries in its search for markets, now energetically tried to exploit them. For the sake of the profitable marketing of goods – and, when the opportunity arose, of simple thievery – ships of

European traders and trading companies ploughed the oceans of the world in long and dangerous voyages. And the cash holdings from this mass traffic in goods prompted capitalists, little by little, to organise mass production. At first, this was done by avaricious, capitalistic domination of petty producers – artisans and handicraftspeople – and at a later date it was accomplished by building large industrial enterprises – factories. From here there arose new practical needs and new cognitive tasks.

One of the most urgent of them was the need for *precise* calculation and implementation. Ships lost in the boundless ocean, among a thousand dangers, could guarantee a timely achievement of their goals – indeed the very possibility of returning at all – only by the most exact orientation. The smallest mistake in direction or in the calculation of distance could subject the ship to the power of hostile elements which could destroy it along with its crew and cargo. The necessary perfection of orientation was achieved only by astronomical methods. There were no reference points on the unvarying watery desert of the ocean for determining location and direction other than the fixed relationships of heavenly bodies. Accurate measurement of angles, reliable tables, and exact computation – these are the conditions without which humans' struggle with the ocean would be unthinkable. The new astronomy and new mathematics were vital needs of commercial capitalism on a global scale; they developed in parallel with the practice of commercial capitalism and on the basis of that practice.[4]

In industrial technology, the desire for exactness appeared somewhat later, but it proceeded, all the same, from real economic motives that had not existed in previous artisan and handicraft production. Individual petty producers in cottage industry, subordinated to the power and exploitation of commercial capital, now sometimes did not make a whole product but only a certain part of it. The capitalist who was in charge then undertook the assembly of the parts – such as, for example, in the production of clocks, firearms, and various instruments – and, naturally, the sale of the product. It is clear that under the

4 Ancient commerce, with its predominantly shoreline sailing, did not need such exact methods of orientation, and ancient astronomy did not progress further than the system of Ptolemy, although some Pythagoreans indeed succeeded in coming up with the idea that the earth revolves around the sun. The discoveries of Copernicus – the foundation of the new astronomy – were based on the material of tables put together in the second half of the thirteenth century by several dozen astronomers, under the direction of the Castilian king Alphonse the Wise, in order to improve and encourage ocean travel. The ancient Ptolemaic tables, transmitted to that era through the Arabs, turned out to be obsolete and useless for practical purposes.

mass manufacture of any small and delicate parts, such as the wheels and levers of a pocket watch, great accuracy of execution was necessary in order that it would be possible to assemble the parts into a whole. Such accurate execution, in turn, required very precise tools.

Not only were these conditions often present in manufacturing because of the technological division of labour among workers, but there were almost always other, no less powerful, motives to develop the precision of tools. In manufacturing, the worker in a petty specialty was given the role of a machine – the mechanical execution of a certain simple operation of production. In the course of each working day, that worker had to repeat the same mechanical motion with the same instrument thousands – sometimes tens of thousands – of times. Let us suppose that there was a very insignificant defect in this instrument that was actually invisible to the naked eye – bluntness in a certain place, a slight inaccuracy of form, etc. In the case of the work of an artisan – who individually made the whole product and therefore was obliged continually to change from one instrument to another and to perform various movements with each of them – such an imperfection would not be particularly significant and no doubt would remain unnoticeable. But when, as in our example, the tool produces its effect many thousands of times in succession, the imperfection ceases to be unimportant and imperceptible. In the course of adding together a massive number of extremely small influences, a large magnitude is obtained which practice must take seriously into account. And since tools absolutely without defects are impossible, the practical task arises of making each inaccuracy in the construction of a tool, each deviation from its normal form, to be of an infinitely small magnitude, i.e. less than any magnitude that has real significance. This is exactly the same task as for the instruments of orientation in the realm of ocean transportation.

The accomplishment of this task is possible only by the most exact measurement, the strictest geometrical formation of parts, and the most painstaking calculation and computation. So life itself directed psychical labour toward the development of methods of mathematics, preparing the ground for quite a number of discoveries in that field and also for the philosophical one-sidedness of Hobbes.

Curiously, the very method of the new mathematics – the analysis of the infinitely small – arose from just this task. It consisted in studying the mutual relationship of magnitudes, intellectually reducing the change of each of them to the infinitely small, and finding the precise relation of the changes for this limit. Accordingly, the basic operation of higher algebra (reducing changes of magnitudes to their limit, to the infinitely small) is the psychical execution of

the same thing that technology was really striving for – to decrease a certain real difference (the imprecision of tools, to be precise) without limit, thereby decreasing the imprecision (i.e. the deviation of both the tool and its function from their ideal model or norm) of its function. The model for practical striving became, in an abstract and idealised form, the model for cognition. The ancient world, possessing neither ocean transportation nor manufacturing production, had no need to strive for the 'limitlessly small', i.e. infinite precision, in its living practice. Therefore, despite the presence of the most ingenious mathematical minds, the ancient world was unable to work out what are in essence extremely simple methods of differential and integral calculus.[5]

But let us return to Hobbes. As we said, the spirit of mathematics ruled entirely over his conceptions of nature. In his opinion, it was possible to know only what could be geometrically constructed and numerically expressed, i.e. bodies and their movement in space. This was reality in its entirety. In themselves, bodies possessed only extension and form. This, however, was not atomism. Hobbes believed in the infinite divisibility of bodies, and he rejected the possibility of absolutely empty space.[6]

Where do the qualities of bodies that we find in experience – such as their colour, hardness or softness, warmth or cold, etc. – come from? They are all sensations that are excited in us by various movements of bodies, their parts and particles. But sensation itself is also only the movement of particles of an organism. Accordingly an extremely homogeneous and completely materialist picture of the world resulted. But for Hobbes, matter was absolutely inert and abstract in comparison with matter as Bacon conceived of it. It was so emptied by mathematical thought that nothing remained of it except for spatial form and movement. Only later, after new successes in physics whereby mass appeared to be a necessary element of calculation, did philosophers also add mass to the essential characteristics of matter.

The relationship of Hobbes's philosophy to religion is characteristic of Hobbes's materialism. Bacon had still been able to escape from any formal conflict with the realm of faith. With Hobbes faith was now only hidden behind a blatantly transparent irony. He spoke as a defender of state religion, and in his political-philosophical tract 'Leviathan' he defined it this way: 'The fear of invisible forces, whether the idea of them is a product of inven-

5 As is now being ascertained, the genius of Archimedes even arrived at similar techniques, but, regardless of his huge authority, this discovery did not find a response and died away in a social environment for which it was not needed and foreign [added in 1923].

6 In this, he was the student and follower of Descartes.

tion or tradition, is religion when it is an idea that is accepted by the state and is superstition when it is not'.[7]

The next important stage in the development of the new materialism was presented in England by *John Locke* (1632–1704). He was a sensualist, and his doctrine, like that of Protagoras, was first and foremost a theory of psychical experience. And for Locke, as for Bacon and Hobbes, questions of method are fundamental, except in a different realm: he was the originator of a new psychology.

Locke taught that all experience and all knowledge developed from two things: sensations that are obtained from the external world and 'reflections', i.e. the processes of their internal treatment, thinking about them. Accordingly, 'there is nothing in the intellect that was not present earlier in external sensation' – a point of view that had already been accepted by Hobbes, but that was developed most fully and systematically by Locke.

In his principal work, *An Essay Concerning Human Understanding*, Locke, on the one hand, struggles against the old idealist doctrine that psychical life is based on innate ideas and, on the other hand, investigates the means by which the whole system of psyche and cognition is formed from the material of sensory perceptions.

The theory that people are born already possessing – although in a hidden form – certain ideas that constitute the basis of their subsequent spiritual life began in the philosophy of Plato.[8] In essence, this is a vestige of authoritarian causality as applied to human consciousness. In the human soul there is a series of higher, authoritative, and governing elements, and a series of lower, passive, and subordinate elements. Naturally, the origin of innate ideas was also explained from a religious-authoritarian point of view – they are placed

7 Further on, the irony becomes still more savage: 'And when these unseen forces are in fact professed in such a manner, then religion is true'. In this way it turns out that a true religion – once it ceases to be professed by the state – immediately turns into superstition. If it is accepted by only one state, then it is the true religion in that state and at the same time in all other states it is superstition.

8 Plato taught that hidden behind the world of perceived reality – of concrete things and concrete psychical phenomena – was another *true* reality: the world of ideas that are the prototypes – the pure forms – of things and phenomena. These ideas represent the organising foundation of all concrete, particular being. Being is merely the more or less imperfect realisation of them. The souls of individuals, before their earthly lives, live in the world of ideas and altogether belong to their nature and are known to them from the beginning. When a soul comes to live among sensory objects and forms concepts of them, it is essentially only 'remembering' the forms of ideas that are the knowable objects subordinated to its being.

there from on high. According to Descartes, the first and most important of those innate ideas is the idea of God. Consequently, Locke's struggle against this doctrine was at the same time a struggle against the powerful vestiges of the old type of thought – the desire to promote the model of a new causality-necessity also based on psychical experience.

The most important and powerful argument in support of innate ideas was that all peoples living completely apart and in the most different circumstances agree on certain religious and moral principles. Locke proved, by means of data procured by observations of the psychology of children and from the reports of travellers about various tribes, that such agreement in fact did not exist. Some peoples considered the highest good what others considered a crime – thievery and murder, for example. And the idea of God – different everywhere – was simply absent from some tribes. Arguments of this kind were a sharp polemical blow to not only the theory of innate ideas, but also the entire authoritarian worldview.

Locke investigated the path along which psychical experience develops. It begins with simple sensations and psychical images that a person accumulates by means of external senses – of colour, sound, hardness, softness, extension, etc. These elementary 'ideas' (this is the term – obviously not accurate – that Locke used to designate them) are grouped according to likeness, and they form general psychical images of various qualities. And from these are formed more complex combinations: ideas about 'substances', i.e. about reality, about bodies and matter. Feelings and emotions are also obtained by means of complex and diverse relationships of simple sensations and psychical images.

Combinations and groupings of simple 'ideas' into complex ones are expressed and consolidated by means of words, and so abstract ideas emerge – the realm of logic proper. The operations of thinking are performed with words; speech is the tool of reason. It is by means of words that the material of the psyche is brought into order, but due to the variability of their meanings many mistakes also emerge. The investigation of reason is first of all the investigation of speech and language. This thought, confirmed by the further development of philology, was very important for philosophy, which continually gets muddled up in words, not noticing their changing meaning and therefore often arriving at random conclusions.

Since sensualism is entirely based on an individualistic understanding of experience, it is understandable that the social character of thought completely eluded Locke. He considered the entire process of the formation of ideas as if it were accomplished completely within the confines of an individual psyche. This is the fundamental and unavoidable deficiency of a method which is characteristic of a philosophy that takes the point of view of individualism.

Materialist substitution played quite an important role in Locke's philosophy, but, as usually happens with sensualists, it was of an indefinite, vacillating character. He accepted the existence of 'substance' – i.e. reality independent of psychical experience, 'things-in-themselves' according to the most usual terminology – but he considered them to be knowable only in a vague sense. For Locke, material substances were to some extent reliable, but spiritual substance seemed to him doubtful and arguable, and the very question of it was absolutely unsolvable. The qualities of things which are inherent in themselves, independent of human sensation, Locke called primary qualities; he took them to be extension (form, size, and position in space), movement, and impenetrability (solidity, mass). He called other qualities secondary and tertiary, and he thought of them as being entirely subjective, i.e. reducible to feelings caused by the action of things on the nervous system.

While Locke can still be considered a materialist without particular misuse of the term, it is much more difficult to apply that designation to *David Hume*, a later representative of English sensualism (1711–76). With Hume, the materialist substitution was well and truly blurred. All qualities of 'things' turned out to be subjective, and the very existence of things was the subject of faith – faith that was necessary and useful in practical life but had nothing in common with philosophical knowledge.

Like Locke, but more profoundly and more fully, Hume analysed individual psychical experience, which is what he thought experience in general boils down to. For Hume, everything that people are accustomed to consider reliably real and undoubted – the external world, space, and time – were only associations of subjective sensations and psychical images (such as various 'things') or associations of the subjective interconnectedness of those 'things' (such as space and time). Two points in Hume's investigation are interesting for our task: his critique of the human 'I' and his explanation of causation.

In his *Treatise of Human Nature*, Hume ironically refuted all philosophers who propose that human individuals are continually conscious of their 'I', as a special, continuous reality that is identical with themselves. He asserted that nothing like this can be found in experience. 'In regard to myself', he says, 'each time I deeply penetrate into my so-called "I", I find some separate psychical images or sensations of cold, heat, light, darkness, love, hatred, happiness, suffering, etc. But I am never able to detect my "I" apart from some feeling, and nothing that I observe in this way is anything other than a feeling'. Nor can one speak of the continuity of this 'I'. At times, in deep sleep for example, any 'I' completely disappears. Hume scoffed at metaphysicians who perceived a 'simple and continuous "I"' in themselves. 'I am personally certain', he said, 'that there is nothing like this in me. Excluding a few metaphysicians, one

can confidently assert regarding all other people that each of them is only a bundle or combination of various perceptions following one after another with incomprehensible speed, constantly changing and continuously moving'.

We know that for individualists the personal 'I', the owner of their experiences, is the centre of their thoughts, interests, and activities. The question arises: since Hume himself was an individualistic thinker and since he recognised only psychical, i.e. individual, experience, how could he dissolve and destroy this sacred 'I', by admitting that it is a philosophical illusion and replacing it with a bundle of perceptions?

This question is more easily answered if we analyse it in conjunction with another apparently just as mysterious question that arises out of Hume's analysis of causation.

Hume reduced the causal relationship to *the habitual succession of perceptions*. If perception A is followed many times by perception B in a person's experience, then a habitual associative connection is created between them that is so strong that, going forward, when one meets A one involuntarily expects B. This habit is expressed by calling A the cause, and B the consequence. Hume asserts that there is no kind of objective necessity in this correlation. It is merely habit and nothing more, and there is no absolute guarantee that in the future the pattern will not be violated. In practice, however, this happens so rarely and the relationship expected because of habit is sufficiently probable that it is quite adequate for everyday experience. Moreover, the conception that A *necessarily* entails B can in no way be proven and is no more than an illusion.

We have seen that, along with the individualism of exchange society, the idea of causal necessity, which originally expressed the power of social relationships over people, also developed and gained supremacy. But here we have a philosopher-individualist – an ideologue, in any event, of exchange society – who apparently forcefully resists this idea and undermines its cognitive credibility. How can such a paradox be explained?

David Hume was a leading and in many ways an extreme representative of the English bourgeoisie of his day. In his youth he attended a school dealing with commerce; as an adult he had a close relationship with the great economist Adam Smith – the living incarnation of the spirit of eighteenth-century industrial capital. Hume sensed the social atmosphere of developing capitalism more deeply and strongly than others, and this was distinctively reflected in his views. He was very familiar with how people were governed by harsh economic necessity. Hume was a youth when the great financial crisis associated with the speculation of his countryman, John Law, exploded in France. Before the industrial crises of the nineteenth century, this was the most vivid example of the instability of the economic fate of people living in bourgeois society – of their

dependence on elemental forces of the market that were incomprehensible and inaccessible to their knowledge. *The impossibility of confident prediction* is the lesson taught by catastrophes like this, which led to the ruin of many thousands of commodity producers. And the constant randomness of competition – raising some up and bringing others down – continues over time to corroborate that lesson. Anyone whose consciousness is especially struck by this side of capitalist life – who especially dwells on it – will inevitably be instilled with a tendency toward *scepticism*. So it was with Hume.

Causation is the *permanent interconnectedness of phenomena* which allows people to *predict* facts. Consequently, when society unconsciously creates for itself an idea of causation based on the pattern of economic necessity, it naturally cannot retain in its model of the causal relationship the element of unexpectedness that is characteristic of the fate – the conjuncture – of the market. But the individual creative work of a philosopher can turn out to be more one-sided and can more directly transfer what is oppressive in economic life to the general regularity of phenomena. The element of unreliability and unexpectedness enters the idea of causation, and therefore causation itself ceases to be causation. This is what happened with Hume, leading him to a sceptical conclusion.

In the usual model of causation, necessity – hidden behind occurrences – steadily and logically unwinds the chain of cause and effect. If at the first, second, third, and every other time, event A gives rise to event B, then every time A is repeated it entails B. For the sceptic, necessity – or, more accurately, the succession of events – retains the same irresistible, elementally fateful character, but loses the character of strict regularity. It no longer gives a certain confidence in the future that permits one to be prepared in advance. If A is followed several times by B, then 'by habit' one can expect that later on the same thing will happen, but there is no guarantee that one might not perhaps have to 'break oneself of the habit' of this habitual relationship. In other words, there can be no reliable reckoning of the future. All such calculations are more or less like market speculation, where regardless of any experience and skill there remains the possibility of unexpected disaster.

Naturally, in these circumstances one's own individual 'I' has nothing to be proud of. It is a mere plaything of events. Sceptics are not inclined to ascribe attributes to it such as simplicity, continuity, or identity that would elevate this 'I' above the fickle flow of events. Sceptics break the 'I' down into perceptions in exactly the same way that they treat the flow of all events. This also explains another apparent paradox of Hume's views. There is no betrayal of individualism in them. This is evident because he recognised the existence of only psychical, i.e. individual, experience. And, in that experience,

he recognised only the subjective connection of associations of sensations and psychical images – i.e. yet again a connection that is unique to the psychical individual. Materialists, after all, also break the individual person down into atoms, for example, and we know that this resulted from the application of a model that arose from individualism itself.

In any event, Hume's scepticism did not satisfy ordinary bourgeois consciousness; he did not generate any broad ideological movement or any significant school. It is more that he pushed bourgeois-philosophical thought forward than that he led it. Kant, himself, for example, admitted that Hume had a huge stimulating effect on him. In essence, Hume's ideas were related to materialism not so much in the immediate content of materialism, as in the results his ideas had in the ideological struggle of that era. Hume's criticism succeeded in destroying many remnants of the feudal-religious understanding of the world; scepticism went hand in hand with materialism against obsolete blind faith.

While examining the English materialists and sensualists, we have continually implied that they were representatives of bourgeois relations and the bourgeois worldview. No one has disputed this with regard to Hume, nor with regard to Locke – considering his liberal economic and political views (he was an adherent of free trade and a constitutionalist). But our literature has expressed a different opinion in relation to Hobbes, Bacon, and certain other English materialists of the seventeenth century. To be precise, there has been an attempt to exhibit them as ideologues of the English feudal aristocracy. Plekhanov has pointed out that in the seventeenth and early eighteenth century, materialism was widely popular among the English aristocracy, and he proposed to explain this fact with the following theory. In the English struggle for emancipation and revolution, the bourgeoisie marched under the religious banner of Puritanism, thereby developing an extreme form of external piety. Aristocrats, embittered against this piety by the defeat they suffered, fell into an anti-religious mood which led them to materialism. Materialism was simply a 'reaction' against the sanctimoniousness of the bourgeoisie.

This construction is absolutely mistaken. No social class can accept ideas that contradict its interests and means of thinking merely out of simple enmity toward another class. Moreover, it was inevitable that the feudal aristocracy, whose entire strength lay in authority and dominion, would incline toward religious forms of consciousness, and, since materialism undermines faith and piety, it would be directly disadvantageous. Actually, the feudal elements of English society marched under the banner of Catholicism or 'Papism', and it goes without saying that the religiosity of the Papists, manifesting the class enmity of the feudal nobility toward the bourgeoisie, stood in stark contradiction to Puritanism. At every opportunity, religious persecution from both sides

led to the most extreme cruelty. The bourgeoisie were so used to looking on papists as their eternal enemies that even down to the present day the constitutional monarch of England is required to take an anti-Catholic oath.

However, there remain facts that require explanation. Bacon was a lord and a supporter of absolute monarchy. Hobbes was a courtier and his main work, *Leviathan*, which presented a system of political philosophy, promoted the doctrine of unlimited state power. In the court of Charles II, the study of natural science was an indication of good breeding. Lords, bishops, and high magistrates set up laboratories. Lack of faith was not persecuted, and materialism flourished, albeit, for the most part, in a peculiar combination with Deism.[9]

It must first of all be pointed out that unlimited monarchy with an autocratic bureaucracy – the ideal of Hobbes and Bacon – was not a feudal institution in the least. Just the opposite, it was historically formed in the struggle against feudalism, and it expressed the needs of exchange society precisely as they existed in the stage of commercial capitalism. Feudal subdivision – with its extreme diversity and instability of legal relations, the impossibility of a unified monetary system, the countless seigniorial requisitions (time and again becoming outright theft), its never-ending wars, the absence of any adequate means of communication, and so on – was a huge obstacle to the development of the exchange of goods. Absolute monarchy eliminated that obstacle and was a welcome escape from feudal civil strife and confusion. This is why the petty bourgeoisie of the towns and the commercial capitalists supported it, and why, in turn, absolute monarchs, through their bureaucracy, patronised both commerce in general, and capital in particular. This was the first stage of bourgeois monarchy.

Hobbes's doctrine regarding unlimited power was therefore not feudal-aristocratic at all, but was bourgeois. Only it was not bourgeois in general, but corresponded to a particular point in the development of the bourgeoisie, exhibiting the tendency of any class to change with each stage of its life, depending on its historical context. Hobbes grounded his doctrine on *individualism* or personal egoism and not at all on the sanctity of authority. For him, the egoism of the ruler was the necessary means of restraining the egoism of the rest – otherwise, in Hobbes's opinion, people would not be able to live with one another. He was an ideologist of the bureaucracy that supported politically the interests of

9 The model of Deism is as follows. An all-powerful first cause created the material world, along with its natural laws. The world then lived on, entirely subordinate to these laws, without the interference of supernatural, nonmaterial forces. Bacon and Hobbes also adopted just such a model, despite its ambiguous or derisory reverence for official religion.

commercial capital. Hobbes's absolutist doctrine was not progressive for England – which had already crossed over into industrial capitalism and which required a constitutional bourgeois monarchy – but it suited the spirit of the times on the continent, and especially in France, where Hobbes lived when he wrote *Leviathan*.

That part of the aristocracy which was attracted to materialism at the time was in reality made up of either the highest bureaucracy or the powerful agrarian bourgeoisie. As Engels has shown, the majority of these aristocrats had quite a different origin from the old feudal lords who exterminated one another in the Wars of the Roses. The habits and desires of the new aristocrats 'were considerably more bourgeois than feudal: they knew the value of money well and quickly raised their rents, having ejected hundreds of small tenants and having replaced them with sheep'.[10] The interests of these wool merchants were very closely connected with the interests of the newly emerging textile manufacturers, and their materialism was just as typically bourgeois as any other.

Materialism in France blossomed in the eighteenth century and was the predecessor of the Great French Revolution. The bourgeoisie, both commercial and industrial, had become consolidated under the protection of the feudal-police state, whose patronage up until that time had been useful to it. But although it was seizing the leadership of the economic life of the country ever more fully, it had no political power and was unable to control the general direction of events. Moreover, the Old Regime was less and less able to cope with the growing economic needs of the country and became an obstacle to further development. The state brought the peasantry to ruin by excessive taxation, and, no longer supported by the bourgeoisie, it depended more and more on the remnants of the feudal class – the nobility and the clergy – all of whom defended their rights to the detriment of society as a whole. The bourgeoisie found it necessary to organise itself and to organise the people in a struggle against the old order. It united its forces under the banner of 'enlightened ideas', which essentially consisted in the slogans of individualism. They took freedom of the individual in economic, political, and intellectual activity as the goal of their struggle. In the realm of philosophy, materialism and doctrines related to it were symbols of ideological liberation from the prejudices and superstitions of the past, and it was therefore a powerful weapon of propaganda against the power of the clergy, the sanctity of the monarchical principle, and the inviolability of feudal privileges handed down from the past.

10 The reference is to Engels's introduction to *Socialism: Utopian and Scientific* [Trans.].

French materialism was put together under the powerful influence of English materialism, from which it borrowed its basic models and methods. It was a broad movement with many variations, from hylozoism to pure mechanistic atomism to sensualism and even to scepticism. Therefore, we will not stop to sort out the separate representatives of this movement but will only note its general historical characteristics.

The first and most important of these characteristics was its *systematising* character. This proceeded naturally from the social role which materialism had to play in France – from its educating and propagandising function. It was necessary to unite social forces under a new worldview. Since it was impossible to create a political organisation strong enough to struggle decisively against the feudal classes and the state machinery that supported them, it was necessary to create a huge, *ideological organisation* of the opposition and so to undermine the old worldview radically and completely. This meant that it was necessary to have a *system* – a complete and coherent worldview – which would be able to oppose on all fronts an authoritarian tradition that had been elaborated over centuries.

This systematising tendency was most fully expressed and embodied in two works – the *Great Encyclopaedia* and *The System of Nature*. The first of these was especially important. It was the collective work of a large group of leading thinkers of the era – with Denis Diderot and Jean-Baptiste d'Alembert, the editors of the work, at their head. It was in dictionary form, and it was named *The Encyclopaedia or Explanatory Dictionary of Sciences, Arts, and Industrial Knowledge*. It was made up of 35 large volumes, and it was published over the course of about thirty years (from 1752 to 1772, for the 28-volume encyclopaedia proper, to which seven more volumes of supplements and an index were added by 1780). The *Encyclopaedia* was a codex of bourgeois culture; it gave answers to all vital questions of the era – answers that were united around a profound commitment to individual liberty.

The editors and main collaborators were materialists, and the spirit of the scientific and philosophical essays of the *Encyclopaedia* corresponded to this. However, not only did the pressure of external conditions, and of the capitalist publisher, inevitably soften – so to say, 'censor' – its content, but also its construction in the form of a dictionary made it altogether insufficient and inadequate for providing a holistic account of a philosophical system proper. In this regard, the *Encyclopaedia* was supplemented by *The System of Nature* – a work that was also partly collective – which appeared illegally and under a false name in 1770. Baron d'Holbach was the main author, but Denis Diderot, Baron von Grimm, the mathematician Joseph-Louis Lagrange, and probably several others also participated. It provided a positive systematisation of materialism

and a merciless critique of the religious point of view, and it drew important socio-political conclusions regarding popular sovereignty and the people's right to revolution.

The colossal success of the *Encyclopaedia* and *The System of Nature*, even outside France, clearly shows how necessary these works were for their era, and what a huge objective organising role they played. The *Encyclopaedia* was the Bible of the bourgeois-liberating movement.

The second distinctive feature of French materialism was the revolutionary resoluteness of its anti-religious stance. Of course, the worldview of materialism was anti-religious in its very essence, but the earlier materialists in most cases tried to soften this aspect of their views by some kind of compromise. Since neither the Milesian school nor Democritus, apparently, come into conflict with the religious fanaticism of their times, we must therefore suppose that they circumscribed their doctrines with prudent reservations. Epicurus accepted the existence of gods, although he also asserted that they live in interstices in the world and were not interested in human affairs. He advised treating the gods as sacred only because of their perfection – obviously a cover for atheism. Lucretius, it is true, was especially critical of religious faith because of the fear, violence, and discord that it produces. But he did so under the cover of the same Epicurean ruse, and he even dedicated his poem to the goddess Venus. Some English materialists openly espoused Deism, and some, like Hobbes, hypocritically hid behind devotion to official religion, no matter what it was. A French materialist of the seventeenth century, Pierre Gassendi, managed to remain an orthodox Catholic priest while popularising Epicurus and making the public far more knowledgeable about his doctrine. Materialist-enlighteners of the eighteenth century behaved differently.

Julien de La Mettrie (1709–51), the oldest of them, expressed himself rather cautiously in his *Natural History of the Soul*, but in *Man – A Machine*, he defiantly derived atheistic conclusions from materialism. Diderot, D'Alembert, and Holbach were open proponents of atheism. And one cannot say that this was due to any particular radicalism in their philosophical point of view. There are sceptical nuances in their doctrines that under other conditions could have led the way to faith. Thus, *The System of Nature* held that the essence of matter is unknown and is not even knowable. All that is known are sensations generated by matter – the results of its actions on the organs of feeling. *In itself*, however, matter remains outside of cognition. Obviously, having situated matter in the realm of 'things-in-themselves' which it is impossible to know with any reliability, it is considerably easier to find a place for some kind of religiously tinged abstraction here than in strict atomism. This is what Immanuel Kant did under similar circumstances. For him, the unknowable 'things-in-themselves' turned

out to be an arena hospitable to faith, and, by means of practical reason, he brought the notion of God, the immortality of the soul, and free will into that arena. Once something can be accepted as being fundamentally inaccessible to experience, it can be accepted as something that is accessible only to faith, and then it becomes a matter of faith to define that something more precisely. However, *The System of Nature* and the majority of French materialists of that time decisively repudiated any religious interpretation of this point, thereby alienating themselves from the major thinkers associated with Deism – the more moderate people of intellect (like Voltaire) and the people of feeling (like Rousseau).

What caused the atheistic vehemence and intransigence of the French materialists? Their historical circumstances, of course. A bitter struggle was going on against the priesthood, the main support of the old regime. In the atmosphere of this struggle, the inclination for any compromises with religious faith disappeared.

The third feature of materialism of the eighteenth century – something characteristic, by the way, of the entire French Enlightenment of the time and, in part, even of its English teachers who had come before – was a distinctive understanding of the laws of social life. This understanding consisted in the idea that the social order must conform to the laws of human nature and that, as a result of this, a definite *natural order* of human life in society was possible. Members of the Enlightenment conceived of this in the form of a *free, individualistic organisation* which would not limit human individuals in their economic or intellectual activity or in their political self-determination. This organisation took the form of a liberal state which would not interfere in private life except for the necessary protection of life, freedom, and property of the citizens and in which their interests would be precisely reflected in political terms by means of representative government. In a word, 'the natural order' was none other than the same bourgeois-individualistic system toward which the liberation movement of that era was striving. It was supposed that this new social order would inevitably bring happiness to people and prosperity to society and put an end to poverty once and for all. Each person would consciously strive for individual betterment, and the betterment of all would result.

The reality of the era did not correspond to their ideal, and they explained this by *ignorance* and *delusion*. The vast majority of people, they felt, do not have an accurate conception of the laws of human nature. Proceeding from false ideas, they form their mutual relations erroneously, they bring in a large amount of unnecessary constraints that fetter life, and they expend their forces fruitlessly. The way out of such a situation consists in the knowledge of truth

and the dissemination of correct ideas which would put society on the path to natural order, on the path to happiness and prosperity.

These views contain a dual distortion of reality. First, human nature is conceived of as something absolute, unchanging, and not dependent on the social order, but just the opposite – as capable of entirely determining the social order by itself. In reality, human nature is determined by the social order, and, being dependent on it, is historically variable. Human nature was not the same for primeval people (who were unconscious communists, not knowing any governing power or inequality) as it was for members of a feudal commune (who were subject to the authority of priests and lords) or as it was for petty commodity producers (who were members of exchange society). Human nature is a socially developing nature. Second, the role of ideas in life was incorrectly understood. It was assumed that knowledge of truth can, in itself, become a force that transforms society. In reality, although ideas serve as organising forms of social being, they do not come from outside but are born within social being and as a product of social being. Ideas can therefore form and organise social transformations that have already begun, but they cannot, by themselves, cause them. So, the idea of a natural order, in the form in which the Enlightenment popularised it, indeed served to organise bourgeois individualism, but it was above all an expression of individualistic relationships that had already developed in certain classes in society.

On the basis of what has already been said, we in effect know why both human nature and the force of ideas were conceived in such a fetishistic and distorted way. Individualists are not conscious of their interconnectedness with the collective that they are factually a part of; they cannot comprehend either their own social nature or the social nature of ideas. Finding individualistic desires and needs in themselves and in others, they consider them to be qualities of a human being in general, of the individual in itself. Observing the real organising power of ideas – the expression of the social-labour and class life that is concentrated in them – they ascribe this power to truth in itself. What we see here is the same old fetishism of the absolute.

The further flourishing of materialism occurred, though less broadly and deeply, in the nineteenth century. Materialism flourished in Germany in the 1850s and 1860s, and with us in Russia, it brilliantly reverberated beginning at the end of the 1850s and ending in the 1870s, especially in the so-called 'nihilistic' movement. In this era, materialism – developing with unprecedented force and quickness – appeared as a philosophy of natural science.

The technology of machine production found its scientific expression in the huge successes of mechanics, physics, and chemistry. Progress in the development of the tools of labour was accompanied by progress in the methods of

supporting, preserving, and renewing labour power, as embodied in the human organism. This side of technology was expressed in successes in physiology and pathology. The utilisation of elements of animate nature in production also progressed – improvement in cattle breeding, agriculture, the acclimatisation of animals and plants, etc. This provided the foundation for rapid developments in all fields of biology. These victories over nature deeply impressed the public and captured their attention. Nature – as the world of resistances, as the *kingdom of matter* – appeared foremost in the thought of those people who were ever more closely and fully connected with the new technology, those who were predominantly in charge of it. This was the position of the bourgeois intelligentsia – engineers, doctors, scholarly specialists, etc. These social groups were strongly attracted toward materialism. Professing materialist philosophy was usually associated with the popularisation of natural science.

The physiologist *Pierre-Jean Cabanis* (1757–1808) can be considered as the intermediary link between the materialists of the eighteenth and nineteenth centuries. He applied the materialist substitution to what he declared to be the psychology of 'discharges of the brain'. He had a huge influence on later German representatives of materialism[11] and especially on the physiologist *Carl Christoph Fogt*.

Another scientist, Jacob Moleschott, at the same time as Fogt and following the same trend, also worked on the physiology of the brain. Ludwig Büchner undertook the systematisation of materialism, and his principal work, *Matter and Force*, had tremendous success and influence, not only in Germany, but probably even more so in Russia. These thinkers' ideas were not distinguished either by particular sophistication or strict consistency. One can find in them many deviations both toward sensualism and even more toward scepticism. Thus, Moleschott, in his *Circle of Life*, asserts that things do not exist otherwise than in their relations with other things, specifically to the sensations of the observer. This is relativism, which is inconsistent with strict atomism, for example, for which material atoms exist first and foremost as things-in-themselves. With Buchner one encounters suggestions that cognition cannot penetrate to the essence of things, etc. Nevertheless, the general tone of their works was not like this; it was full of energy, self-confidence, and scorn for old authorities.

11 At the same time, Cabanis himself was not a strict and consistent materialist. He was a proponent of vitalism, that is, the belief in a special power that governed life processes. In general, he tended toward pantheism.

In Russia, 'nihilism' produced such prominent popularisers as Nikolai Chernyshevsky and Dmitrii Pisarev. Many Russian scientists adhered to materialism, although only Sechenov, Timiriazev, and Stoletov[12] are worth remembering. But materialism did not remain forever a philosophy of natural science, and it also did not remain the typical worldview of the most progressive part of the bourgeoisie.

The new materialism was not a simple continuation of ancient materialism. Naturally it was composed under the influence of ancient materialism – but in different historical circumstances and subordinate to different social needs. Reflecting technological progress, the many and diverse victories over nature, and the never-ending discoveries and inventions of modern times, materialism attained a predominantly *methodological* character. It took its general point of view and its basic models from its ancient teachers and strove to apply all this to the tasks of further investigation.

Bacon was an ideal model in this regard. He understood the goal of knowledge in completely materialist terms – as the winning of power over nature – and from this he drew the conclusion that real knowledge must come entirely from real experience. He considered induction to be the only rational method for the study of nature – to ascend from the observation of separate facts to ever-broader generalisations. The significance of precise experiment was not clear to him, and this aspect of the new scientific method was developed by his contemporary Galileo. Nonetheless, Bacon provided a basically accurate description of that higher level of induction which we call the abstract-analytical method. The essence of this method is to establish the *tendencies* that underlie the study of facts in relation to their conditions; the formulation of the basic trend of a series of occurrences presents the *abstract law* that governs them. In order to establish this, it is necessary to simplify phenomena and to remove incidental, complicating tendencies from them along with those particular conditions on which they depend. In a precise experiment this is achieved by real, technological simplification of the investigative processes; where the experimental method cannot be applied, it is replaced by the intellectual abstraction of complicating elements, based on observation of those conditions in which they are apparent to a greater degree and those in which they are apparent to a lesser degree.

12 Ivan Mikhailovich Sechenov (1829–1905), 'father of Russian physiology;' Kliment Arkadievich Timiriazev (1843–1920), botanist and physiologist; Alexander Grigorievich Stoletov (1839–96), physicist and pioneer in electrical engineering [Trans.].

Bacon outlined precisely this approach to analysis in several Scholastic accounts as a way of finding 'formal causes'.

Bacon outlined a broad programme of inductive investigation into the most varied realms of experience, and, by the way, considered it both possible and necessary to apply the same methods to the knowledge of people and society.

Regarding Bacon's understanding of matter, it appeared to him in its concretely sensuous form, not lifelessly inert but full of inner activity – an understanding close to ancient hylozoism.

In many ways, the materialism of Hobbes is distinguished by its contrary one-sidedness. His entire methodology boiled down to mathematics – to geometrical construction and to computation. In this Hobbes expressed the spirit of that era when a new technology based on precise measurement and numerical computation was being born. The conditions of commercial ocean voyages, on the one hand, and the conditions of manufacturing, on the other, demanded precise instruments and rigorous but versatile techniques of calculation. The efforts of the best minds were focused in this direction, and Hobbes reflected this mood that pushed forward quite a number of scholarly mathematicians, physicists, and astronomers and gave birth to a series of revolutions in science. Striving for precision also provided the foundation for the very method of higher mathematics – the decomposition of magnitudes into infinitely small elements – first applied by Newton and Leibniz.

Hobbes's materialist substitution had an abstractly geometrical character; for him, bodies in themselves possessed only extension, form, and movement. Their other sensuous qualities were only feelings aroused in us by the movement of their particles. And these very feelings were also reducible to the movement of particles of our bodies. Hobbes's worldview was so geometrical that his bodies or particles – unlike the atoms of Democritus – did not even possess mass. For Hobbes, hardness, impenetrability, and weight were the only sensations.

Hobbes was a political writer, a defender of absolute monarchy with a subservient state religion – a point of view that corresponded to the demands of commercial capitalism in the early stages of its development. In essence, this philosophy was anti-religious, and it facilitated the development of atheism.

Locke's sensualism was associated with the development of the psychological method. For Locke, individual psychical experience was the only given. However, he supplemented it with a vaguely materialist substitution in the form of vaguely knowable 'substances'. He took the intrinsic or primary qualities of substances to be spatial form, movement, and mass. The inclusion of mass was the result of the great progress that had been made in physics, and

specifically the systematisation of mechanics by Newton. Locke reduced all other qualities of substances to sensations.

In his energetic struggle against the doctrine of innate ideas, Locke developed the point of view that the psyche originates as a 'tabula rasa' – like a clean sheet of paper on which nothing is yet written. The entire content of the psyche is acquired through external sensations and consists of, on the one hand, perceptions, and on the other, meditations that relate to those perceptions, i.e. reflections upon them, thinking about them, the processing of them. Elementary sensations and psychical images are grouped according to resemblance – first ideas of definite 'qualities' are formed, then stable combinations of 'qualities' give rise to ideas of 'substances', and so on. All such combinations, of various levels of complexity, are expressed by means of verbal signs and are registered in the consciousness in the form of ideas. Words are processed by logical operations, so that in order to think accurately it is necessary continually to study the changeable meaning of words. The study of reason must begin with the analysis of speech.

Hume, a more extreme sensualist who verged on scepticism, undertook a fuller and deeper investigation of psychical experience. Hume was 'agnostic' with regard to substances in general and matter in particular – i.e. he did not believe it was possible to know the qualities of substances as things-in-themselves. He took the existence of substances as a matter of faith, legitimate because it is a practical necessity. Hume's sceptical tendency was clearly expressed in the way he broke the individual 'I' down into a bundle of feelings and reduced the causal relationship to the habitual association of the consistent succession of facts. More keenly than other thinkers, Hume reflected in his philosophy the fundamental instability of the bourgeois world, the inherent unpredictability of its social phenomena, and the subjection of the people in it to the caprices of economic fate. This explains both his understanding of causality and his criticism of the metaphysical conception of the human 'I'.

The flourishing of English materialism in the seventeenth century was continued in the flourishing of French materialism of the eighteenth century where it was inextricably associated with the pre-revolutionary movement of the Enlightenment. This materialism was not notably original in its methods, but it was propagated to an unprecedented breadth. The most characteristic feature of French materialism was its systematising character that proceeded from the need for a solid and coherent ideological organisation of progressive forces and was incarnated in the *Great Encyclopaedia* and *The System of Nature*. Vehement anti-religiosity was another of its typical features, the result of an intensifying struggle against the clergy and old authorities. The social worldview of Enlightenment materialism was characterised by the idea of 'natural order',

understood as a free individualistic system, and by the faith that it could be realised through the dissemination of ideas. The first of these ideas was based on an abstractly fetishistic conception of human nature as absolute and independent of the social system; the second was based on the same fetishism in its conception of the role and power of ideas in life.

The last flourishing of materialism took place in the 1850s and 1860s in Germany and also in countries under its cultural influence. The basis of this ideological movement was the many successes of natural science, which, in turn, were based on rapid and multifaceted technological progress. Philosophically, it was far inferior to the French Enlightenment in both depth and originality. It was an ideological trend mainly among those members of the bourgeois intelligentsia who were most closely connected with progress in technology and the natural sciences.

CHAPTER 4

Empiriocriticism

The development of the materialist substitution in ancient and modern philosophy went through three completely analogous stages. In the beginning it had a living, concrete character, such as with the Milesian school and with Bacon. Then it was transformed into an inert, abstract form, as in ancient atomism and Hobbes's geometrism. Finally, it became vague and diffuse, as in Protagoras and Locke. In ancient philosophy, materialism could not advance further than this stage; in modern philosophy, that line of thought led to still another – a fourth – phase, in which substitution was represented as being completely eliminated but in fact continued to exist in a hidden form. This phase is modern empiricism.

We have seen that questions of method came to the forefront in the materialism of recent centuries, but these questions, in turn, were inseparably connected with the nature of substitution. Substitution was the basic method that logically determined the others – in effect, summing them up and unifying them. We know, for example, the extent to which the abstractly geometrical substitution of Hobbes was combined with his understanding of the methods of cognition. In general, if thinkers wish to see 'materiality' in phenomena, then this means that they want to study those phenomena by methods that are appropriate to 'matter' – i.e. external nature – mastered by human labour. In other words, they want to gain knowledge with the aid of positive scientific methods based on labour techniques, even though they, themselves, do not understand this relationship.

Modern empiricism intensifies the development of this tendency – the scientific, positive method of cognition – but strives to free it from the materialist substitution, which it considers a misrepresentation of experience. The point of view of modern empiricism is this: there is no material for cognition other than the data of experience, and the closer cognition holds to those data and the more exactly it describes the interconnectedness that exists among those data, the more completely it achieves its goal.

Thus, the concept of 'experience' is central here. But it is significantly different from what we found among the sensualists. For the contemporary empiricist, experience definitely does not boil down to individual sensations and psychical images; modern empiricism decisively rejects such a subjective, purely individualistic understanding as being a distortion of actual experience as it is 'immediately given' to the cognising subject. What exactly should we

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understand by 'immediately given'? *Both things and sensations* – both of them together – form the system of experience; both of them are equally the material for cognition.

Let us take as typical the characterisation of experience that *Richard Avenarius*, the greatest systematiser of contemporary empiricism, takes as a starting point.

Before you philosophise, asserts Avenarius, you already have the material *upon which* you philosophise – a collection of primary data on which you operate. You find yourself in a specific environment that consists of various items including both other people and things. You find that in addition to your own sensations, strivings, feelings, and *utterances*, there are also other people who make utterances of their own, and you *understand* these utterances as they relate to the various parts of that same environment. For example, when another person says 'the sun came up', you understand this to mean that one part of the environment – the 'sun' – appears in a specific connection with other parts – the part it moves across and the various objects that it illuminates. This means that the environment you are in is shared with other people *in common*, otherwise their utterances would not have applied to it. According to Avenarius's 'first axiom of empiriocriticism', the content of experience begins with this, and this is the primary conception that people have about the world.

What is further made with this conception? In the process of elaborating more worldviews, it is transformed. To be specific, something is added to or subtracted from its content. A materialist conception of the world is created by adding the features of 'materiality' that pertain to the 'environment, or the physical side of experience, to the entire psychical side of experience. Contrariwise, the view of the world as the totality of 'conceptions' was arrived at by intellectually removing the physical or material qualities from that same 'environment', etc.

What then is the task of cognition with regard to the system of experience that confronts us? It is a task of *orientation* in it with the least possible labour and with the greatest possible completeness and precision. Such an orientation is necessary for the successful attainment of all *practical goals*. Cognition may be acknowledged as 'true' precisely to the extent that it provides a useful orientation in practice. This is what its *practical* nature consists in. And at the same time it is essential – if its application is to be successful – that it be as simple as possible and as 'economical' as possible, in the sense of the expenditure of energy in assimilating it. The 'truer' the orientation is, the easier it is to master it. This is what the *economical* nature of cognition consists in[1]

1 In this expression, the word 'economical' is obviously used not in the sense of political economy, but in the sense of simple thrift.

in the expression of another leader of contemporary empiricism, the physiologist and physicist, *Ernst Mach*.

How does this cognitive orientation occur? By breaking down the system of experience into its constituent parts and explaining their mutual interrelatedness. This is how everyday thinking operates; this is how scientific thinking operates. There is, in general, no difference between the two except that scientific thinking embraces experience that is more extensive and packages it into models that are more precise and are of greater practical use. Scientific thinking develops out of everyday thinking, on the one hand, by cleansing it of contradictions and 'fabrications' and, on the other hand, by systematising it.

The 'fabrications' of everyday cognition include all kinds of misrepresentations of experience, adding to it something that is not given in it. This includes the products of phantasy – forms of superstition, arbitrary hypotheses, and so on, for example – approximately the same as Bacon's 'idols'. It is necessary resolutely to remove them, in order to make a *critique of experience*. It was from this critique of experience that Avenarius's school of thought obtained its name – 'empirio-criticism' ('empirio' = experience).

Thus, cognition must take the world of experience as it is in reality, as it is given to people in their observations, and as it emerges from their critically verified utterances. Cognition must break experience down into its simplest parts, into 'elements', and determine the interconnectedness of these elements.

The environment or 'physical experience' contains various *bodies*. If we begin to examine any of these bodies more closely, we will find that it is a complicated 'complex', i.e. the combining, the intertwinement, of certain *properties*. Consider, for example, a tree of one kind or another. It possesses a certain *spatial form*, more or less complex, with various *colours, smells*, and *hardness* in its various parts, at a specific *temperature*. When there is wind or a storm, the tree seems to be the source of *sounds* – rustling, clicking, etc. Each of these qualities can be broken down further but only to a certain limit at which our analysis stops. So the form of the tree can be broken into the minimal spatial elements that we are capable of distinguishing. We break its colour down into the simplest elements of green, brown, grey, and so on. Further, and in the same way, the elements that are hard, soft, warm, or cold, the elements of sound and tone, etc. follow. It is impossible to specify an absolute limit to analysis. Things that seem simple and indivisible on one level of cognition can appear complex on a higher level. For example, the development of the science of acoustics allows the use of resonators to decompose various 'noises' into simple, pure tones, and after the invention of microscopes spatial elements are far different from how they were before. But at any given time there is a factual boundary beyond which the human capacity for discrimination

cannot go. It is at this boundary that the *elements of experience* lie. Every body presents a complex of such elements.

Now let us analyse any part of psychical experience – any perception or psychical image, the perception of the same 'tree' just mentioned, let us say. A tree is a body, but to you or me the perception of it is a psychical fact. The perception breaks down into *elementary sensations*. What sensations appear here? Spatial form, colour, hardness and softness, warmth and cold, smell, etc. We see that they are the same elements that we found in the physical complex of 'tree'. What appears as a sensory element in one case is called an elementary sensation in the other. Does this mean that the body and the perception of the body are the same thing? Not at all. The elements are the same, but their *interconnectedness* is different.

We have arrived at another phase of investigation – at the question of how the elements in physical and psychical complexes are connected to one another. The difference is very easy to grasp if we take into account our own relationship to the complex being investigated. Let us suppose that you turn your back to the tree. What has become of your *perception* of the tree? It has disappeared. And the tree itself, the physical body? It, of course, did not disappear and remained in its previous place, as anyone can easily be convinced of, and as you, yourself, even if you do not turn around, can learn from the utterances of other people who continue to see it. By the same token, the *psychical image* of the tree, the psychical remains of perception that are preserved in the memory can appear and then disappear from consciousness, while the tree – the physical body – does not undergo any sort of change.

What is the essence of the difference? The tree – as a body – changes only in the event that it is acted on by other physical complexes, i.e. *in interconnectedness and correlation* with them. It bends if a strong wind blows, it withers if there is no moisture in the air and soil, it falls if the axe of a woodcutter cuts through its trunk, it disappears into a pile of ashes if it is engulfed by fire, etc. The perception of the tree changes under other conditions, which lie in *the nervous system* of the observer. As soon as light reflected by the surface of the tree ceases to stimulate the retina – the terminal apparatus of the optic nerve – visual perception comes to a stop. If the optic nerve is cut through, it disappears forever. If the nervous system is poisoned with santonin, all visual perceptions will be transformed, taking on a yellow hue. When the nervous system is severely exhausted, psychical images can attain the vividness of hallucinations. Under the mild intoxication of narcotic toxins, psychical images can also become just as vivid as perceptions; under stronger intoxication, they disappear in deep sleep.

Thus, psychical complexes are characterised by their *dependence on the status of the nervous system of the individual*, while physical complexes *lack such dependence*. In the view of Mach, the complex of a 'body' and the complex of a 'perception' or 'psychical image' of that body are *identical* except for the nature of their interconnectedness and correlations in experience. The exact same elements of experience are taken as 'sensations' when they are dependent on the nervous system and are taken as having a physical nature when considered in their 'independent' or objective connection in their correlation with elements of their environment. In short, 'physical' and 'psychical' are nothing more than two forms of the interconnectedness of experience and not two forms of content of experience.

Here we see a fundamental divergence of the empiriocritics from the earlier sensualists. The sensualists accepted not two but only one form of interconnectedness of experience – psychical, to be precise – which, of course, they did not identify as being dependent on the nervous system but that they took simply as the interconnectedness of associations of sensations. For them, therefore, all elements of experience were only 'sensations', a term that is purely psychological. In the literature on the subject in Russia, certain supporters of materialism – Plekhanov, Ortodoks,[2] Lenin – consistently attribute just this point of view to the empiriocritics, asserting that the words 'elements of experience' signify nothing other than sensations. This is a gross misunderstanding, which, to be truthful, has its causes, and we will explain them later. For Mach and the empiriocritics, of course, elements of experience possess a *sensuous* character, but they accept the sensuous world as genuine reality, and by no means as sensations and psychical images produced in us by the actions of 'things-in-themselves'. A body is a sensuous body and nothing else, and therefore its elements are also sensuous; a tree in fact possesses green, brown, and grey colours, hardness, odour, etc., independently of whether we 'sense' them or not. It is only when the individual 'senses' all these things that those elements also become 'sensations' *for that individual*.

Many people are confused by the very expression 'experience', which the great majority of philosophers before now understood in the *individualistic* meaning of the term. They considered that 'experience' lies entirely within the confines of private consciousness – that it boils down to psychical experiences, to subjective 'psychical images'. But this is precisely what the empiriocritics deny. They say that experience includes both things and psychical images.

2 The pseudonym of Liubov Axelrod (1868–1946), a Menshevik and close associate of Plekhanov [Trans.].

Experience is everything that cognition has to do with, and cognition has things as its object even before it begins to distinguish psychical images from things. Another term habitually employed by the empiriocritics that confuses many people is 'experiences',[3] when it is applied both to physical experience and to bodies. Our home-grown materialists think that 'experiences' means sensations, but in fact it does not mean that at all. *'Erlebnisse'*, or 'experiences', expresses exactly the same thing as *'Erfahrung'*, or 'experience'. Bodies are 'experiences' in the sense that a person stands in a living relationship to them. For example, one knows them, relates to them in their 'environment', etc., i.e. exactly in the sense that they enter into one's own experience and no more. But since they enter simultaneously into the experience of other people, they are not at all merely their personal experiences. They are not sensations or psychical images but are genuine, real things.

Such an understanding of experience can be called *realistic*; and if we take into account that this experience is not possessed by a separate person, then a more precise term would be 'impersonally realistic'. It represents the basic characteristic of empiriocriticism, and at the same time it *approximately* corresponds to what has been, to this point, the most usual understanding of experience. Professional philosophers call it 'naïve realism' and consider it to be un-philosophical.

Only professional philosophers – and, moreover, only within the confines of their professional works – are capable of arguing that experience is nothing more than personal sensation, that the world is an individual's psychical image, and so on. In practice, however, even the most extreme individualists accept things as things and not as psychical facts; they admit that they are precisely the way they sensuously apprehend them and not a mystery hidden somewhere 'in themselves' underneath the surface of phenomena. In real-life relationships with other people and nature, every philosopher takes exactly this position, since it is impossible to do otherwise. No matter how narrow the practical activity, it involves real resistances – the objective, not subjective interconnectedness and regularity of the surroundings. Quite a number of

3 As explained in the introduction, English uses the same word, 'experience', to translate the Russian *perezhivanie* [*Erlebnis* in German], which can mean a single event in a person's life or a single event of consciousness, and the Russian *opyt* [*Erfahrung* in German], which refers to the totality of a person's conscious past. In most cases in this book, the distinction is obvious from the context (mostly because the first usage is *almost* always in the plural and the second usage is *always* in the singular). In this paragraph, Bogdanov uses *perezhivanie* in the singular, but I have made it plural (despite the awkwardness) to clarify the distinction that Bogdanov is making [Trans.].

philosophical schools reduce all experience, in theory, to sensations and psychical images. This includes Kantians, most idealists, sensualists, a great number of materialists who are close to the sensualists, etc. They are all committed to a characteristic 'double-entry bookkeeping' – accepting 'naïve realism' as sensible and consistent in practice, while considering it wrong in theory. This is possible for them by virtue of that fetishism which attributes existence to truth independent of practice. But the contemporary empirical school strives to eliminate this duality, to bring philosophical thought back to the realism – the living experience – from which it has been torn.

However, the point is not the simple restoration of primitive faith in the entire sensuous material of experience. One must admit that criticism is required here. Much that our distant predecessors considered to be the most authentic and obvious reality, we call illusion, myth, fiction, etc. What seem to be 'bodies' in dreams and in hallucinations subsequently turn out to lack any physical qualities. However, does this mean that experience itself contains something that is false, a lie? Mach and the empiriocritics answer 'no': experience always is experience, and, as such, presents no delusion of any kind. The point is only in the interpretation, the understanding of the interconnectedness of experience. What I see in a dream is also reality – but a psychical and not a physical reality. The point of criticism is to reveal what kind of interconnectedness of elements is involved, objective or subjective. Someone who takes forms in a dream to be physical complexes is deluded; someone who sees it simply as a dream is not. The same principle also applies to incidental or conventional illusions and to traditional religious beliefs. A mirage is a physical complex, but only of a purely optical character, like depictions obtained from mirrors and lenses. If someone takes a mirage as pure hallucination, as the result of a morbid condition of the brain, then that person is mistaken. But someone who consciously associated the elements of form and colour observed in a mirage with elements of hardness, flavour, etc., would also be mistaken. A woods goblin – as a product of popular creativity, as an expression of emotion evoked in an uncultured person in a forest environment – is real, but not real as a particular zoological species. The criticism of experience does not need to throw out anything from the content of experience; it must simply present it in its actual and precise interconnectedness.

The task of cognition consists, therefore, in correctly stating and describing the interconnectedness among given elements and complexes without misrepresentation, neither adding anything nor subtracting anything. This is the task of *pure description*, and it is the foundation of the doctrine of method developed by Mach and the empiriocritics.

The majority of scientists and thinkers, in investigating facts, strive to *explain* them. The empiriocritics consider this striving to be mistaken. Phenomena are known, they say, when their interconnectedness and dependence are found and accurately indicated; in this way, 'clarity' is achieved in relation to them, and no other 'explanation' is – and cannot be – required. When people seek something else – something greater – from cognition, then they set off on a false path. They inevitably bring an element of arbitrariness into their construction, a misrepresentation of the real data of experience. And, in any event, they clutter up knowledge with unnecessary 'inventions' and useless hypotheses. An example of this is the idea of causation, which empiriocriticism subjects to the most decisive critique. The essence of their critique is as follows.

People are accustomed to think that the relationship of cause and effect is more understandable than any other relationship, and that it therefore 'explains' facts to the greatest possible degree. But what exactly is the causal relationship? If we determine all the conditions in which a given phenomenon occurs, then we recognise its dependence on other phenomena. This, however, is still not 'causation', but a simple description of the interconnectedness of facts. When we say that heat develops when there is friction of two pieces of wood, we assert an unarguable, repeatedly observed consistent sequence of data of experience. But, in addition, we usually think that the friction 'brings about' or 'causes' the heating of the pieces of wood. But here we have something different, something that we add to the facts that exist. Indeed, we have adopted a conception from a completely different realm. Due to habit, what seems most 'understandable' to people is the connection between an act of will and the action that follows it. That is the basis of the idea of causality, in the opinion of the empiriocritics. When one phenomenon is thought to be the cause of another, then the first phenomenon is conceived as bringing about the second phenomenon in the same way that our will brings about a movement of our body. In reality, this correlation does not exist. It is brought into experience by our imagination, and it must be rejected like any other anthropomorphism. In order to remain within the bounds of experience and make a pure description of it, it is necessary to discover the connection between conditions and what is conditioned. This connection, however, is not to be understood in the sense of 'causation'.

All forms of interconnectedness in experience can be reduced to one type – 'functional dependence', to be precise. Its model is this: if *A* is present, then *B* occurs. *A* can signify a series of circumstances, while *B* signifies what results from these conditions, i.e. what follows them. This is the 'functional relationship of succession'. For example, when two bodies strike one another, they become warmer. This is precisely the sort of dependence that is usually con-

sidered causal. *A* and *B* could be strictly simultaneous and parallel. For example, a certain condition of the brain can occur simultaneously with the psychological process with which it correlates. Here we have the 'functional relationship of simultaneity'. All these correlations, once they are precisely established and expressed, must be considered identically understandable and clear, and no further 'explanation' is necessary. On the contrary, the desire to 'explain' them only complicates and obscures them by additions which do not come from experience and which lead to groundless suppositions and mistaken analogies. So, causation is a mistaken analogy, an anthropomorphism. It is a 'thing-in-itself', lying beyond the realm of experience; it is a groundless, fruitless supposition.

In the critique of causality, we should particularly keep in mind the interesting fact that causality has its origin and model in a practical, living correlation, although the attempt to discover and to determine precisely what that correlation is has not been entirely successful.

Empiriocritics seek the model of causality in the separate individual; but in reality, as we have seen, it must be sought in social relationships. The connection between the act of will and the movement of muscles – as it is conceived in everyday consciousness – is itself a particular case of *authoritarian causality*. To be precise, it is a correlation between the soul and the body, which is an example of authoritarian social collaboration and which is copied from a well-known social formation. Obviously, the empiriocritics' analysis is both imprecise and incomplete.

Avenarius's critique of 'introjection' was carried out specifically to remove false analogies and hypotheses from the system of experience. 'Introjection', i.e. 'insertion into', is the means by which everyday consciousness imagines the relation of body and soul, imagining the psyche – with all its perceptions, psychical images, wishes, etc. – as being located *inside* the body. In the opinion of Avenarius, however, this is a fundamental mistake from which quite a number of distortions of experience flow.

When we observe the utterances of other people, we ascribe corresponding sensations, feelings, and hopes to them. This is proper and necessary, since without it we would not be able to orient ourselves in the system of experience – and specifically in our mutual relationships with other people. But when human thought situates the stated facts of consciousness inside the body, it thereby brings into experience something that is absolutely not in it and never will be. No matter what method is used to investigate the human body, we shall always find organs, tissues, nerves, etc., but never any kind of sensations or psychical images. This is an incontestable fact. The physical world, to which the bodies of human beings belong, is a continuous whole. All its complexes are

only physical; there is no place for psychical complexes. Psychical complexes lie *in a different field* of experience, or, what is the same thing, in a different regularity. Accordingly, introjection is a logical error, the confusion of different sorts of interconnectedness of experience. In its development from primitive forms – such as naïve animism – to extremely complex and subtle forms – such as philosophical idealism – introjection has given birth to a multitude of other delusions of a more particular character that complicate and confuse the picture of experience. The task of scientific-philosophical criticism is to struggle with this and progressively to remove all of its ramifications. The result must be to obtain a correct idea of the world, cleansed of 'foreknowledge'.

In general, the picture of the world that the empiriocritics present is this: There is an eternal, continuous fabric of elements that form various complexes in various changing mutual interconnectedness. Within this fabric there can be distinguished complexes that are more coherent and richer in content – human individuals. Other complexes appear with them in varied correlations and each network of correlations like these is an individual system of experience. The centre of each network is the nervous system of the individual (system *c*, according to Avenarius – that part of the brain with which consciousness is connected). The development of any individual network of experience boils down to the adaptation of the central member to the whole – i.e. to the environment. In regard to all other complexes in this fabric, to the extent that they are taken in their interconnectedness independently of the central apparatus, they form physical experience, and, to the extent that they are taken to be dependent on this apparatus, they form psychical experience, 'consciousness'. Thanks to the utterances of individuals, an interconnectedness is created among such separate systems of experience, and a general idea arises among people of a *world* that embraces and contains all of them as parts of a whole.

Let us now critically investigate this worldview and the methods on which it is based.

On the surface, it is completely free of both the materialist substitution and the idealist substitution. It is altogether hostile to substitution, except for the necessary case when the question at hand involves the utterances of living organisms – cries, words, gestures, etc. It considers every other substitution in philosophical and scientific theories to be mistaken in principle, because substitution always signifies an attempt to *explain* one or another fact, when what in reality is useful and necessary is only the pure description of facts. For example, for precise knowledge there is no need to understand that light is a wave-like movement of ether; it is sufficient to assert that certain mathematical formulas can be applied to the phenomenon of light which are consistent with

formulas that could be inferred by a mechanic for the transmission of vibrations in solid, elastic bodies. This gives us a practical orientation toward the phenomenon of light, and nothing more is needed. It is particularly un-useful and mistaken to take psychical processes to be movements of particles of the brain – their chemical and electrical changes, and so on. All this does is add a fruitless analogy to the data of experience; it does not provide any kind of real knowledge – i.e. it does not provide any kind of practical-reasonable orientation toward actual facts.

But here is one of the foundational propositions of the school: psychical complexes are characterised by their dependence on the condition of the nervous system. If this proposition is true, then it contains a worthwhile practical orientation. What kind of orientation precisely? The idea that in order systematically to change psychical complexes, it is necessary to influence the state of the nervous system in a corresponding manner, and this, moreover, is the sole path towards that goal: it is impossible to change *dependent* facts without also changing what is dependent on them. By the same token, precise cognition of a 'dependent (or psychical) series' is made possible only by a study of the 'independent (nervous-physiological) series'. It is precisely upon this idea that Avenarius constructed his entire *Critique of Pure Experience*. But in what way is such a point of view distinguished from the materialist substitution? It is obvious that the only difference is in the form of expression and no more.

As a matter of fact, when materialists assert that psychical facts are *essentially* nothing other than nervous processes, what does such an expression mean? It means that the solution to the secret of the psyche and the means of mastering it lie in nervous processes – that the successful cognition of the psyche is possible only by means of the substitution of neural-physiological phenomena for the facts of consciousness. Empiriocritics say and do just the same thing when they propose that a dependent series can be known by means of an independent series. They only avoid using the term 'essence'. That term, it is true, is metaphysical and vague, and it is appropriate to get rid of it. However, in practical terms, the substitution remains in the analysis of experience as it did before; it remains in the very *method* of studying the psyche – and method is 'the essence' of scientific and philosophical theories.

Moreover, this is a materialist substitution of the purest and most definitive type. We saw that among modern materialists the idea of matter began to become diffuse and began to lose its sensuous character, turning little by little into a murky abstraction. Empiriocritics, though rejecting the word, restored its meaning, which is precisely this: physical complexes as they are given in experience.

Thus we are completely justified in viewing empiriocriticism as a continuation of materialism. The new school preserved and confirmed in its method the same substitution on which the old school based its 'explanation' of the world.

But the new school, as we know, rejects the very idea of any 'explanation' whatsoever; it wants only to *describe* facts and their interconnectedness. Did it in fact succeed at this? Is this at all possible? Is it possible for an exact science itself to get by without 'explanations' which are always based, as we know, on some kind of substitution?

Let us take any abstract law – even Newton's law of universal gravitation – and see how it applies to the facts of experience. He says that any two material bodies are attracted to one another with an acceleration that depends on their mass and the distance between them. When the law is applied to bodies that are freely falling and that are sufficiently heavy, it can be accepted as a 'description' of facts that is approximately true, at any rate. But here, for example, is how that law applies to clouds. The droplets of water that make up a cloud are so small that they cannot individually be seen with the naked eye. They fall *without any acceleration*, with *uniform* speed, and quite slowly – their speed is measured in centimetres per minute. What has this to do with the law of acceleration? Science accepts that the law remains in force and the droplets actually do accelerate toward the centre of the earth, but resistance first decreases that acceleration and then, at a certain point, eliminates it completely. Can it be said that such a model 'describes' the facts of experience? Of course not. In *experience* – in its immediately given facts – there is no acceleration at all, and no one could ever see it. Acceleration is *substituted for* the existent movement as a hidden tendency: the result is that the phenomenon is *explained* and not just simply described.

When Newton's model is applied to heavenly bodies, it is even less similar to a description of them. His model is applied in this form: the earth and the planets continually fall toward the sun, and the sun falls toward them, without them getting any closer to one another. The idea of 'falling', just like the idea of 'acceleration', is taken, no doubt, from living experience, and includes in itself the idea of the *real approach* of one body to another. But if the ideas are applied where there is no real approach, then the logical law of identity is violated: 'falling occurs without falling and acceleration occurs without acceleration'. And, as we have already seen, logical principles are violated precisely in those cases where substitution is employed for explaining facts. With simple description, of course, they are not violated.

In the present case, the movement of the planets is broken down into two movements – one heading directly toward the centre of the sun, and the other

heading laterally. It is accepted that together or 'in sum' they form an indirect, curved movement of planets in an orbit. But it is clear that – from a logical point of view – the two different lines are two straight lines and not one circular line. If it is accepted that they are the same thing, then the substitution is obvious. And the science of mechanics is based precisely on this substitution of 'integrating' and 'dis-integrating' movements.

The same situation absolutely applies to any abstract law and consequently to any advanced science; *explanation* and not description is the highest task of science.

Advocates of pure description attempt to remove substitution and to impart a literally descriptive form to abstract scientific models. For example: 'planets move around the sun *as if* they were executing two independent movements – one of them moving toward the sun and the other perpendicular to the first'. But this is just a scholastic subterfuge; it does not change the facts. There is no such thing as 'as if' in experience; there are only individual, real phenomena. Since it is impossible to find either the real falling of a planet into the sun or movement in a completely perpendicular, lateral direction from it, then it is impossible to 'describe' those movements: one can only bring them into cognition as an explanatory substitution.

Mach's and the empiriocritics' rejection of causality appears to be imaginary to the same degree. Their refutation relates only to one of the historically appearing forms of the causal relationship – the authoritarian form – and even then, as we have seen, it is not understood with complete accuracy. Their refutation did not include causality in all its historical development, which even now is far from being completed. More than that: in reality, the empiriocritics accept causality in its strict, contemporary sense, although not in its most perfected form. They only call it by another name.

They propose that the 'functional relationship between conditions and what is conditioned' is fundamentally different from the causal relationship. Avoiding any fetishism, they do not go beyond a simple description of the facts. In their opinion, when we state that in the presence of certain conditions – gunpowder and a spark, for example – there ensues what is conditioned – an explosion – we have not in any way gone beyond what is given in experience; we add nothing to experience. Instead of the fetishistic question 'why?', we state the strictly scientific question: '*how* do the facts occur?', and we answer it scientifically.

But this last formulation already shows that what is mainly at issue is the meaning of words, and the questions 'why?' and 'how?' can be equally suitable for understanding the interconnectedness of any phenomena you like. If we would speak not of one but of both interrelated facts – or of a whole chain

of conditions and consequences – then the appropriate question would be 'how?' *How* did the events occur? There was some gunpowder, a spark came into physical proximity to it, there followed a series of rapid chemical reactions. If our interest is focused on the explosion itself, then we would ask *why* did it occur? And as empiriocritics we would answer: because both of its conditions – gunpowder and a spark – came together.

It would consequently seem necessary to insist on a new understanding of causality, cleansed of fetishism. But this would be an exaggeration.

Empiriocritics accept that the relationship between conditions and what is conditioned is that they are *synonymous*. The expression comes from Petzholdt,[4] one of their most important representatives. It signifies that under specified conditions the consequences are fully determined and cannot be otherwise. But do we not express the same thing, in more usual words, if we say that conditions *necessarily* bring their consequences after them? But this would be the model of causality-necessity.

Let us take the relationship of conditionality on a universal scale. The following is obtained. Some events follow others and are fully determined by them, and the world process cannot be other than it is; it must be exactly as we observe it. This is a familiar picture: universal necessity unwinds a chain of phenomena, successively bringing forward conditions which are followed by their consequences and then the consequences of their consequences, and so on without beginning and without end. It is obvious that the functional relationship of conditionality is precisely abstract causality, only in a moderated form.

And it is easy to see that regardless of this moderation, something is being added to experience that is not in it. The idea of 'synonymous dependence' includes *confidence* in the immutable character of the relationship – in the idea that once the conditions exist, then what is conditioned inevitably ensues. But in experience, if we keep strictly to what is 'given' to us, we do not find any guarantee of confidence like this, especially if we keep in mind that the exact repetition of all conditions never happens. In this case, Hume – proposing, as he does, that it is only habitual and based on a certain number of approximate repetitions – is closer than the empiriocritics to a 'pure description' of the relationship between conditions and consequences. Belief in the immutably regular procession of phenomena – the basic characteristic of causal necessity – is unquestionably an addition to what is 'immediately given' in experience.

4 Alexander Petzholdt (1810–89), a German chemist [Trans.].

Thus, despite the sincere desire of the school of empiriocriticism both to remove from cognition any explanation of facts and to throw out the idea of causality, neither the one nor the other is in reality carried out. Nor *can* they be carried out at the present stage of development of scientific thought.

The idea of pure description turns out, first and foremost, to be a utopia. The essence of this utopia is that it expresses a passive – as Marx would say, 'contemplative' – relationship to experience. Cognition *organises* experience, while pure description wants only slavishly to subordinate itself to experience, to reflect it. In organising any kind of material into a coherent whole, the material cannot but be changed to a certain extent. The same is true of experience. Cognition must appropriately transform and supplement it; otherwise it could never master it. Truth is not at all a simple copy of facts; it is not a trivially exact portrait of them. Rather truth is a tool for mastering the facts. That is why, for example, the law of gravity can be a great truth, even though in nature there probably does not occur a single movement that *completely* conforms to Newton's model. In exactly the same way, not one chemical formula appears as a pure copy of any really occurring chemical reaction. In general, not one abstraction of cognition is any kind of *concrete* reality.

In order to be clear, we must turn our attention to the characteristic duality of the views of empiriocriticism regarding experience and cognition. As far as *cognition* is concerned, empiriocriticism relates to experience passively and contemplatively, but at the same time it recognises and emphatically emphasises the *practical role* that cognition plays in life. It considers cognition as practical adaptation – as a tool for labour goals – and quite properly proposes that the *truth* of cognition consists in its practical usefulness. So, Mach repeatedly points out that cognition even proceeds from the needs of labour; in one place he says outright that it proceeds from 'technology'. But all this concerns the *application* and not the *method* of cognition. Cognition must serve human activity, but it does not itself need actively to operate with its material. Cognition does not need to change the material that it knows, and it limits itself to only description – 'recording', 'classification' in the words of the Marxist Dietzgen,[5] taking the point of view of Mach's school in regard to this one question. For empiriocritics, the task of investigation is 'orientation' in the system of experience – i.e. the elucidation of where something is located and what it is connected with.

In reality, scientific thought is an organiser which frequently connects things and facts that originally could not have been more separate in experience. For

5 Joseph Dietzgen (1828–88), a German working-class, self-educated philosopher [Trans.].

example, nebulas, which are so very distant from us in space, and the origin of the solar system, which is so very distant from us in time, were brought together in one brilliant picture by the Kant-Laplace[6] theory of the birth of worlds. And it was corroborated by juxtaposing the rings of Saturn with the rings obtained in Joseph Plateau's[7] experiment regarding the rotation of liquid in conditions of weightlessness. If this is 'description' or 'recording', then it is hard to conceive of a worse performance of such operations.

True, constructions like these are not in the least repudiated by contemporary empiricism. It tolerates them in the form of so-called 'heuristic constructions' – that is, constructions which serve to discover interconnectedness in experience. So the theory of the origin of the sun and planets from a nebula is a construction by means of which the interconnectedness of the various forms of heavenly bodies, their movements and transformations, can be conveniently represented. But then one inevitably obtains one of two possibilities. The first possibility is that our 'construction' is genuine, true, and enjoys full rights, so to say, to be considered *knowledge*. And since it is not merely a simple description of astronomical forms and processes, then it must be accepted as an *explanation* of them as proposed by the makers of the theory themselves. Then the substitution is also legitimate since the theory is based on it – in place of the forms and relationships of heavenly bodies that exist in experience are substituted long processes of development with considerably more complex and rich content and with a multitude of stages, quite unlike the immediately observed condition of these or other celestial bodies. The other possibility is that the entire construction is only a fiction, *imaginary* and not genuine knowledge. The substitution then remains, but as a subordinate tool for 'description' proper. In so doing, it takes on a new form, which is approximately the following: 'the sun, earth, and planets present such correlations, *as if* they were formed from a planetary nebula, *as if* that nebula appeared according to such and such a process, *as if* it arrived at such and such a rotation, *as if* it were subject to such and such a transformation, *as if* it broke up into such and such parts, and so on and so on'. In a word, it is a systematic 'description' of something which supposedly does not exist at all – a strange caricature of a great theory.

The principle of pure description has in mind *economy* of thought: in order to embrace experience with the least expense of effort, it is necessary to remove from cognition all 'excess'. But there are different kinds of economy, and the

6 The theory that solar systems result from the cooling and contracting of nebulae was first proposed by Immanuel Kant (1724–1804) in 1755, and was further developed by Pierre-Simon Laplace (1749–1827) in 1796 [Trans.].

7 Joseph Plateau (1801–83), a Belgian physicist [Trans.].

simple conservation of expense is not always the best economy. In its historical development, humanity has continually enlarged the sum of its labour and its efforts, and all this has been more than compensated for by the results. Victory over nature is achieved not by petty preservation of energy but by the fullest, most productive use of it. In this regard, cognition is no different from other realms of human labour; it is creativity and struggle and not mere record keeping.

The same contemplatively passive position is revealed in the very understanding of experience, in the general model that Avenarius calls the concept of the world. The content of experience is 'given' to the knower; individuals 'find' various parts of this content, and it is left to them to 'accept' them as they are 'given'. Here, obviously, the task of cognition cannot be anything other than 'orientation' and description.

Let us recall what Avenarius's 'first axiom of empiriocriticism' says. *Originally*, one finds oneself in certain surroundings consisting of various parts. Human beings with their utterances are also found in these surroundings, and one understands those utterances to be related to parts of the surroundings. Can this concept of the world actually be considered 'primary?' The history of culture unquestionably testifies how untrue-to-life this characterisation is.

One finds oneself with other people … This formulation first suggests that the concept of 'I' has already been elaborated in which 'I' is understood as set off from all other people. Second, the concept of 'person' in this neutral, abstractly neutral meaning could be attributed to any creature with a human image and likeness – whether this is a relative or a stranger, a co-worker or an enemy. But to suppose all this to be true of primordial people is wrong in the extreme. Primordial people still would not in any way separate themselves – as independent living units, as special 'I's – from that close kinship group to which they belong. They 'originally find' precisely that group – a cohesive commune related by blood – and they are situated not simply in 'a certain surroundings' but in a desperate, gruelling struggle with the surroundings. The group lives as a single organism, and members of it would no more take it into their heads to separate themselves from the whole – as far as becoming individual producers of knowledge – than they would cut off their hand or head from their body. If they met other, alien people, then, given the extreme power of the struggle for existence and the tightness of kinship ties, they would 'accept' those people not as harmless 'fellow humans' but as *enemies* – as dangerous, powerful beasts from whom they could not expect mercy. And if a concept originally arises on a purely practical basis – and this is undoubtedly the way the empiriocritics themselves see it – then it is absolutely unthink-

able that at this stage both kinfolk and enemies could be associated together in the general concept of 'fellow-humans'. Otherwise primordial people would have had to transform from a zoologically elemental type into a placidly philosophical type of observer, with sufficiently developed individualistic thinking.

The matter of 'utterances' relating to certain parts of the environment fares no better, and, if possible, it fares even worse. We have already seen, in connection with the question of the origin of speech, that the first utterances that were to any extent definite were related not to parts of the environment but to the joint labour activity of the group. They were collective and not individual. One can point out, of course, that these very actions were directed at well-known parts of the environment, and this is perfectly true, but what follows from this is precisely the conclusion that the role assigned to utterances in the empiriocritics' axiom must be assigned exactly to labour activity. It is precisely in the process of *labour* that the whole generality of their surroundings *first* appears. It is only significantly later that this generality is also reflected in their utterances. Moreover, the discrimination of parts of the environment as separate 'things' develops still later. Consequently, the way that Avenarius and his school present the primitive concept of the world is factually wrong and put in an extremely modernised form. A more accurate model would be as follows:

While beginning the process of cognition, individual people find the world as an elemental complex of activities, reducible in their turn into two complexes. One corresponds to the tightly cohesive kinship group to which those individuals belong, which they cannot distinguish from themselves either practically or intellectually and in which each is merged as an organic part. The other complex is the rest of nature, seen as the sum total of hostile forces, with which the group struggles for its existence. Certain utterances are connected with the first of these two complexes, or, more accurately, various utterances begin to be distinguished during activities – cries that correspond to various acts of labour. In the end, this model cannot with complete accuracy be called a primitive concept of the world. For primordial people, 'concept' has to do with separate actions but not with the world as a whole. It is appropriate to speak of a primitive *relationship* to the world, which is transformed into 'concept' only in our contemporary formulation.

Obviously, the empiriocritics based their construction of the original concept of the world on a false thought – as if it were possible to establish the content of this concept by purely logical operations. In reality, it can be explained only by social-historical investigation and not logic and philosophical reflection, which, without the assistance of history, provide a concept

that the philosopher already possesses ready-made, instead of a primitive concept but in a simplified form.[8]

It remains now to consider how successfully the empiriocritics carried out the general analysis of experience – breaking it down into its elements and understanding the differences between the physical and psychical series of phenomena.

The breaking down of experience into elements is borrowed in its essential traits by the empiriocritics from the sensualists in a form very close to Hume's, but with the fundamental difference that for sensualists all elements are 'sensations' and all experience is individual and psychical. For empiriocriticism, on the other hand, the psyche makes up only one realm or side of experience, while 'the environment' or 'the physical' makes up the other side, and the elements of both realms are identical. By this means, the world of experience simultaneously is both divided in two and is brought into a certain unity. The latter – i.e. the unity of elements – represents a great step forward in comparison with the old philosophy, which continually inclines toward the idea that the 'body' and the 'soul' are of very different material.

However, it is easy to notice one peculiarity in these 'elements' which does not correspond to the general nature of our experience. Our experience is first of all *movement*, the flow of occurrences, while the elements such as 'red', 'green', 'hard', 'cold', etc., are distinguished by a kind of immobility. They are static. It is possible to put them together into a rich and complex picture; by themselves, they are alien to *change*, and without change experience is unthinkable. This means that if one takes them in this form, they are simply insufficient to express reality.

Let us suppose that you look at a glimmering star. The elements of light replace one another more than once in a second. Red is replaced by green, after that by blue, again by green, again by red, etc. The empiriocritic describes it in this way: different elements of light enter one after another into a connection with your visual field and then leave this connection. But in such a case, what you are receiving is not individual elements but a kind of activity which now connects some elements with others, now breaks the connection. If this *activity* does not belong to the elements themselves, then it is a new 'element' and, moreover, the most important element, since it governs the distribution and interrelationships of others. It is something like Anaxagoras's *nous*, 'mind', that

8 This entire critique of 'world idea' applies specifically to the school of Avenarius. Mach, a careful philosopher and natural scientist, does not indulge in any speculations on this question.

governs the interconnectedness of the particles of the world – homeomeria. If it is inherent in the elements themselves, then they are far from as simple as is expressed in their designation. They are already then not 'red', 'blue', 'hard', etc., but all those things plus a peculiar attraction to and repulsion from other elements.

Thus, if everything in experience flows and changes, then its elements must be not 'static' but 'dynamic' – not sensuously contemplative but sensuously active in nature. This reveals the general deficiency of the entire philosophical line of Mach and the empiriocritics. It is the deficiency of the old materialism that Marx noted – a passive point of view in understanding the world. 'Elements', of course, are not atoms. But like atoms they present, in their given form, material that is too dead to be able to form the living fabric of experience. In order for it to be fully suitable for our goal, it is necessary to profoundly remake this idea. We will see *how* to remake it later on.

Now, if the 'physical' and the 'psychical' represent only two different types of *interconnectedness* of elements, then philosophy – which is essentially the striving to unify all experience – must inevitably pose the question: how are these two types of interconnectedness combined or 'connected'? The various fields of science must continually answer questions like these. For example, animals and plants are two differently constructed types of organism, and they, in turn, are subdivided into quite a number of types. It is the task of biology to explain the unity behind them all, and it resolves this with the theory of *the general origin* of living forms – differences appear as the results of development according to the same laws and on the same principle. Different forces of nature display dissimilar regularity; physics reduces them to monism, subordinating them to a more universal interconnectedness – the conversion of energy. And, yet again, it evidently finds its explanation in the quite clear, already noted tendency of contemporary science toward a single origin of forms of energy. It is natural to expect that scientific philosophy, having discovered two types of structure in the system of experience, will follow the same path and will attempt either to subordinate both types to one universal type, or, penetrating still deeper, to find a common origin from which they both developed. Is this what contemporary empiricists are really doing?

We have seen that they are not. True, they accept both the physical and the psychical as forms of 'functional dependence', but this does not combine the two types. Functional dependence signifies nothing more than interconnectedness in general, and the question is not changed at all by what designation we prefer.

But here the principle of pure description arrives on the scene. They use it to propose to override and abolish the very question as being improperly

put. They say that the point, after all, is only to state and to precisely describe those connections which we find in experience and not to 'explain' them and combine them in some kind of unity. All we have are two connections. We ascertain and elucidate both of them with precision. It is impossible to achieve anything more, and nothing more is required. Actual clarity has been obtained, and to seek something further means simply to fall into metaphysics and fetishism, into fruitless attempts to go beyond the boundaries of what is given in experience. And, once again, delineated before us is the lifeless aridity of the idea of pure description and the passive tendency that is hidden within it. If biology had taken such a point of view in the last century, we would not have the theory of the origin of species; it would have been sufficient only to state and accurately describe the forms of organic life which are 'given in experience'. To seek an explanation of why they are the way they are, and what were the causes of the observed resemblances and differences between them, would be an unscientific task, a question improperly posed.

The principle of 'pure description' or 'economy of thought' no doubt has value, albeit a thoroughly limited and relative value. When ideas which are impossible to verify in experience or to apply in any kind of practice are brought into science or philosophy, then it is legitimate and proper to point out that there must be nothing superfluous in knowledge, just as there can be no superfluous parts in a tool. But when they try to draw the conclusion that cognition must only be an accurate copy of experience, they make the same mistake as if one insisted that a tool should be only a copy of the material which is being processed by it. Limiting the tasks of cognition is absolutely illegitimate. Nevertheless, if we recall the views of the empiriocritics on 'heuristic constructions', then it becomes clear that their point of view also permits the attempt to represent the two kinds of interconnectedness of experience – as, for example, united by a common origin or a broader and deeper third regularity – except that they have already rejected the possibility of *this very* heuristic construction.

Besides, the 'description' of two dependent relationships of experience that is provided by the empiriocritics turns out under closer investigation not at all to be so complete and accurate that we must necessarily accept it.

As a matter of fact, 'physical' is defined as the interrelationship of elements that is independent of the status of one or another nervous system. But can we consider the statement that physical experience in general does not depend on any nervous system at all to be accurate? After careful consideration, it becomes obvious that this is not the case. Visual, coloured, and spatial elements and complexes occupy a huge place in our physical experience. People who are blind from birth do not know colours or visual space, but they must believe

from what other people say that all this exists and that it is only their physical experience that is incomplete. But what if all people and animals were blind from birth? *In whose* experience would the visual world exist then? Obviously, in no one's. Physical experience would be different; it would consist of a smaller – much smaller – sum of elements. This means that the content of physical experience depends not on one nervous system or another, but on the sum total of all nervous-sensory systems.[9] For animals able to distinguish colours not visible to our eyes, physical bodies have a different chromatic character than they have for us. Thus, certain objects that appear to us as only black can appear to ants to be of a kind of 'ultraviolet' colour, since ants are able to directly distinguish ultraviolet light rays. Bodies that are dark to us can appear to glow in the dark for certain nocturnal animals – owls and bats, for example – if it is true that their eyes can see thermal, infrared rays with a long wavelength. The same applies to elements of hardness and warmth, to sounds, smells, and so on.

Thus the empiriocritics 'describe' the physical interconnectedness of experience insufficiently and not quite correctly. And the psychical interconnectedness?

They define psychical interconnectedness as a 'functional dependence on the nervous system' (according to Mach) or specifically on 'system C', i.e. the highest centres of the cerebrum (according to Avenarius). And, of course, it is completely true that each psychical complex, each 'fact of consciousness' does functionally depend on the nervous system. In other words, it corresponds to definite processes which flow through it, and it appears and develops in strict interconnectedness with changes in it. But all the same, this characterisation is unsatisfactory because it cannot be applied with complete legitimacy to psychical phenomena alone.

As a matter of fact, due to the living unity of an organism, *all its parts are in mutual interdependence*. Its tissues and organs are connected by definite correlations, which physiologists and pathologists study. Consequently, any tissue and any organ – physical complexes and not psychical complexes – also stand in a functional interconnectedness with the nervous system, i.e. they fit the above-mentioned definition of 'psychical'. The contraction of muscles and the discharge of glands take place according to processes of nerve action coming from the brain. In nervous diseases, certain kinds of degeneration or

9 To express it more rigorously, it depends on the sum total of all *sensory-motor apparatuses*. A one-celled organism, although it does not possess a nervous system, does have such a sensory-motive apparatus, and it is undoubtedly able to distinguish some elements of its environment from others, although in a different and incomparably weaker form than we do.

damage to the functioning of neurons are accompanied by certain changes of other parts of the body. It is clear that this interconnectedness is *different* from what exists between psychical and neural processes. But from the point of view of the empiriocritics, it is impermissible to make this distinction, since for them 'functional dependence' – a most general concept – equally encompasses all cases of the interconnectedness of facts, and they understand 'functional dependence' as a characteristic of psychical experience in precisely this most general meaning.

True, they often stress that psychical complexes 'perform in a different field' from physical complexes, but this adds nothing to the basic definition, since 'a different field' is nothing other than a system of other interrelationships – that very same psychical experience which it is necessary to define.

Obviously, the functional dependence of the psyche on the nervous system and the functional dependence of various organs of the body on the nervous system are different because in the first case the interconnectedness has the character of *substitution*, while in the second case it does not. But to accept substitution as a special type of interconnectedness means to accept it as a special method of cognition, and this would be precisely a method of *explanation* and not description. Consequently, here too, hostility to 'explanation' appears as an obstacle to the correct and clear 'description' of the psychical connectedness of experience.

Actually, physiological psychology *explains* the facts of consciousness through corresponding changes in the nervous system. So, a doctor, examining a patient with hallucinations, tries to understand their origin. Suppose that a series of other facts in the investigation points to a severe depletion of the cerebrum. This can serve the doctor as the basis for *understanding* psychical illness and can provide a guiding strategy for overcoming it – that is, the doctor works to promote the nutrition of the brain. First in theory and then in practice, the doctor substitutes one fact – the depletion of the nervous centres – for another fact – the hallucination – and, by following this path, the means for overcoming the disorder of the ill organism is found. In another case, the explanation of the hallucination will be different, and the method of treatment will also be different.

Let us note that both in this example and everywhere in general where the question involves the psyche and the nervous system, not one but two substitutions are performed. First, in place of the words, gestures, and certain facial expressions the doctor substitutes the psychical complex 'hallucination', then, in place of this psychical complex, he substitutes a neuro-physiological complex – the state of the brain. The second substitution is the result of the long progress of science. As science develops further, a third substitution will

appear. Perhaps physiological 'depletion' will be explained chemically – as an insufficiency, let us say, in the intake of oxygen into the blood and the flow of phosphorus out of it. There subsequently might follow a fourth substitution, and so on with no end in sight. Such is the *chain of explanation* that penetrates deeper and deeper into the world of experience.

Summing up our critique of contemporary empiricism, we can say that in certain points it represents progress in comparison with the old materialism and sensualism. In other ways it only differs from them verbally – sometimes not to its benefit – and in general it continues their philosophical heritage. Its main mistakes all stem from the same theoretical-contemplative point of view regarding the tasks of cognition that are characteristic of this entire heritage.

In any event, the school of contemporary empiricism now exerts a wide and still growing influence on the most varied fields of scientific-philosophical thought, and we must turn our attention to the roots that this school has in contemporary society and that its doctrines have in the living practice of society.

The representatives of this school consistently base all of their arguments on the natural sciences. Many of them are themselves prominent natural scientists of one or another specialty – physics, physiology, biology, etc. Just as the philosophy of natural science was pre-eminently materialist in the past, so now materialism has been supplanted by empiriocriticism and doctrines close to it. But the natural sciences themselves are expressions of contemporary *technology*; they generalise all its methods and its rich experience. Consequently, it is precisely in technology and the social groups connected with it that we must search for the basis of the school we are studying.

The nineteenth century was an era of great technological revolutions, the essence of which boils down to the development of machine production in all larger-scale enterprises. Capitalist-entrepreneurs *introduced* this new technology, but they themselves became increasingly separated from it. First, they had to concentrate on the commercial side of business, and they turned the technological side of the enterprise over to hired agents. And after that they even transferred the commercial side over to specialist employees, and they reduced their own function to receiving profits and accumulating capital. In the majority of cases, capitalists now have no need even to know which machines are used in the enterprise, who their employees are, or who the shareholders are. As a matter of fact, they often do not know any of this. The labouring proletariat *implements* the new technology with their own hands, but they do not manage or direct it, and they do not comprehend it in its fullness and breadth. Individual workers know their own jobs and, in practice, attain a certain general idea of the methods of machine production, but they do not master those meth-

ods scientifically. The real directing and organising role in production is played by a particular social group that occupies an intermediary position between capitalists and workers: educated foremen and engineer specialists – that is, the technical intelligentsia. They are the bearers of scientific knowledge; they relate to entrepreneurs as hired employees and to workers as authorised managers. Their calculations and instructions direct the whole process of production and the entire assignment and application of labour in the enterprise.

The work of the technical intelligentsia is almost entirely intellectual. On the one hand, they calculate and elaborate technical plans with the help of the exact formulas of science, and, on the other hand, they supervise and monitor the implementation of those plans. In the most significant and advanced enterprises, special laboratories are set up with large staffs of scientists and specialists who are entirely occupied with scientific work on the improvement of production. They systematically create new models of instruments and machines, and they invent new methods of manufacturing. So, for example, in the chemical and dying industry, new compositions, new colours, etc. are discovered. All this is accomplished on the basis of a strict division of labour, whereby the leaders outline only the most general plan, some of their helpers work out the details, others perform verifying tests, a third group calculates the value and commercial results of the new contrivances, and so on. Each new step of technological progress ceases to be an individual and more or less random event as it frequently was in the past.

At the same time, major capitalist enterprises – various 'institutes', observatories, laboratories – are created that pursue purely scientific goals. The majority of them are set up by the government, social institutions, and scholarly societies, but sometimes even individuals create them. These enterprises are distinguished from industrial ones by virtue of the fact that their purpose is not the immediate extraction of profit, and they are organised in the same way as the factory laboratories described above. They are systems with hired labour and separation of function. At the head are scientific leaders – including directors, professors, and academics – and then a whole staff of assistants and laboratory workers – including ordinary workers, mechanics for the machines and instruments, clerical workers, and, finally, unskilled labourers. The combined, systematically assigned work of this entire army provides new 'scientific products' with the greatest speed and productivity, enabling the resolution of the kind of tasks that solitary scientists, with their limited powers and means, could not even venture to provide. A real life example is the recent discovery of Ehrlich.[10]

10 Paul Ehrlich (1854–1915) was a German physician and scientist who founded and led a

Is it conceivable that an individual investigator in a study could obtain, in just a few years, 606 different – and to a significant extent new – chemical compounds and test all of them therapeutically on animals? Only the complex and powerful organisation of a contemporary major scientific enterprise possesses the capability of delivering such results in response to tasks set in advance.

Contemporary medical institutions – clinics, public and private hospitals – are set up in an analogous way. They resemble industrial enterprises even more closely and are often completely commercial. Thanks to their division of labour and superior technological means, they are rapidly supplanting individual practices and are turning doctors into hired employees in continually growing numbers. In advanced countries, doctors in individual practice are gradually becoming the exception.

Thus capitalism and scientifically organised production have transformed the social-labour status of the technical intelligentsia. As a consequence of this, it is inevitable that new characteristics of thinking must develop among them, which are most fully reflected in their philosophy. It is natural and understandable that its philosophers should have come from the intelligentsia who work in specialised scientific enterprises and from scholarly theoreticians of the natural sciences, such as Mach, Petzholdt, and Duhem.[11] Even though Avenarius was a professional philosopher, he still dedicated a significant part of his life to the study of those same natural sciences, and, moreover, with encyclopaedic breadth. It is precisely because of this that he expressed the intellectual tendencies of the entire movement more completely than others and that he has taken centre stage in our critical investigation of it. In general, contemporary empiricism presents many individual, minor nuances which it is not necessary for us to take up. A theoretician of the intelligentsia, being an individualist, always strives for originality both unconsciously and consciously, and this explains the great variation in philosophical formulations, while the model of thinking remains approximately the same.

This is above all true of the understanding of experience known as 'impersonal-realistic' – the idea that experience embraces both things and sensations and that it is not reducible to personal experiences but consists of the physical environment that is common to all people and in which their external activity occurs. Sensualists and many materialists understand experience differently,

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number of research institutes of the kind Bogdanov describes here. The discovery to which Bogdanov refers here is probably Arsphenamine – the first effective cure for syphilis – which Ehrlich produced in 1909 [Trans.].

11 Pierre Duhem (1861–1916), a French physicist and philosopher of science [Trans.].

considering it to be nothing but the sum total of personal sensations and psychical images. This individualistic conception is possible and natural for people who never leave their studies and who are solitary in their work, such as the intelligentsia of the past. Contemporary scholars and engineers cannot take such a point of view; their labour thrusts them into a particular technological organisation where they and their co-workers – equals or subordinates – deal with common tools and materials, i.e. with the same objects, in their surroundings. In practical terms, they find themselves in the same system of experience. To consider all this to be their own private set of sensations is too difficult; they must take their co-workers and surroundings just as they are, realistically. Here, as in other cases, practice works out the habits of cognition and provides the model according to which the picture of experience as a whole is constructed.

The school of Avenarius allots a special role to 'utterances'. By means of utterances, people understand one another and *are convinced of the reality* of their surroundings. Each person sees that the utterances of others relate to the same objects, the same parts of the surroundings with which one is dealing, and one therefore finds oneself and one's co-workers to be in the same surroundings. By these means, the entire understanding of the system of experience is maintained on the basis of utterances. This is a characteristic taken yet again from the living practice of the technical intelligentsia. Engineers and scientists fulfil their organisational function in production entirely with the help of utterances – oral directives – which relate to various 'parts of the environment' – instruments, materials, etc. It is by means of utterances that the interconnectedness of their labour experience is realised. And the ideologist-philosopher of the technical intelligentsia transfers this point of view to the entire world of experience, declaring that the unity of that world is realised in utterances.

For workers, the interconnectedness of the labour experience is felt all the more profoundly and immediately in those *actions* which they execute jointly with other workers, based on the same material and the same tools. For workers, words, signs, and facial expressions do not create this interconnectedness; they express and organise it. Consequently, in the worker's worldview, the role of utterances must be to express not the foundation but what is derivative from it. This is exactly how proletarian philosophy views *ideology* as a whole, the elements of which appear as utterances.

Further, among the many characteristic features of contemporary empiricism, we have noted its contemplative view of cognition – that experience is viewed as something 'given', that experience is broken down into sensuous 'elements' of an inactive character, and that cognitive tasks are reduced to 'orientation' and 'description of data'. We also saw that the contemplative character

of empiricism is in line with its recognition of the entirely practical function of cognition in life. They understand that cognition is an adaptation; its 'truth' boils down to its fitness to govern practice. All this is the consequence of the factual conditions of labour of a technical specialist or a natural scientist. Science leads them in all their labour activities and serves as their basic tool. But this activity is almost entirely 'intellectual'. It does not impinge directly on the resistance of nature as the physical labour of the workers does. It does not change nature by itself, but only through the means of outside forces, the results of which it observes and monitors; this explains the contemplative character of its thought.

The principle of 'economy of thought' is no less understandable if one pays attention to one very important peculiarity of the contemporary development of science. Alongside the rapid progress of production and labour experience, a huge accumulation of material and an extreme complication of methods are occurring within each scientific specialty. An enormous expense of time and energy is necessary in order to learn one or another realm of science, and then considerable further effort is required in order not to fall behind the continually advancing progress of any given specialty. Meanwhile, the success of the careers of intelligentsia-specialists depends on the complete mastery of their branch of science, which, for someone with moderate abilities, requires a whole life of persistent work. It is natural that one should strive to economise forces in knowledge and to remove from it all that is superfluous and complicating. It is natural also that this economising attains the narrow character that we have noted: the concern of these specialists is excessively concentrated on reducing the expense of energy – cutting expenditures, so to speak – hence the slogans 'pure description' and 'pure experience' and their hostility to 'hypotheses' and 'explanations', etc. All the while, they fail to bear in mind that under certain conditions an increase in expenditure produces a much greater efficiency of effort.

Intelligentsia-specialists sell their labour power on the market, competing with other such specialists and also bargaining with the capitalists. Therefore, price relations occupy the principal place in their life, and, as a result, individualistic forms of thinking, with their abstract fetishism, pile up. We saw exactly this, for example, when we reviewed how contemporary empiricists understand causality. They entirely reject it verbally, but in reality they accept the model of causal-necessity that is characteristic of exchange society.

The very idea of 'pure experience' – to which a human being contributes nothing – is also a fetishistic abstraction. The essence of experience consists in *labour*; experience springs up at the point where human effort overcomes the elemental resistance of nature. Experience is the correlation of human

activity with nature, but that activity is not individual but collective, and, as such, it is inaccessible to the consciousness of the individualist. Therefore, 'pure experience' without any 'addition' is just as impossible as resistance without the force with which it is correlated. This sort of fetish was, as we know, created originally under the name 'matter' which existed 'in-itself' or 'absolutely'. 'Pure experience' is a fetish of the same order and is formulated in exactly the same way.

The exchange relationship is not the sole form of social collaboration customary for the intelligentsia-specialist. In the factory or laboratory, the specialist is the organiser of labour – the manager who gives orders and to whom workers are subordinated. The manager is usually also subordinated to others – organisers who are superior in authority. This is authoritarian social collaboration. Even though it is limited to the bounds of the working day and to agreements over pay, its essence remains the same. Consequently, authoritarian models of cognition also necessarily develop, and also – it goes without saying – within those limited confines. This is the model of the dualism of spiritual and bodily being.

We can easily recognise this model in the doctrine that holds that the two types of interconnectedness of experience – the physical and the psychical – are fundamentally different and not reducible to a unity. Dualism consists precisely in the irreducibility of the two types; it sharply differentiates between physical and psychical experience, turning them into two worlds between which there is no crossing over. Despite being identical elements, there is no intermediary link and no continuity of development from one to the other. Only the form of dualism is moderated; where the old philosophy recognised two 'substances' – two essences – the new dualism speaks of two kinds of interconnectedness or two natural regularities – i.e. it expresses the difference *methodologically*. The entire character of contemporary empiricism is based on this; philosophical questions present themselves first and foremost as questions of *method*.

We have already seen such a tendency in the new materialism, beginning with Bacon. The empiricism of our times continues it further. This is its most progressive side, mitigating many of its errors and contradictions.

Contemporary empiricism is the highest stage that has been achieved by the *contemplative* philosophy of experience.

Contemporary empiricism strives to be exclusively a philosophy of experience and moreover a philosophy of *pure* experience – critically verified and freed from any additions, fabrications, or distortions. It finds its scientific foundation in the methods of modern natural science. The social basis of this philosophy

is formed by the conditions of labour of the technical intelligentsia who work for major industrial and scientific enterprises.

Previous empiricism is distinguished by the individual-psychological understanding of experience, such as that of Locke and Hume; they reduced experience to sensations and psychical images. Current empiricism is characterised by an *impersonal-realistic* understanding of experience; such experience includes both things and sensations, both physical and psychical complexes. This shift in point of view results from a change in the type of work of intelligentsia-specialists. Previously they could do their work individually, in the confines of their studies or home laboratories; now their activities take place in a wide and complex organisation of social collaboration, where it adapts itself to conditions that are common to all co-workers, including the sum total of material and tools. These conditions of their labour experience do not have a narrowly personal or a psychological character. Consequently, in that context, thinking does not habitually reduce experience to personal sensation, but it learns to take experience as something independent of one or another individual, as something real in itself.

The empiriocritics – the school of Avenarius – connect this concept of experience with the accumulation of human utterances. Every person understands the utterances of other people as they relate to the very same subjects that the individual finds in the surroundings, so that these surroundings – the physical world – are identical for the individual and other fellow humans. This special role of utterances in the system of experience corresponds to their special function in the labour practice of the contemporary engineer, doctor, or natural scientist. By means of utterances they – as organisers of labour in the factory, in the hospital, or in the laboratory – enter into a relationship with their co-workers and carry out their leadership of the common task – i.e. they realise in practice the unity of the labour system.

The task and meaning of cognition for contemporary empiricists consists in the adaptation of human beings to their environment. Knowledge is true to the extent that it achieves this goal, and in this way truth is entirely correlated to living practice and necessarily changes along with it.

Cognitive adaptation to the environment is nothing other than orientation in the system of experience; the less the expenditure of effort in this orientation – all other things being equal – the more 'economically' it is implemented, the more perfected it is. The methodological principle of *pure description* proceeds from this idea. For successful orientation, it is sufficient to state clearly and to determine accurately the accumulated connections in the system of experience, adding nothing to and subtracting nothing from the description of them. All attempts to give something other than this and more than this

are mistaken; they contradict the principle of economy of thought. The desire to 'explain' reality is therefore mistaken. In practice, it leads only to the introduction into cognition of fruitless hypotheses, false analogies, and a picture of experience distorted by unnecessary complications.

On this basis, contemporary empiricism rejects not only the materialist substitution – and in general the idea of 'substance' in all its forms – but also the principle of causation. Every relationship in experience can be expressed as a functional dependence of some of its data on others. Specifically, the relationship that is usually understood as causality is reduced exclusively to a functional correlation between conditions and what is conditioned. The idea of causation is nothing more than a false hypothesis, conceiving a relationship between facts of experience on the pattern of the relationship which exists in everyday consciousness between an act of will and the corresponding movement of our body – one of the remnants of anthropomorphism.

In science there are many models that can in no way be taken as being simple descriptions of facts and which are always considered to be explanations of the facts. This applies to the majority of scientific theories. Such models are acknowledged as 'heuristic constructions' that are provisionally applied as an auxiliary method for finding and identifying relationships in experience.

The empiriocritics' understanding of experience as the sum total of 'data', their reduction of cognitive activity to orientation, and their principle of pure description reveal a contemplative, passive tendency in relation to experience. This tendency reflects the character of work of the scientific organiser-specialist – work predominantly of reflection, observation, and monitoring. It does not immediately engage with the resistance of nature, which is what the physical activity of the worker-implementer deals with. And the principle of 'economy' in the narrow, limited meaning in which it is applied here originates in the contemporary development of scientific specialties, the extreme accumulation of material in them, and the complexity of their methods. Because of this, becoming proficient in one of these specialties requires the expenditure of an overwhelming amount of labour and time.

In reality, scientific cognition is active and not passive in relation to experience. It continually goes beyond the scope of description, and explanatory substitutions are necessary tools to which it owes its greatest successes. 'Explanation' and specifically 'causation' are repudiated only verbally by the empiriocritics. 'Explanation' really governs in all heuristic constructions. 'Causation' is implied in the expression 'the functional interdependence of conditions and what is conditioned', which is accepted as 'meaning the same thing' – i.e. in essence, it is a *necessary* relationship (a model of causal-necessity worked out on the social foundation of exchange relations).

The analysis of experience by contemporary empiricists leads them to break experience down into sensuous elements that are identical for physical bodies and for psychical forms. A body and the perception or psychical image of that body are treated as identical in regard to the elements of which they consist; they differ only in their interconnectedness. The interconnectedness of physical experience is 'independent' or objectively regular. Psychical experience is characterised by dependence on the nervous system of the individual. These two types of correlation between elements are not reducible, either one to the other or both together to some third. The interconnectedness of experience is in principle dualistic.

Sensuous elements of experience for Mach and the empiriocritics are distinguished by their *static* character – colour and sound, spatial and thermal elements, and so on. Meanwhile living experience is entirely dynamic. It is an uninterrupted flow of events, a chain of changes, and it is impossible to reduce its content to static elements, and any analysis that leads to this is insufficient and inaccurate.

By the same token, the empiriocritics' characterisation of physical and psychical experience is not entirely valid. Physical experience is not dependent on the individual nervous system but is unquestionably dependent on all existing motor-sensory bodies. Not only psychical experience but also quite a number of vital processes in other organs and tissues of the organism are functionally dependent on the individual nervous system.

The assertion that psychical experience is dependent on the nervous system is a hidden, disguised form of the materialist substitution – if, in general, one is to consider such substitution to be a method of cognition, which in reality it always is.

The dualism of psychical and physical experience is a remnant of the authoritarian distinction between spiritual and bodily nature, preserved on the basis of the authoritarian, organising function of the intellectual-specialist in manufacturing.

On the whole, contemporary empiricism is the philosophical reflection of the conditions of life of a group that is intermediary between the two main classes of capitalist society – a group that is in many ways still progressive but no longer the most progressive. It is the highest stage of the *contemplative* philosophy of experience.

CHAPTER 5

Dialectical Materialism

The word 'dialectic' has been applied in a wide variety of meanings and connotations. Originally, its meaning was associated with the idea of 'discussion'. The Greek '*dialégomai*' means to converse, to argue, and it is also the origin of the common terms 'dialogue' and 'dialect'. Dialectics, properly, is the art of argument, and this meaning, among others, remains today. How was the transition made from this meaning to a philosophical idea? In order to explain this, it is necessary first of all to present the phenomenon of 'argument' in its living meaning in social practice.

Suppose that you and your co-worker must accomplish some common task, but because of a difference in your dispositions or experience, you have differing opinions on the way to achieve your goal. If you would both set to work, each in your own way, your work would be *disorganised* and nothing would come of it. Instead, you should first of all enter into a dialogue and come to an agreement.

In the first act of your dialogue, each of you would give an account of your own opinion. The contradiction that, before that moment, remained hidden would now be revealed – one of you thinks this, the other thinks that. Then, in the second act, each of you begins to object to the other, standing up for your own idea and attempting to undermine and demolish the other one. To reinforce your idea, you draw on the material of experience on which your opinion is based and with which it is organically connected. The person with whom you are talking behaves the same way, and the contradiction between you unfolds and develops. If all your experience were completely incompatible, you would not be able to find any common ground, and the contradiction would result in a complete impasse. But this does not usually happen. You are both members of one system of social collaboration, and that also means one system of experience. You have a sufficient amount of material of life in common, and the evidence that is valid for one of you will make an impact on the other. Because of this, when a contradiction achieves the greatest fullness and clarity, a turnabout occurs in the course of the process, and the third act begins. Your efforts are directed more and more against the contradiction itself, and it is gradually overcome. Either one of the two participants in the dialogue gives up their opinion and accepts the opinion of the other, or both of you accept a new resolution of the question that emerged from the combination of the material that was brought into the argument. One

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way or another, two co-workers have reached an agreement, and from that point they have a common plan for carrying out their work *in an organised way*.

We see here that the dialectic is nothing other than *an organising process, proceeding by means of contradiction*, or, what is the same thing, *by means of a struggle between different tendencies*.

A similar picture is presented by any cogitation, any deliberation that – in the words of Plato – is 'a conversation of the soul with itself concerning any subject whatever'. Here, within one psyche, all possible incompatible views on the matter come forward. Each view attracts to itself the whole sum of experience to which it corresponds and which consequently supports it. Subsequently, as in the previous case, there occurs a turnabout toward the overcoming – the reconciliation – of the contradiction that had developed. The ambiguity and indeterminacy that have introduced disorganisation into consciousness are removed, and consciousness achieves a higher state of organisation than before.

The dialectical process that is most usual and important in life in exchange society is what occurs between the seller and the buyer in the act of commodity exchange. It begins with the contraposition of two prices proposed by the two different sides, and it is concluded by an agreement on a price, whereupon the exchange is completed.

Thus, the idea of dialectics originally is related to specific social phenomena of an ideologically organised character. But, consistent with the law of 'sociomorphism', which we have come across so often, the model of the dialectic created in one realm of social phenomena can also be applied outside those boundaries to other realms of phenomena, both social and extra-social. In reality, it is extremely versatile and useful, and so it can be very widely applied.

Two tribes live isolated from one another; then historical conditions bring them into contact. Being alien to one another, the two organisations enter into hostile relations. A war begins, develops, and then ultimately concludes with peace. Either one side subordinates the other, or they both – having become better acquainted with each other and having mutually learned to value the powers of their opponent – switch to friendly economic relations and political alliance. In both cases, organised relations replace the previous existential contradiction by means of the development of that contradiction.

A person's organism is exposed to a harmful influence – the invasion of disease-producing microbes which rapidly multiply in it. The organism begins a struggle against them and the toxins they produce. This struggle proceeds in the form of 'illness' and is accompanied first by the growing destruction of vital

equilibrium and subsequently by the gradual restoration of that equilibrium. The microbes die or transform into a relatively harmless culture. The result is that the vital system turns out to be organised somewhat differently from before the illness, in that it displays, for example, the fact of 'immunity' – i.e. a heightened power of resistance to the sort of microbe which had caused the illness. In this case, it is also obviously easy to present the whole process according to the dialectical model.

Indeed, all the phenomena of life, in general, can easily fit into this model. The struggle for existence, for animals and plants alike, is accomplished by the expenditure and assimilation of energy – two opposite tendencies which take on various forms and by means of whose interrelationships the course of life is conditioned. This is sufficient to allow us to depict life in its most general form as a dialectical – i.e. organisational – process that operates on the basis of the struggle of opposites.

Further, it is possible to apply the same point of view to the rest of 'dead' nature. To do this, everything we find that is stable and more or less permanent – for example, all kinds of bodies with their observed forms – must be understood as the product of the equilibrium of oppositely directed tendencies. So, a waterfall retains the same structure, even though the water in it continuously flows from above to below. A crystal formed in a solution of salt continually loses particles which go off into the surrounding liquid and obtains new particles which precipitate out of that liquid. In every thing, in every phenomenon, one can find, or more accurately, one can *substitute* two such movements – two streams of change flowing in opposite directions.

Nevertheless, this still does not give us the dialectic in its full and exact meaning. According to its basic definition, obtained by analysing how it arose out of social being, it is an *organising* process. The idea of 'organisation' is usually applied only to living nature and the rest of nature is called 'un-organised', 'non-organic'. It is obvious that in order to apply the dialectical model in its true meaning, it is necessary to revise this distinction between organic and non-organic and remove the absolute character which it acquires in everyday thinking. We need to understand 'dead' nature as being merely *organised more weakly and to a lower degree* than the realm of life, but organised to some extent, all the same. We need to consider any stability – any definite equilibrium in bodies that do not possess the characteristics of life – to be an expression of a certain lower stage of organisation. Then it is possible to talk about dialectical processes also in relation to the non-organic sphere of our experience.

Historically, the idea of the dialectic in philosophy was worked out very gradually and is almost as ancient as philosophy itself. Its origins are already

evident in the Milesian school, with the enigmatically profound thinker, Anaximander. His 'boundless-indeterminate' contains a latent form of the dialectic in the contradiction between 'hot' and 'cold', which separated themselves out of the chaos of primordial matter and then united to form water, the basis of all other things. Water therefore appears as the dialectical product of two antagonistic forces. Through their struggle the unorganised basis of the universe, *apeiron*, is transformed into the organised foundation, water.

The creator of a real dialectical worldview was Heraclitus the Obscure, who lived approximately 540–470 BCE.[1] Heraclitus was born in Ephesus, second only to Miletus as the most important trading colony of the Greeks in Asia Minor. Unfortunately, only insignificant fragments remain of the work of this brilliant philosopher. Furthermore, because of the still insufficiently developed philosophical terminology of his day, it was difficult for him to express his ideas. That terminology debased his ideas badly, and the explanation of those ideas by later writers is extremely unreliable. Therefore, one can talk about the views of Heraclitus in only the most general terms.

Heraclitus was, in the first place, a successor to the hylozoism of the Milesian school. Like Thales and Anaximander, he solved the mystery of being through the materialist substitution but in a radically transformed form. He took fire to be *arche*, the origin and essence of all things. In the naïve observations of naturalists of that time, fire was conceived as a sensuous thing, but one which was at the same time a living movement. Fire itself continually changes, and it changes everything on which it acts. For Thales and his successors, *arche* possessed an internal activeness but was not itself activeness, while for Heraclitus activeness is exactly what it was. He rejected any stasis, any stability, any unchanging basis of phenomena. 'Everything flows' is the universal formula of his philosophy.

However, do we not see various solid things around us? Herodotus would reply that this is an illusion, an error of sensory perception. In the universal flow – in the eternal fire – things only come into being and are destroyed. If something seems permanent to you, this is the result of the temporal equilibrium of opposing movements.

Of all the processes of nature, the great power of fire summons up the idea of struggle, of the pitiless mutual destruction of hostile elements. Heraclitus conceived of all being – the entire development of the world – precisely in the form of struggle or enmity, *polemos*. 'One must know that war is universal, that

1 The exact dates of Heraclitus's birth and death are not known, and today they are generally given as c. 535–c. 475 BCE.

justice is discord, and that everything arises through struggle and of necessity'. 'War is the father of everything, the king of everything'.[2] In the struggle of opposites, each thing necessarily transforms into its opposite.

The same applies to the universe as a whole. Following exactly the same path, it cycles through two movements, downward and upward. The first leads toward the transformation of the world fire into the seemingly solid elements of air, water, and earth; the second leads toward their opposite resolution into fire. So, the world springs up out of fire and disappears into fire in a strict, periodic pattern; it is resurrected again only to perish again.

What remains in this cosmic flow? Only one thing: the regularity of its changes, the consistency of its coming into being and its destruction. What remains – speaking the language of later philosophy – is only the dialectic itself.

Fire, according to Heraclitus, is not only the fundamental principle of nature, it is also the essence of the soul – a particle of the primordial world fire contained in the human body that is a person's *logos*, reason, organising force of life. And that is why the soul can apprehend the external world: because it is consubstantial with it.

Historians of philosophy suggest that Heraclitus's doctrine regarding fire as the source of the life of the universe was formed under the influence of eastern-Aryan religion, with its cult of fire. This is very probable. About a hundred years before Heraclitus, the great religious reformer Zarathustra (Zoroaster) appeared in eastern Iran. Zarathustra gave an extremely refined form, of a deeply philosophical character, to the ancient popular faith of the aboriginal tribes of that region, who were fire-worshippers. His doctrines were at a level of abstraction that put them on the border between religion and philosophy, and, in their genius, they were capable of making a powerful effect on such a serious thinker as Heraclitus.

Moreover, certain elements of the dialectic are outlined in Zarathustra's doctrine, although in a dualistic form, that Heraclitus – coming from a different social formation – had to discard. To be precise, Zarathustra conceived of the life of the universe as *the constant war of two principles*, good and evil, Ahura-Mazda and Angra-Mainyu (Ormuzd and Ahriman in the usual, corrupted translation). The former is the incarnation of the organising, creative power of human labour; the latter is the incarnation of elemental nature which is labour's enemy. In Zarathustra's cosmogony, when the universe was created, these two world principles were still combined. It was only afterwards that they became separated and came into conflict, and that conflict will be resolved

2 The quotations from Heraclitus are new in the 1923 edition [Trans.].

when they are united again. The model is almost dialectical. The extent to which such a religion could have prepared the way for Heraclitus's ideas is clear, and he surely was familiar with it, since in his time the Greek colonies of Asia Minor were actually politically subordinated to the Persians, who were followers of Zarathustra.[3]

Heraclitus's doctrine had a great influence on philosophers who followed, and elements of the dialectic can be found in all their doctrines, even in those that appear most hostile. But the dialectical worldview, as a system, did not spread in the ancient world, and did not even give rise to a philosophical school. Heraclitus was not understood, and no one popularised his ideas. Subsequently, with the passage of time, the development of ancient society – owing to its slaveholding organisation – slowed down, came to a stop, and then began to decay. The dialectic – the philosophical incarnation of real development through the process of contradiction – did not have a solid foothold in the reality of the day.[4]

In his historical context, Heraclitus himself was quite an enigmatic person. He was an aristocrat and a reactionary. He was an enemy of the 'demos' which was rising at that time in Ephesus as in other cities of Greece. A strange figure to be the bearer of such revolutionary philosophical ideas! This is all the more true, since in his times the Eleatic school – which articulated the conservative ideas of the aristocracy and a school that took a position diametrically opposed to him – already existed. Xenophanes and Parmenides taught that in reality movement was impossible, that unitary and universal being was static and unchanging, and that everything that humans perceive as change was only outward appearance, a deception of the senses. Such a point of view was much more understandable and natural for supporters of stasis in social life, no

3 Fire-worshipping religions were formed under the patriarchal-clan way of life before feudalism. They are dominated by the spirit of labour and not the spirit of exploitation, which permeates religions of the feudal type. Characteristics of the household economy are clearly revealed in ancient Iranian beliefs: respect for labour is the basis of their morality. The fire of the home hearth was the centre of the labour economy of the small kinship group and later of the family, especially in the harsh climate of the more northern lands from which the Aryan tribes came to Media and Persia, and it is also true of the eastern plateaus of Iran, where they first settled. This was how the cult of fire originated. Aryans of ancient India – close relatives of the Iranians – were apparently originally also fire-worshippers, and many scholars consider the ancient Indian gods as various 'hypostases' – that is, appearances in various personae – of the separate aspects and characteristics of the one god – Agna, Fire.

4 And the word 'dialectic' at that time had not attained its later meaning. It retained its literal meaning – that is, the art of argument and proof – as it was taught, for example, by the Sophists.

matter how difficult accepting it would be for people who were insufficiently imbued with an authoritarian, static mode of thought.

Heraclitus is portrayed as a pessimist. In his philosophy, the movement of the universe actually lacks any kind of progressiveness; it goes in an eternal circle. His dialectic was not a theory of development in the proper meaning of the word. It is very probable that Heraclitus, like the Eleatics, was spiritually drawn to the permanent and unchanging, but he happened to live in a trading colony in an era when it was rapidly developing economically and politically and when the natural economy and feudal forms of life dear to his heart were collapsing. Perhaps it was because he felt the changes that were going on around him so painfully that they struck his consciousness and decisively influenced his philosophical thought. But having arrived at the unhappy conclusion that 'everything flows', everything changed for him. With great honesty and consistency of thought, Heraclitus did not seek false consolation in treating the flow of reality as an illusion, but rather made this conclusion the foundation of his worldview. But he must have remained all the more isolated a figure within his surroundings.

After Heraclitus, we encounter the dialectical model – with some variations and sometimes in a disguised form – among a majority of thinkers of ancient and modern times. But to find worldviews in which the dialectical model is all-encompassing, we need only look to the recent past – to the philosophy of the classical German idealists, Fichte, Schelling, and especially Hegel.

The doctrine of *Johann Fichte* is a metaphysics that is based on individualism. Fichte conceived of universal being according to the form of the individual 'I'. As an idealist, he considered the essence of this being to be thought – the logical development of ideas that, in his opinion, formed all of reality. He took the primary idea to be the universal or absolute 'I' which is none other than all-creative will – pure, eternal activity.

The beginning of the world process consists in this universal 'I' striving to be conscious of itself. But activity cannot be conscious of itself until it meets resistance that it must overcome. Without the presence of resistance it is no more than elemental, inchoate instinct. It is an unconscious striving to be active, but is not activity itself. And since nothing except for the universal 'I' exists yet, it must create or find *in* itself resistance *to* itself. This resistance is called 'not-I', or an object, things, the material of physical nature. It is thus that the formula 'I posits not-I' is obtained, i.e. primordial will separates the world from itself, in order to have a field for its activity, and, by means of this activity, the will comes to self-awareness.

Accordingly, the primordial, universal 'I' disintegrates. 'Not-I' is separated from it, and that means that 'I', itself, from this moment on finds itself already

not everything but only a part, a limited quantity. 'I' is limited by 'not-I' – by resistance, by matter. Each human individual, taken in its surroundings, is a limited 'I' situated in a struggle with a corresponding 'not-I' – with external objects. To the extent that the 'I' masters the 'not I', it achieves self-consciousness. That is, to the extent that human activity masters the world, it becomes ever more rational. The rationality of the will is its *moral* character. Therefore, the result of the successful struggle of 'I' and 'not I' must ultimately be an ideally moral universal order consisting in complete harmony between a person – as a morally active essence – and nature – as the object or arena of that person's practice.

The arbitrariness of this construction does not need any particular demonstration. Even logically it does not withstand criticism. 'I' is an idea about the individual that has been created in the course of human practice and that signifies one person in contradistinction to other person; it is a separate centre of interests and strivings. Consequently, that universal 'I' – which for Fichte pre-exists all being and does not resist any other 'I's – is simply an unthinkable idea. It is the application of the word 'I' to something that has nothing to do with 'I' at all. But what is interesting for us is something else, and that is precisely the application of the dialectical model. With Fichte, it emerges in a more developed form than with Heraclitus.

As a matter of fact, Fichte's struggle between 'I' and 'not I' is a process that is, first of all, progressive – that carries the universe forward – and, secondly, that is explicitly organisational – that brings the universe to a higher form of organisation, to a moral world order. At its basis is hidden a valid idea – in its struggle with nature, humanity organises nature for itself and is itself organised in an ever more perfected system of life. But this idea is encased in two forms – two models – that obscure it. One is Fichte's individualistic, arbitrary application of the idea 'I' to the universe, and the other is the idealist substitution of logical processes in place of the struggle of real forces and of the creativity of thought in place of the efforts of labour and of elemental resistances.

The model of the dialectic dominates *Friedrich Schelling*'s *Philosophy of Nature* not only as a whole but also in its particulars, and the dialectic is systematically used as a method of construction.

The starting point for Schelling is also a universal, creative 'I' which is incarnated in nature, appearing as an 'objective system of reason'. In its striving for self-consciousness, objective reason takes on various forms, from the simplest to the most complex: from inorganic matter to light and electricity, then to chemical affinity, all the way up to the living organism – the series of levels of perfection. It is the interaction of opposites that generates these forms. Thus, matter is the result of the equilibrium of the forces of attraction and repulsion –

a theory Schelling borrowed from Kant. In order to give a full picture of the world, Schelling partly used scientific doctrines of his time and partly supplemented them with his own hypotheses – most of them highly arbitrary. At every turn he tried to represent phenomena according to the model of polarity – the combination of opposing elements such as positive and negative electricity, the magnetism of north and south poles, etc. This reveals the influence of the science of the day – a time of great discoveries in the realm of electricity and magnetism, in which the model of polarity plays a major role.

Schelling applied the same techniques to other parts of his system. They appear in his doctrine of 'subjective reason', i.e. spiritual development proper, which proposed that subjective reason proceeded from moral activity to cognitive activity and subsequently to aesthetic activity – the life of art – as the highest level. These techniques also appear in his doctrine of the 'identity of nature and the soul'. This 'identity' consists in the fact that both nature and the soul are manifestations of the 'Absolute', which Schelling conceived in the form of absolute absence of difference, where all opposites are merged. This relationship between the 'real' and the 'ideal' is the basic antithesis; all the diversity of being arises from it. The real and the ideal are combined in every phenomenon but in varying proportions. In the life of nature, the real predominates; in the life of the soul, the ideal predominates. The universe is an eternal and continuous series containing all possible combinations of both elements. As a whole, the universe contains both in equal amounts, in the same way that a magnet that has different ratios of north and south attraction at each of its points comprises equal quantities of both attractions.

Hidden in these obscure, arbitrary formulations is a striving to understand the universe as a chain of development, as a process of transition from less organisation to more. But stasis and conservatism still weighed upon thought, and science itself still had not found the means to explain the origins of various forms in nature. For Schelling, therefore, the series of manifestations of the 'Absolute' did not appear historically; higher forms did not proceed from lower forms according to the law of causality. Instead, they all spring directly from the 'Absolute'; they are all parallel to one another and are connected as parts of a single godlike organism – the universe – supplementing one another rationally and aesthetically. This is an immobilised dialectic. The struggle of opposites – and all possible combinations of them – occurs not in the living history of the world but beyond its boundaries – outside all time and space – in the 'Absolute', which is striving toward self-consciousness.

Classical German idealist philosophy was brought to a conclusion in the doctrine of *G.W.F. Hegel*. He not only applied the dialectic, he made a special study of it and formulated it as a universal method.

The basis of Hegel's system consists in the idea that the world process is none other than the self-development of Spirit, or – what is the same – Absolute Idea, or – to put it still another way – God. The activity of Spirit is thought, and thought is realised by means of ideas. The entire meaning of the history of the world consists in that Spirit reveals its content incrementally, proceeding from one idea to another and achieving ever more perfect self-knowledge.

'Idea', for Hegel, signified not what we usually understand by this term but something much bigger, not a simple symbol of a certain series of phenomena but the actual sum total of these phenomena – reality – which the symbol contains. For example, the idea of 'religion' for him was the same as religions themselves with their entire content and in their entire development. This terminology – that seems extremely strange to us – is explained by the idealist substitution. Hegel substitutes 'Idea' for a given sum of phenomena – as the essence of that sum, as something cognitively identical to it. Accordingly, the life of the universe, in its essence, is the succession of ideas in the mind of the world spirit.

The method according to which this development of ideas occurs is precisely dialectical; the 'logic' of the world process boils down to the dialectic. Hegel investigated this logic and discovered its laws, which he expressed in specific models. We will examine the most basic one, the so-called 'triad'.

Each idea, as soon as it is defined and formed, immediately reveals a fundamental contradiction in its content, which transforms the idea into its opposite. For example, the first, most general, idea of the logic of the universe is 'being'. Being seems at first glance to be simple and devoid of any duality or contradiction. But as soon as the idea is conceived in a pure, perfect form, a peculiar movement begins in it which leads to its breaking down. Pure being means a being in which there is nothing other than being – no kind of properties or concrete features. There is no content of any kind, i.e. nothing at all. Consequently, there is something that is the opposite of being – 'not-being'. Pure being logically turns into not-being because of the dialectical contradiction hidden within it. In order to *be*, it is necessary to be *something*, and in order to possess *being* and nothing more, it is impossible to be anything *concrete*.

Thought, proceeding from the 'thesis' of the original idea to the 'antithesis' – its opposite – arrives at a contradiction with itself. Of course it cannot remain there and seeks a way out in further movement. The way out consists in the creation of a new, higher idea – a 'synthesis' which unites and harmoniously combines the content of both thesis and antithesis, thereby eliminating the contradiction between them. In our example above, the synthesis is 'becoming' – the idea of the transition of something into something else. 'Becoming' contains both 'being' and 'non-being' that are immediately connected at each

point of the process. What *is* simultaneously ceases to be and is replaced with something else. The triad is completed; the 'Idea' has made a definite step forward in its development. The stage that has been achieved then becomes the beginning of the same dialectical movement – and in fact the same arbitrary intellectual construction: a new triad, etc.[5] This is the method of idealist dialectics.

If the universe is the development of the world Idea, then it stands to reason that this dialectical method must be applied to all its phenomena, and Hegel applied his system to every realm of knowledge with extraordinary acumen and consistency. So, for example, the course of development of nature begins with the 'thesis' of matter which in itself is inert. It proceeds to the 'antithesis' of massless forces that present various forms of movement – such as light, warmth, and electricity – but which are still lifeless and incapable of independent, stable existence. And it concludes with the 'synthesis' of an organism – that combines in itself materiality and independent existence with living movement, etc.

Possessing enormous encyclopaedic knowledge, Hegel was able to construct a really universal, all-encompassing system in which he presented a remarkably coherent picture of the world process from a single point of view and by means of a single method. It would be impossible in a few words to give an idea of its breadth, consistency, and aesthetic wholeness, and that is not our task. But the historical role and fate of Hegel's philosophy can teach us a great deal.

Hegel's philosophy not only created the most important and notable philosophical school in the nineteenth century, it also had a huge influence on all the scientific and philosophical development of the era. Moreover, it was for the most part an enlivening and beneficial influence. Thinkers such as Feuerbach, Lassalle, and Marx came from this school. More indirectly, it predisposed minds to adopt evolutionary ideas in all realms of science. In Russia, all the best critical writers of the 1830s and 1840s – such as Vissarion Belinsky, Alexander Hertzen, Mikhail Bakunin and others – were trained in Hegelianism. Later on, Nikolai Chernyshevsky came to Hegelianism through Hegel's influence on Feuerbach. The difficult, intricate account that Hegel gave of his doctrine took possession of their minds with unusual force and pushed them considerably further forward beyond what its own author – a conservative German professor and respectable Prussian official – was capable of. Meanwhile, what were the foundations of Hegelianism?

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5 Sometimes not one but two intermediary stages precede the synthesis, and the model that is obtained is not tripartite but quadripartite.

The starting point – the idealist substitution, the understanding of the world process as the self-development of the spirit in ideas – was undoubtedly false. The method – the dialectic of ideas – was arbitrary to the highest degree and was not susceptible of an exact scientific formulation. It was essentially naïve sociomorphism. Is it not clear, for example, that the triad is simply the typical model of an argument, where one participant in a conversation puts forward one proposition, the other participant puts forward another proposition that contradicts the first, and, as the result of the dialogue, a new proposition is developed that takes both into account and eliminates one-sidedness. It stands to reason that Hegel's dialectic could not be other than the model of an argument, since he substitutes thought for real processes. After all, we know that thought is 'speech minus sound' or 'the conversation of the soul with itself', and it is clear that, in its movement, thought reproduces the course of living, socially flowing speech. But it is also obvious that countless events of nature and history have too little in common with 'conversation' and 'cogitation' to permit them to be handled according to this model without strains and distortions. So, what is the strength of Hegelianism?

Its strength is that it was the most complete and coherent system of cognition for that era. One must keep in mind that cognition is the *organisation* of experience. Despite the fact that Hegel's point of view and method were imperfect according to our ideas, he was still able to use them to organise a colossal amount of material, and, due to the consistency of his methods, the symmetry of his exposition, and the depth of his treatment, he produced such an integral system that it gave the richest possible content with the minimum effort to those who studied it. No matter how difficult Hegel's philosophy was, its content and unity still outweighed the inflexibility and aridity of its form, creating the possibility of more fully mastering the accumulated experience of humanity. It is not accidental that beneath Hegel's difficult models it is often possible to find profound and true explanations of a variety of facts and phenomena of culture, especially the development of art. It is not accidental that in other cases Marx only had to turn Hegel's thought upside down in order to obtain an accurate understanding of the subject. Material that has already been combined and tied together is considerably more useful for further organising activity than material that is uncoordinated and chaotic. Hegel's system was the truth of its day, and its forms were also the very best in its times. Even if its general models have since been demolished, much of its content remains intact even now.

Some writers have tried to separate Hegel's dialectic from his idealist system, accepting the first but rejecting the second. This is a mistaken distinction.

Hegel's dialectic was idealist and it could not be otherwise; his model was the processes of discussion and contemplation which belong to the sphere of ideology.

When we examined materialism and the worldviews related to materialism, their pre-eminently *contemplative* character, conditioned by their social foundation, was clear. They were worked out by classes and groups which were not immediately involved in productive labour and did not directly engage with the resistance of external nature. Now we have reviewed several dialectical systems. It is evident at first glance that they display active features. But can we acknowledge that they are genuine philosophies of action? Have they really lost that passive relationship to the world that makes other systems deficient?

Take Heraclitus, who took the essence of the world to be movement and found the universe to be nothing other than the eternal transformation of the primordially active, divine fire. What is the relationship between his philosophy and this stream of being? Marx defined the difference between theoretical and active worldviews in these words: 'previous philosophers only *interpreted* the world in various ways; now, however, the task at hand is to change it'. Does the system of Heraclitus provide anything other than an interpretation of the world? No, it takes account of the movement of the universe, and explains it by means of the metaphorical substitution of fire, but that is all. It does not contain any impulse to 'change' the world, i.e. to definitely and systematically influence the course of events. It does not offer any *programme* for the active transformation of the human world.

In the course of millennia, humanity has struggled with hostile elements. The world is the field of battle. If philosophy is reduced to description and explanation of the world, then it serves in the war with nature in the same way as a map of the theatre of war serves an active army. It provides a useful and necessary orientation but no more than that. A philosophy of action must provide not only this orientation but a whole plan of campaign – a programme for labouring humanity's victory over the elements. The plan of the campaign can be successful only when it is based on accurate maps and an altogether complete knowledge of local conditions. In the same way, a philosophy of action must start with a description and explanation of the world, but this 'interpretation' of the world is different in that it offers the direction and methods for practical progress. This would be the kind of philosophy that would 'change the world'.

The philosophy of Heraclitus is only *contemplation* of the activity of the world, but it is not a *programme for human practice in the world*.

But is it possible that the dialectical idealism of the German classics satisfied the demands that Marx set for philosophy? If the world is interpreted as the

self-development of the creative 'I' or absolute spirit, then is this not a genuine theory of progress of the universe and does it not point out a path and methods for human activity – investigating that universal, divine activity which it sees manifested in humanity itself? But how does German Idealism understand that activity?

In the first of his eleven 'Theses on Feuerbach', Marx wrote: 'in contradistinction to materialism, idealism develops the principle of activity only in an abstract sense, because idealism in its nature does not know real, sensuous activity, as such'. Why exactly does it not know this? Because real activity is hidden from idealism by the idealist substitution. Idealists consider *thought* to be the essence of what is real, so that for them practice in the world has a theoretical character. But the conquest of the world by humanity is fundamentally not a theoretical process, even though theory serves as a powerful weapon for that conquest, just as war is not the study of the terrain and consideration of a plan of action, although both are the necessary means for that war. When the abstract activity of thinking is substituted for the living activity of labour, it is impossible to obtain a philosophy that actually changes the world. In a plan of campaign, the basic and primary element of calculation must be the real fighting power of the soldier and not the scientific and strategic power of the commander – otherwise there would only be military speculation. Idealism was a speculative doctrine, and therefore it could not be a philosophy of concrete action.

No worldview is capable of deciding this task as long as it is imbued with the spirit of individualism. The fact of the matter is that, in essence, concrete human activity is not individual but social. The goal of transforming the world can only be undertaken by the collective; the individual is far too insignificant. Therefore when one 'I' counterposes itself to the universe as the infinite 'not-I' – and this is precisely the starting point of German Idealism – then its stance in relation to the world process is either contemplative or speculatively active, i.e. only an imaginarily active relationship. We see the latter in the idealist dialectic.

Consequently, it was necessary to take the dialectic beyond the framework of individualism. This was impossible for bourgeois thinking; it was individualistic through and through. The new understanding of the world had to find its support in the experience of a new class. The transition did not come about immediately. In the 1830s and 1840s, the philosophy of *Ludwig Feuerbach* served as an intermediary stage.

Feuerbach was a Hegelian from the very beginning, and he remained a Hegelian in that he retained the method of developing ideas in dialectical models. But he was a person of fervent feelings and could not be satisfied

with the abstract aridity of Hegelianism. He decided to retrieve philosophy from the cold heights of the self-developing idea to immediate, sensuously concrete life – to take real human existence as the foundation and centre of his constructions and to make philosophy the 'anthropology' of the self-awareness of human beings.

'The old philosophy', Feuerbach says, in *The Principles of the Philosophy of the Future*, 'started with the proposition: *I am an abstract, purely thinking being; the body does not pertain to my essence*. The new philosophy begins with the proposition: *I am a real, sensuous being*; my body is related to my essence; moreover, *it, in its entirety, is my "I"*. This is its very essence'. This, of course, is the materialist point of view, and Feuerbach was, in general, a materialist. But the originality of his views consists in that he understood the human being not as an isolated individual – not as an independent 'I', albeit corporeal. Feuerbach observed and deeply felt the living incompleteness of separate, solitary individuality and forcefully pointed out the fact that *a reasoning, thinking being can only be created by the power of communication*.

'The light of reason is ignited only when one person faces another', he says. 'Ideas appear only through communication between people, only by the conversation of one person with another. Humans arrive at ideas – and at reason in general – not in isolation but by two people together. Two people are necessary for the creation of a person – spiritual as well as physical'. We already know that this is true, and yet Feuerbach's formulation is still far from a compete idea. While speech – 'conversation' – gives birth to thought, speech itself is produced by shared labour. It is not two people but a labour collective that is the source of the development of spiritual life. But all the same, this was a huge step forward in comparison with the old, naively individualist doctrines, for which the knowing subject was some sort of eternal Robinson Crusoe on a little island of experience in the ocean of the universe.

In the opinion of Feuerbach, it is *feeling* – and, to be precise, *love* – that ties one person to another and gives rise to communication between them. Moreover, this love is not a social instinct developing in collective labour, but ordinary, individual love, as between a man and a woman or between two friends. This is an individual feeling and not a social tie. This means that Feuerbach does not yet genuinely deny individualism; he has only gone part of the way towards such a denial.

The fact of the matter is that he was an ideological representative of the petty bourgeoisie – an extremely atomistic class, imbued with the spirit of private property, and consequently individualistic in its very nature. But in that era, the petty bourgeoisie was devastated by, on the one hand, the power of capital and, on the other, an obsolete state order, and its best elements were in a revolution-

ary mood and sought new conditions of life. The powerlessness of the isolated individual amid the elemental forces of society was felt very painfully, and this gave rise to desires that contradicted individualism. In the economic realm they were manifested in vague, semi-socialistic utopias, while in philosophy they found their most vivid expression in the ideas of Feuerbach. But in so doing it is natural and understandable that petty-bourgeois consciousness was not able to escape beyond the boundaries of its usual methods and experience. Just as the utopias that were produced were not actual socialism, so also their philosophical quests took a far from collectivistic outlook on the world. Realising that the isolated individual was an incomplete being, Feuerbach supplemented that individuality in philosophy no more than *the family* supplemented the individual in real life. The family is the last remnant of the ancient kinship collective remaining in exchange society, and it obviously served – perhaps without the philosopher himself realising it – as the basis and model for his construction. When he says that 'two people are necessary for the creation of a person, spiritual as well as physical', and that 'one person with another – the unity of "I" and "thou" – is God', he fully reveals the secret of his thought. Two people and the love between them is the starting point of Feuerbach's philosophy, but it is also the starting point of the monogamous family. This explains the role that he ascribed to feeling, when, for example, he declared that love is the proof of the existence of an object outside our consciousness. 'No', he says, 'there is no other proof of being besides love and feelings in general; only that exists whose being gives you joy and whose non-being causes suffering'. This mood infuses all his writings and clothes the most abstract questions in a poetical form.

'We feel', he writes, 'not only wood and stone, not only flesh and bone; we also feel feelings when we shake the hand or kiss a sentient being. We apprehend with our hearing not only the roar of water and the rustling of leaves but also the intimate voice of love and wisdom. We perceive with our sight not only reflective surfaces and coloured forms but also another person's views. This means that the object of feelings is not something external but internal, not only the body but also the soul, not only things but also our *I*'. In individualistic society, only the family still preserves (and not always, of course!) that degree of intimacy among people whereby it seems that they can perceive the thoughts and feelings of others.

Religion was the main subject of Feuerbach's inquiries, and he concealed his own essentially anti-religious worldview behind a religious exterior. Since social-labour unity remained outside his field of vision, he was naturally unable to discover the social meaning and origin of religion. However, he understood that it is impossible to seek the basis of religion in the individual. Once again he took an intermediate position. Religion, in his opinion, expresses the *generic*

tendency of humankind – 'the generic essence of humanity', in his terminology. In religion, a human thinks and feels the eternal. This means, as Feuerbach says in *The Essence of Christianity*, that the ability to think, the ability to feel, are eternal – not, of course, in a separate, particular manifestation, but in the generic essence of human beings. A deity is a graphic representation of this essence that fantasy separates from humans themselves, and places outside and above them. But it is impossible to explain religion in its living concreteness by means of such abstractions.

In this regard, Marx noted (in Theses 6 and 7): 'Feuerbach reduces the essence of religion to the essence of humanity. But this latter is not a kind of abstraction, located inside a separate individual. In its reality it is the sum total of social relations … Feuerbach does not see that the "religious sentiment" is itself a social product and that the abstract individual which he analyses pertains, in reality, to a particular social formation'.

Marx himself was the thinker who was first able to understand and investigate the social essence of human beings. For him, the starting point was neither the individual nor the monogamous family – that petty, outmoded fragment of the ancestral collective – but the working class, the new labour collective then being born.

Feuerbach was a materialist and a dialectician, but he did not create a materialist dialectics. His materialism remained contemplative; his dialectics were applied only to the development of ideas and not to reality itself. Marx learned a great deal from him, but he also radically transformed the basis of Feuerbach's worldview in a much more radical way than Feuerbach himself had transformed the old philosophy. Although Marx also called his doctrine 'materialism', his central idea is still not 'matter', but practice, activity, living labour.

In the first scene of Goethe's famous tragedy, Doctor Faust is seeking the principle of life. In an open Bible he reads: 'In the beginning was the Word'. The powerful Word is the slogan of the authoritarian, religious worldview. Faust rejected it and arrived at the conclusion: 'In the beginning was the Thought'. This is the slogan of idealism. But Faust was still not satisfied with it, and he arrived at the final conclusion: 'In the beginning was the Deed'. It was the philosophy of Marx that first logically and systematically advanced this slogan.

Marx taught that 'reality must be understood as practice'. But what exactly is human practice? Before all else it is the struggle with elemental nature, the process of subordinating nature to humanity, i.e. *production*. It is carried out not by individual but by collective forces, and therefore the practical nature of humanity is social. It is in this social nature that we must seek explanations for the entire development of humanity, for the forms of its life and thought.

The conditions and means of production compel people to stand in definite relations with one another – simple social collaboration, the division of labour, exchange, etc. These relations – 'economic relations' – form the *structure* of society, its basic organisation. The 'ideological superstructures' – political and legal forms, morality, art, science, philosophy – grow out of that basic organisation and are therefore determined by it. Marx called production, along with its economic organisation, 'social being', and he called the entire system of ideology 'social consciousness'.

Production is not stationary 'being' in the sense of the old metaphysics; it is struggle, process, and genuine 'becoming'. Through its labouring forces, society changes external nature – the surrounding environment – but finding itself, in turn, to be dependent on external nature, society changes its own nature. It increases the energy of its labour, improves its methods, and in general develops its 'productive forces'. And, at the same time, productive relations – the whole 'economy' of society – also necessarily develop. New relations of production require a new ideological superstructure. But this new superstructure does not appear all at once, and it takes even longer for it to attain supremacy, so that for a certain period of time the old ideological forms still continue to apply. A contradiction accordingly develops between the economy and the ideology of society, which hinders and holds back the progress of productive forces. This contradiction intensifies, develops into a real war of social forces, and culminates in revolution. The previous superstructure collapses and perishes. In its place new forms begin to rule – political, legal, and intellectual forms that correspond to the level of productive forces and social structure that has been achieved. Contradictions are eliminated, and the obstacles to economic progress fall away. Society embarks upon a new stage of 'organic development' until its base and its superstructure once again begin to diverge, new contradictions accumulate, and a new revolutionary crisis erupts.

The preparation and enactment of these revolutions consists of a struggle between social forces, and these forces are embodied in social classes. People have different interests and acquire different mentalities, depending on the role they play in production. This is how they come to be grouped into social classes. The ruling class necessarily strives to retain and increase its power. Corresponding forms of ideology serve as the means for this, and the ruling class consequently defends these ideological forms and fights for them even when they contradict productive relations and hold back the progress of society. This was how feudal lords, both ecclesiastical and secular, behaved at the time when capitalistic, bourgeois relations were emerging. This is how the bourgeoisie behaves in our times. By contrast, classes which are involved in the development of production, by virtue of their position in society, necessarily develop

a new, progressive ideology. They fight for it, and their victory signifies their own dominance in society. This is how the bourgeoisie behaved in the era of their liberating struggle with the feudal classes, and this is how the proletariat is behaving at the present time. In this way, history is moved forward by the force of class antagonism.

Scientific philosophy, as one of the forms of ideology in a society, is a weapon used by the progressive classes in their struggle. It must explain the laws and direction of social development and thereby provide a planned character to the struggle for higher social forms and enhance the activity of the classes that are the bearers of the future. It is consequently a class philosophy, and for our era it is precisely the philosophy of the proletariat.

We see that this is indeed an *active* worldview. The method by which it is constructed – which Marx called the materialist dialectic – is the opposite of Hegel's idealist dialectic. Both of them defined the dialectic as *development through contradictions*, but for Hegel the dialectic has to do with contradictions in the internal movement of ideas, about the struggle of various sides of an idea as it independently constituted itself, while for Marx it had to do with the contradictions of real life, the struggle of real forces. In Marx's understanding, the dialectical aspects of history are the struggle of humanity with nature and the struggle of classes inside society. These are not logical processes but are 'material' in his inexact expression. It must be noted that it is only the first of these – the struggle with nature – that is the basic, ongoing, motive force in history; the second – the class struggle – is derivative and temporary. Class struggle did not exist in primordial tribal society. It arose and increasingly intensified in later social formations but must necessarily be eliminated, along with all classes, in socialist society.

In any event, the new dialectics preserved many characteristics of the old – especially the model of 'triads'. The entire edifice of *Capital* is imbued with it. The main triad sums up the course of the development of society as a whole. The 'thesis' is the connection between producers and the means of labour in the context of small-scale production. The 'antithesis' is the expropriation of producers in the transition to large-scale production under capitalism. The 'synthesis' is the expropriation of the expropriators – the restoration of the connection between producers and the means of production by transferring the means of production into the hands of all society, a socialist organisation. Marx also breaks down the development of exchange and of capitalism into quite a number of similar triadic patterns.

One of the principles of Hegel's *Logic* – the transformation of quantity into quality (and back again) – is combined with the idea of the transition from one member of the 'triad' to another. In the struggle of two forces, their *quanti-*

tative correlation gradually changes. For example, the power of the progressive class grows and the power of the conservative class diminishes, but as long as the preponderance – no matter how small – remains on the side of the latter, society 'qualitatively' appears to be the same – for example, capitalistic. But as soon as the preponderance shifts to the other side, the face of society qualitatively changes. The dominance of another class results and, along with it, the dominance of other forms of ideology and, in general, a new organisation. This is the epoch of revolution, a sharp leap forward in the course of development.

Using our methods, we have defined the dialectic from the very beginning as an *organising process*, occurring through the struggle of opposing tendencies. Is this consistent with Marx's understanding? Not completely, obviously. For Marx, the question is about *development* and not an organising process. But what does the word 'development' signify?

It is a comparatively imprecise term. It is usually used in the sense of the strengthening and increasing complexity of certain complexes, whether real or abstract. For example, one speaks of the development of an organism, the development of machines, the development of an illness, and the development of contradictions. In the first and partly in the second example, there is an element of increase in the degree of organisation, while in the two others there is not. Sometimes the word simply expresses a continuous series of changes flowing out of each other – for example, when 'progressive' is distinguished from 'regressive' development. If we say that in the second half of the life of an organism, its 'development' becomes regressive, then it is clear that this use of the term does not in any way imply the strengthening or increasing complexity of the life processes we are talking about. We have in mind only change in general.

Accordingly, the basic concept of the dialectic with Marx, as with Hegel, did not achieve full clarity and completeness, and because of this the application of the dialectical method turns out to be imprecise and vague. Its dialectical models are somewhat arbitrary, and not only does the field of application of the dialectic become unclear, but sometimes the very meaning of the dialectic is greatly distorted.

The explanation and defence of materialist dialectics is dealt with in several chapters of a big polemical work against Eugen Dühring written by Engels and no doubt edited by Marx.[6] Let us trace the principal ideas of these chapters

6 The reference is to Friedrich Engels's *Anti-Dühring: Herr Eugen Dühring's Revolution in Science*. [Trans.].

regarding dialectical contradictions, the negation of the negation, and the transition from quantitative to qualitative changes.

'As long as we consider things as static and lifeless, each one separately, one after another', says Engels, 'we do not run up against any contradictions in them … But it is completely different when we take things in a state of motion, as they change, live, and interact with one another. Then we immediately enter the realm of contradiction. Motion itself is a contradiction. Even simple mechanical change of position can only come about when a body is simultaneously located in one place and in another place – that it is located and, at the same time, is not located in a given place. Movement represents nothing other than the continuous assertion of this contradiction and simultaneous resolution of it … We have seen that life, too, consists above all in this – that at every moment a given being is both itself and something else. Life is therefore a contradiction that is inherent in particular things and processes, a contradiction that is continually manifesting itself and being resolved. As soon as this contradiction disappears, life itself is cut short and death arrives'.[7]

But there is only one way to understand a real contradiction – as the struggle of real forces, two contradictorily directed actions. Is this what Engels is talking about? Obviously not. In mechanical movement, he sees the contradiction of a body both being located and not being located in a given place – as was pointed out by the Eleatic philosopher Xenon, who wanted to use this example to prove the real impossibility and illusory nature of movement. In reality, Engels discovered – as Xenon did also – only the contradiction of two *concepts* applied to motion – the concepts 'to be located' and 'not to be located' – and not a contradiction of real forces or tendencies. And the contradiction of two concepts is only an ideal contradiction, a contradiction existing only in thought. To reduce a physical fact – movement – to an ideal contradiction means to cross over to the point of view of idealism, to return to the dialectics of Hegel instead of creating a materialist dialectic.

At the same time, if we investigate the matter precisely, it will become clear that it is wrong to apply the concept 'to be located' to a moving body. We must recall that concepts originate in experience and are related to experience and do not live as things-in-themselves. When we say that 'a body is located in a certain place', what facts of experience do we express by this? Either it is the case that we cannot ascertain that the body in question has changed location, or that, even if we could, the change in location does not seem significant or has not attracted our attention. The second meaning is the most usual. If,

7 *Anti-Dühring*, Chapter 12 [Trans.].

for example, it is asserted that the Pope is 'located' in Rome, this does not at all mean to assert that he is stationary. It is only to note the limitations of his movements and the possibility of finding him within certain spatial boundaries. Here the concept 'to be located' does not give rise to any dialectical contradiction. The Pope could energetically move around his room, his whole palace, or even around all of Rome, but it still would be impossible to say that he is both located in Rome and not located there. He is 'located there' and that is all.

But the Eleatics, and Engels after them, took the word not in this sense but in the sense of expressing the lack of movement – being stationary. A body 'is located' in a certain place and nothing more; there is no movement, or more accurately, none is noticeable. But taken in this meaning, the word 'located' is obviously inapplicable to a moving body, since it in no way corresponds to those facts of experience that are signified by the term 'movement'. So one must put it this way: a body is not *located* in any definite place but *moves* there. Again, there is no contradiction. In order to obtain one, it is necessary to use the same word in the first meaning we have considered and then in the second. But is it possible that the dialectic consists in disdain for the exact meaning of ideas?

Engels arrives at a completely analogous misunderstanding when he deals with the contradiction contained in the process of life. One time he uses the term 'to be the same' in its ordinary, approximate sense; another time he uses it in its metaphysical, absolute sense. The contradiction originates because two different ideas are being expressed by one symbol.

For an idealist it is completely natural to explain movement by the contradiction or struggle between the idea 'being located' and 'not being located' in a certain place, but for a realist this is inadmissible. But must we conclude from this that it is impossible to consider movement as a dialectical process? Not at all. But its dialectic is not where Engels found it by using the Hegelian method.

Engels himself mentions that a contradiction appears where things are taken 'in their interaction' with one another. Indeed, a contradiction exists only where there is a real collision of forces, a real meeting of opposites. But this simply does not exist in the dialectic of movement as it is depicted by Engels; he does not speak of any interaction of moving bodies with one another. And as soon as any such interaction is taken into account, a 'contradiction' is revealed – not of ideas, however, but of physical forces.

A body always moves in some *environment* – i.e. in spatial correlation with other bodies. This environment provides *resistance* to it, opposing a change in location by mechanical energy. Resistance can be significant or inconsiderable. In outer space it is very close to zero, in air it is noticeable in ordinary circumstances, in water it is very strong, and in hard bodies it is huge. But it does exist,

and, to one degree or another, it continually weakens the force of movement. Movement continues until the force of resistance exceeds it. At a certain point equilibrium is achieved and the body comes to a stop. There are some cases when the resistance, growing quickly, produces in its turn an overbalance, and the body is forced to move backward – for example, the case of 'rebound' from a blow by a resilient body. What we have here is not only 'contradiction' or, more accurately, opposition – a term much more appropriate for materialist dialectics – but also a case of transformation from quantitative to qualitative change. The decrease in speed leads to movement being replaced either by the condition of being at rest or by movement in the opposite direction.

The same real 'dialectic of motion' applies in mechanics when bodies at rest are represented in the form of the sum of two equal and opposite velocities that cancel each other out, and so forth.

It is necessary to add that the pure motion that Engels talks about – without regard to the surroundings in which it occurs – lacks all *organisational* character. By contrast, movement taken in connection with the resistance of the surroundings tends toward a *stable equilibrium* which is a special, lower type of organised state, characteristic of so-called 'dead' nature. This means that in this form movement can be understood as being an organisational process.

The misunderstanding into which Engels falls in regard to the dialectics of life can be analysed in a completely analogous way. Life is in fact dialectical but not in the sense that an organism contradicts itself – being at the same time both 'the same' and 'not the same'. No, the point lies elsewhere. An organism struggles with its environment. It continuously gives up to the environment the energy that it expends, and it continuously assimilates energy from the environment. The organism remains 'the same' to the extent that these two processes approximately counterbalance one another, and it becomes different – 'not the same' – to the extent that one of them prevails over the other.

Here is yet another example of the dialectic brought up by Engels: 'Among its basic propositions, higher mathematics contains the contradiction that straight and curved lines in certain conditions are identical'. Indeed, analytical geometry considers a straight line as a special case of a curved line ('a curve of infinitely small curvature') and breaks curves down into infinitely small elements, considering each of them to be straight. In the head of someone who is not used to studying them, these abstractions can provoke a very strong 'contradiction', but there is no real contradiction here. In real experience, the straight and curved lines that geometry discusses – i.e. having only length but no breadth or thickness – simply do not exist. In real experience there are joists, wires, rails, ink marks on paper. These are all physical bodies, which during calculation are replaced by the abstract symbols of lines because at

that moment the investigator is not interested in their width, thickness, and other characteristics but only in their length. Rails possess not only curvature but, in general, even irregularities of form, as is easily seen with the help of a microscope. However, if the curvature and irregularity are not so great as to harm the normal movement of the train, the rails are legitimately considered to be 'straight'. The contradiction between the two designations of the rails as straight and as slightly curved boils down to a dual use of the word – in an approximate sense and in an absolute sense – just as in the previous examples. Once again, higher mathematics *is* dialectical, but in a different and more profound way than Engels proposes.

All magnitudes are abstract symbols of real things or processes. But the fundamental role in analytical algebra and geometry is played by *infinitely small* magnitudes. What does this symbol express? It signifies that a variable magnitude decreases to such a degree that it becomes less than any given magnitude. But if a variable magnitude stands for any real process – for example, the motion of a body, such as the magnitude of its speed – then how can it be reduced to something infinitely small? Obviously, for this to come about, it is necessary that the given motion be counteracted by another motion, one that is headed in the opposite direction and whose energy grows to the point at which it cancels out all the speed of the first motion. That means that the infinitely small is a symbol of the struggle of two forces, one of which cancels out the other. The limit of the infinitely small is zero, i.e. the absence of any magnitude. Zero is the symbol of the complete cancellation of both forces – complete equilibrium. Quantitative change here is transformed into qualitative change, magnitude into the absence of magnitude, movement to rest.

By failing to discern this living, real meaning of the dialectic, Engels and Marx lost the capacity to *explain* the transition from quantity to quality, whereas, after our investigation, the explanation turns out to be very simple. If one or another process – the motion of a body, the life of an organism, the development of society – is determined by the struggle of two opposing forces, then as long as one of them predominates quantitatively – if only by a small amount – then the process proceeds in favour of – goes in the direction of – that force. As soon as the other force ultimately grows to be equal to the first, the whole character of the process immediately changes. Either the process is terminated, or with further increase of the second force – even an inconsiderable increase – the process will go in the opposite direction. In either case our senses inform us that we see something 'qualitatively' different from what it was before.

Engels's favourite example on this theme is boiling water. If water is heated under normal conditions, its remains in a steady state while its temperature

rises from 0° Celsius to 99° or even 99.9°, to be precise. As soon as it reaches 100°, it becomes turbulent and begins to rapidly turn into steam – a gas with characteristics completely different from water, a liquid. If this is a dialectical process, then what is its essence? The answer is provided by the mechanical theory of heat. At any temperature, water vaporises – i.e. transforms into a gas – but the escape of steam is prevented by air pressure. Two forces meet; the pressure of steam proceeding from the liquid outwards, and the pressure of the atmosphere from outside upon the liquid. Below 100°, the pressure of steam is less than that of the atmosphere and cannot overcome it, so that only a small amount of steam escapes from the surface of water and mixes with the surrounding air. But with the increase in temperature, the pressure of steam increases and at 100° it is equal to atmospheric pressure and consequently overcomes its counter-action. It is then that steam escapes – one of the revolutions in the state of water.

That the matter has to do precisely with the struggle of two real forces can be corroborated by extremely simple experiments. Let us heat water to 70° and place it under a bell jar with a vacuum pump. One does not need to pump out much air before the water suddenly boils. Why? Because by removing some of the air we decrease its pressure – i.e. one of the two opposing forces. By this process the other force, which was less, now becomes equal, and the 'transition from quantity to quality' – boiling – occurs not at 100° but at 70°.

We also find in Engels a number of misunderstandings regarding the 'triad' of development. According to Hegel, in his elaboration of the concept of 'antithesis', the second stage is the negation of the first (for example, 'non-being' is the negation of 'being', 'quantity' is the negation of 'quality', etc.). The third stage, 'synthesis', is a negation of the negation, i.e. a new *positive* concept, which must be similar in form to the thesis but with a higher and richer content (for example, 'becoming' is related to 'being' but is richer in content and more perfected). Engels applies all of this to real processes without even trying to explain the reason for such a connection between different levels of development. Here are the kinds of illustrations he gives for this 'law'.

'Take a grain of barley. Thousands of millions of grains like this are milled, boiled, brewed, and then fermented in the making of beer and accordingly perish. But if such a grain of barley finds conditions which are normal for it – if it falls on suitable soil – then under the influence of heat and moisture it undergoes a characteristic change; it germinates. At this point the grain, as such, perishes; it is negated; in its place appears the plant which has arisen out of it – the negation of the grain. But what is the normal life-process of this plant? It grows, flowers, is fertilised, and in the end produces more grains, and as soon as these have ripened, the ear dies off and, in its turn, is negated. This

negation of the negation results again in a grain of barley, but now we have not one but twenty or thirty'. Further on, Engels explains that, in such cases, besides such quantitative growth, qualitative progress is also possible. In the course of a series of life cycles, plants develop and transform into more adapted and more perfected forms.

Another example is the communal ownership of land as it originally existed among all civilised peoples. Communal ownership subsequently became a constraint on economic development, and then its negation – the private ownership of land – arose to replace it. In our era, in turn, private property has become a hindrance to the development of manufacturing, and, as a result, history must proceed to social ownership of the land – the negation of the negation. In form, this phase is like the first, but it is broader, higher, and more progressive, since it is based on all the technological attainments of the past.

Let us take an example from mathematics. Take any quantity, let us say 2 (Engels uses the algebraic form a). Its negation would be -2, a negative number. In order to obtain the negation of the negation, we multiply -2 by -2. We obtain +4, a positive number, like the 'thesis', 2, but representing a second degree of two – two times two.

The last example reveals even more clearly how imprecisely and arbitrarily Engels applies the term 'negation'. Within the scope of one triad, the second negation is methodologically completely inconsistent with the first. First a value is negated by means of the change of a sign, then it is negated by means of raising it to the second power. Moreover, if any value is multiplied by itself, then it also is negated, but this operation could no less correctly be called an intensified affirmation of it. In general, the play of imprecise, continually changing concepts in this case is obvious, and, in reality, it has no relation to materialist dialectics.

Engels himself admits the multiplicity of meanings of the term 'dialectical negation', and he says this of it: 'Every kind of thing, and every kind of psychical image or concept has its particular means of negation that leads to development. In the numeration of infinitesimals, the process of negation does not proceed in the same way as in the formation of positive powers from negative roots. This has to be studied like everything else. It is not enough to know that a grain of barley and the analysis of infinitesimals is subject to the law of development through negation in order successfully to cultivate barley or to differentiate or integrate'. But the question arises: is this term useful or necessary when it has so many variable meanings?

The idea of 'negation' is borrowed from the realm of speech and thought. To 'respond in the negative' means to speak or think something the opposite of what someone else is affirming. Naturally, Hegel's dialectic can be built on

'negations'; his dialectic is entirely concerned with thinking – with concepts that idealism substitutes for living reality. But if one is not making that kind of substitution – if one substitutes material forces, as Marx and Engels do – then is it possible to speak of affirmation and negation? Can a good-humoured form of conversation, in which two opinions at first contradict one another and afterwards are reconciled, be compared to the bitter struggle of the elemental, heartless forces of the universe? Does such a model explain anything or make facts more understandable? Obviously not. This is *naïve* sociomorphism and is therefore scientifically inappropriate.

A seed consists of an embryonic cell and nutritive material enclosed in a hard casing. When the seed germinates, the embryonic cells multiply. The nutritive material is absorbed by them and enters into the cells in changed form. It is only the casing that breaks up and disintegrates. Does this mean that the seed is 'contradicted' or perishes? The cells of a plant are the multiplying cells of the seed; how is this a 'negation' of the seed? It is obvious that the Hegelian term adds nothing to a botanist's explanation of how a plant develops. On the contrary, it needlessly complicates the matter, and the imprecision of the term can only be detrimental to precise study.

But Engels finds in the 'negation of the negation' a regularity that obviously must be recognised as really important. To be precise: the third stage of the dialectical process is formally comparable to the first – in the way, for example, that social ownership is comparable to communal ownership, or in the way that the yield of an ear of barley is comparable to the seed from which it grew, etc. This regularity, it is true, is very imprecise and does not lend itself to exact description, because in all cases the resemblance of the third stage with the first is of a different kind. But, all the same, since there is a resemblance, it deserves attention and especially an explanation. In Hegel's dialectic, the resemblance is sufficiently explained by the fact that in our thinking the negation of a negation is an affirmation, and therefore the triad, beginning with some kind of affirmation, must return through two negations to a new affirmation. But for materialist dialectics, this is manifestly unsatisfactory, even though Engels essentially comes to a stop at this point.

Let us again recall our initial definition of the dialectic: an organisational process, proceeding through the struggle of opposing forces. If this process has any kind of beginning, then it is clear that *before* it began there was *not yet* a struggle of the two opposing forces participating in it, and some kind of equilibrium existed in the relationship. If the process comes to an end at some point, then undoubtedly the struggle of the given two forces has ceased and they have arrived at a relationship with one another which is some kind of *new equilibrium*. Here then is the whole triad: from equilibrium through a

struggle of two forces that disrupt it to a new equilibrium. Let us apply this point of view to various concrete examples.

A seed presents the most stable and balanced form in which a plant can exist. A seed sometimes lies for many years without any change in its structure. It is reported that some of the seeds found in the tombs of ancient Pharaohs were still able to germinate. Chemical action of the soil is the cause that brings the seed out of this stable equilibrium. The embryo's struggle with its surrounding environment for existence then begins. The cells of the embryo assimilate more energy from the environment than they expend, and, accordingly, they proceed through the stages of rapid and intense life – growing, multiplying, specialising, and forming a complex system of leaves, roots, and stalk. But sooner or later in its struggle with the elemental forces of the surrounding environment, the plant will be overbalanced and it will then face one of two outcomes: either to die irrevocably or to return to a stable equilibrium in the form of a seed, for which the struggle for existence is reduced to an insignificant minimum. Due to natural selection, life processes have been worked out in a *cyclical* form, corresponding to the annual cycles of nature. Some of the cells of the plant create a balanced combination of the previous type of cells – i.e. seeds – and they are the only part of the plant that survive the harshly destructive changes in the environment brought by the autumn and winter.

If we look upon a plant as a colony of multiplying, living cells, then we do not see any 'negations'. We see instead a continual struggle of these cells with the environment. The periodic repetition of favourable seasons makes for a periodic intensification of aggressive struggle on the part of the cells, and, correspondingly, the periodic onset of unfavourable conditions make for an attenuation of the struggle – that is to say, an avoidance of struggle.

In this example, the dialectic is, all the same, undoubtedly present – life is essentially an organisational process and is based on struggle. But notice how easy it is here to apply the 'triad' with its 'negations' where no kind of dialectic exists in reality. Take any periodic process in nature and juxtapose two comparable stages, and then call the stage that is intermediary between them and differs from both of the other stages a 'negation', for example, yesterday – night-time – today; full moon – new moon – new full moon; the upswing of a pendulum – the downswing – a new upswing, and so on without end. It is clear how unproductive, superfluous, and arbitrary this model inherently is.

Another example from Engels: communal life – private property – communism. In the original commune there is tight cohesion resulting from the complete domination of social instinct. Private property appeared when individualistic tendencies (the struggle of '*eros*' and '*eris*' – love and strife – accord-

ing to Empedocles) began to wage war against this social instinct.[8] Communism signifies the completion of this struggle – the victory of deepened and broadened social interconnectedness. It is obvious that the triad results not as the consequence of 'negation' but as a consequence of the choice we have made of what moments to compare. We took the phase of equilibrium before the struggle of the two forces began and then the phase of equilibrium after the struggle was completed. Given this method of comparison, the formal resemblance of 'thesis' and 'synthesis' is inevitable.

The same thing can be applied to any other triad – except for those examples which are forced, as in the case of the squaring of negative values. The real dialectic does not need Hegel's models, and the main thing is that it can *explain* them.

Marx called his worldview dialectical *materialism*. Meanwhile, he himself noted that at all times – down to and including Feuerbach – philosophy had been contemplative and not active, while Marx's own doctrine was active. If this is so, then the question arises that, since Marx invested new content to such a degree in the old term 'materialism', why did he use the term at all and what did he mean by it?

The foundation of Marx's worldview consists, as we have seen, in its social-philosophical theory that the development of society is determined by its productive life. He specifically applied the term 'materialism' to his theory in order to contrast it to all the former idealist theories of society, which assumed that the development of society is determined by its intellectual life. The old materialists also shared that point of view, unconsciously lapsing into idealism.

Production is usually taken to mean the 'material' side of the life of a society. But this should not be understood to mean that it is a process that is entirely material in its content. Marx himself defined production as being the *consciously rational activity of people*, and of course the role of consciousness in production is huge. Therefore, when production is taken as being the basis of social development, we are not looking at the simple application of the philosophical principle which says that matter is the essence of all things. Here the word 'materialism' has another conventional meaning; it is meant to signify, by and large, the opposite of social idealism and a denial of the primacy of ideas in social life. It does not reduce social life to the naked machinery of matter.

In his philosophical works, Engels repeatedly displays sympathy for materialism in general or, more accurately, with the materialist method in the cognition of nature. There are even individual phrases such as 'the unity of the

8 This appears to be an error. Empedocles actually used the terms *filia* and *neikos* [Trans.].

world consists in its materiality', which can be understood in the sense of universal materialist substitution. But the old materialism considered matter as the final resolution of the question of the essence of things and as an absolute idea which, in itself, is not subject to development. The dialectic, on the contrary, does not admit any kind of absolute truth and consequently must adopt a conception of matter that is devoid of any absolute meaning. In one place in his pamphlet on Feuerbach, Engels notes that materialism must adapt itself to every new important discovery in natural science, and in his book against Dühring he writes: 'the ludicrousness of attributing any kind of absolute validity to our current thinking is evident from the fact that the history of humanity up to the present falls between two practical discoveries – the transformation of mechanical movement into heat and the transformation of heat into mechanical motion' (i.e. from the practice of making fire by rubbing together two pieces of wood to the invention of steam engines).

Consequently, in this respect, too, we encounter a radical divergence from the old materialism. Our ultimate conclusion must be that if we compare two worldviews – one which has a contemplative attitude toward things and pretends to absolute knowledge of their essence, and another which is fundamentally active and denies knowledge of absolute essence, then it must be obvious that it would be a misunderstanding to signify them both with the same term, 'materialism'. This would be almost as inaccurate as, for example, calling Feuerbach's worldview a religion. In the history of ideas, one frequently runs into this sort of situation where an old term is preserved even when its content has been radically changed.

The German working-class philosopher, *Joseph Dietzgen*, stands very close in outlook to Marx and Engels. In the realm of social-historical theory he was their student, while he came to the materialist dialectic independently of them. The main characteristic of his views consists in the attempt to combine dialectics with the pantheism of *Benedict de Spinoza*, the most profound thinker of the sixteenth century, who had the idea of the monistic being of the universe.

Spinoza taught that only one all-encompassing reality exists – nature, which he also called God, without giving the term an authoritarian-religious meaning. The entire material world – or 'extension' – and the entire spiritual world – or 'thought' – represent only two different aspects of this reality, two of its 'attributes', i.e. literally 'properties'. In reality, there are an infinite number of attributes, but only these two are known to us. Each concrete thing and each idea is a particular manifestation of one or another attribute, their 'modes' (literally 'forms' or 'means' – i.e. precisely the means by which they are expressed

or embodied). All modes – things and ideas – derive from infinite substance, or nature, or God as particular consequences of the universal cause, and each of them is a limited expression of that cause. They are all tied together by a necessary interconnectedness. Since attributes belong to a single reality, they unfold in parallel. On the one hand, there is the necessary interconnectedness of things that have extension, and, on the other hand, there is the necessary interconnectedness of ideas that are thought. Each thing has a corresponding idea; the ideas of simple things are simple, and the ideas of complicated things are complicated. The human soul is nothing other than the idea of the human body.

Essentially, for Spinoza, God or nature is that universal necessity which is hidden behind all phenomena, which generates them and connects them all together. In other words, it is their *cause*, as causality is understood in exchange society. Spinoza was the most brilliant exponent of this second stage of the development of causality, for which – as we know – the economic necessity of the market served as the model. Spinoza was a representative of the Jews, the people most involved in trade, and he lived in Holland, the country that was most engaged in trade at that time. He mastered the forms of the exchange mentality with incomparable depth for his time and applied them to the construction of a holistic worldview.

Dietzgen took from Spinoza the idea of a single universal reality, determining everything by itself and containing everything in itself. Sometimes he called this reality 'nature', sometimes simply 'being', sometimes 'the universe' (*Universum*), and sometimes 'the infinite'. For him it was also the basis and precondition for all phenomena – their common essence, which is partially expressed and reflected in each of them. Even Dietzgen's proof of this idea more or less coincides with Spinoza's proof. If human beings can think of infinity, it means that they are part of infinite being and that their thinking and they themselves are part of this being, a manifestation of it.

But Dietzgen did not adopt the doctrine of 'attributes'. Materiality and spirituality, in his opinion, existed in phenomena together and inseparably – not as parallel aspects of phenomena but as if mixed together. 'Matter is not as material as it is usually thought, and spirit is not so completely spiritual'. Here Dietzgen is close to Schelling, for whom the real and the ideal also existed simultaneously in all phenomena, forming an infinite gradation of correlation of the one to the other. But Dietzgen tends, in general, toward materialism. Matter plays the predominant role in his picture of the world, and he sometimes even characterises universal 'being' as material.

Dietzgen's monism of 'being' is as abstract and devoid of content as Spinoza's monism of 'substance'. However, despite all his deficiencies, he displays an

extremely progressive tendency by insisting that a worldview should be strictly holistic, free from any kind of dualism and eclecticism, and, along with that, the conviction that this is possible.

With regard to the question of methods of cognition, Dietzgen was close to the empiriocritics. For him, cognition boils down to the 'recording' and 'classification' of phenomena, i.e. the 'pure description' of them. In this respect, he deviates from Marx towards a contemplative relationship to experience. But we should note that at a time when this idea of pure description first appeared, it was for the most part utilised as a weapon against metaphysical constructions, so in this sense Dietzgen was progressive.

Dietzgen's works represent an important stage in the history of philosophy. Being the first working-class philosopher in the nineteenth century, he is interesting not only because he was able to arrive almost independently at the most advanced ideas of that era and because he was able, to some extent earlier than others, to understand and adopt the results of the great scientific-philosophical revolution carried out by Marx. Dietzgen is also remarkable because he was the first to express, even more decisively than Marx, the idea that special proletarian-class forms of cognition – 'a special proletarian logic', as he put it – will inevitably be produced.

Another very distinctive position is taken by a group of Russian writers who profess to be resolute supporters of dialectical materialism and even custodians of its traditions – Plekhanov, Ortodoks, Lenin, and certain others – but who radically part company with the doctrine of Marx and return to the materialism of the eighteenth century on two essential points. On the one hand, they understand matter as a 'thing-in-itself', and, on the other, they retain the conception of absolute truth.

'In opposition to "spirit"', says G.V. Plekhanov, one of these authors, '"matter" is a term for what, acting on our sensory organs, produces in us one sensation or another. What is it exactly that acts on our sensory organs? To that question, along with Kant, I answer: *things-in-themselves*. Consequently, matter is nothing other than the sum total of things-in-themselves – to the extent that these things are the source of our sensations'.

Another of these authors, Ortodoks, writes: 'Matter is matter. It is a primary fact, the starting point of external and internal experience … Naturally, it cannot be defined by any other cause located outside of itself, and from this it follows that matter is known by means of its action upon us'.

What we see here is a human being, with its consciousness, being presented as a passive product of external matter. This is precisely the contemplative relationship to reality that is characteristic of all the old materialism that Marx rebelled against. Matter is really the object of human activity, but with these

writers, on the contrary, a human being is considered entirely as the object of the action of matter. This is a direct contradiction of the social-historical theory of Marx, in which the starting point is production, labour, and human activity.

Since, despite this, the aforementioned authors accept the social philosophy of Marx, this explains the extreme incompleteness of their views. They do not try to establish an internal connection between their general-philosophical views and their socio-historical views, but are satisfied with a superficial connection. They apply the same term – 'materialism' – in both spheres, where, however, the term has two completely different meanings.[9]

It goes without saying that if matter is the absolute basis of experience and does not require verification, then the idea of 'matter' lies outside any dialectic and represents absolute and eternal truth. In connection with this, the existence of other absolute and eternal truths is accepted – among which are included Marx's historical doctrine, a number of his economic theories, etc. But for historical materialism, 'eternal truths' are simply impossible, since all ideology – meaning all knowledge and its formulations – depends on the changing and developing practice of production. Moreover, it is obvious that it cannot be asserted that one or another truth is eternal, since an accumulation of experience might demonstrate otherwise. This means that the acceptance of an 'eternal truth' presupposes a simple faith, based, as always, on authorities of one kind or another who determine specifically which truths are eternal and which are not.

Here we have an obvious break not only with dialectics but also with contemporary scientific thinking in general, which insists on unlimited questioning and rejects anything absolute in knowledge.

Analysing Feuerbach, we saw that the acceptance of materialism, on the one hand, and of the dialectic, on the other, does not amount to dialectical

9 The place that the abstract question of 'things-in-themselves' occupies in the thought of these authors reveals the extent to which they have an essentially different set of ideas from those of the founders of dialectical materialism. Marx and Engels were not interested in this question, or, to be precise, they rejected it. In one of his introductions and also in his pamphlet on Feuerbach, Engels says that it was natural in Kant's day to discuss the question of 'things-in-themselves', when the properties of most things was too poorly understood; now, however, thanks to the great progress of technology and the natural sciences, the former 'things-in-themselves' have become 'things-for-us', because people have learned to make use of them and reproduce them – even formerly baffling organic compounds. By contrast, for Plekhanov, Ortodoks and others, the question of 'things-in-themselves' is fundamental and occupies a truly overwhelming place in their works. It is almost the only thing they have elaborated on, and, given the old-fashioned nature of this topic, the sterility of their work was unavoidable.

materialism. When the dialectic and materialism are understood in such a way that they contradict one another, not only is there no dialectical materialism, but there is no definite worldview at all.

The main deficiency of today's dialectical materialism is that it neither clarifies nor explains the dialectic. But if it did this, it would cease being what it is and would become a different form of understanding the world.

In reality, the dialectic is an organisational process that proceeds according to the struggle of opposites. It is sufficient to state this for it to become clear that the dialectic is not at all something universal and that it cannot become a universal method of cognition. It is a particular instance of organisational processes that can also proceed along other paths. We, for example, have no grounds for assuming that the coming together of propagating cells in a colony, which initiates the development of multi-celled organisms, is obtained as the result of a struggle between these cells. Nor should we assume that the tribal social collaboration of aboriginal groups was produced by a process of struggle; their method of organisation was undoubtedly different from the formation of present-day great nations through war and conquest or of great enterprises through economic competition. By the same token, the scientific method of generalisation, as a means of organising the facts of experience, cannot be reduced to the dialectic, and so on. Elements of the dialectic can be found almost everywhere, but that is not all there is to life and movement.

Consequently, philosophy must set itself a broader and more general task: to investigate the interconnectedness of the world process in terms of *all possible paths and methods of organisation*. This is the basic idea of empiriomonism.

The dialectical outlook on the world is almost as ancient as philosophy itself. In the usual meaning of the term it is even older, since its embryonic form existed in the dualistic religion of Iranian fire-worshippers. Anaximander was the first of the Greek philosophers whose conception of the world possessed a dialectical character. His *apeiron* – the eternal and indeterminate essence of things – contained all the contradictions of being in an undifferentiated form. It was Heraclitus of Ephesus, however, who formulated the first completely dialectical worldview.

Heraclitus conceived of the universe as an eternal stream of change, flowing forward in the form of the struggle of opposites; everything that seems stable in this flow is the result of a temporary equilibrium of opposing processes. Fire is the essence of all changes, the basis of the universal flow, transforming through the process of condensation into air, water, solid bodies, etc. and subsequently being reborn through the destruction of those things. The life of the universe is therefore cyclical, an endless series of repetitions. The idea of

development and progress was alien to Heraclitus. His understanding of the world was contemplative and not active.

The dialectic played a subordinate but always more or less significant role in the systems of ancient and modern philosophers who followed Heraclitus, but thoroughly dialectical worldviews appeared once again only with the classical German idealists, Fichte, Schelling, and Hegel.

The idealist dialectic – the dialectic of ideas – governed this entire group of doctrines. Thought was conceived of as the active principle of the universe. For Fichte, the starting point was an initial 'I' which created the 'not-I', or external nature, as a field for its activity – that is, the striving for self-knowledge. The task of this activity consisted, in its turn, in overcoming the 'not-I' – in subordinating it to the efforts of the 'I'. For Schelling, the starting point was the Absolute, which contains in itself all polar opposites. The basic opposition is that between objective and subjective reason, the real and the ideal. Separating out from the Absolute in all possible combinations, they form a stairway of the phenomena of the universe starting with matter, in which the real, or objective, almost entirely dominates, all the way to aesthetic reason – the highest form – in which the ideal or subjective is dominant. The sum total of all these combinations forms the organism of the universe. The idea that forms develop in time, according to the law of causality, is absent.

Hegel not only produced a dialectical system – portraying the world process as the self-development of the Spirit in ideas – he also systematised the dialectic itself, investigating and setting it out as a universal method. His *Logic* is a philosophy of the laws of the development of ideas, and the rules of his *Logic* determine the construction of his entire philosophical system. His philosophy is the most grandiose and most profoundly thought-through idealist presentation of world development.

Hegel's philosophy created the greatest school of the nineteenth century and gave a huge impetus to the movement of thought of that era. But above it – as also above all preceding doctrines – there hovered, on the one hand, the spirit of individualism, and on the other, the idealist substitution. These two characteristics rendered it incapable of becoming a true philosophy of active engagement with the world. In reality, it is not the individual but the collective that changes nature, and full, real activity consists in labour, not in thought.

A product of Hegelianism, Ludwig Feuerbach rejected the idealist substitution and made the transition to materialism without rejecting the dialectic. In addition, he attempted to put an end to the individualism of previous philosophy. He asserted that human beings become spiritual beings through communication, and that an isolated individual could not become a thinking being. But Feuerbach understood communication not as *social collaboration*

but as *love* in its individual manifestations – as conversation and contemplation between two individuals. He was an ideologue of the revolutionary petty bourgeoisie, and the idealised monogamous family served as the model for his system. His doctrine was not a philosophy of action – even of action understood abstractly – just as was the case with the classical idealists. But he prepared the way for Marx's dialectical materialism.

Marx examines reality from the point of view of social practice in its direct, immediate form – i.e. in the form of production. The technological conditions of production and the interrelations among people that arise in the course of these conditions constitute 'social being' or the 'material' side of life. They determine the 'spiritual' side of life or 'social consciousness' – the ideological superstructure that exists above the system of production. The technological progress of society conditions its economic progress, and in their sum total they sooner or later generate the necessity of change in the ideological superstructure. This change usually occurs in the form of a revolutionary crisis, which concludes the era of the struggle between certain social classes. Classes are social groupings of people based on their positions in production – positions that determine their interests, desires, and ways of thinking. Each class defends the conditions and means of its dominance in society, and that is precisely the significance of a class's ideology. Therefore the victory of a new class also signifies the transition to the dominance of a new ideology that has overthrown the former ideology.

Production – the struggle of society with nature – is the basic dialectical force of social development. Class struggle is derivative and is characteristic of a society not organised in its entirety, particularly capitalist society.

Marx's and Engels's understanding of society is the same as Hegel's – 'development through contradictions' – with the difference that it is concerned with the contradiction of forces and not merely ideas. They also apply certain basic models of Hegel's *Logic*, especially the model of triads and the model of transformation of quantity to quality, without attempting to explain the inner meaning of these models, the origin of the regularity that they express. This produced a number of misunderstandings in the application of the dialectical method itself.

The actual origin of the dialectic is this: it is modelled on the ideological process of discussion that begins when two mutually contradictory opinions meet and that concludes when the contradiction between them is removed. The contradiction is 'reconciled' on the basis of the conclusions reached in the argument itself; it is a new step in the organisation of experience of both sides. When this model is applied outside the bounds of ideology (i.e. speech, thinking, values) then it obviously must take on the following form: an organ-

isational process which consists in a struggle between opposites. This form of the dialectic is suitable for organic, living nature without limitation. For 'inorganic' nature it is applicable only in cases where inorganic nature is considered to be of a lower type and level of organisation and not simply lacking organisation. This point of view is obviously completely consistent and permits one to posit the universal continuity of the world process and thereby to acquire knowledge of it in a systematic way. Specifically, stable equilibrium may be considered to be the type of organisation that is characteristic of non-living nature, as the result of the dialectical unity of changes that are in opposition to each other. This is a universal model for all material 'things' and for all cyclically self-contained processes that repeatedly go through the same stages.

The logic of contradictions in the form of triads is fully applicable only to the idealist dialectic of concepts but not to the real dialectic of the universe. The applicability of the 'triad' to many real phenomena is the result of the method of comparison that is selected by the person who is thinking about them. When attention is fixed on the moment before the struggle of two contradictory forces and the moment when the struggle is over, then a formal resemblance between these two phases of equilibria is inevitably obtained, and the intermediate period of struggle can arbitrarily be described as the phase of negation.

The transformation of quantity into quality is a direct consequence of the struggle between two forces. The predominance of one gives a specific character and direction – a definite 'quality' – to the entire process. As soon as the other force becomes equal to the first, this 'quality' comes to an end; it is destroyed or replaced by a new one – one that is simply different or one that is the opposite.

All these explanations are possible only when the *organisational* content of the dialectic is understood. The founders of dialectical materialism did not grasp this, and in general their followers did not go further than they did. Only Dietzgen displayed philosophical independence of thought. First, he energetically advocated the need for a *monistic* worldview, for which he employed Spinoza's idea of a single, universal being, and he connected this idea with realist dialectics. Second, he put forward the idea of the dependence of forms of cognition on social being even more decisively than Marx and Engels. To be precise, he recognised that thought *originates* in the labour process, and that the new working class – the proletariat – must develop a new *logic* – i.e. a new basis for thought – for itself.

Other advocates of dialectical materialism, on the other hand, revealed the desire to return to the old 'contemplative' materialism, mechanistically combining it with the dialectics and social theory of Marx.

The principal step forward from this review of dialectical worldviews is that the dialectic itself has been examined and explained. The historical limitations of the dialectic and the need to move forward to a broader and more universal point of view have become clear. Organisational processes in nature come about not only through a struggle of opposites but also by other means. The dialectic is, therefore, a special case, and its model cannot become a universal method. Empiriomonism is the new point of view that proceeds from this analysis.

CHAPTER 6

Empiriomonism

1 Labour Causality

Each new class that steps into the arena of history does so only at the cost of long effort and struggle in developing its own culture – its own particular understanding of the world. Dialectical materialism was the first attempt to express and formalise the point of view of the working class in regard to life and the world. We have seen how powerfully this attempt was affected by the ideological influence of the old ruling classes – both their methods and their ideas. Because causality is the basic principle – the organising foundation – of any system of thinking, this new understanding of the world can achieve full independence only when a new form of *causal relationship*, appropriate to it, is summed up and distinctly clarified. All religious worldviews stand on a common ground because they are constructed on the same thing – the causal relationship of the authoritarian model. All abstract philosophical worldviews stand on a common ground because they are governed by and permeated with the principle of necessity – natural necessity in realism, logical necessity in idealism. Proletarian consciousness is not satisfied by either the one or the other; it exposes their fetishism and rejects it. Why? Because in the life of the proletariat, other practical relationships develop and gain predominance which are different from those that were generated by previous models of causality and previous methods of thinking. Different practice produces a different logic. Let us investigate this logic.

The proletariat is a labouring class that is directly involved in production. In its work it confronts and continually overcomes the resistance of external nature. It begins to be conscious of itself as a separate class in the era of machine production, which unites the forces of people on a broadly collective scale and overcomes the most colossal resistance of elemental forces. Hence its active relationship to the world; hence the slogan 'change the world'. In its essence, the logic of such thinking cannot be other than practical; it is the expression of those same means by which contemporary production 'changes the world'.

What do these means consist in? In the systematic and deliberate *transformation of forces* or, to be more scientific and exact, in the *transformation of energy*. Such is the essence of machine technology. The chemical combination of coal and oxygen from the atmosphere is transformed into the heat of fire, heat into the pressure of steam, pressure into the motion of a piston, and the

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motion of a piston into the motion of a flywheel, belt-drives, and lathes. The motion of the lathes is transformed into various changes in the worker's material, and all this results in a certain product. In other cases, the weight of falling water is transformed into the rotation of the turbine of a dynamo, and this rotation is transformed into electric current which then produces the energy for mechanical movement, light, chemical forces, etc. By such means the forces of nature are transformed by the forces of the labouring collective; any one of them can become a *technological source* that can be applied to all the tasks that are set for labour. As sources of productive energy, they all can substitute for and replace each another. So, in the majority of countries, heavy industry develops on the basis of coal dug from the earth, while in countries where coal cannot be obtained, the current of rivers, mountain streams, waterfalls, etc. are used instead. For example, in northern Italy an extensive electro-technological industry has sprung up using this 'white coal'.

Thus, the practice of machine production contains a new point of view. This point of view strives to be – and is actually becoming – universal. The labouring activity of humankind also finds its place in the series of transforming forms of energy. The effort of a worker is one of the links in the chain of production; it generates other links, and it is capable of substituting for them and being substituted by them. Sometimes damage to a machine forces a worker temporarily to carry out the work usually done by that machine, but even more often the machine replaces and supplants the worker's labouring power. And, as far as those elemental forces which have not yet entered the chain of production are concerned, the exact science that arises from technical progress will discover their uniformity or identity with those elemental forces which have already entered the chain. This means that any phenomenon or any process of nature is a *potential source by which the labour collective can obtain any other processes it pleases*. It is in this that the practical interconnectedness of phenomena – the practical unity of nature – consists.

What we have here is a new model of causality. If A is the cause and B is the consequence, then this means that A is transformed into B in just the same way as the energy of coal or flowing water is transformed by technology into the work of a machine – in the same way as, in general, one force that is being applied in production is transformed into another.

Further, in order to apply any forces technologically and expediently, the collective must find them in nature – must derive them from sources accessible to it. The collective only *exploits* them in its labour; it *does not in any way create them*. By the same token, when it comes up against the hostile and unfavourable forces that nature directs against it, the collective only *incapacitates* them; it counterposes to them other forces that it has at its disposal, but it *does not in*

any way simply destroy them. From the point of view of the new causality, there is no essential difference between the two forces of nature. Those forces which are hostile at one time might be beneficially utilised later on; what applies to one set of forces also applies to others. This means that, in the practice of the collective, energy is not created and is not destroyed; it only changes its forms. Hence there is still one more characteristic of the new causal relationship: *cause is equal to effect*. If A transforms into B, then A is also equal to B. If any phenomenon is taken as the technological source of any other phenomenon, then it is possible to derive only as much energy from it as it contains – never any more. To use all its energy entirely is the ideal limit of technological perfection.[1]

Thus, the following are the elements of *technological labour causality*. The effect *is obtained* from the cause, as in production the practical result is obtained from the energy expended on it. The effect *exhausts* the cause, or, what is the same, the effect is *equal* to the cause, just as in production the practical results – the sum total of useful and useless or harmful energy – exhaust the energy that is expended in production.

But is not this exactly the same thing that physics teaches as the 'law of the conservation of energy'? One must answer 'both yes and no'. The law of the conservation of energy is indeed the basis of the new causality, but in current science it is understood abstractly and fetishistically, and in such a form it cannot become a universal form of thinking.

This law arose on the basis of machine production, which developed in Europe at the turn of the nineteenth century. Originally it was formulated as a principle of thermodynamics – the science of heat energy – and it is at the heart of the most general, abstract laws of the operation of steam engines. It was elaborated by specialists in technology and science – the military engineer Carnot, the physician Mayer, the factory owner Joule, and the academic physicists Helmholtz, Clausius, and others.[2] They were not representatives of the

1 But this is only an ideal limit. Part of the energy is inevitably spent on so-called 'parasitic drag' – friction of parts of a machine, for example. Consistent with the law of 'entropy', each transformation of energy is accompanied by the conversion of part of the energy into heat, which then is dissipated in space, such that the sum of heat energy constantly grows at the expense of other forms of energy. And since it dissipates into space, heat usually cannot be utilised – at any rate not in the machine. On the other hand, since heat is one of the conditions of life, its increase through entropy need not be considered as an absolute loss of energy as far as society is concerned; in part, this portion of the work of elemental forces – now useless or harmful – will also find an application in the future.

2 Lazare Carnot (1796–1832), Julius von Mayer (1814–78), James Prescott Joule (1818–89), Her-

new class that needed a new model of the causal relationship, but instead they were people who had been brought up in the old individualistic thinking with its abstract fetishism. The corresponding form of this principle that their thinking necessarily obtained was the conservation of energy.

There exists, as a matter of fact, not one but several different understandings of this law among contemporary scholars and philosophers, but they consist in either of two extreme forms. According to one of them, energy is the foundation and essence of all phenomena, and in the new scientific worldview, it must take the place of the 'matter' of the old materialism. According to the other understanding, energy is only a pure symbol in human thought that has been adopted as a convenient term to designate a connection between phenomena. Both of these extremes, however, have a great deal in common. Both are equally distant from the correct point of view, and both shy away from – or, more accurately, do not attain – the correct point of view for exactly the same reason.

If energy constitutes the basis of all things and occurrences, then it exists in nature completely independently of humanity and its labour activity. If energy is only a symbol, then it exists in human thinking independently of nature – the world of resistance with which society struggles in its labour. In both cases, energy is understood as *cut off* from either of two sides of one objectively indivisible reality. In both cases, it attains an *absolute* character – to be precise, either as an absolute real thing or as an absolute ideal thing. However, in reality, energy is nothing but a practical relationship of society to nature.

To see 'energy' in the processes of nature means to look at them from the point of view of how humanity might exploit them in its labour. To recognise that some phenomenon – an ocean tide or a piece of coal, for example – contains a certain sum of energy means to believe that if one succeeded in completely mastering that phenomenon and successfully utilising it for the goals of labour, then it could serve to overcome a certain sum of the elemental resistances of nature. The principle of energy is the ideal of the power of society over nature. But to individualistic thought – to which the conception of a labouring collective is foreign – the living meaning of the active principle of cognition is inaccessible. It is muffled by the fetishism of abstraction, which consists in the separation of ideas from the social practice that generates them.

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mann von Helmholtz (1821–94), Rudolf Clausius (1822–88). While the scientist James Prescott Joule took a great interest in his family's brewery, Bogdanov was mistaken in referring to him as a 'factory owner' [Trans.].

Only when humanity, through its labour techniques, attained the ability to deliberately and systematically make some phenomena the source for obtaining other phenomena in pursuit of its productive goals, only then can the idea of the transformation of energy in nature be scientifically worked out. This is an unconscious repetition of that 'basic metaphor' which we saw at the very beginning of the development of thought – ideas applied to nature according to their original significance for human activity.

We have already said that cognition at its highest level is not only the description and explanation of the world process, but also a programme for world development – not only a map of the theatre of humanity's war with the elements, but also a plan of campaign against the elements. Now we see that the idea of labour causality actually contains a programme and plan for the conquest of the world – to gradually master circumstances and things in such a way as to purposefully obtain some things from other things and by means of some things to overcome other things.

Let us now take a general overview of the history of the causal relationship in human thought.

The first stage is the undifferentiated kinship group with virtually no division of labour. There is, in general, no worldview, and the idea of the causal relationship is also lacking. There is *habit* that has built up over the course of millennia. It came to be expected that following certain actions – in the group itself or in the natural world – other actions would follow. After a blow with a stone comes the fall of an enemy; after the rising of the sun comes the waking of birds and animals; after the rubbing together of pieces of wood comes their bursting into fire. There is an immediate labouring relation to the world, but no kind of *explanation* of the events that occur.

The second stage is the authoritarian commune, first of the patriarchal then of the feudal type. It has an ever-deeper division between organisational and implementational labour. Religious worldviews arose on the basis of the causal relationship that this division of labour generated. The relationship of organising, governing activity to implementing, subordinate activity served as its pattern. Cause summons effect, just as an order summons the implementation of the order; cause rules over effect, just as something more powerful, more active, and more important rules over something weaker, more passive, and less important – in general, as a superior rules over a subordinate. In principle, the cause is greater than the effect.

The third stage is exchange, individualistic society. It consists of the unorganised, anarchic division of labour among separate, private enterprises. People are ruled over by economic necessity that determines both their actions in relation to one another and also the results of these actions without regard to their per-

sonal hopes and preferences. The worldviews of this stage are philosophical and abstract. The causal relationship is conceived according to the pattern of economic necessity. Natural necessity, hidden behind phenomena, generates both causes and their effects. The effect necessarily follows after the cause – this is the entirety of their relationship. An effect can be distinguished from its cause both qualitatively and quantitatively. An effect can differ from its cause in any respect; it can be greater or lesser.

The fourth stage is the formation of the new labour collective, first in a form organised on the basis of the labour and struggle of the working class and then in the form of a socialist society. The struggle against the power of economic relations over people is carried out on the basis of organised comradely social collaboration, and that power is finally overcome. With the help of the methods of machine production, humanity's rule over nature will grow without limit. The causal relationship corresponds to these methods; the cause is the technological source of the effect, the energy at the expense of which the effect is obtained. Cause and effect are equal to each other. The relationship to the world is socially active, and in it the interpretation of the universe merges with the conquest of the universe.

In contemporary thinking – both everyday and scientific – it is the third stage – abstract causality-necessity – that predominates. Some remnants of authoritarian causality also remain – for example, the habitual representation of the soul as a cause of the movement of the body, of free will, etc. The idea of labour causality is making progress, but the old fetishistic forms are being cast off slowly and with difficulty.

Dialectical materialism still has not arrived at this highest model of causality, but it is on the path toward it, because it has placed production – the social-labour activity of the people – at the foundation of its worldview and because it sees the productive powers of society as vanquishing and subjugating the forces of nature.

At the present time, the task at hand is to consciously and steadfastly use the idea of labour causality in order to construct a holistic, clear, and scientific understanding of the world.

2 Elements of Experience

We view reality – the world of experience – as human collective practice in all of its living content and in the entire sum of forces and resistances that generate that content. The task of cognition consists in expediently organising experience. Every act of organisation is carried out precisely by combining

specific elements. Consequently, it is necessary to have elements of experience before us, and they are not merely 'data' given to us 'ready-made'. They must be singled out and isolated from the continuous flow of experience.

We have seen the kind of analysis of the elements of experience that was proposed by the empiriocritics. Their analysis is doubly inadequate for us: their 'elements' lack a fluid character and do not come from active practice. We must break down experience in a different and new way, applying *our* point of view. In this sense the question of elements was investigated for the first time in any detail by the late philosopher-worker, N. Vilonov, who was mentioned at the very beginning of this book. I shall provide a general outline of the conclusions of his still-unpublished work that are relevant here, adding certain explanations of my own.

Vilonov approached his task by means of the historical method. He asked how and why specific parts of people's experience are isolated out when they perform the act of thinking. He immediately discovered that, from the very beginning, the elements of experience were essentially related to labour; they were singled out precisely in people's practice and on the basis of the needs of that practice.

Actually, what people first began to distinguish cognitively – i.e. to treat as elements of experience – were their own *activities* which they carried out together with others. This, as we know, was the substance of the first word-ideas, which developed out of cries during work. By means of the basic metaphor, the same word-ideas served for singling out various activities that occurred in nature and had living significance for society, useful or harmful. This means that the initial elements of experience had an entirely active character based on social practice.

Subsequently, ideas of *things* were developed. Yet again, first of all came ideas of tools, materials, and, in general, the objects of production – i.e. useful or harmful resistances to labour activity. As before, the needs of practice determined the singling out of one or another element. If, for example, one or another animal, plant, or mineral was made note of, given a particular name, and remembered, then this occurred precisely in the event that it was needed in the process of labour or that it presented an obstacle, danger, or harm – when it was necessary to apply some kind of effort to it. In the same way, any star or planet would become an established element of experience only when it turned out to be useful for the orientation of labour, and so on.

The very same things can stand in different relationships to labour and can be susceptible, for example, of different applications. A tree can be used both for building dwellings and for heating, and it sometimes also can be used as a source of nourishing food or even just for shade in hot weather.

Because of this, as this development goes forward, the 'qualities' of things begin to be distinguished – wood as a building material is something that is 'hard', as a heating material it is something that 'burns', and it can also be 'fruit-bearing', 'shady', etc. Things are broken down in this way into simpler elements – 'qualities'.

To the extent that labouring life becomes broader and more complex, as human activity penetrates into nature more deeply and in ever more varied directions, the elements of experience – including actions, things, and qualities – grow and multiply. The increasing content of experience is further broken down as it comes to be analysed according to new needs. New elements are formed, each one simpler and with less content. Each element reflects one or another sum of human effort invested in the world of experience; each element is the product of these efforts and is consequently 'crystallised' labour. This was how Vilonov defined it, using Marx's expression relating to all the products of production.

Elements of experience are like bricks that can be used to construct a worldview. An ordinary brick is nothing other than a certain quantity of clay, separated out and processed by labour. Clay is 'matter'; it is resistance. Bricks are made by the effort of people directed against this resistance. Just as all reality boils down to the sum of efforts and resistances, so also a brick – the concrete component of that experience – is the crystallised combination of the effort of social labour with the resistance of nature. This is fully applicable to any element of experience. A brick itself is such an element as long as it is not broken down further – as long as its component parts and qualities are not isolated out. But every time, in order for an element to be broken down, a new effort – which overcomes new resistance – is necessary.

Let us suppose that you find the colour red in a brick, as one of its 'elements'. In the opinion of the empiriocritics, this 'element' is 'given' directly to us along with the brick. But in reality, that is not so. In order for the red colour to become an element of experience, it must be separated and abstracted from the whole of which it is a part. This operation – carried out by others long ago and repeated billions of times – has now become so habitual that we do not notice the effort that it costs us. A special symbol – in the present case the word 'red' – serves as the tool for this. But the symbol must be arrived at through the real needs of labour and at the cost of social energy that is unconsciously expended in the creative work of speech. Any new application of the symbol is again an expense of energy – even if it is very small, it is still unquestionably real. Even when a word is only 'thought', the very same muscular efforts occur in abbreviated, incomplete forms that are fully articulated in the act of pronunciation of words. In general, the element 'red' is the product of both past and

new labour, like the brick in which that element is manifested. And no matter how far experience is broken down into smaller and smaller elements – right down to the infinitely small – each element will still represent a crystallised effort and an overcoming of resistance. Each element will retain a collectively labouring character.

As one can see, this is the application of the socio-economic principle of labour value to experience. An element of experience is the product of social labour that has entered into cognition. It is created on the basis of social needs for the differentiation of the multifarious conditions and components, and it is in this that what Marx would call its 'use value' consists. It is separated out and formed by the expenditure of social-labour energy – this is its 'labour value'.

Work, by means of which elements of experience are formed, is first 'physical' and subsequently 'conceptual'. So, in order to obtain the element of a 'brick', it is necessary first physically to make it and subsequently to signify it with a verbal symbol. In order to find the element 'hydrogen' in water, it was necessary first technologically to break down the compound of water, and subsequently to produce a formula for that compound. In order to discover the elements of 'cells' in an organism, it was necessary first to apply the technology of the microscope, etc. Even if an element is formed only by means of psychical operations – for example, an 'atom' or 'monad' – even then these operations take technological-labour processes as their model. In this case, the model is the process of splitting, subdividing, pulverising.[3]

'But', the reader will say, 'what is it that you call elements? They are all so varied and heterogeneous – actions and things and characteristics, bricks and the colour red and hydrogen and cells, and finally even atoms and monads –

3 As we see, in every case the application of a word or other sign or formula – in general, a symbol – is necessary for the isolation of each element of experience. A symbol is a tool of social communication such that, because of it, the element that is singled out acquires social validity; it enters the experience of the collective, and it is consolidated and preserved as a part of real *experience*. This significance of symbols is wonderfully expressed in certain turns of speech of ancient languages. Thus, in the beginning of the Babylonian book about the creation of the world that served as the prototype of the Jewish book of Genesis, it says: 'When the sky above had no name and there was no earth below, there was only the primordial Abyss and Dark Chaos … Then there were no fenced fields. Gods had not appeared in the world … they had no names' (cited according to Ragozina, *History of Chaldea*). Here 'did not have a name', 'did not have an appellation' signifies that *it did not exist in experience*; it was not singled out in experience as something separate and objectively given. It is not accidental that along with this there is a reference to 'fenced fields' – that is, to the work that in reality physically isolates and delimits parts of nature.

that it seems strange to identify them all identically as elements of experience'. However, this is the only correct point of view regarding the question; experience is analysed in a great variety of ways. Certain parts of the content of experience are distinguished according to the historical level of development and according to the tasks for which the analysis is carried out. In those times when human thought had managed to single out only a few of a people's labouring activities, it was precisely these activities that constituted the sole elements of experience. As more and more labour was invested in the world of experience, the sum total of elements grew, and at the present time the quantity is enormous. But thought operates with the elements of experience according to the technological and cognitive goals that are in hand; each of the manufacturing and scientific methods differentiates its material into elements in its own particular way. In machine technology, elements of the labour process are different from those of textile mills or handicraft production. In geometry, they are different from those of mechanics or of chemistry. The elements of political economy include enterprises, people, and people's interests and needs; in human anatomy, they include organs and tissues; in histology, cells; in physiology, the functions of organs and cells, and so on. Atoms are elements for those materialists who have substituted atoms of matter for all experience; elemental ideas are elements for idealists; elementary sensations are elements for sensualists. Even for similar tasks elements must often be taken in very different forms and scales. Our author explains this very aptly with an example relating to elements of the measurement of length:

'In drafting we use millimetres as the unit of measurement and a mistake of one tenth of a millimetre makes a significant difference. In surveying land, measurement is done in rods and acres. The distance from the earth to other planets is measured in millions of miles, and interstellar space is measured by the light-year, i.e. the distance that light travels in a year'. In other words, in the first case the element of length – the smallest unit with which cognition is concerned – would be less than a tenth of a millimetre, while in the latter case it would be more than thousands of millions of kilometres.

It goes without saying that it is also possible to be more or less correct, i.e. to make a more or less expedient choice of elements of experience. Thus, breaking the world down into atoms can be less satisfactory than breaking it down into the sensuous elements of Mach and the empiriocritics, while this latter – as we explained earlier – is quite insufficient for an active, social-labour worldview. It would be the height of naiveté to attribute final, absolute significance to any one division of experience. Our times have provided the most dramatic proof

of this. For a long time, chemical elements were considered immutable and indissoluble, and now this view has been refuted.

Understanding the elements of experience from the perspective of labour guarantees against mistakes like these. From the perspective of labour, elements entirely correlate to the task at hand, whether it is practical or cognitive. These elements are crystals of social activity formed in the course of labour/experience as material for systematic grouping in conformity with the needs of the collective that is the bearer, or subject, of experience.

3 Objectivity

We will now investigate the means by which elements in a system of experience are classified.

First of all, we come up against the difference between physical and psychical phenomena. Empiriocritics quite correctly point out that the essence of this difference is to be found not in the elements themselves – for they can be the same in both cases – but in the nature of their interconnectedness, in the way in which they are combined. But the empiriocritics are unable to give an accurate and satisfactory explanation of the interconnectedness of elements in regard to either the physical or the psychical. We, however, can easily do this as soon as we look at the question from the point of view of the living practice of human society.

As a matter of fact, consider how *in practical terms* an axe, as a physical body, is distinguished from an axe, as a psychical complex – i.e. a perception or psychical image of it. The axe as a physical body serves to cut wood, but what about the axe as a psychical image? You would say, of course, that it is not useful for cutting wood, and you would be essentially right, but this is not all that could be said. In a dream, individuals might be convinced that they are cutting wood with an axe, but their tool in such a case would not be a physical body but a psychical form. You will object that the dream axe is not a tool at all, since it only seems to sleepers that they are working, while in reality nothing of the kind happens. But here you fall into the realm of philosophical debate. Philosophers of the sceptical or critical school would explain to you that in experience, in general, there is nothing except for psychical images or 'outward appearances', and consequently when you are awake you are 'given' only psychical images of the axe and of the work you do with its help – the 'reality' of both of them is hidden from you. If this is so, then you cannot distinguish the axe as a physical body from the axe as a psychical form. And you will never extricate yourself from these difficulties and scholastical subtleties

as long as you remain within the realm of personal individual experience, in the realm of the isolated thinking 'I', the usual hero of old theories of cognition.

Even the fact that the dream-axe disappears when you wake up does not essentially change anything. First, the real axe can also be taken from you. Second, psychiatry knows of hallucinations so durable and systematic that figments of the imagination do not disappear with any change of condition of the ill person and play their role with complete consistency. Such phantoms come and go just like real people, and the senses of sight, sound, and feeling are involved in the hallucination, not allowing the patient any possibility of verification. If one considers the individual 'I' as the subject of cognition, then there is no obstacle in principle to apprehending the entire world as a complex, elaborate, comprehensive and systematic hallucination of this kind.

But the axe-body is suitable as a tool not only for you, but for any other person who uses it. The dream-axe, by contrast, exists only for you alone; no one else can pick it up. The first one is located in the same moment of time and at the same point in space both for you and for other people with whom you communicate; it is composed of the same parts and possesses the same qualities, and, in general, presents the same elements in the same interconnectedness. The experience of people regarding it is *socially agreed upon* or – what is the same thing – *socially organised*. But one cannot say that the corporeal axe is identical for all people. For the lumberjack who is working with it all the time, it has a greater sum of qualities than for a tailor who almost never works with it. For a scholar learned in physics and chemistry, it contains a greater number and a greater variety of elements than for a person who is not educated. But even so, in the experience of these people there is concordance and no contradictions. There is sufficient agreement for it to be assumed that for the entire collective the corporeal axe is 'the same thing'. This experience is *socially valid* or *objective* – philosophical terms that have always given rise to many misunderstandings because their exact meanings could not be understood as long as philosophical investigation does not adopt a social point of view. Now the inner meaning is clear to us: the objectivity of physical experience is its social organisation.

As regards the 'axe' as a psychical complex – i.e. a perception, psychical image, dream, hallucination, delusion, etc. – it is *not objective*. My perception of the axe arises independently of the experience of other people and independently of any consultation with them as to whether they are having similar perceptions at that moment in time. I can look at the given axe at a moment when no one else is looking at it and turn away from it precisely at the moment when they turn their attention toward it. An image also appears in my

memory irrespective of whether it has appeared in other people's memories or of the form in which it appeared to them.

An illusion or hallucination of an ill person, if that person has any doubt, can be verified with the aid of social interconnectedness; the patient turns to other people in order to clarify whether the images the patient perceives agree with their experience – i.e. whether they possess 'social significance', whether they belong to socially organised experience. 'So is it true *in reality*?', the patient asks. And the way the question is posed reveals the true meaning of the idea of 'reality', which here is consistent with the idea of 'physical experience'. If other people say, 'yes, we see and hear the same thing that you do' – i.e. if the patient's experience and other people's experience agree (are socially organised) – then the patient's experience has to do with real subjects: objective, physical phenomena. If, on the other hand, other people say that the images the patient perceives do not exist for them, it becomes clear that the patient's experience in the present case is only 'subjective', only psychical. It is an illusion or hallucination.

It is necessary to note that psychical or subjective experience is also far from lacking organisation. Psychical images, images from memories, even visions in dreams and hallucinations during illness, all pass through the consciousness with a certain interconnectedness and regularity whereby some of them are attached to additional images, others to still different images, and so on. This is so-called 'associative interconnectedness' that embraces and organises the entire psyche of the individual, but it is organised by a given individual and does not go beyond the confines of the life of that individual. This means that this experience is *individually organised* experience. This is the true meaning of 'psychical' or 'subjective'.

It is necessary to recall that the terms 'socially organised' and 'individually organised' signify precisely the *method of organisation*, which is far from identical with the terms 'social experience' or 'individual experience'. The latter terms express whether experience pertains to the collective or the individual and do not refer to methods of organisation. We will explain this with a couple of examples.

Any astronomer who discovers a new comet calculates its position in space, its path, and its magnitude and determines its form and composition, etc., still cannot publish all this since no one else has seen the comet or knows about it. Consequently, for the time being, it pertains only to the astronomer's individual experience and not to social experience. However, it was found, identified, measured, and investigated by scientific methods which had been worked out collectively by humanity in order to organise its experience. This means that the comet had already entered into *socially organised* experience and had taken

its place in the series of objective, physical phenomena. This is revealed in practice in the fact that every other observer will find the comet in exactly the same place and with the same characteristics as the first person who discovered it.

For wide circles of the backward peasantry, wood goblins and house spirits represent living reality and are accepted as phenomena of the physical world – humanlike beings of a particular sort and with special characteristics, possessing tails, horns, exceptional strength, etc. If there were no other social groups in the world than the backward peasantry, then wood goblins and house spirits would still even now possess an 'objective' character and would be treated as socially agreed upon experience. But humanity also contains other more progressive classes, and it has collectively built up another, richer and more coherently interconnected experience, in the form of science, which stands in contradiction to conceptions of wood goblins and house spirits; it denies that they are real and treats them as products of popular fantasy. Accordingly, the experience of contemporary humanity as a whole is not socially organised, since it is not agreed upon by different classes and groups. However, this experience is nevertheless that of a social group. And when one of us comes upon a fantastic being like this in a dream, for example, we characterise it as a purely psychical event, as the result of a recollection of childhood summoned up by the association of psychical images – in a word, as experience that is only organised individually.

From our point of view, it is easy to understand how, in the history of thought, objectivity sometimes was on the side of only one person who was at variance with all the rest of humanity. So, in the time of Copernicus, objective astronomical reality existed for him alone, and hundreds of millions of people were in error. The fact of the matter was that Copernicus alone possessed all the accumulated astronomical experience up to that time, and he was able to organise it coherently by methods which corresponded to the level achieved by the collective work of humanity. Other people possessed this experience only partly and in fragments, so that for them it was organised only in part and not in all its fullness.

From this, by the way, it is clear how poorly those critics who presumed that the question of objectivity can be determined by a majority vote understand the theory of the social organisation of experience. The fact of the matter is that *majority* and *organisation* are not only not the same thing, but down to the present day they have increasingly appeared to be on opposite sides.

It is necessary to note that, in general, this theory, which is essentially very simple and follows necessarily from the social-labour view of cognition, has

given rise to a truly incredible misunderstanding in the heads of quite a number of critics during the last ten years since I formulated it. Their incomprehension is as deep as what is usually conferred only on the most important and remarkable scientific theories. This incomprehension begins with the attribution of the honour of creating these new views entirely to me. This was unjust, since the fundamental idea was – albeit in passing – completely and decisively expressed by Marx.

Marx was the first to understand that objectivity does not have an absolute but a *socially practical* meaning. He first pointed this out in his notes on Feuerbach to which we have referred a number of times. In these notes he proposed to understand reality, *Wirklichkeit* – the objective world – as human practice and therefore as social. The second time he spoke of this – and he expressed it quite precisely – was in *Capital* where he exposes and explains commodity fetishism – the characteristic of exchange society. This, as we already know, is the method of thinking that conceives of the relationships between people (the division of labour among them) in the form of relationships between things (commodities) and precisely in the form of their 'value' (their capability of being traded). Having unmasked this fetishism, Marx adds: 'These are socially valid and therefore objective forms of thinking for a given historically specific means of production – commodity production to be precise'.[4] But, as he explains further, all fetishism dissipates as soon as we adopt the point of view of other means of production (he has in mind the ancient communal organisation of labour and the future socialistic organisation). Accordingly, what is objective under some social conditions ceases to be objective – i.e. socially necessary and socially useful – under other social conditions. Both these nuances are contained in the Marxian expression 'social validity' [*gesellschaftlich gültig*].

It is curious that it is precisely those writers who declare themselves to be the most ardent supporters of Marx who now react with particular indignation to the social theory of objectivity. I will cite the most typical objections. This is what G. Plekhanov writes:

> Now as a matter of fact not a few people have categorically denied the existence of devils in general and house spirits in particular. Today the term 'evil spirits' is devoid of any 'social validity'. But there was a time – and moreover an extremely prolonged time – when that term was totally valid and it did not occur to anyone to contradict the 'objectivity' of the

4 *Capital*, Volume I, Chapter 1, Russian translation by Bazarov and Stepanov.

> house spirit. But what follows from this? Did the house spirit really objectively exist? Reasoning with the help of your 'higher criteria of objectivity', it would be necessary to say – 'yes'.[5]
>
> *From Defence to Attack*, pp. 77–8

> According to the clear and incontestable meaning of your theory of objectivity, we must answer the question of the existence of the house spirit thus: there was a time when the house spirit was inherently an objective being, but later that 'grandfather' (as it was called not so long ago by our peasants) was deprived of objective being, and it now exists only for Moscow merchant wives and for other individuals who have the amusing custom of using the same expression.
>
> *From Defence to Attack*, p. 79

As we see, the entire argument boils down to the fact that 'objective being' is understood in an absolute sense. The wood goblin and house spirit either absolutely existed in the era of our ancestors or they absolutely did not exist, whereupon our critic, proud of his free thinking, accepts the latter. Meanwhile once he himself, while popularising the dialectic, wrote that the dialectic rejects the old precept according to which one should say only 'yes – yes' or 'no – no', whereas for the dialectic 'yes' and 'no' existed simultaneously in reality.[6] But even if the ancient Plekhanovs ascribed absolute being to the spirits of the elements, and the latter-day Plekhanovs ascribe non-being to them, they share a very important common characteristic, and that is an un-dialectical, un-historical way of thinking. But to those who consider reality as social practice, the matter presents itself differently.

For our distant ancestors, the deep forest was full of dangerous mysteries. A person was surrounded there by mysterious sounds, dim, fluctuating forms, innumerable fears and dangers. There were wild animals, the mocking cries and phosphorescent eyes of night birds, the cold fire of swamps, strange, fantastic combinations of light and shadow in the leaves producing thousands of illusions. Our ancestors did not understand that people who are lost walk in circles while thinking they are walking in a straight line. There was the constant risk of being attacked by predatory animals which stalk in the twilight. All this

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5 Between 1908 and 1910, Plekhanov wrote three letters criticising Bogdanov's philosophy. They were published in a chapter 'Materialismus Militans: Reply to Mr. Bogdanov' in a collection of Plekhanov's polemics against revisionism titled *From Defence to Attack* [Trans.].

6 Plekhanov took this from Engels's *Anti-Dühring* [Trans.].

together formed a complicated complex that includes a sense of being out of one's element, of anxiety, and of mistrust of the surrounding environment. The thinking of those times was concrete and authoritarian; people could not interconnect and unify this complex in any other way than in the living form of an elemental creature: the ruler of the forest. This creature gave form to a rich and real living content; it was a form that was socially necessary and socially useful, i.e. objective. Did it exist? The question is naïve if it demands an absolute 'yes' or 'no' for an answer. It existed as a living sum of the natural phenomena of the forest and of the human frame of mind that was inseparable from it. It existed as a form of the polytheistic, 'multiple-godly' worldview that was inextricable from popular consciousness. It existed in the sense of social practice; it existed as everything exists for us – only relatively and not absolutely.

Wood goblins do not exist for G. Plekhanov. Upon this, the esteemed critic is to be congratulated. But, first, is there any kind of guarantee that many of the facts that he now accepts as indisputably objective will not seem to future generations to be just as lacking in objectivity as the elemental spirits of the past seem to our generation? And, second, has the aforementioned thinker not noticed by whom all of these wood goblins and other 'demons' were actually exterminated and destroyed? They were not eliminated by the absolutely 'orthodox' people of olden times, but by heretics – not by the Plekhanovs but by the opponents of the Plekhanovs. The 'orthodox' defended the wood goblins forcefully and passionately for a long time, and *our* predecessors – the heretics – were sorely tested by the power of obsolete objectivity. And now the Plekhanovs have betrayed their old wood goblins and 'absolutely' reject them. And for what? Only in order to defend the contemporary wood goblins of *absolute* truth, *absolute* objectivity, *absolute* matter, etc.

Let us take another objection that is also frequently repeated. The same author writes:

> But we already know from you, Mr A. Bogdanov, that 'in general the physical world is socially agreed upon, socially harmonised, in a word, socially organised experience'. It therefore follows that the existence of people preceded the existence of our planets. First there were people. People began to 'make utterances', socially organising their experience. Then, thanks to this fortunate circumstance, there appeared the physical world, in general, and our planet, in particular. This, of course, is also 'development' but only development backwards. It would be more accurate to say development in the wrong direction.
>
> *From Defence to Attack*, p. 80

Plekhanov does not believe that the earth appeared as the result of human conversation, just as he does not believe in the existence of wood goblins. This once again does honour to his perspicacity. But I think that if anyone asserted something like what he is ascribing to me – repeating, by the way, what two or three other critics have said – then no self-respecting writer would bother opposing it. This means that either the refutation is completely unnecessary, or it is based on an untrue account of the opponent's position. In fact, it boils down to a vulgar misrepresentation of the idea of 'physical experience'.

The following is characteristic. This same critic has translated into Russian (and translated it very poorly, to be truthful, as was noted in the press) Marx's famous *Theses on Feuerbach*. In those theses, Marx argues that reality should be understood as human practice. Is it not strange that the translator did not raise his objection then? Is it not obvious that he could have said the following? The earth, the sun, and Sirius all belong to reality; if one must consider this reality to be human practice, then it is obvious that people must have been present from the beginning. It was they who were engaged in practice, and 'thanks to this happy circumstance', the earth, the sun, and other things appeared. The argument would have been just as incontestable and a dangerous heresy would have been nipped in the bud, as Marx in the present case would undoubtedly have had to admit.

What then is the genuine, as opposed to the distorted, essence of the matter? Physical experience is the experience of *someone* – of all humanity in its development, to be precise. This is the world of strict, established, worked-out regularity and the world of specific, exact correlations. It is that well-ordered world in which all theorems of geometry, all formulas of mechanics, astronomy, physics, etc. operate. Is it possible to accept *this* world, *this* system of experience as being independent of humanity? Is it possible to say that it existed before humans did?

We have already seen that theorems of geometry and laws of nature are products and tools of collective work. In recognising them, we thereby also recognise humanity and its activity. When G. Plekhanov convinces us that 'our planet' existed earlier than humanity, he of course has in mind the earth, its specific position in the solar system, its subordination to the laws of inertia, gravity, etc. But what does it mean if one says that the earth is, and always has been, subordinated, let us say, to the law of gravity? According to this law, the attraction of bodies is proportional to their masses and inversely proportional to the distance between them. It is clear that the action of this law presupposes the *measurement* of mass and distance using, moreover, long-standing, exact *measures* which were worked out by consensus among people. This presupposes the algebraic operations of multiplication, raising to the square, division, which

are carried out, clearly, by people. Throw out the 'social practice' of measurement – the establishment of units of measures, calculations, etc. – and nothing remains of the law of gravity. So if it is said that the law of gravity operated *before* there were human beings, then this is not the same as saying that it is *independent* of human beings.

What we have here is simply *conditional transference* of our activity beyond its historical bounds. *If* humanity existed millions of years ago, and *if* it had utilised the same methods of measurement and calculation as we do, then it would have been able to comprehend astronomical phenomena with the help of such a law.

If we completely abstract ourselves from humanity and its methods of labour and cognition, then there would be no physical experience, no world of regular phenomena. There would remain only the elemental spontaneity of the universe, which would know no laws, since it could not measure, calculate, or communicate. In order to understand it and to master it, we are obliged once again to *introduce* humanity, which would exert its efforts to struggle with that spontaneity, to know it, change it, and organise it. Then, once again, we would obtain physical experience, with its objective – i.e. socially worked-out and socially useful – regularity.

4 Sociomorphism

How is objective regularity figured out, or – what is the same thing – how is the social organisation experience produced?[7]

The first step in the development of embryonic thoughts as they become systematised was the basic metaphor which conceived of the phenomena of external nature according to the model of human activity. This was the initial sociomorphism that opened the way to the limitless broadening of the field of thought that organised experience.

The causal relationship is the most common method of such organisation. On all three of its levels, which we have surveyed, it has as its basis a practical

7 Bogdanov wrote *'Kakim zhe obrazom vyrabatyvaetsia ob"ektivnaia zakonomernost', ili, chto to zhe, sotsial'naia organizatsionnaia opyta'*, which could also be translated as 'How is objective regularity, or – what is the same thing – the social organisation of experience produced?' This latter would seem to imply that the objective regularity of nature is a human construct, while I am convinced that Bogdanov believed that there was, in fact, an objective order to the universe that human beings *discover* and do not *create*.

connection with the process of social labour. All worldviews, from naïvely religious to scientific-socialist, are constructed on this universal sociomorphism.

Subsequently, in quite a number of scientific and philosophical systems, we have seen how thinking has derived its methods from those social practices. For example, the model of individualism has frequently appeared in various forms characteristic of the relationships of exchange society; we found it in monadology, atomism, sensualism, solipsism, pan-psychism, Fichte's philosophy, etc. The economic fact of competition served as the model for the principle of natural selection; the ideological process of debate served as the model for the dialectic. The examples that could be used are limitless. The question consists only in how universal is this 'law of sociomorphism'? Is the organisation of experience always subject to it?

The question is easily answered if we keep in mind the origin of human thinking. The initial word-ideas – the embryonic elements of thought – were separated out from labour activity. They first made up the involuntary part of labour – shouts while working that were forced out during physical efforts. Thereafter, thought continued to develop as a product of growing social-labour practice, corresponding to the needs of that practice. This means that first there were the activities of people in a specific interconnectedness and interdependence that were generated by the very course of their living struggle with nature, and subsequently there emerged thoughts – abbreviated forms of these activities. Therefore, the practical organisation of the efforts of labour precedes the intellectual organisation of elements of experience and produces it. If this is so, then from where else can the methods of the organisation of experience derive if not from the methods of organising activity that are already to hand? Obviously, this must have been the origin, since otherwise they must have originated in themselves, created out of nothing.

Accordingly, methods of social practice provide the foundation for cognitive methods. This role is played equally by *methods of technology* – i.e. those means by which society organises external nature for itself – and by *economic relationships* – i.e. the means by which society organises itself in its labour. Both are equally conditioned by the immediate needs of social life; both find thinking ready-made in social experience. For example, authoritarian causality has its foundation in the productive economic relationship of the organisational-implementational function, whereas the highest level of causality – the collectivistically labouring level – originates in the technological relationships of machine production.

It is self-evident that in all these cases it is not a question of simply transferring methods from the realm of practice to the realm of cognition. Being applied to different material, the methods of organisation inevitably undergo

a variety of changes themselves – simplification, complication, combination, etc. These variations are often so significant that only after long and painstaking analysis can one succeed in uncovering the original model that is hidden beneath them. Thus, we have seen to how great an extent the model of individualism is simplified and abbreviated in atomism. In social life the elements of the model of individualism appear as complicated, living, active complexes – individuals; in the doctrine of atomism they are reflected as extremely simple, lifeless, passively moving atoms of matter. In other cases the changes are not so deep and the pattern is easier to recognise in its copy. For example, the relationship between 'soul' and 'body' in animism is considerably closer to the real connection between organiser and implementer; the form of social collaboration is almost directly transferred into cognition – only in a generalised and deepened form – so that the organisational side is entirely active and the implementational side is purely passive.

Thus sociomorphism is a necessary and universal law of the organisation of experience. It can be formulated in the following form:

In the final analysis, thought takes its forms from social practice. Or, to put it another way:

The interconnectedness of the elements of experience in cognition has as its basis the correlation of the elements of social activity in the labour process.

5 Substitution

Philosophy strives to elaborate a coherent and holistic system of experience in which one method and one tendency would dominate, and where there would be no gaps or contradictions. But the material on which it works presents huge difficulties and resistances. Its elements are extremely heterogeneous, and their combinations are often contradictory to the highest degree. 'Psyche' and 'matter', 'freedom' of will and 'iron necessity' of phenomena, the limitedness of cognition and the endlessness of being – how can all this be connected, united, and reconciled?

The active nature of cognition is all the more clearly revealed in those methods by which it overcomes these discrepancies and contradictions.

Cognition *changes* and *replaces* the available elements and combinations. All such methods are particular cases of one universal method, one that is already known to us as *substitution*. Let us recall its origin. The beginning of substitution coincides with the beginning of speech and thinking. Its starting point is the connection between an 'utterance' and its 'content' – i.e. above all, between the word and the action which the word designates. Beneath

the 'symbol' something is substituted that is usually extremely dissimilar to it but which 'corresponds' to it – i.e. is connected to it in a strictly defined and constant fashion. This correlation becomes a model for the organisation of facts; some phenomena are substituted for others so that the first are as if transformed into symbols of the second. Subsequently, instead of dealing with the first phenomena, it is the second that are investigated, grouped, and, in general, organised. For example, in the kinetic theory of gases, the pressure, volume, and temperature of the bodies being studied are intellectually replaced by the mechanical movements of solid, extremely small molecules of gas. This movement can be investigated with the help of previously developed methods of mechanics. By means of the conclusions obtained in this way one can succeed in mastering the qualities of gases, because 'what is substituted' for molecules is connected to them by a constant and definite connection, and it is possible to draw from one of these two sides accurate conclusions about the other side, and vice versa.

All everyday, scientific, and philosophical explanations are based on substitution. In order to more clearly present the essence and meaning of this method, let us examine more closely one or two typical cases of more elaborate and thoroughgoing scientific substitution.

We usually observe the sun in the form of a shining yellow circle on a blue field. This is a purely visual form, and if primitive people consider the form to be a material body, then this is an unconscious substitution of the elements of hardness – as perceived by touch – for the elements of colour and form – as perceived by sight.

Very early on – apparently even before the birth of scientific astronomy – people began to guess that the sun is not a flat circle, as it appears to the eye, but is a sphere. If, in experience, a given circle with no shading is accepted as a sphere, then this, of course, is nothing other than a new substitution changing the observed complex and replacing it with another, new one.

But all the same, in both cases the substitution is kept so close to immediate experience that it can without much of a stretch be accepted as a simple 'supplement' to the given fact – as an 'addition' to the elements at hand of still other elements, transforming the circle that is seen into a mentally comprehensible sphere. But when a precise astronomical theory enters upon the scene, the essence of the method is revealed much more sharply and definitely.

For contemporary science, the sun is a spherical mass of gaseous[8] bodies occupying a space 1,300,000 kilometres in diameter. It is obvious here that

8 In the 1913 edition 'and liquid' was included here [Trans.].

immediate experience and the astronomical substitution that is connected with it are quite incommensurate and to reduce the substitution simply to the supplementation of new elements to the living form would be ludicrous. This would be the same as 'appending' a library of a million volumes to a single letter of the alphabet or 'appending' the Louvre to a kitsch painting.

The sun, as it is understood by astronomy, cannot be perceived by a human being either as an individual impression or as an individual complex of impressions. More than that, nothing – not even the most active and vivid imagination – is capable of embracing it. Nonetheless, in astronomical experience it appears exactly as described and in no other way. This is one of the examples of the extreme inadequacy of the individualistic understanding of experience, of its utter lack of correspondence with scientific knowledge. We might ask how such an outrageous and supra-individual substitution could come about.

The path to it was cleared by *technological* substitution, based in the present case on optical instruments. Galileo's telescope already magnified the optical image more than a thousand times. Its 'linear' magnification was 32 which means that the magnification of the surface, 32×32, was 1024. Moreover, in addition to the quantitative change, an even more important qualitative change was achieved. For example, Venus was transformed from a simple star with an indeterminate outline into a clear sickle comparable to the sickle of the moon. The sun was transformed from a pure disk to a disk with spots, etc. Currently, large telescopes magnify the image by one million times (linearly by 1000–2000 times and even somewhat more). The calculation of the size of observed bodies continues along these lines, irrespective of the limitations of perception and imagination of individuals.

Technological substitution reveals the social origin of physical experience to us with particular persuasiveness. With the naked eye you see a not very vivid star, unflickering and with an imprecise and dull cast – the planet Saturn. With a telescope, a strikingly strange, mysterious picture appears before you – a bright sphere with stripes and spots, circled by three or four flat rings, with several little stars continually accompanying it. You believe that you are looking at 'the same thing' as in the first case – the planet Saturn, to be exact. However, how can you be so sure of this? If, instead of a telescope, you substituted a kaleidoscope, you would see still more original things, but this would not at all be 'the planet Saturn'. What guarantee do you have that the telescope gives a truthful depiction of the object? The guarantee is that it is constructed in a particular way and according to definite technical methods. Its glass was oriented properly, poured in a particular form, and ground according to certain methods. And all this depended on the development of optical and geometrical constructions, calculations, and designs. In a word, the entire guarantee of

'objectivity' of the phenomena observed by you with the help of the telescope is contained in that sum of systematically applied labour of other people which has been socially crystallised in this instrument. If this guarantee is violated – if some of the work on it was misapplied, if there was an inaccuracy in the grinding, if a mistake was made in calculating the surface, if the casing was not straight, etc., for example – objectivity would also be destroyed; you would see something that does not exist. A new application of labour would be necessary in order either to remove the distortion of reality by repairing the instrument or to extract the truth from the 'untrue' depiction by adjusting the calculations.

But let us return to the consideration of the substitution which is connected with the physical complex of the 'sun'. Thanks to spectroscopes, the chemical composition – if not of the sun as a whole, then at least of its atmosphere – has been determined. Dark lines in the light spectrum obtained by refracting a ray of light through a prism reveal what gases that ray of light passed through before it reached the spectroscope. By this method, chemical bodies – elements of matter with definite properties – are substituted for the astronomical image of the sun.

For contemporary chemistry, elements are made of atoms which are distinguished by their relative weights and this determines their affinity and other characteristics. The atomistic substitution posits – in place of the tiniest particles of matter previously accessible to our senses – an immeasurably large number of almost infinitely small atoms freely distributed and moving about in space. Consistent with calculations based on the mechanical theory of heat, the average size of an atom is about 100 millionths of a centimetre in diameter, while our eyes under normal conditions can hardly distinguish one hundredth of a centimetre. Now if you try to conceive of a quantity of such atoms in the gigantic mass of the sun, you would obtain a number so far beyond the realm of our imagination that it would be completely pointless to state it. All of these atoms are conceived of as being in rapid, changing, and diverse motion, in complex and intricate mutual interrelations. This is what substitution has produced from the simple, stable, sensory complex that is familiar to everyone as 'the sun'.

But it goes further. In current theories of the structure of matter, every atom is a whole world of still smaller elements and still more impetuous and chaotic movements. It contains from thousands to hundreds of thousands[9] or more electrons and protons – 'atoms of electricity' – that are located within its empty space, just like planets in the space of the solar system. Despite the huge

9 The 1913 edition said 'tens to hundreds' [Trans.].

number of elements,[10] the volume they occupy is tens of billions times smaller than the unoccupied volume of the atom. They rush with a speed 10,000 times greater than the speed of a cannon shot, colliding and changing their trajectory an incalculable number of times per second. This is a stormy ocean of forces and tensions, a whole realm of elemental struggle of activities locked up in the infinitely small.

We said that electrons and protons are atoms of electricity (the electron is negative, the proton is positive).[11] But what is electricity? It does not present a particular type of sensory perception – like colour or heat or sound – for which there are particular, separate organs of sensation. Electricity manifests itself in the most varied forms but not in any one in particular. For example, an electric spark is not, properly speaking, 'electricity', but rather an induced complex of electrical energy involving heat, colour, sound, mechanical, and even chemical activities. The word 'electricity' expresses precisely the connectedness and interdependence of quite a number of such sensory phenomena. When it is said that such and such a body 'possesses an electrical charge', this signifies nothing other than the possibility of making this body – by certain methods – the technological source of the phenomenon of a spark, or of attraction or repulsion, or of a chemical reaction, or magnetisation, etc. The electron is the smallest real quantity of such a charge – i.e. in order concretely to understand the 'electron', it is necessary to substitute the technological capacity of all these phenomena at a correspondingly small scale. In order to see the sun as being a gigantic stream of electrons and protons[12] grouped into atoms, it follows that we have to perform this substitution yet again. So far, this is the ultimate substitution for the example we have chosen.

Let us now take another illustration. A ray of light is a comparatively uncomplicated complex – very constant, with extremely stable regularity, which was discovered long ago. To be precise, light follows a linear path, it is a force that diminishes proportionally to the square of the distance, and it is reflected like the repulsion of elastic bodies that are struck, etc. We can say that for us – in our experience – this complex is quite well organised and its elements are solidly and coherently connected to one another. But, on the other hand, comparatively little can be done with it in this form. In order to master it more fully and to utilise it more completely in pursuing the goals of science, scientific thought was obliged to explain it, to resort to substitution.

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10 The 1913 edition said 'electrons' [Trans.].

11 In the 1913 edition, instead of this sentence, Bogdanov wrote: 'We said that the electron is an atom of electricity' [Trans.].

12 The 1913 edition said only 'electrons' [Trans.].

Isaac Newton conceived of light as a stream of special atoms thrown out in all directions by a glowing body that cause the sensation of light by striking the retina of the eye. And here, as in the previous case, a complex of a few solidly combined elements was replaced by a complex of elements that is richer but less connected. This, however, turned out to be inadequate; it accounted for some, but not all, optical phenomena. Huygens, Fresnel, and Young[13] worked out another incomparably more complex substitution in the form of a theory of waves of light in the ether.[14]

According to this theory, the essence of light consists of oscillations in the ether, emitted in the form of waves from every light-emitting source. In so doing, each oscillating particle of the ether, in its turn, becomes the source of identical waves emitted in all directions, so that the process is multiplied to infinity. As light travels further and further from the original source, each point of the universe becomes a source of identical – only continually weaker – movement and turns into a derivative light centre. The original and the derivative waves combine and clash – partly intensifying and partly destroying one other – and a ray of light is a line in which the various oscillations combine in such a way that they intensify each other. This theory substitutes in place of a ray of light (a simple and geometrically orderly phenomenon) an elemental struggle of an infinite number of other more complex and less orderly movements. But this substitution made possible the achievement of a considerably deeper understanding of the processes of light and a fuller subordination of those processes to the labour objectives of humanity. It succeeded in explaining a number of facts: interference (in which the combination of light and light can produce darkness), diffraction (in which a ray of light bends around a dark object), polarisation (which distinctively changes the behaviour of a ray of

13 Christiaan Huygens (1629–95), Augustin-Jean Fresnel (1788–1827), Thomas Young (1773–1829) [Trans.].

14 For a variety of reasons, before the twentieth century most philosophers and physicists believed that the universe was a plenum – full of substance and with no 'nothing'. The term 'ether' was given to the invisible substance that supposedly filled all the space of the universe not occupied by visible bodies. At the time that Bogdanov wrote this, physics was undergoing a revolution in the understanding of space. James Clerk Maxwell (1831–79) advanced physics by proposing that light, magnetism, and electricity are manifestations of the same phenomenon, that is, the electromagnetic field. However, to understand how they travelled in space, he had to conceive of them as waves in the ether, and this is what Bogdanov is referring to. It was Albert Einstein's (1879–1955) special theory of relativity (1905) that demonstrated that the assumption of ether is unnecessary. It was not until after the 1920s that Einstein's view became generally accepted [Trans.].

light), and so on. As a result, more accurate knowledge was obtained for many practical applications, not only in scientific technology – in the construction of optical instruments, in methods of mineralogy and crystallography, and later on in photography, etc. – but also in purely industrial technology – in the use of polarising instruments to analyse solutions in sugar-producing and various chemical industries.

At the present time, the electromagnetic theory of light of Maxwell and Hertz[15] has gained predominance. This theory involves a different substitution, even more complicated and less precise. Instead of simple mechanical vibrations of particles of the ethereal environment, this theory posits wave-like alterations of its electrical and magnetic properties. This involves the substitution of various complexes – visual, thermal, mechanical, chemical – in the form of which electrical energy is understood. There is the same infinity of minimal, interwoven movements, but each of them represents a much greater sum of more varied elements.

Thus the process of substitution unfolds, penetrating ever more deeply into the depths of phenomena. We see that in place of more simple, definite, and stable complexes there are substituted elements that are ever more complicated and richer but less well-defined and less cohesive – from less but more organised content to fuller but less organised content. How can this tendency be explained? Can it be considered typical and invariable?

These questions are easy to answer if we adopt the point of view of labour and consider knowledge as the product of effort, as the result of the struggle with nature. Then it will become clear to us that the production of knowledge, like the production of all other products, can be accomplished more successfully *the richer the material* that is processed and *the less the resistance* it offers to processing. Applying these conclusions to the method of substitution, it becomes clear that, *on the whole*, substitution strives to replace less content with more content, permitting more combinations for cognition, so the material for processing becomes richer. At the same time, more stable and more coherently organised complexes are replaced by less stable and less organised complexes that will offer less resistance to the productive activity of thought.

Thus, in our last example, a ray of light is a phenomenon so definite in itself and so solidly organised in our experience that, taking it such as it is in our usual sensuous reality, we can accomplish very little with it. Of course, we can 'describe' it and 'ascertain' its linear path and its other characteristics. But within these confines we would never be able to foresee and understand

15 James Clerk Maxwell (1831–79), Heinrich Hertz (1857–94) [Trans.].

how, under certain conditions, light when combined with light produces darkness. This would be incomprehensible and clearly contradictory for us, since the stable and regular complex that we conceive of as a ray of light is incapable of changing simply by combining with another ray, and it is still more impossible that two rays could destroy one another. We can only extricate ourselves from this contradiction by an expedient substitution which replaces material that serves poorly for combinations and that lacks flexibility with other material that is richer and more flexible. Wave-like motions are just such material; they offer incomparably more varied combinations with the most varied results. Two identical waves, combining, can either strengthen or weaken each other, depending on the extent to which they coincide. They completely cancel each other out if the assent of one completely coincides with the descent of the other, and vice versa. In this way, if we replace the phenomenon of light with wave-like processes then we obtain the circumstance in which light is weakened or cancelled out by light. The task is resolved. A theory of interference has been created which has many important and practically useful conclusions.

Analogously, there is no direct path from the linearity of light, which is familiar to everyone, to the fact, which was later established, of a certain bending of light around the edges of opaque bodies. It is a different story if we think in terms of waves pouring out into space; it is both experientially possible to observe and theoretically not difficult to conceive of the phenomenon of light flowing around obstacles – the longer the wave, the more significant the phenomenon. Here again, a substituted content that is less stable and definite and of a more diffuse character turns out to be useful for cognition.

But does it follow that the tendency we have discovered should be considered to be a constant and absolute rule of substitution? The same labour point of view immediately suggests the contrary. This is only a *general* rule and a *general* tendency; in certain cases success can depend on other conditions. Suppose, for example, that it is necessary to investigate a phenomenon with an extremely rich and unstable content, but for which suitable methods have simply not been worked out yet. In such a case, it is often necessary to substitute content that is less rich and more organised but which can be processed by methods that are more familiar to us.

Thus, in the present state of psychiatry, the understanding of psychical illness and the discovery of methods of fighting it have elucidated only to a low degree the patient's psyche, sensations, psychical images, emotions, and volitional motives, even though all this forms both extremely complicated complexes that allow a great many combinations and that, moreover, are not solidly organised and tend not to be lasting. We are as yet unable to deal with them

confidently and expediently, and therefore we must have recourse to a substitution in which the material lends itself to methods of cognitive organisation that we have already studied and are familiar with. The physiological processes of the brain serve this purpose. The doctor ascertains, for example, a manic agitation with its stormy flood of images, feelings, and impulses and concludes that it is based on congestion of the brain (an excessive flow of blood). Undoubtedly, as far as cognition is concerned, congestion of the brain presents less material and less flexible material than a psychical map of mania. On the other hand, it has one invaluable advantage, which is that the doctor understands it better and knows how to handle it. For the time being, therefore, congestion of the brain serves as an expedient substitution. But when proper psychological methods bring psychology out of its underdeveloped condition and attain appropriate precision and definiteness, then the doctor will not cling to the idea of congestion of the brain. The analysis of the psychical complexes of consciousness and unconsciousness will lead to a considerably clearer understanding of psychical illness and a considerably more decisive and systematic struggle with it. Then an opposite, more typical substitution might turn out to be advantageous – more complicated and less determinate experiences of the psyche will be substituted for the physical life of the brain.

We have acknowledged that this new understanding of the world must be constructed on the basis of social-labour causality which considers every process of nature to be a technological source of other processes for the collective in its practice and in its thinking. At the same time, we find that a coherent and holistic organisation of experience can be achieved only by applying substitution. Does this not imply that two different methods must be applied in pursuit of a single goal?

In reality, it is precisely now that these two methods boil down to one; the new form of causal relationship becomes the basis and the explanation of substitution. This is easily seen in a simple comparison of them.

Let us begin with scientific-technological substitution. The science of optics says that white light is the sum of the coloured rays of the spectrum which can be separated by a prism and recombined by a collecting glass or concave mirror. This substitution is unquestionably an example of the new causality. In human practice, a white ray turns out to be the technological source of coloured rays, and vice versa. This is the exact same sum of energy changing its appearance. But such a correlation is also easy to establish for theoretical substitution – for the oscillatory theory of light, for example.

In the science of optics, one runs into two different expressions of this theory with equal frequency: 'light *is* a wave-like movement in the ether', and 'the phenomena of light are *aroused, conditioned* by wave-like movements in

the ether'. The first expression is an example of substitution; the second is an explanation of causality, and meanwhile the objective meaning of both is identical.

Light phenomena exist in the immediate experience of people, for whom they are extremely unlike the oscillations of particles of the ether or of its electrical and magnetic state which theory substitutes for them. These vibrations exist beyond the boundaries of immediate experience, since no one has seen them and probably never will. They exist in experience indirectly and by extension but also completely *objectively* – i.e. they possess social validity, which is evidenced by the living practice that is based on them and scientific prediction and the rational calculations which depend on them. It is altogether simpler and more natural to accept that waves in the ether are the cause or the source of light processes in exactly the same way as the combining of coloured rays is the source of white light. In other words, this is the same sum of energy in two different forms. Thus, all the difficulties of substitution disappear, and its logical contradiction – to be precise, the declaration that different things are identical – is resolved. Waves of ether flowing in the realm of extended, indirect experience are transformed in the sphere of direct, immediate experience into light processes – they transform into them as, in general, energy changing forms.

The physiology of the organs of sensation leads precisely to the same conclusion. It teaches that waves of the ether are the *cause* of the visual impressions received by the organism. Visual impressions or perceptions are the visual elements in subjective (or psychical) interconnectedness – i.e. they are organised individually, which is the only way they can be organised by a separate being, human or animal. Humanity, however, in its labour and communication, by exchanging perceptions and mutually monitoring those perceptions and thereby organising them socially, produces its objective visual world: physical experience in colours and forms visible to the eye. This is the sum of the physical phenomena of light. Consequently, one must assume that if visual elements are caused by waves in the ether, then all light processes that consist of these elements in an objective interconnectedness are also the results of the oscillations of the ether – i.e. the transformed form of their energy in human practice. Substitution boiled down to causation.[16]

16 This relates, of course, not to any substitution, but only to those explanatory forms that are worked out by science. Various forms of everyday substitution do not belong here – for example, when we substitute our own experiences, objective and subjective, for the words of someone we are conversing with, or when we substitute the totality of the ideas

The most important case of substitution that contemporary philosophy continually runs into is the relationship between the brain and consciousness. The brain is a physical, objective complex in a series of other physical bodies. From the time when its role in an organism was first known, the processes of consciousness – the psychical experience of the individual – were scientifically substituted for the brain. Is it possible to posit here the relationship of cause and effect? Individualist philosophers have muddled this question awfully and have made it completely metaphysical. And yet the question is really about the best way of connecting the facts, and it turns out to have a simple and easy solution, if we compare this less frequently studied case of substitution with other cases. If we compare it with the explanatory theories of physics – the theory of light, the theory of atoms and the subatomic structure of matter, mechanical theories of heat, etc., for example – the similarity of method turns out to be complete.

As a matter of fact, in both cases the phenomenon for which a substitution is made lies in the realm of immediate, direct experience, and what is substituted for the phenomenon lies in the realm of indirect, extended experience. A person's brain is accessible to the perceptions of other people in one way or another the same way as colour, matter, and heat are accessible. By contrast, a person's psyche is not accessible to the perceptions of other people, just as waves in the ether, atoms and their internal life, the thermal vibration of particles, etc. are not accessible to others. In both cases, what is substituted is characterised by an incomparably greater wealth of content in comparison with what it replaces, but it is also less stable and definite than the lower level of organisation. The brain is a measurable, precisely delimited body, which changes according to strict physical, chemical, and biological regularity, while the processes of consciousness do not have exact boundaries and flow in a fanciful interconnectedness of associations. Obviously there are no obstacles to applying a single method of understanding to all these cases. What would then be obtained?

If light is a wave-like vibration of the ether in the transformed form in which it is perceived by our senses and if matter is a complex of electrical processes transformed in the same way, then the brain, in its physiological existence, turns out to be *the same psyche in that transformed appearance as it is perceived by people in their physical experience*. From the point of view of the

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expressed in a book for its cover. Substitution is generated independently of causality, and it is only in the modern era, when the convergence of diverse methods began, that substitution came to be associated with causality and subordinated to it.

causal relationship, it is the same sum of energy in two of its phases but pertaining to different realms of experience.

At first glance, such an idea seems strange, owing to an everyday way of thinking that has been reinforced by past philosophers; it is the habit separating 'psyche' and 'matter' by a whole chasm, considering them to be things that are absolutely heterogeneous and completely incommensurable. But we have already seen that in reality there is no such absolute distinction, and that even elements of experience in both 'worlds' are the same – only in a different interconnectedness. If that incredibly rapid flow of atoms and subatomic movements that constitutes matter appears in our normal experience as solid 'matter', then why should the living flow of psychical processes not appear in our normal experience as the organised tissue of the 'brain'?

This interpretation also removes that impermeable boundary which the old worldview created between 'dead' or inorganic and 'living' or organic nature, considering the first to be absolutely lifeless and devoid of any organisation. This everyday understanding of things in effect contradicts the technical evidence – life is constantly maintained at the expense of the material of inorganic nature, and dead matter, being assimilated by organisms, actually turns out to be capable of life. Now we can see that theoretically, too, the means of understanding – the means of explaining – are the same in both cases. In order to understand and predict the behaviour of other people and animals, we substitute in place of their bodies a changing state of psyche of more or less complexity. In order to unravel the secrets of inorganic nature and predict its elemental changes, we substitute in place of its substances and forces other processes of gigantic complexity but lower organisation. This unity of method is in fact the cognitive unity of being.

6 The Picture of the World

Universal substitution permits for the first time the elaboration of a coherent, continuously holistic picture of the world, free from cognitive discontinuities and contradictions.

The universe presents itself to us as an endless flow of organising activity. The ether of electrical and light waves was probably that primeval universal environment from which matter with its forces – and later on also life – crystallised. This initial principle of the universe must be understood as a chaotic mass of elements of an infinitely low degree of organisation. That is why the ether seems to offer no or – more accurately – infinitely small resistance to all movements that are performed within it. That is why the ether is passively

subordinated to movements, transmitting them to boundless space. This is because organisation manifests itself first of all in resistance to force.

Inorganic matter with its intra-atomic and inter-atomic energy represents a higher level of organisation. Here the organisation of elements is already present, but in primitive and lower forms. These elements possess more or less stability and display resistance to external force, but no more. They do not manifest any noticeable tendency to overcome the surrounding environment, to master the material of that environment, and to progress at its expense. If they are damaged by external forces, they do not restore themselves by their own activity as living organisms do. A diamond or a piece of platinum can remain intact for tens or hundreds or thousands of years, but it is only preserved; it does not grow or multiply.

Nevertheless, these characteristics are not absolutely absent. They can be found under certain conditions with crystals – at any rate in embryonic form – so that in this regard the transition to the realm of life is not a leap and does not violate continuity.

Life is the highest type of phenomena in the universe, a type that is aggressively progressive. Life, too, displays a series of various levels of organisation, from the simple cells of the microscopic or even sub-microscopic monera to the human organism – a colony formed of many[17] trillions of considerably more complex differentiated cells. Here before us is a staircase of development of psychical complexes from the primitive associations of sensations characteristic of the amoeba to the most complex psychical experience of human beings – various levels of *individual* organisation of elements.

The highest step of this staircase is the *human collective*, in our time already a system composed of many millions of individuals. In labour and in cognition, humanity works out its own 'reality' – its own objective experience with its strict regularity and coherent organisation. The practice of this great social organism is nothing other than *world-building*, in the expression of the late worker-philosopher of whom I have spoken more than once. This world, which has been constructed and continues to be under construction – the realm of the conquest of elemental spontaneity by life and thought, the kingdom of the socially organised elements of the universe – is the most grandiose and perfected that we know; it is the incarnation of life in nature.

Such is our picture of the world: an unbroken series of forms of organisation of elements – of forms that develop in struggle and interaction without any beginning in the past, without any end in the future.

17 The 1913 edition says 'hundreds' [Trans.].

Empiriomonism is a *social-labour* understanding of the world. In this are its essence and its unity, and from this all its distinctive characteristics flow.

(1) A new social-technological form of the causal relationship. On the basis of machine production with its diverse transformations of forces, a point of view coalesces according to which any given phenomenon can be the *technical source* of other phenomena in the practice of the collective. This correlation becomes the type and model of the relationship of causes with their effects. Cause and effect is the very same sum of energy in two consecutive phases; they are equal and belong to one continuous process in the labour or the experience of the collective.

(2) A new *sensory-labour* understanding of the elements of experience. These elements are the product of social efforts in work or in thought, they are isolated out depending on practical needs, and they develop and accumulate with the growth and the increase in complexity of the system of labour. As it is with experience as a whole, so also each of the elements of experience is simultaneously a spontaneous resistance and an expedient activity – sensuous material in the crystal of labour.

(3) The removal of abstract fetishism from the philosophical concepts of objectivity and subjectivity. What appears objective in experience and thinking is socially agreed upon, or, what is the same thing, *socially organised*. Accordingly, objective physical experience is experience that is socially organised, and, conversely, subjective psychical experience is experience that is only organised individually. These are different levels of organisation of experience with continuous crossing back and forth between them.

(4) The doctrine of the *sociomorphism of thought*. Practical methods provide the foundation for cognitive methods. The relationship of elements of technology in production and the relationship of people in the economy serve as the source and model for the relationship of ideas in cognition. This fact is usually masked by various forms of fetishism and also by those variations, combinations, complications, and simplifications to which practical correlations are subject as they are being transformed into models of cognition. But after sufficient analysis, the social-labour origin of these models can always be discovered.

(5) The theory of *universal substitution*. The model of substitution originates in the relationship between utterances on the one hand, and the content of these utterances on the other, between symbols and what is symbolised. The method of substitution has been applied very widely but not consciously or systematically until now. In science, the general tendency

of substitution can be clearly seen in various explanatory theories aiming at replacing less but more organised material of experience with material that is richer and less organised, i.e. providing a greater sum of combinations that are more easily processed. In its scientific form, substitution must be reduced to social-labour causality. For example, if waves of ether are substituted for the processes of light, then light must be considered as the effect of these waves – as the transformed form of their energy in our immediate experience.

(6) The same correlation should be established *between physiological processes of the brain* and *the psychical phenomena* that are substituted for them. That sum of energy that appears (in indirect, extended experience) as the psyche is transformed (in direct, physical experience) for other people into physiological changes of the brain. Thus a continuity of substitution along the entire line of experience is created, leading to a monistic picture of the world.

(7) This picture presents the universe to us as an uninterrupted chain of development of forms that proceed along a path of struggle and reciprocal action from the lowest levels of organisation to the highest. Logically and in theory, this universal chain of progress would have originated in complete lack of organisation – pure chaos of the elements of the universe. The highest level achieved up to the present is the human collective with its objectively regular organisation of experience, which it works out in its labour – world-building.[18]

18 The word *mirostroitel'stvo*, a neologism that Bogdanov attributed to Nikofor Vilonov, was created by combining 'world' [*mir*] with 'building, construction' [*stoitel'stvo*]. It could be translated as 'construction of the world', but I suspect that it may have been intended to evoke a contrast with the 'God-building' [*bogostroitel'stvo*] of A.M. Gorky and V.A. Lunacharsky [Trans.].

CONCLUSION

The Science of the Future

Any organisation is organised precisely to the extent that it is integrated and holistic. This is the necessary condition for viability. This is also true of cognition, once we recognise that cognition represents the organisation of experience. Therefore cognition always tends toward unity, toward monism. In the history of humanity, there have been various means by which this monistic tendency has been accomplished.

The first worldviews were, as we know, religious. They appeared and became dominant in the era when the division of labour in society was still weak. Because of this, these worldviews did not involve any significant degree of specialisation, and they were distinguished by their simplicity and wholeness. All the material of experience was aggregated around a chain of authorities in the form of their precepts or revelations. The methods of these worldviews were undifferentiated and essentially boiled down to authoritarian causality. In developed religions, a unified structure was achieved through the centralisation of authority in the form of a supreme deity.

In a social system based on exchange, the broad and increasingly deepening division of labour resulted in the fragmentation of social experience and the specialisation of knowledge. The technological sciences directly corresponded to various branches of production – for example, agronomy to farming and various fields of technology and applied mechanics to various realms of industry. 'Abstract' sciences – mathematics and the natural and social sciences – were applied, it is true, in many fields simultaneously. Mathematics, for example, was employed in all fields. Astronomy – to the extent that it was used to measure time and to determine location and direction – was also employed in all fields. Zoology was employed in fishing, hunting, and cattle breeding, and also in agriculture to the extent that it is necessary to study animals that are harmful or useful for agriculture. And so on. But each of these general sciences itself became a particular specialty, elaborating its own particular technology and sharply separating itself from other scientific specialties and even more from technological specialties. It is precisely in our times that the most perfect type of specialist has appeared – a person with narrow one-sided experience, routine methods, and a complete lack of understanding of nature and life as a whole.

Specialisation is a necessary stage in the development of labour and cognition. Thanks to specialisation, a continually growing quantity of material builds

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up in each sphere of experience, and methods achieve a previously inconceivable perfection and refinement. Narrowing the field of work for separate individuals, specialisation permits a much better and more complete mastery of these fields. But, like any adaptation in life, specialisation also contains elements that resist adaptation. As specialisation develops, its limitations are revealed ever more sharply. In our times, the need to overcome specialisation has already become obvious, and, moreover, the path toward overcoming it has already become apparent.

Specialisation stands in contradiction to the tendency toward the unity of knowledge. It breaks up experience into pieces so that each is organised independently. As a result, two hugely important negative phenomena characteristic of contemporary science come about: an excessive accumulation of material and heterogeneous methods of cognition.

The accumulation of material in each special science is now so great that it can be mastered only after many years of study. For people of average abilities, sometimes even an entire lifetime is not enough. It is very rare that scientists are able to work in two or three specialties. More often they are completely closed off, each in their own field, and outside that field they become the most maladapted, limited people.

This insularity and limitedness sustains, consolidates, and intensifies the divergence of scientific methods. Every specialty works out its own separate methods in isolation – otherwise it would not be able to stand apart. As time goes on, it develops its methods in a one-sided way, moving ever further away from the methods and points of view that are developed by other fields. This is useful for continuous improvement in minor details, but it severely hinders any progress in the bases and the principles of a given science. Furthermore, an extreme conservatism of specialisation arises – 'the philistinism of specialisation', in the expression of Mach – a kind of professional obtuseness, which is why the greatest discoveries of past centuries usually encountered the most resistance from official representatives of that same branch of knowledge. There are as many examples to cite as one would like. One need only recall the disdainful indifference with which learned physicists reacted to the brilliant idea of Robert Meyer when he first formulated the idea of the conservation of energy or the bitter struggle that had to be waged in the last century to support the theory of evolution of animal and plant forms. Subsequently, after a discovery is finally adopted by the mass of specialists, they, of course, successfully apply it further and improve it in particular details, without abandoning their fundamental conservatism in the least, displaying it anew at the next revolution in science.

If we examine more closely how these revolutions occurred and what they involved, we find that they usually involved the destruction precisely of the

boundaries between specialties. Some technique, method, or point of view that had already been applied in one field of science or production was transferred to another and transformed it. Thus, the law of the conservation of energy was actually the idea of the indestructibility of existence that had long ago been introduced into chemistry by Lavoisier and was already known in philosophy by the ancients, but only in the 1840s was it applied to the phenomena and forces studied by physics. And Lavoisier arrived at the law of the eternal existence of matter because he was the first to use the method of accurate weighing in his research in chemistry – a method of which had long been used in physics. And the technique had been borrowed by physics from the technology of mining and the jewellery trade, where strict determination of specific gravity of minerals, metals, and alloys is important. Darwin reformed biology by introducing the principle of the struggle for existence which he took from the economic doctrine of Malthus. Marx applied the dialectic – formerly only a philosophical method – to the social sciences. The greatest successes in physiology have been due to methods of physics and chemistry, and contemporary psychology depends to the same extent on the methods of physiology.

This all speaks clearly to us of the possibility – and even the necessity – of drawing together and unifying the various scientific methods and thereby overcoming specialisation. But as long as specialisation still rules, the unity of science is impossible, and social experience remains fragmented and unorganised as a whole. It is from this state of affairs that the need for philosophy arises.

Philosophy is nothing other than precisely the striving to organise what has been divided and broken up by the force of specialisation. This is the meaning and significance of philosophy; this is why it is historically necessary. But this is also the basic contradiction of all philosophy – the tragedy that is characteristic of it and inseparable from it.

In human practice, social experience is, *in reality*, atomised. Is it possible for a philosophical construction to combine, to connect what reality has disunited? It is *objectively* impossible to achieve this; the task becomes *objectively* achievable only when reality changes, when practice ceases to be broken up and disconnected and when specialisation is overcome by life itself. No power of thought is able to gather and organise into a living whole the pieces of a body that has been torn apart. Philosophy cannot work miracles, and to resolve the tasks placed before it with the means available would indeed be a miracle.

Does this mean that philosophy is fruitless and impotent? Not at all. Philosophy cannot resolve its task as a whole because society and its experience are not organised as a whole. But, all the same, exchange society is not an absolutely anarchical system, and the division of labour does not signify the disintegration of the social whole into completely separate individual units. Spe-

cialisation *does prevail* over the opposite tendency, and the struggle between enterprises and groups *does prevail* over the connection between them, but communication nevertheless occurs. Specialties are not so restricted that there is no contact between them. Collective organisation of experience *is being created*. If this were not the case, there could be no talk of society – the very word would lose its meaning.

Let us take, for example, the handicraft system at the end of the Middle Ages, characterised by extremely sharp specialisation. Each craft was organised separately and independently of others – even now, the word 'guild' is a synonym for 'specialty'. However, it was not accidental that guilds supported each other in the struggle with the old aristocratic patricians of trade. It was not accidental that they acquired an extremely similar internal structure; it was not accidental that they developed approximately the same moral norms. A practical community of interests and experience obviously existed. And, actually, no matter how dissimilar the technologies of the various handicrafts were, they still had much in common in their ongoing manual techniques, in the simplicity of their tools, in the small scale of their production, and in quite a number of relationships among producers that arose from these factors. This commonality found expression in similar methods of thought, of faith, of political views, etc.

The historical life of exchange society proceeded dialectically, in the genuine meaning of this term; the separation of social human beings and the gathering together of those same human beings – presenting two opposing tendencies – took place simultaneously. In the beginning, fragmentation predominated, inhibiting the process of aggregation so much that it completely masked it, making it invisible to ordinary, imprecise observation. Subsequently, aggregation gained momentum and little by little prevailed over fragmentation. It was not long before the relationship between aggregation and fragmentation was completely reversed.

This means that philosophy can organise general social experience to the extent that experience is in reality tied together and united by life itself. Within these confines, the unifying models of philosophy will be objective; outside these confines, they will inevitably be arbitrary and will have significance only for particular groups or schools and sometimes even for only an individual. For example, in all modern philosophy – down to and including German classical idealism – there is an underlying individualistic point of view; the separate human individual is taken to be the centre of activity, the subject of cognition and moral duty. This is an *objective* philosophical generalisation regarding *those* eras and regarding the developing bourgeois-capitalistic system. It is accepted by everyone, both in life and in theory, as something that is self-evident. On the contrary, any doctrine of monads or atomism, theories of 'things-in-

themselves', or the principle of the creative 'I' which 'posits not-I', belong to the realm of the debatable and the unreliable. All of these doctrines are individual attempts or, at most, group attempts that are incapable of grasping and organising social experience as a whole. They are incapable of attaining the power of objectivity; they are products of limited experience that appear as universal truths only to their creators and their creators' disciples. But, as with all sorts of organised endeavours, even goals only partly achieved provide material for further unifying work.

The saddest fate that can befall philosophy is when the power of specialisation completely predominates and creates a kind of guild philosopher – 'a philistine of a specialty'. This is a completely perverse outcome, one of the most absurd results of the atomisation of humanity. Philosophy exists precisely in order to organise the disparate parts of experience into one whole, to establish the interconnectedness which was destroyed by the division of labour and by the professional narrowness that it produced. And now philosophy itself becomes just such an isolated part, a particular branch in the division of labour with its own professional narrowness – and what narrowness! The result is an individual with a study and a library who can, of course, organise only what that individual possesses, which is, to be precise, the experience of their study and their library – an infinitely small and very unimportant portion of the gigantic amount of material which genuine philosophy must deal with. Each of these individuals reads a hundred or a thousand philosophical books that are taken from outside of the reality which gave birth to them and from outside of the interests, forces, and social struggles that are reflected in them – the preserved, cold corpses of experience lived by other people. These corpses are dissected, scholastically investigated, and cut up into small pieces, all the while assuming that the highest wisdom consists in the best method of splitting a hair into four parts. Afterwards they take the bits and pieces and stitch them together into a new book which, naturally, also possesses all the characteristics of a corpse, except for one – that a corpse was at one time a living body. Such is the philosophy of true specialists, or of the majority of them, and especially of those who work in university departments of philosophy. Other than in their use of terminology, they have nothing in common with philosophy as a social-historical phenomenon and as a social form of worldview. They provoked Feuerbach's sarcastic comment that the first indication of a genuine philosopher is not being a professor of philosophy.

As for the great masters of philosophy, they usually had an encyclopaedic grasp of the knowledge of their times, and many of them, in addition to that, were people of practical life and struggle. It is understandable that such people were able to attempt to organise experience as a whole – if not with com-

plete objective success then at least with some benefit for the development of human thought. But the further specialisation has gone, with its accumulation of material and diversity of methods, the more difficult it has become for individuals, no matter how brilliant, to acquire an encyclopaedic knowledge of their times. Ultimately, philosophy – not as the knowledge of guild specialists but as the actual generalisation of social experience – would simply have been impossible if the new forces of life had not caused a turnabout in its development.

The starting point of this turnabout lies in labour practice – machine production, to be precise.

Machine production arose out of manufacturing, which took the specialisation of labour to its limit. Manufacturing broke work down into such small, elementary operations, that workers who carried them out were reduced to the roles of living machines. But then, since it is not difficult to build a machine to execute a series of simple movements, this made it possible to transfer separate parts of work to real, inanimate machines. And when this was accomplished, it turned out that specialisation was transferred from people to machines.

Work with machines brings together various forms of labour, and the further technology develops, the more fully and thoroughly those forms of labour are brought together. No matter how different the goods that are produced, the producers have much in common in the content of their labour experience. The same basic relationship to the machine, consistent with the predominant nature of effort, is required of the worker – management of the machine, monitoring its movements, intervention to the extent that it is necessary, and, consequently, attention, discussion, and understanding. Physical action on the machine, which is of the most varied kinds, represents a continually less significant portion of the overall sum of labour experiences. Moreover, to the extent that machines are perfected, that portion continually decreases to the point where machines are transformed into a type of automatic process, and the mechanical aspect, proper, of the worker's function completely disappears.

At the lowest levels of machine production there still remains a marked difference between the operating function of a simple worker and the organisational labour of an educated specialist-engineer. As machines become more complex and perfected, this distinction decreases. Automatic mechanisms already require an intellectual preparation of the worker that goes far beyond the boundaries of purely practical skills. Workers must *understand* the mechanisms they are dealing with, not only in those particulars which are at their fingertips, so to speak, but also in general and as a whole. Technical calculation based on knowledge (perhaps not strictly scientific but nevertheless quite

precise knowledge) occupies a continually more important place in their activities, both when they simply manage the whole complicated sum total of a machine's movements and especially when small irregularities, which occur quite frequently in the operation of machines like these, demand that workers consciously take the initiative and intervene quickly and systematically.

The increasing use of mechanisms that are not only automatic but automatically self-regulating will raise the worker to a still higher level. This type of machine will obviously serve as the foundation of the technology of collectivism. At present, this is only on the horizon. Many machines, beginning with steam engines, already are fitted with regulators that mechanically monitor one or another of their functions and correct any irregularities that arise. When such methods achieve full development and become the norm, and when the main occupation of someone who works on machines is to observe and correlate the given state of affairs reported by the monitoring and recording devices and generally to supervise and direct those regulating devices – and all this with the help of appropriate scientific knowledge – then any qualitative difference between a worker and an engineer will disappear, and all that will remain will be a quantitative difference in preparation and proficiency. In this way, labour will be reduced to a single type. The extremely deep divergence produced in practice by specialisation will be removed, the division of labour will cease to fragment humankind, and there will appear a simple division of effort directed at various objects but essentially of the same kind.

Cognition, expressing and reflecting practice, follows behind the progress of practice, and cognition will also experience the convergence of specialties. The transfer of methods from one field to another, which we have already noted, prepares for the elaboration of general, unifying techniques of cognition. Fields formerly extremely distant from one another will merge together – as, for example, in physics the theory of light merges with the theory of electricity – and, by all appearances, in the near future those theories will combine in a general theory of matter. And right now, all physics and chemistry are in effect only subdivisions of general energetics, and psychology is on the path towards merging with physiology, etc. But all this convergence occurs without any planned pursuit of it; it has not been posed as a task for the development of science, and it continually encounters passive and very often even active resistance from many scientific specialists. And they are essentially incapable of posing this task, not only due to force of habit and professional-guild insularity, but also due to the force of their real interests. For such scientists, specialisation is tied to their privileged position. Specialisation denies the mass of the population from being admitted to their circles, it diminishes competition, and it keeps their salaries at a high level.

By contrast, the working class, which in practice is moving toward the overcoming of specialisation, can and must set the very same task for scientific knowledge. This is a matter of urgent self-interest; it is the precondition for a cultural upsurge to a higher level and for the possibility of becoming the actual master of social life without the tutelage of the departmentalised intelligentsia. This is one of the most important needs of the new *proletarian culture* that is now being born and is taking shape.

What will this unity of cognitive methods look like that will break through the boundaries between specialties and that will organise social experience holistically, harmoniously, and coherently? Our point of view allows us to make a definite and confident prediction about this.

We have seen that the progress of machine production imparts an ever more fully and clearly expressed *organisational* character to the activity of the worker. This is fully consistent with the historical tasks of the working class as a whole – *organisational* tasks of unparalleled breadth and complexity. The resolution of those tasks cannot be haphazard or spontaneous; by necessity it can only be rationally planned and scientific. And this presupposes the unification of all of the organisational experience of humanity in a special *general science of organisation*. Such a science must be *universal* in its very essence.

As a matter of fact, all human activity has one thing in common – the processes of organisation. Technological activity organises elements of external nature in society; cognitive and artistic activity organises the social experience of people. Even destructive work is nothing other than the struggle of various organisational forms or tendencies. As we have already noted, war is an organised dialectical process in which each side is related to the other in the same way that people typically relate to the hostile forces of external nature – i.e. they strive to overcome or incapacitate the objects their energy is directed toward, and they consequently also strive to generally organise the surrounding environment in conformity with their interests. Even the activity of someone who violates the law has – from the violator's point of view – a completely similar meaning. This is all the more true of the technically criminal activity that goes on in the struggle for new, higher forms of social life against the old and obsolete forms.

Even the elemental life of the universe is nothing other than the struggle and development of various types and levels of organisation. In this, human activity is indistinguishable from the activity of the world from which it is crystallised and at the expense of which it continues to grow. A science of methods of organisation must therefore both embrace the methods which nature has worked out and perfect its own forms of organisation. Universal methodology – this is the essence of this science of the future.

Each of the contemporary sciences, technical and abstract, represents a partial organisation of experience within one field or another. It is clear that, as the general science of methods of organisation emerges, all sciences will conform to it. The particular methods of particular fields will be partial applications of the general conclusions of the general science. This will represent the real overcoming of scientific specialisation. The differentiation between the fields of cognition and practice will remain, but this will not mean that those fields will be isolated from one another, that they will develop separately, or that they will continue to diverge. They will be vitally and ever more tightly interconnected, they will continuously exchange techniques, and their points of views will continuously interact. All the sciences will be guided by a universally wide science – not one that is hypothetical, debatable, and vacillating like philosophy, but a science that is *exact* and thoroughly *empirical*.

In this regard, this science will be the direct opposite of philosophy, which is much less empirical than all the particular sciences. Philosophy is necessary now because of the rupture of the various fields of experience, but it is not capable of repairing that rupture. And that is why, not having its own special sphere of experience, it cannot simultaneously and directly rely on the living experience of all the separate fields, since they do not make up one whole but are divided by blanks and gaps that sometimes form impassable chasms for specialised thought. The new universal science, by contrast, will have its own basis in experience just as broad as all practice and cognition taken together; it must take note of and coherently systematise all of the methods and means of organisation which are *in fact* employed in society, in life, and in nature. The regularity that will be discovered and confirmed will provide universal guidance for the mastery of any aggregation of forces of nature, of any aggregation of the data of experience.

From the most primitive cosmic combination of elements to artistic creativity – which is by all appearances the highest and, so far, the least understood form of organisational activity – everything will then be elucidated, clarified, and harmoniously interconnected by the conclusions of the formally organised experience of the whole of humanity.

But, the reader asks, is such a science possible? Is it possible to generalise and reduce to a unity what would seem to be heterogeneous – the methods by which nature operates in its spontaneous creation of forms of movement and life and the methods by which humanity operates in its diverse forms of labour and thought?

In principle the answer is very simple. History sets tasks, and so far humanity has resolved all the tasks that history has set for it. Humanity continually organises for itself the most alien and the most hostile forces of the universe; it

will also be able to organise for itself, in the process of its cognition, the same methods of organisation. No one has ever proven that anything has existed – in the world, in experience, or in human activity – that is essentially inaccessible to organising efforts. The only question and doubt is *how much* such effort and *how much* labour energy will be necessary for resolving a task and whether humanity has accumulated *sufficient* energy to be able to bring the task to a successful conclusion. But we will discover this only in practice.

But in addition to this, there is now already a great deal of concrete evidence which argues in favour of the possibility and the necessity of a universal organisational science. We have in mind those cases when nature or humanity, or both, simultaneously apply the same method in the creation of forms and combinations that are completely independent of one another and sometimes belong to quite different realms of being. One can point to facts of this kind that are truly amazing and are unquestionably not chance coincidences.

For example, the higher animals and plants descended from common single-celled ancestors that did not possess sexual difference or reproduce sexually – unless one considers as 'copulation' the fusion of a pair of cells that have begun to decompose, after many generations, that were obtained by simple division into two. Sexual difference – this ingenious method of producing new combinations of properties of life – developed independently and in parallel in the two realms of nature. If we compare the organs of sexual reproduction, we find an amazing architectural resemblance of structure in two such vastly different branches of life as the higher mammals and the higher flowering plants. This resemblance is striking to anyone who has studied the anatomy of flowers and even extends to quite a number of details …[1]

The same deep parallelism of structure exists between the seed of a plant and the egg of a bird, for example. In both cases, there is an embryo surrounded by a nutritive layer and then a protective casing; only instead of the animal proteins of the egg, the seed contains plant proteins, and instead of the fat of the yolk, a physiologically similar starchy substance. In addition to this, the distribution of nutritive layers in the seed is approximately the reverse of what is in the egg.

Still more striking is the similarity of the structure of the eye of cephalopod molluscs – octopuses, cuttlefish, etc. – to the eye of the higher vertebrates. The eye is unusually complex; it is an apparatus for organising the visual elements of light and form, consisting of many diverse parts. The common ancestors of

1 In the 1913 edition, this sentence ended 'which we, however, to avoid a long digression, will not dwell on' [Trans.].

molluscs and vertebrates, it goes without saying, did not have eyes and had, at most, pigmented spots for the retention of radiant energy. Nevertheless, the construction of our eyes and the eyes of any octopus are almost identical down to the tiniest detail, except that, once again, the layers of the retina are arranged in reverse order, as if specifically emphasising the historical independence of the production of both apparatuses.

It can also be confidently asserted that the distant common ancestors of humans and ants were not social animals and of course did not possess even an embryonic form of cattle-breeding technology or of slave-owning institutions. Nevertheless, various species of ant have been observed, on the one hand, to breed grass aphids that produce sweet juice in a way that is completely similar to the breeding of dairy cattle by humans and to cultivate edible fungi in a manner similar to agriculture,[2] and, on the other hand, to practice forms of slavery that are highly reminiscent of the military slave-owning system of ancient Sparta. As superficial as our knowledge of the life of social insects might be, these major organisational coincidences have nevertheless been discovered and many others besides.

The lives of human societies that develop independently of each other present an incomparably greater congruence: the same general historical path of development of economic interconnectedness. Thus, the transition from primitive communism to patriarchy and from patriarchy to feudalism took place on different continents without any mutual borrowing of forms.

Finally, let us compare the realm of life with the realm of so-called inorganic or inert nature. Exactly the same model – the rhythm of waves – is endlessly repeated in both realms in the most heterogeneous processes. We find it in the movement of the sea, in the phenomenon of sound, in the radiant energy of light and electricity, and – in astronomy – in the change of relationships of planets to their central sun. But it is also found in the fluctuation of the pulse, the breathing of animals, even in psychical changes of attention. The same model also governs well-organised work and artistic creativity, such as rhythm in music and poetry, and so on without end. The most dissimilar elements known to us, elements that are incommensurable both quantitatively and qualitatively, group themselves according to one type.

It would be naïve and unscientific to consider all these and countless other similar facts to be chance analogies; the theory of probability would unquestionably not allow this. The only possible conclusion is this:

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2 The passage 'and cultivate edible fungi in a manner similar to agriculture' is an addition to the 1923 edition [Trans.].

There exist general methods and natural regularities according to which the most varied elements of the universe are organised into complexes.

This proposition provides the basis for the great new science that will take over from philosophy in order to resolve the tasks that are beyond the power of philosophy. With the help of this new science, humanity will be able systematically and comprehensively to organise its creative powers, its life …

This same science will for the first time create genuine *universal formulas*. They will not be that absolute universal formula that Laplace[3] dreamed of; they will not be a formula that would embrace the universe in all its complexity but that would itself be as complex as the universe; they will be other, practical formulas that will make possible the systematic mastery of any possible sum of given elements of the world process.

Philosophy is living out its last days. Empiriomonism is already not entirely a philosophy but a transitional form, because it knows where it is going and to what it must give way. The foundation of a universal new science will be laid down in the near future.[4] The blossoming of this science will spring up out of that gigantic, feverish, organisational work which will create a new society and bring the agonising prologue to the history of humanity to its conclusion. That time is not so far off …

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3 Pierre-Simon Laplace (1749–1827) was the first person to give full expression to law-governed, materialist determinism, that is, the idea that the universe is nothing but matter in motion according to fixed laws, and that an intellect vast enough to embrace the positions of all the particles in the universe could produce a formula that could predict the future. Needless to say, Bogdanov shared the outlook of natural determinism, but he treated all human-made theories and formulas as relative and not absolute [Trans.].

4 This was written in 1911. There now exist the first attempts at the exposition of the bases of organisational science: my works, *Tektologiia*, Vol. I (1913), Vol. II (1918), in a new edition, parts I, II, and III in one volume (published by Grzhebin in Berlin in 1922); 'Outlines of Organisational Science', in the journal *Proletarian Culture*, 1919–20, nos. 7–21. There are also independent articles and pamphlets by the author, working in the same direction [this footnote was added to the 1923 edition – Trans.].

APPENDIX[1]

From Religious to Scientific Monism[2]

1

1. Cognition is practical in its very nature. It is a tool of practice, and it is produced in practice. This is clear in relation to cognition as a whole, and it is easy to establish this principle with regard to any element of cognition, if it is taken in *life*. Let us take the most abstract idea – 'existence'. In life, the term has an obviously *practical-directive* character: such-and-such an object (a microbe, a dragon, the workers' movement, God) 'exists' or 'does not exist' depending on whether or not it enters into the practical consideration of our efforts in the struggle for life and in the organisation of life. Its existence depends on whether or not it is a factor that influences how we direct our expenditures of energy as well as influencing the results of those expenditures. An imaginary image produced by a mirror or mirage exists. It can be photographed, it can in practice determine a person's fate, but there is no corresponding object behind the mirror or in the place of the projection of the mirage, and they must not be taken into account in actions that are oriented on these points. In either case, every *question* expresses a need for such a directive tool.

2. A tool provides the *answer*. There could be several answers: different tools could be used to perform the same task. But it would be absurd to cut down a tree with a stone axe, if a steel axe were available. One could calculate the apparent position of the planets by using Ptolemy's cycles and epicycles, even today, but no one is going to do that. The choice is determined by the practical sophistication of the tool. This results from the application of the following cognitive tool: 'the criterion of truth is practice', and, moreover, not individual but collective practice. The collective is always the subject of practice. The tool must be suitable *for the collective*: truth must be objective, i.e. 'socially valid', i.e. *socially meaningful.* And this means that the subject of cognition is also that same collective. A cognitive tool is made of collectively organised experience,

1 This appendix is an addition to the 1923 edition [Trans.].

2 This is a very condensed statement of a report that I delivered at the Institute of Scientific Philosophy in February 1923. *The Philosophy of Living Experience* was written more than twelve years ago; since that time my views, developing along the line which was marked out in this book, changed in the direction of a stronger declaration of the 'sunset of philosophy' and of the transition to the construction of a purely scientific monism. This report provides a general substantiation of my new position.

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just as a technological tool is made from collectively organised matter (the material of things, of physical complexes). And the practical role of a directive tool is that it co-ordinates and organises human activity into actions not only on an individual scale, but also on a collective scale. Cognition does not prescribe the goals of the collective, *these* directives are given to the collective by the struggle for life and development; but cognition does organise the efforts of the collective and directs them toward these goals. Cognitive complexes are collectively produced tools of the organisation of the activities of the collective.

3. But these tools are *alive* and not dead. Their sum total must not be imagined in the form of a mechanical mass of separate tools for separate uses. That sum total develops within the living organism of the collective and must itself be organised in a living form. These tools must not simply lie side by side like implements in a worker's tool-bag or on a bench in a workshop; they cannot but influence one another. They must, by necessity, be assembled into a co-ordinated whole, into an *organised system*. This is the tendency towards 'monism'. It is expressed, first, in a *commonality of structural type* of the cognitive complexes of the given collective, and second, in the production of a complex superstructure of particular *complexes of interconnectedness*, the role of which consists precisely in the organic unification – the application of monism – to all elements and forms of cognition, both existent and emergent. This is the function of the highest generalisations, classificatory models, explanatory hypotheses, and theories.

4. Thus the ideal type of a system of cognition is one that corresponds to the maximum extent – both in its parts and as a whole – to the real tasks of the practice of the collective, and it is a system in which all parts mutually support one another. Such support is realised in all organised systems according to the principle of *complementary correlations*. Thus, all parts of a system of cognition must complement each other in all details, and they must be connected together coherently. This is what makes for the *highest coefficient of useful action* for the expenditure of energy in both acquiring and applying knowledge.

5. For every cognitive complex, the criterion of truth-objectivity is, first, its fitness as a tool in immediate practice, and, second, its harmony with the general system of knowledge. Both, obviously, boil down to the coefficient of useful expenditure of energy from the point of view of the collective in its integral life and development, since, if some complexes were incompatible with others, it would mean diminished productivity in the expenditure of energy – including expenditures of energy in the realm of thought. (It would be difficult to remember these complexes, to orient within them, and to combine them for concrete tasks).

2

6. The first form of cognitive monism known to history was the 'religious worldview' or the *authoritarian* system of thought, manifested in the purest form in authoritarian-tribal and feudal society. In these societies, the principle of all classifications and of any regularity boils down to the polar model of *command-execution* with its attendant variations, such as power-subordination, qualitatively superior-qualitatively inferior, spiritual-bodily, sacred-profane, heavenly-earthly, etc. Authoritarian thought contains a kind of automatic polarising mechanism which divides everything – both actions and objects – in the same way. Even cognition itself appears according to this model: revelation from on high, passive acceptance from below.

7. The simplicity and clarity of this form of monism are invaluable because they provide the key to understanding the process by which monism developed. It is perfectly clear that the polar model here is the simple transfer of the practical polarity of authoritarian relations of production – the relationship between the organisers and the implementers of labour – to the sphere of thought. The basic form of social collaboration at this stage of development became the basic form of thought, crystallised in an all-encompassing cognitive model. The organising principle of the economy gave form to the ideology.

But this is not even the primary principle of social being. The basic relationship between people in production originates in the basic technical relationship between a person and a tool. Only when the development of tools led to an organic, stable connection between a given tool and a given individual in the collective, could there also be produced the kind of organic connection whereby one person became the permanent tool of another individual in the collective. Before this, tools were hardly differentiated and were not persistently connected with an individual. They appeared as tools of the primitive collective, and people were not differentiated to the extent that one person could become the tool of another. And after this, when the connection of a particular person with a tool began to lose its organic character and to develop into an irregular connection, the disintegration of the organic authoritarian correlation between people began.

8. Thus a common organising principle, having been transferred from technology to economics, is then ideologically crystallised into knowledge. From this issues the striking coherence of authoritarian formations, the supreme monism of their practice and theory. The directive, practical-organisational role of cognition is not obscured in the least. The religious understanding of the world also simultaneously forms the practical discipline of society. 'The sun commands the ear of grain to grow properly' – this is how one ancient Egyptian inscription expressed the causal relationship of the basic facts of agriculture. And the son of the sun – the pharaoh – ordered the peasants to contribute three grains from each ear to his granary. The one was as nat-

ural, incontestable, and understandable as the other. Theoretical reason had not yet been distinguished from practical reason. And God – the living, concrete image of their general monism – was also objective and socially incontestable in the same way that 'energy' is now the necessary formula of monism for the technology of machine production and for contemporary physics that has developed out of it. And the origin of God (the theoretical centre) from a distant ancestor (a practical organiser) clearly underscores the coherent unity of being and thinking of the people of that time.

9. This system was elementally conservative throughout. The very nature of authoritarian social collaboration was conservative, and authoritarian thinking was even more so. Thinking is always more conservative than practice – the living experience that forms and reinforces it. But life – albeit slowly and often imperceptibly – overcomes the tendency to conservatism. Within the forms of religious monism, experience nevertheless broadens, and knowledge of the interconnectedness among phenomena is built up. Chains of causality become longer and more sophisticated, fully in harmony with the manner in which authoritarian chains of authority and subordination become longer and more sophisticated in practice. And although this understanding of causality was authoritarian, it did not lose the element of regularity in the least. After all, in real life, government was not entirely reduced to arbitrary rule. In practice, in the overwhelming majority of cases, the authorities governed in conformity with habit and tradition; in reality, arbitrary rule was an exception.

10. From this point of view, one must understand the role of the conception of a 'miracle' in the development of cognition in a completely new way. A 'miracle' served to *support and strengthen* the idea of the regularity of phenomena. Everything that did not fit into the natural determinism that had been worked out and that would radically undermine faith in it (an eclipse of the sun, an earthquake, plague, etc.) was considered to be the *special* and *particular* intervention of the supreme authoritarian will, originating outside of and apart from that regularity and having no relation to it. Thus, things were set aside, as it were, from it, and they therefore did not destroy cognitive faith in it as a real and altogether stable regularity. Thus the wholeness of the system of thought was preserved, and it was able to develop through the accumulation of experience and knowledge.

3

11. But little by little the course of events undermined the wholeness of practice itself. The boundaries of the *division of labour* – 'specialisation' – cut into it more and more deeply. Society was broken up into groups with increasingly different kinds of labour-experience. Points of fragmentation and anarchy developed in the organisation of pro-

duction; the market was born and the exchange of goods progressed. And although thought is more conservative than practice, it still must follow after practice; it is only delayed. The former wholeness of thought fractured along those same lines of specialisation. For a peasant, the majority of practice – and therefore of knowledge – is not the same as for a blacksmith, and it is different still from that of a cobbler, a merchant, and so on. In the technological process, knowledge becomes specialised, originating precisely as the practical knowledge of one or another field. In part, knowledge was acquired through oral tradition, in part, through imitation in work itself: 'science' and 'skill' were only beginning to be differentiated from one another.

12. Nevertheless, the scope of such specialised knowledge was at first much broader than what we now understand as the specialised, technical sciences. Thus the knowledge of a farmer was certainly not limited simply to the rudiments of agronomy; it also included elements of calandarian astronomy, the geometry of areas, animal husbandry, veterinary science, and also, of course, arithmetic for the accounting of seeds and vital supplies, etc. The 'science' of the blacksmith included not only metalworking but also, usually, metallurgy, certain elements of the geometry of forms, and, it goes without saying, mechanics, physics, chemistry, and, similarly, arithmetic and domestic bookkeeping on a greater scale than for a peasant. The merchant requires, of course, even more knowledge of arithmetic and bookkeeping, but also merchandising, and, to the extent that the merchant is engaged in transportation, knowledge of astronomy (for orientation), geography, ethnography, etc. But each of these diffuse systems of science or skill has its own central core (for the peasant, agronomy; for the blacksmith, metalworking; for the merchant, bookkeeping, etc.), and, to the extent that knowledge is built up and its precision and coherence grows, that core develops into a real technical science that is subsequently formalised in written language.

13. Besides these technical-scientific complexes – and going far beyond their boundaries – *general* knowledge, *general* techniques and methods that have application in the most varied fields of the social division of labour also needed to be specially systematised. Techniques and methods of numerical accounting were separated out and organised in the form of arithmetic. Techniques and methods for measuring and comparing space took the form of geometry. Methods of orientation in space and time provided the basis of astronomy. Knowledge related to the resistance of materials, having significance for all aspects of labour, was organised into mechanics and later physics. Methods of harmonising ideas in deliberations among members of the collective and later in individual cogitation – important, yet again, in all aspects of human activity – were specialised into the form of 'logic', and so on.

14. So the subdivision of labour in society led to the ideational subdivision of experience; and the people in the collective were subdivided in the same way. The stereotypical unity of the religious phase was destroyed: knowledge spread among people

unequally and in heterogeneous bits. The coherence that was taking form in each technological science and especially the broad commonality of application of the findings and methods of the meta-technological, generalising sciences were, of course, *elements* of a new monism, but monism *as a whole* did not yet exist. In the presence of sharp differences in specialised practice, the fundamental cognitive relationship toward them also became different: special forms of thinking were produced by each specialty. If one recalls the directively organising role of cognition, then it is immediately clear how unalike the tendencies of, let us say, the peasant, the blacksmith, and the merchant must be. The peasant continually deals with the forces of nature – with indefinitely changeable resistances (conditions of soil and weather), with implements and objects of labour that are alive and that are subject to diseases that the peasant is powerless to treat, and with unforeseeably and inevitably variable results of labour. The circle of peasants' interests is limited almost exclusively to their parcels of land. On the other hand, blacksmiths are seldom affected by the forces of nature. They operate with stable and definite conditions of labour, with implements that are inorganic and stable, and they can predict the results of their labour with great precision. Blacksmiths' circle of interests expands beyond the walls of their workshops due to necessary, continual dealings with customers and the market. Finally, for merchants both the conditions and the results of their activity are again indefinite and fickle, but they are dependent not on natural but on social spontaneity. Merchants' relation to objects is completely different from the two other cases. Merchants do not improve objects but rather preserve them and move them from place to place; their focus of interest unfolds uncertainly together with their field of activity – the market. It is not only the *material of their knowledge* that is different, but also the *direction* of the thinking that is brought to bear on that material.

15. The systematisation of cognitive tools is accomplished in all cases, however, leading to a certain semblance of monism. Each group looks *on everything* consistently from its own point of view; there is a certain wholeness in each group's understanding of the world. But this wholeness has only the limitedness of its labour – the experience of differentiated fractions of the collective – as its basis. It is therefore existentially unstable, and it falls apart whenever life deviates from its usual course. The elemental power of the market can incomprehensibly crush the economy of a peasant whose thinking is built on managing land. Fire can destroy the small enterprise of a handicraft worker, providing a bitter reminder of the power of nature, a power that had been forgotten in the workshop. Then cognitive helplessness is added to the practical, existential losses, and this undermines faith in the accustomed pillars of support – the very 'meaning' – of life.

Such is the 'sub-monism' of the social group (a monism that is imperfect and incomplete).

4

16. Specialisation broke up the unity of the collective but did not completely dissolve it. Many threads of communication were preserved and interaction existed among groups – crossovers and crisscross connections. In the common field of the market, apparent antagonism concealed real social collaboration. There was a need to escape beyond the constraints of unstable, unreliable 'sub-monisms' to co-ordinate heterogeneous cognitive tools, and this need made a path for itself by creating a new type of ideology and a distinctive social type as its bearer: these were *philosophy* and the *philosopher*.

In their initial form, philosophers began with an unusual breadth of individual experience plus an unusually developed capability to organise it. These were the 'sages' of classical antiquity. They were neither bookish theoreticians nor contemplative hermits; they were people of life and experience, for the most part well-travelled, who had conversed with people of various social strata and of various nations, observed their practice, gathered those people's knowledge and perspectives together, and then, through intense psychical labour, organised it all into one coherent whole. Being encyclopaedists and monists, these philosophers appeared to people who were out of touch and limited as a kind of higher being. Often, thanks to the breadth of their experience and familiarity with various methods, they could get people out of a practical dead-end, but even in cases where this was not within their power, they saved people from overwhelming cognitive helplessness or moral despair. Approaching the matter from a new, unexpected point of view, sages made understandable what was painfully incomprehensible, and they reconciled what was painfully contradictory in an acceptable way. In a bad situation, philosophers pointed out a basis for transition to something better. They were singular personal incarnations of the inner interconnectedness of a collective that was outwardly falling apart.

18. But these teachers of life were only human beings and could synthesise only the material that they found in their social environment. And this environment was continually changing. People continued to be atomised, and social relationships became more complex. Many new facts accumulated, and the previous synthesis became inadequate. A philosopher is never altogether *completely* satisfactory – this is attested to by their 'debatableness' even in their own times. Another sage would seize upon other instances of life, gather different materials and methods, and work out different systems that disagreed with the first but were in themselves no less rich and coherent. And later both sages ceased to satisfy thoughtful people; a new sage-encyclopaedist appeared on the scene, constructing an edifice on a broader foundation. But this edifice also awaited the very same fate, and so on. When the class structure of society is sufficiently formed, with truly irreconcilable class contradictions, then synthesis becomes possible only within the framework of

a class, and the synthesis of an aristocratic sage will inevitably be different, for example, to the synthesis of a plebeian sage.

19. Accordingly, in the best of times philosophy gives only a debatable '*quasi-monism*' that is quickly superseded. It cannot be otherwise: the organisation of knowledge is determined by the organisation of practice; when the latter is atomised and pluralistic, then the former cannot become objectively whole. The cultural value of the systematisation of knowledge is relative, in general, and, to the extent that progress quickens and the contradictions of life become deeper, it becomes all the more relative. This does not, however, prevent that value from being huge. Since only systematisation creates a broad basis for further ideological development, quasi-monism is nevertheless a form of organisation which is necessary and preferable, as long as there is no ground for another.

5

20. But there comes a time when even the quasi-monism of the philosopher-encyclopaedist turns into an unattainable ideal. Growing specialisation of knowledge – the proliferation of scientific fields with isolated methods and a huge, overwhelming accumulation of material – leads to a situation where an encyclopaedic embrace of the world of knowledge is no longer possible for anyone, no matter how great a genius. At that point, a curious transformation occurs: all-conquering specialisation overwhelms philosophy, which is itself transformed into a speciality and then into quite a number of specialties. A new type arrives on the scene: the *philosopher-specialist*.

21. These are no longer people of life but people of the study. For them the material of experience is not encyclopaedic but specialised. First, it is bookish material, including past and present attempts at a philosophical synthesis plus whatever fragments of scientific data happen on a philosopher's way. Second, the material is 'inner', 'self-contemplative' experience that is obtained by 'retreating into oneself', where, it goes without saying, philosophers cannot find anything other than the well-established forms of thinking of their class and of their social group.

22. What kind of synthesis can be worked out on such a basis? It is obvious that the reality of experience that has been broken up and that continues to be further broken up cannot be cognitively organised into a unity on a *real* basis. Monism, consequently, is constructed *outside* the boundaries of what is real. But outside these boundaries there is neither experience nor cognition. What is there then? The *metaphysical* or *transcendent* world. This is the world of *verbal constructions*. It is on this basis that the various forms of *pseudo-monism* of specialised philosophy spring up.

It could not be otherwise. The starting point of the new constructions is the presence of previous constructions that are delivered, of course, in verbal symbols. And the

significance of these symbols *changes* from generation to generation, from class to class, from social group to social group, and even from one task to another, to the extent that those tasks are relatively specialised. Because of this, a word is a splendid tool for unifying what is really not unifiable, for reconciling what is not reconcilable. A stable word as the expression of a variable idea – this is the basis of philosophical synthesis at this level of development.

23. Multiplicity (and therefore both the debatableness and the instability that philosophical systems obtain on such a basis) gave rise to a vague awareness of the unreliability of the methods by which such syntheses were constructed and impelled philosophical thought to seek more reliable, so to speak 'guaranteed' methods. This led to the investigation of the 'conditions of cognition', its 'premises', its 'boundaries', etc. – in general to what is called 'epistemology'. Here, however, the question is not about the biological and social conditions of cognition – not about its origin as a living fact – but of 'logical' conditions, found by way of 'critical thinking'. In its essence, the task is to derive the premises of thought from thought and by means of thought in exactly the same way as trying to drag yourself out of a pit by your hair. Thus there appeared the vast and subtle modern scholasticism, 'critical philosophy' – which in reality is *pseudo-criticism*.

24. The actual development of philosophy was not so straightforward as we have described it, because the development of the life of society does not express itself along simple lines. There are cycles: civilisations collapse and then are followed by repetitive movements through phases that are similar to former ones and are complicated by the partial use of the creative work of previous cycles. Between the broad quasi-monism of the philosopher-encyclopaedists and the armchair pseudo-monism of specialists, there are many transitional forms. In the receding wave, there are recurrences of the surge, since philosophy, after all, reflects on a general scale the fluctuations of real life. The next form of philosophy reveals the influence of the successes of the scientific-monistic tendency, about which more will be said later, although it already existed in a hidden form in the very earliest eras of the development of philosophy.

25. In any event, by using pseudo-criticism, philosophy cannot by itself escape from the framework of quasi-monism and pseudo-monism. And this is precisely because the real disruptions in life that give rise to philosophy remain outside its field of vision. Philosophy cannot see the collective that is hidden beneath isolated functional elements and the anarchic struggle between those elements. It is also incapable of grasping the living unity of labour and experience, of practice and cognition. For philosophy, the subject of experience and cognition is only the individual, and cognition itself has a contemplative and explanatory – and not an organising and directive – character. This fetishism of individual and self-sufficient cognition is the inevitable limit of its achievements.

26. This also explains the peculiar relationship of philosophy to religion. The principle of philosophy, obviously, is inconsistent with the principle of religion, since it

corresponds to a fundamental difference in their social bases – authoritarian versus anarchistic social collaboration. But philosophy is incapable of ejecting religious monism not only from the consciousness of the broad masses but even, to a certain extent, from its own consciousness. There is an objective cause of this in the sphere of practice: commodity-exchange society – and in particular bourgeois society – cannot be built entirely on the principles of specialisation, economic anarchy, and individualism: it would then simply fall apart. Its unifying organisation of class rule – the state with its bureaucracy and army – preserves a more or less authoritarian form; and its basic cell – the private enterprise, whether a family enterprise or one that has expanded into a capitalistic factory – also unavoidably contains remnants of authoritarianism, which support its wholeness and coherence of function. Organisation of any another type is in principle alien to this society. And therefore the monistic tendency in philosophy is always tinged with authoritarian thinking to one degree or another. Sometimes philosophy straightforwardly includes denatured religious models of an abstraction – of God, for example – and sometimes it imparts certain characteristics, borrowed from these models, to its ultimate conceptions. After sufficient analysis, this can be discovered even in the most radical and atheistic systems.

6

27. Progress in the division of labour is the principal and most noticeable tendency in commodity-exchange society, but it is not the only one. The interconnectedness of the collective is hidden, but this does not mean that it has ceased to exist; it is growing even deeper and stronger. Some parts of the whole depend increasingly on others and are increasingly less able to live outside this interconnectedness. Communication between various specialties of both physical and psychical labour, though little noticed, nevertheless continues to exist, sometimes weakening and sometimes growing stronger. Methods develop in each field not only independently and in isolation; they percolate up from one field into another, sometimes slowly and imperceptibly, sometimes in major breakthroughs. The majority of technical and scientific revolutions were accomplished by the transfer of methods and, along with those methods, the points of view which are inseparably connected to them. For example, transportation was transformed in the nineteenth century by the application of steam engines which had been created in industrial technology. A new type of motor that provided the basis of aviation was the result of the application of the technology of explosives that had been developed in various fields having to do with the military. Lavoisier transformed chemistry based on the techniques of precise weighing that had originated in the mining and jewellery trades. The methods of physics and chemistry made physiology into an exact science, and an analogous role was played by the methods of physiology in

psychology. Marx brought the essential point of view of the natural sciences into the social sciences. The list could go on. In all these ways, the sum total of the common content of various fields of experience and thought increased step by step, beneath the exterior of their formal isolation. This hidden *monism of science* grew and manifested itself from time to time by bursting the formal boundaries between scientific fields. A clear example is the gradual merging of various sciences that have now formed a system of physics, chemistry, and theory of the structure of matter (so-called 'physico-chemistry'), which apparently also includes geometry.

28. The monism of science simply did not become apparent for a very long time and in any event did not rival the pseudo-monism of philosophy. The division of the major fields of science remained. Philosophy, when the opportunity presented itself, used the highest generalisations of science as material for its unifying constructions. Scientists, even those who mastered the broadest scope of knowledge, retained the psychological outlook of specialists; they did not consciously strive toward scientific pan-monism and considered the pursuit of monism to be the business of philosophers. Philosophers, for their part, did not even contemplate the possibility of transferring the pursuit of monism into other hands.

Moreover, both philosophers and scientists understood monism contemplatively, supposing it to stand outside of any connection with practice, outside real verification. And this is the basic difference between philosophical and scientific constructions: that the first are not subject to direct verification by observation and experiment, while the second are ultimately accepted or rejected only on that basis.

29. A fundamentally new point of view was necessary in order to overcome the traditional understanding of the connection between science and philosophy. This point of view had to ascend above the narrowness of specialisation in general, above individual knowledge, and above the detachment of knowledge from practice. These revolutions in points of view would be possible only as a result of the emergence of new classes with new forms of social collaboration. This is what actually happened. The industrial proletariat entered the historical arena. And although proletarians themselves were not initially either scientists or thinkers, still the *position of a class* in the system of social life is an objective fact, and it creates the possibility for an intellectual, even though not belonging to that class, to adopt their position theoretically and thereby acquire a new point of view. This is what Marx succeeded in doing.

30. The position of the industrial proletariat permits the fetishism of the 'abstract' – the detachment of cognition from practice – to be overcome. This is because, as science performs its task in the conditions of machine production, its directively organising character becomes increasingly clear, a character that is clearly expressed in the concept of 'scientific technology'. This directively organising character is equally evident for the role of social-scientific cognition in the class struggle of the proletariat.

31. The individualistic understanding of labour-experience is overcome as a consequence of the fact that, under the conditions of the labour-experience that are created for the working class, there develops a real and perceptible collectivism and the momentum of the disunity of interests and aspirations progressively weakens. On the one hand, there is the objective accumulation and systematic organisation of the strength of workers within the bounds of individual enterprises, and, on the other, there are the organisational demands of struggle.

32. The narrowness of specialisation is overcome along two paths. First, in practice, specialisation takes on new forms, although, of course, it certainly is not eliminated. Second, the needs of labour and social struggle carry proletarian consciousness far beyond the boundaries of the horizon of specialities. The former is revealed – as the transition is made from the lowest to the highest stages of machine technology – in that the basic content of labour on different machines becomes continually more similar. Purely physical effort, with its strict differentiation of skill, occupies a decreasingly important place in labour, and gives way to effort of an intellectually volitional kind that corresponds to the 'organising' function of the management of machines (attention, supervision, comparison and collation of the data provided by various 'indicators' of the machinery and the understanding needed for intervention in the course of its work). These kinds of interventions, which require a specific cultural preparation, are relatively common for workers of various specialties of machine industry. The possibility of mutual understanding in labour and of mutual support among workers continually grows – for example, advice can be given in the event of a malfunction in the working of the machinery, workers can temporarily stand in for one another, and a short course of training can be provided for transfer to another specialty. Elements of a new form of social collaboration – *collectivistic* or synthetic – combined with the basic characteristics of both *organisational and implementational* labour are developed, accumulated, and organised, and they rise above the fundamentally limited systems of authoritarian and anarchistic social collaboration alike.

33. There is another side to the matter: the directively cognitive needs of the working class have a propensity toward universality. Leaving to one side the narrow opportunities for the education of workers today, what, as a matter of fact, must metalworkers learn in order to attain the maximum effectiveness in their work? By no means should their education be limited only to metal technology as a part of applied mechanics, but it obviously also should have general mechanics as its theoretical foundation. Both applied and theoretical mechanics are inconceivable without algebra and geometry. Then there is the theory of steam power (applied and theoretical) for steam engines, electro-technology (with the theory of electricity for electrified manufacturing as its foundation), and in part also chemistry (which also, after all, is necessary for metal technology), and so on.

The economic trade-union and class struggle for the improvement of the conditions of labour requires, of course, an understanding of what is involved in the rational arrangement of the conditions of labour, i.e. knowledge of hygiene and sanitation along with physiology and anatomy as their foundation. This leads, once again, to physics and chemistry and also in other aspects to biology. In essence this entire group of sciences, which encompasses questions of the struggle of an organism with its environment for survival, represents an *education in workers' power*. On a wider scale, this same economic struggle and the political class struggle also require a command of the basic social sciences and of social philosophy, while the ideological struggle requires a mastery of the basic sciences of culture.

It is obvious that the scientific needs of a textile worker hardly differ from those of a metalworker as summarised above.

Such are the *objective* needs of the working class regarding knowledge, the *objective* needs of its labour and struggle, despite how insufficiently, unsystematically, and disjointedly satisfied they are, in reality and to the detriment of the class.

This universalism of cognitive needs issues from the universal-organisational role of the working class – the collective organiser of things, people, and ideas. The vital necessity for such universalism does not exist, or more accurately, until now has not existed for the bourgeoisie nor even for the organisational intelligentsia – technical, bureaucratic, and other. For example, individual engineers, mechanics, or technicians who need to seriously study one basic group of sciences connected with their specialty do not need to study hygiene, physiology, biology, etc., since they do not need to struggle to improve the sanitary conditions of their work. Such specialists can also more easily get by without political economy, a theory of progress, or a doctrine of the state, etc., since their positions do not by their very nature impel them to carry on a broad economic and political struggle; their careers are completely individual and not collective. At the very least, this is how the matter stands for them in normal, organic eras. Revolutionary eras push all classes and groups towards encyclopaedism, since all aspects of life are unstable. But the difference in the degree of this tendency, of course, remains.

By the power of his genius, Marx, as far back as the 1840s, captured the basic point of this new position. In his eleven theses,[3] he concisely expressed both the connection between cognition and practice ('the criterion of truth is practice' … 'philosophers have tried to explain the world – but the point is to *change* it') and the objective collectivism of practice ('people in their practice are social beings') and thus also of cognition. Later, Marx even went on partly to develop this idea in his theory of commodity fetishism as a form of thinking, in which, in passing, he defined objectivity as 'social meaningfulness'

3 Marx's 'Theses on Feuerbach' [Trans.].

(page 44 of I. Stepanov's translation of 1920). He did not draw the conclusion that the role of philosophy is transitional, but it is clear that monism – verified by the practice of changing the world (i.e. the experience of labour and struggle) – is *not* philosophical but *scientific* monism. Marx's *historical* monism partly, but essentially, represents this. There was insufficient material available at that time for taking up the question of a fully scientific monism.

36. But now there is much more of such material. The vast field of physico-chemistry has been given a monistic form by energetics; the principle of relativity, it would appear, has not only developed this monism further, but it has incorporated the field of geometry within it. The point of view and methods of physico-chemistry are increasingly taking over the biological sciences. The methods of the social sciences, on the foundation of Marxism, are approaching the methods of natural sciences and in many important cases have already achieved the possibility of prediction. On the other hand, there has arisen the *theory of analogies*, i.e. the unity of models of regularity for the most heterogeneous phenomena, for spheres of experience that are most distant from one another. The fundamental pluralism of scientific points of view and methods is coming to an end.

37. What path must be taken, then, if scientific monism is to be realised? It must appear by means of a unity of methods for the resolution of all possible tasks. And it can arise only from a unity in the very understanding of these tasks, how they are formulated. This formulation will be *universal-organisational* (tektological).

In reality, any task of practice or cognition, from a task in elementary arithmetic to the task of restructuring the world, boils down to organising a certain sum of elements into a cohesive and coherent whole. This means that all methods of resolving such tasks are, in their very nature, organisational methods. To discover and to generalise these methods completely means to establish universal organisational natural regularities. This task is *not* philosophical but scientific, since all organisational methods and natural regularities are entirely subject to active verification in labour-experience, in construction, and in struggle.

Universal organisational science is the completely natural ideology for the class that is itself of a universal-organisational type.

Religious monism was a *conservative* universal-organisational form of practice and thought. Scientific monism is a universal-organisational form that is *dynamic*.

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