Tacit Knowledge: A Wittgensteinian Approach

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ABSTRACT Key Words: Wittgenstein, K.S. Johannessen, the strong thesis of tacit knowledge, intransitive understanding, pragmatic turn in epistemology.

Influenced by later Wittgenstein's philosophy, a group of Scandinavian philosophers, with K.S.Johannessen as the leading figure, make a unique contribution to the ongoing discussion of tacit knowledge. They differentiate the strong and the weak interpretations of tacit knowledge, and put their emphasis on the former. Based upon his practice-centered interpretation of later Wittgenstein's philosophy, Johannessen makes much out of Wittgenstein's notion of intransitive understanding to argue for the strong thesis of tacit knowledge and advocates a pragmatic turn in epistemology.

In the ongoing discussion of tacit knowing/knowledge, the Scandinavian Wittgensteinians are a very active force. In close connection with the Swedish Center for Working Life in Stockholm, their work provides us with a wonderful example of the fruitful collaboration between philosophical reflection and empirical research. In the Wittgensteinian approach to the problem of tacit knowing/knowledge, Kell S. Johannessen is the leading figure. In addition, philosophers like Harald Grimen, Bengt Molander and Allan Janik also make contributions to the discussion in their own ways. In this paper, I will try to clarify the main points of their contribution to the discussion of tacit knowing/knowledge.

The Target of Attack

According to Johannessen, one of the salient features of the traditional conception of knowledge is that it is basically propositionally oriented, that is, it underscores the inner relationship between knowledge and language. Anything qualified as knowledge must be capable of being articulated by verbal means, or in some notational form.[1]

The historical development of this propositionally-oriented understanding of knowledge is briefly delineated by the Wittgensteinians. Harald Grimen suggests its origin in Greek philosophy.[2] For instance, in Plato's dialogue *Laches*, the theme of which is courage, Socrates claims that "And that which we know we must surely be able to tell."[3] Laches, who is a distinguished general, says: "I fancy that I do know the nature of courage, but, somehow or other, she has slipped away from me, and I cannot get hold of her and tell her nature."[4] According to Socrates' standard, now that Laches cannot tell the nature of courage, he does not know what it is.

The idea that what counts as knowledge must be capable of being verbally articulated and what cannot be told is not knowledge was strengthened in modern times. As Johannessen points out, from Galileo's famous saying "The book of Nature is written in mathematical language," to Leibniz's dream of an universal language, i.e., his *characteristica universalis*, to logical positivists' view of knowledge, the propositionally oriented

understanding of knowledge became more and more prominent and influential. He claims that, within the framework of logical positivism,

> [K]nowledge and language are woven together in an indissoluble bond. The requirement that knowledge should have a linguistic articulation becomes an unconditional demand. The possibility of possessing knowledge that cannot be wholly articulated by linguistic means emerges, against this background, as completely unintelligible.[5]

However, this doctrine of logical positivism has been called into question since World War II. Johannessen observes:

> It has in fact been recognized in various camps that *propositional* knowledge, i.e, knowledge expressible by some kind of linguistic means in a propositional form, is not the only type of knowledge that is scientifically relevant. Some have, therefore, even if somewhat reluctantly, accepted that it might be legitimate to talk about knowledge also in cases where it is not possible to articulate it in full measure by proper linguistic means.[6] (italics original)

Johannessen, using Polanyi's terminology, calls the kind of knowledge that cannot be fully articulated by verbal means tacit knowledge.

Tacit Knowledge: Strong and Weak Interpretations

One of the contributions that the Wittgensteinians make to the discussion of tacit knowledge is the clarification of different meanings of the term. The most important distinction that the Wittgensteinians bring forth is the following: tacit knowledge as something that **cannot** be articulated verbally **in principle** in contrast to tacit knowledge as something that **is not** articulated by verbal means, but **can** be articulated linguistically. The distinction is a consensus among the Wittgensteinians; however, everyone has his version of it. In the following, I will take Grimen's discussion of different interpretations of the concept of tacit knowledge as an example to illustrate the distinction, with reference to other Wittgensteinians at various points.

Polanyi has a famous saying which goes together with his term "tacit knowledge," that is, "We know more than we can tell," which is diametrically opposed to the aforementioned claim by Socrates: "that which we know we must surely be able to tell." According to Grimen, there are different interpretations of Polanyi's saying and the concept of tacit knowledge. I shall focus on those which are epistemologically interesting.[7]

The first interpretation is called the Gestalt thesis of tacit knowledge. When one is engaged in a certain activity, such as playing piano, riding a bicycle, swimming etc., one has to rely on certain unproblematic background, otherwise the activity cannot be fluently carried on. On the contrary, if one focuses on the background and tries to articulate it by linguistic means, one will obstruct the performance of the activity. That is to say, the unarticulated background which is necessary for the performance of a certain activity cannot be articulated by the agent himself in the process of performance. The knowledge that the agent has about this unproblematic background is a kind of tacit knowledge. It is worth mentioning that this interpretation of tacit knowledge only claims that for the sake of not obstructing the performance of an activity, the agent can not articulate verbally the background on which he relies, it does not claim that this kind of knowledge is verbally unarticulatable in principle. For what the agent cannot articulate linguistically in the process of performance,

can well be articulated by others or by himself after the performance. In Grimen's view, this interpretation of tacit knowledge is clearly influenced by Gestalt psychology, so he calls it "the Gestalt thesis of tacit knowledge." He holds that Polanyi's thinking is close to the Gestalt thesis.

The second interpretation can be characterized as "the thesis of epistemic regionalism." All the knowledge that one has constitutes a vast, loosely knit and not perspicuous system. At any given moment, one can only reflect on small parts of this knowledge system and verbally articulate them. No one can articulate the whole system simultaneously. In terms of having a perspicuous overview of the knowledge that we have, we are all regionalists. This amounts to the fact that, at any given time, we always have certain verbally unarticulated knowledge in our thinking and action, namely, tacit knowledge. Grimen calls this interpretation of tacit knowledge "the thesis of epistemic regionalism." In light of this interpretation, no specific element of knowledge is in principle verbally unarticulatable; but at a given moment, the knowledge that we can verbally articulate is limited. We cannot verbally articulate all that we know. There is no unifying perspective from which we can verbally articulate at the same time all the knowledge that we possess.

It is interesting to note that, notwithstanding these different emphases, the focus of both the Gestalt thesis of tacit knowledge and the thesis of epistemic regionalism is on the verbally unarticulated knowledge contained in the background of our thinking and acting. We rely on a lot of things that we take for granted but normally don't articulate by verbal means. Tacit knowledge in this sense covers a wide range of things. The "absolute presuppostions" of natural science discussed by Collingwood is a paradigm case of this type of tacit knowledge, according to Allan Janik.[8] In this connection, Grimen alludes to Habermas' understanding of lifeworld. [9] In the same vein, Johannessen mentions various implicit knowledge within a culture. [10]

The third interpretation is the strongest, and Grimen calls it "the strong thesis of tacit knowledge." From this perspective, there are specific kinds of knowledge which are in principle verbally unarticulatable, which means that, in those cases, there exists a logical gap between our capacity of cognition on the one hand, and our capacity of verbal articulation on the other. The knowledge that is in principle verbally unarticulatable, is tacit knowledge. Grimen holds that this interpretation of tacit knowledge is more radical than the Gestalt thesis of tacit knowledge and the thesis of epistemic regionalism, because the latter two don't claim that there are specific kinds of knowledge which are in principle verbally unarticulatable. That is the reason Grimen entitles this interpretation "the strong thesis of tacit knowledge" and characterizes "the Gestalt thesis of tacit knowledge" and "the thesis of epistemic regionalism" as the weaker theses. Grimen claims that the strong thesis of tacit knowledge is more connected to the Wittgensteinian tradition and he doubts whether Polanyi supports this position. He prefers to discuss tacit knowledge from the perspective of the strong thesis. Similarly, Johannessen also emphasizes that when we say that tacit knowledge is something which is not possible to articulate adequately by linguistic means, we mean this "not possible" in a logical sense: "Tacit knowledge is thus knowledge which, for logical reasons, cannot be adequately articulated by linguistic means."[11]

Influenced by the propositionally-oriented understanding of knowledge, people might say that the experience which can hardly be fully articulated by verbal means should not be called "knowledge," rather it should be called "intuition." However, Grimen refuses to adopt this ambiguous and mysterious term—intuition—to describe this kind of epistemic phenomenon.[12] He thinks that we have good reasons to call it "knowledge.".First, the strong thesis of tacit knowledge doesn't claim that tacit knowledge is completely unarticulatable. What is absolutely unarticulatable doesn't make much sense in epistemology. All knowledge can be articulated, but not all knowledge can be articulated verbally. According to Grimen's terminology, the

concept of articulation covers more than the concept of language. Besides verbal articulation, we have other modes of articulation, such as, for instance, action. Grimen holds that as far as the articulation of knowledge is concerned, action as a mode of articulation is as fundamental as language. Tacit knowledge cannot be fully articulated by verbal means, but can be articulated in action. The theory of tacit knowledge will enhance our theoretical sensitivity to non-verbal modes of articulation. Thus, the strong thesis of tacit knowledge is not concerned with the distinction between what is articulatable and what is unarticulatable, but with the distinction between verbal articulation and non-verbal articulation. Mystical intuition is normally deemed as unarticulatable in principle, therefore has to do with the first distinction. In contrast, tacit knowledge in the strong sense is articulatable: although it cannot be articulated by verbal means, it is still open to non-verbal modes of articulation.

Further, Grimen points out that tacit knowledge can also be learned, transferred, accumulated and criticized. Of course, the modes of learning, transferring, accumulating and criticizing tacit knowledge are different from those of verbally articulated knowledge. For example, we can simply resort to words and statements so as to transfer verbally articulated knowledge, while the transference of tacit knowledge relies more on first-hand experiences, examples and guided instructions of the master. Again, to criticize verbally articulated knowledge, we can examine the statements of knowledge, but in order to criticize tacit knowledge, we must appeal to action or practice.

To sum up, according to Grimen, although the modes of articulating, learning, accumulating and criticizing tacit knowledge are different from those of verbally articulated knowledge, tacit knowledge and verbally articulated knowledge have many features in common: they are both able to be articulated, learned, transferred and criticized. Thus, although it is tacit in the sense that it cannot be adequately articulated by verbal means, it still is a member of the family of knowledge, and not something else. We can legitimately call it tacit **knowledge**.

Three Types of Examples of Tacit Knowledge

Inspired by Wittgenstein's later philosophy, Jakob Meløe, a Norwegian philosopher, developed a contextual pragmatics which is later known as praxeology. Since the 1960's, praxeology has become an important Wittgensteinian tradition in Scandinavia. Methodologically, one of the most prominent features of praxeology is its careful analysis of examples. Therefore, praxeology is basically a case-oriented contextual pragmatics.[13] The case-oriented approach is fruitfully carried out by the Wittgensteinians in their discussion of the problem of tacit knowledge.

With the distinction between the strong thesis and the weaker theses of tacit knowledge discussed above, the Wittgensteinians distinguish themselves by focusing on the strong thesis. The examples they choose to analyze in favour of the strong thesis are of the following three types.

The first type has to do with the experience of the sense qualities. We will find sources for this kind of examples in Wittgenstein's writings. Let's take a look at the following paragraphs from Wittgenstein's *Philosophical Investigations*:

> Comparing *knowing* and *saying*:
> how many feet high Mont Blanc is——

how the word "game" is used——
how a clarinet sounds.

If you are surprised that one can know something and not be able to say it, you are perhaps thinking of a case like the first. Certainly not of one like the third.[14] (italics original)

Describe the aroma of coffee. ——Why can't it be done? Do we lack the words? And *for what* are words lacking?——But how do we get the idea that such a description must after all be possible? Have you ever felt the lack of such a description? Have you tried to describe the aroma and not succeeded?[15] (italics original)

The knowledge of sense qualities, such as that of the sound of a clarinet or the smell of coffee, is inexhaustible by verbal descriptions. There is a limit to verbal articulation of such knowledge. Johannessen develops the point a step further and talks about a certain type of aesthetic knowledge, for instance, the knowledge that I have of the unique sound of a particular performance of a piece of music. No matter how hard I try to verbalize what I know about its tonal colouration, there is always something left about it, and my interlocutor can only have very vague ideas of what the sound is like. For a thorough communication of what I know, the best choice would be to perform fragments and passages of the work in question. This is, on the one hand, the best way to prove my knowledge of the tone color of the piece of the music, and, on the other hand, it is also the best way to provide the person I talk to with a first hand experience, that is, the immediate exposition to the sound, for him to gain the knowledge that I intend to convey.[16] As Grimen points out, for the acquisition of the knowledge of sense qualities, first hand experience is indispensable. The indispensability of first hand experience is an indication of the inadequacy of verbal descriptions of sense qualities.[17] Moreover, Allan Janik argues that once the people we intend to communicate our knowledge of sense qualities have had the requisite first hand experiences themselves, the demand for verbal explanation ceases to press upon us.[18]

The second type has to do with physiognomy-recognizing. I know perfectly well the appearance of my friend. My knowledge of his face can be demonstrated by the fact that I can pick him out instantly in a large crowd. But on being asked how I can do this, I get stuck. Of course, I can enumerate certain features of his face; however, as Johannessen points out, these verbal descriptions provide only a pitifully insufficient basis for someone else to attempt his identification.[19] With these verbal descriptions only, the person, to whom I want to convey my knowledge of the face of my friend, will not succeed in identifying my friend's physiognomy. To accomplish this, what is needed is the first hand experience of it. Here again we see the gap between the knowledge of somebody's face and its verbal description. The difficulty of verbally articulating the knowledge of a friend's face does not lie in the amount of details, because as Grimen points out, a good artist can capture the characteristics of a face with a few lines without presenting the complexity of all the details. What is difficult to accomplish verbally can be easily done visually. This indicates that the gap between the knowledge of somebody's face and its verbal articulation is a logical one. It is not a question of degree. Grimen generalizes the example of face-recognizing by talking about various gestalt-identifying activities which cover identifying various contexts or situations of human action.[20]

The third type concerns skill. Craftsmanship is a paradigm case of skill. No doubt craftsmanship involves certain occupational knowledge. When asked about the process that leads to his remarkable products, the skillful craftsman might mention certain general features of his performance, such as some rules of thumb, some hints about the methods and the use of the tools, etc. However, his skill is not exhausted by these verbal descriptions of his action. Johannessen claims that the occupational knowledge embodied in a skill finds its

primary expression in the very practice of the occupation. Therefore, it is impossible for the skillful craftsman to express his entire occupational knowledge in a purely linguistic form, and it is equally impossible for an apprentice to become a skillful craftsman simply by reading these verbal descriptions. What is crucial here is practice. That is why, in addition to his verbal instructions to his apprentice, the craftsman would continually show it by doing it. That also explains the fact that practice is a necessary precondition for the apprentice to gain the expertise in the occupation. [21] Skill lies in proficiently carrying out a sequence of steps that constitute an action which Grimen calls the choreography of an action. Grimen notes the difficulty for both a skillful performer and a keen observer to fully articulate by verbal means different kinds of choreography in manual work, care-taking, etc. The inadequacy of verbal articulation of the choreography of an action is made clear by an interesting observation that he offers about the instruction manuals for building and repairing machines: the verbal instructions are always accompanied by the visual illustrations. Grimen claims that without these visual illustrations in each step, it would be very difficult or even impossible to understand these instruction manuals. [22]

The latter two types of examples can also be found in Polanyi's writings. It is interesting to note that Polanyi's use of these examples is different from that of the Wittgensteinians. While the Wittgensteinians use these examples to illustrate the logical gap between knowledge and verbal articulation, thus in support of the strong thesis of tacit knowledge, Polanyi's emphasis is on the from-to structure of tacit knowing based upon two kinds of awareness, which is more related to the Gestalt thesis of tacit knowledge, to use Grimen's terminology.

A Justification for the Strong Thesis of Tacit Knowledge

The Wittgensteinians all believe that tacit knowledge in the strong sense exists. But Harald Grimen feels that it is hard to justify this thesis[23]. In my view, however, this is exactly what Johannessen wants to accomplish with his practice-centered interpretation of later Wittgenstein's philosophy.

Grimen does not tackle the issue in length, but he mentions in passing two possible approaches to the task of justifying the strong thesis of tacit knowledge: (1) one might think of some pre-verbal experiences that are not covered by language or (2) one may argue that it is language that creates the basis for some experiences that are beyond verbal articulation. Grimen himself prefers the second approach and thinks that the first one is indefensible. Since Grimen is too brief here, it is difficult to know the substance of these two approaches that he has in mind. However, what is clear from his presentation is that there can be at least two ways to argue for the strong thesis of tacit knowledge, that is, arguments can proceed either on the pre-linguistic level or on the linguistic level.

Polanyi deploys both strategies in his effort to bring to light the tacit dimension of human knowledge. It is not difficult to see that as far as the goal of arguing in favor of tacit knowledge is concerned, the real difficulty lies not in the pre-verbal level. Pre-linguistic intelligence is tacit by definition. What constitutes a real challenge is to argue for the tacit dimension in the domain of explicit knowledge. Polanyi traces man's tacit powers to animal's inarticulate intelligence and argues that not only on the pre-verbal level, but also in the domain of explicit knowledge, tacit powers constitute man's ultimate faculty of acquiring and holding knowledge. Methodologically, Polanyi's approach is a mixture of conceptual analysis and empirical research.

Johannessen operates primarily on the linguistic level to argue for the strong thesis of tacit knowledge. Working in the Wittgensteinian tradition, Johannessen's approach is more a logical-grammatical one than an empirical one. With a practice-centered interpretation of Wittgenstein's later philosophy, he uncovers the built-in tacit dimension in our use of language. I would summarize Johannessen's argument in the following way.

(1) The use of language is a rule-following activity

Since the early 20th century, a rationalistic view of the nature of language, which we can find in Russell, Whitehead, logical positivists and early Wittgenstein, has been very influential in philosophy and other related areas such as linguistics, cognitive psychology, and computer sciences. The concept of rule plays a central role in the rationalistic understanding of language. The logical form of language is the sole feature that matters in such an analysis of the nature of language.[24] It is this rationalistic understanding of language that the later Wittgenstein wanted to call into question. According to later Wittgenstein, the rationalistic view is insufficient for an adequate understanding of the nature of language because too much is left in the dark. Johannessen points out, later Wittgenstein came to see that "the *use* of language was not something that was only contingently related to its nature: it should instead be thought of as *constitutive* of it" (italics original).[25] Thus, the use of language in various situations became the focus of his later philosophy. This is what is often called "the pragmatic turn" in philosophy of language. According to later Wittgenstein's pragmatic view of language, it is not the concept of rule but the rule-following behavior that is in the center of stage. The use of language is essentially a rule-following activity. In commenting on later Wittgenstein's philosophy, Johannessen declares: "What is most striking is perhaps his turning away from dealing with rules and their logical form to investigating what it means to *follow* rules"(italics original).[26]

(2) The application of linguistic rules is ruleless

Since the 1980's, the theme of rule-following has been recognized as the very center of Wittgenstein's later philosophy . Different from Gordon Baker's interpretation of rule-following, the emphasis of which is more on the rule-aspect of the rule-following activities,[27] Johannessen highlights the practice-aspect of rule-following. [28]

> [T]here is far more to rule following than the rule that is followed. The rule itself is the least important element in the analysis that Wittgenstein made of the phenomenon of rule-following. It is the *very act of following it* and how to establish its identity that occupies the center of his interest.[29]

To understand the practice-aspect of the rule-following behavior, it is important to see the difference between a rule and its application. Wittgenstein claims that a rule can be interpreted in different ways; therefore, it cannot determine how it is to be applied. But can we formulate another rule which will lay down how the first rule should be applied? To Wittgenstein, this is a futile effort, because the same problem will arise once again to the second rule. Thus, if we try to solve the problem of the application of a rule by appealing further to other rules, we will end up with an infinite regress. In a word, the application of a rule is not determined by the rule itself and by other rules.[30] Johannessen summarizes this line of argument with a brief statement:"The application of rules is accordingly in principle ruleless."[31] Applying this general thesis about the application of rules to the particular case of the use of language, we arrive at the following conclusion: "In the final instance

15

there cannot be rules that lay down how a semantic rule or a definition should be applied. The application of a definition (semantic rule) is and must necessarily be performed without the support of any further rules" [32]

3) Practice as the expression of intransitive understanding

Though not the first one who attaches great importance to the notion of intransitive understanding in Wittgensteinian scholarship, Johannessen distinguishes himself by working out a Wittgensteinian conception of tacit Knowing/knowledge with his brilliant elaboration of intransitive understanding.[33]

Wittgenstein introduced the term "intransitive understanding" in the following passage in his *Philosophical Grammar*:

> If I say: "I understand this picture" the question arises: do I mean "I understand it *like that*"? With the "*like that*" standing for a translation of what I understand into a different expression? Or is it a sort of intransitive understanding? When I am understanding one thing do I as it were think of another thing? Does understanding, that is, consist of thinking of something else? And if that isn't what I mean, then what's understood is as it were autonomous, and the understanding of it is comparable to the understanding of music. [34]

A passage that conveys a similar message in *Philosophical Investigation* runs like this:

> We speak of understanding a sentence in the sense in which it can be replaced by another which says the same; but also in the sense in which it cannot be replaced by another. (Anymore than one musical theme can be replaced by another.) In the one case the thought in the sentence is something common to different sentences; in the other, something that is expressed only by these words in these positions. (Understanding a poem.)[35]

The paradigm cases of intransitive understanding can be found in our experience of different forms of art, such as picture, music, poem, etc. Johannessen makes a careful and detailed analysis of intransitive understanding and attempts to spell out its various aspects. In his view, in our immediate traffic with art, intransitive understanding has the following characteristics: 1) In contrast to transitive understanding which can be translated into other medium of expression, intransitive understanding is autonomous, it does not relate to anything else. 2) In intransitive understanding, a work of art is grasped individually as an entirety of sense and expression. 3) In intransitive understanding, to understand a work of art is to experience it. Intransitive understanding is a particular kind of experience. 4) Intransitive understanding involves a feeling of familiarity with a work of art. In sum, Johannessen claims that the important thing about intransitive understanding is that "it is self-sufficient in the sense that the point of it is wholly *immanent* in undergoing it." [36] The intransitive understanding in our aesthetic experience can only be adequately expressed in the aesthetic practices, in our immediate traffic with works of art, both as artists or as beholders. Of course, in the aesthetic situations, verbal expressions are also used. We often make remarks like "You have to see it like this," or "You have to hear it like this."[37] However, these remarks are extremely vague. "At most they could be said to be employed to gesticulate towards something that is clarifyingly embodied in the accompanying examples."[38] In some cases, "words are of no help anymore. Ways of responding and acting must do in their place. It is thus no accident that the ostensive content of the pointing gesture remained verbally unarticulated."[39]

Although our aesthetic experiences typically illustrate intransitive understanding, one should not be misled to think that intransitive understanding is confined to the aesthetic realm; it is not. Intransitive understanding is a global phenomenon. It is at work ubiquitously. In the use of language, for instance, there is also an element of intransitive understanding. We have seen that the use of language is a rule-following activity. The application of the linguistic rules is ruleless. But this is only a negative statement. Then the question is, positively speaking, what guarantees the competent application of the linguistic rules?

> The application of semantic rules and definitions is not, however, a completely spontaneous and unfounded reaction. It is anchored in a kind of experience having the character of intransitive understanding and judgmental power that in a logical sense cannot be cast in the form of propositional knowledge or articulated as a system of rules.[40]

The competent use of rules, such as the fact that they are applied in the same way in various situations, is secured by intransitive understanding. We are well justified to call the intransitive understanding and the judgmental power in our use of language, which cannot be put into the form of propositional knowledge, tacit knowledge. According to Jonhanessen, this aspect of our use of language is underscored by Wittgenstein with his concept of practice.

> This aspect of our grasp of a natural language is thus said to have a tacit dimension that should not be overlooked when scrutinizing Wittgenstein's view of the relationship between language and world. Wittgenstein is in fact using the concept of practice to underline this very element in our linguistic handling of reality. [41]

In commenting on Wittgenstein's comparison: "The understanding of language…is …of the same kind as the understanding or mastery of a calculus, something like the *ability* to multiply,"[42] Johannessen remarks:

> Once more we get an indication that there is a kind of understanding that is an integrated part of being a competent user of language, but which cannot be expressed *by* language. This is what I have chosen to call *intransitive* understanding. It is internally related to this overarching grasp of language that is only adequately expressed in the competent exercise of the manifold of practices that constitute human language. [43]

The intransitive understanding in the competent use of language can only be adequately expressed in various forms of practices. Language is insufficient to give it a full expression. This implies a logical gap between verbal articulation and intransitive understanding and points to a concept of tacit knowledge in the strong sense.

Let us recapitulate Johannessen's justification for the strong thesis of tacit knowledge: The use of language is a rule-following activity. However, the linguistic rules do not determine their application. The application of the linguistic rules is ultimately determined by intransitive understanding which cannot be fully articulated by verbal means and can only be adequately expressed in actions or practices. Thus there is a built-in element of tacit knowledge in our use of language. As I understand it, these are the main points of Johannessen's argument for the strong thesis of tacit knowledge through his creative interpretation of later Wittgenstein.

Towards a Pragmatic Turn in Epistemology

Johannessen reminds us of the fact that practice is one of the key concepts of Wittgenstein's later philosophy. He holds that the philosophy of later Wittgenstein can be viewed as a kind of practice philosophy, which "operates from the insight that there exists a complicated network of the mutually constitutive relations between concept formation, human reaction and activities and what we call reality." [44] He advocates a pragmatic turn in epistemology on the basis of his practice-centered interpretation of later Wittgenstein. This involves a pragmatic view of meaning, a pragmatic view of concept of concept and a pragmatic view of knowledge.

Let us look at the pragmatic view of linguistic meaning first. The crucial question is: What gives words meaning? What makes various kinds of signs meaningful vehicle of human communication? According to Wittgenstein, it is not interpretation, but practice which is decisive in sense making. In the context of the discussion of the rule-following behaviour, interpretation is characterized by Wittgenstein as "the substitution of one expression of the rule for another. "[45] Johannessen points out that interpretation to Wittgenstein is something that involves conscious intellectual activity and to interpret means to form a hypothesis. Interpretation as a hypothesis-making intellectual activity cannot determine meaning. Wittgenstein makes this point crystal clear with the following remarks: "Any interpretation still hangs in the air along with what it interprets, and cannot give it any support. Interpretations by themselves do not determine meaning." [46] Therefore, if we submit to the idea that acting according to rules is a matter of interpretation, we will find ourselves in the following predicament: on the one hand, by one interpretation, every course of action can be made out to accord to with the rule; on the other hand, by another interpretation, it can also be made out to conflict with it. Thus we end up with an inevitable conclusion which is absurd: there would be neither accord nor conflict here. Wittgenstein's way out of this logical impasse is the following: "What this shows is that there is a way of grasping a rule which is *not* an *interpretation*, but which is exhibited in what we call 'obeying the rule' and 'going against it' in actual cases".[47] This non-interpretive way of grasping a rule is acting (obeying a rule or going against a rule) in actual cases, that is, practice: "obeying a rule" is a practice. [48]

Back to the question of what gives various signs meaning so that they will function well in human communication, we have seen that interpretation does not determine meaning. But this is only a negative answer. Positively, what determines meaning? At this juncture, the concept of practice is called upon by Wittgenstein to accomplish the task: Practice gives words their meaning.[49]

The pragmatic view of meaning is interwoven with a pragmatic view of concept. What is the nature of concept? In Johannessen's view, one of the features of the traditional understanding of concept is that it takes it for granted that concepts can be verbally articulated in their entirety. [50] We can have a glimpse of it by looking at what is taught even today in logical textbooks concerning the nature of concept: "A legitimate and scientifically respectable concept is established if and only if we are able to specify the necessary and sufficient conditions for using the verbal expression of the concept." [51] This is called into question by the pragmatic view of concept which emphasizes the constitutive role of practice in the formation and application of concepts. According to the pragmatic view, our conceptual hold on the world is not exclusively revealed in our ability to formulate correct propositions about reality. It is in a fundamental sense anchored in certain forms of action. If one claims to have mastered a given concept, one has to be accepted as a competent performer of the established form of action which incorporates the concept. Johannessen lays out the principle of conceptual

mastery in the perspective of the pragmatic view of concept as follows: "The grasp that a given concept gives us on the world is basically and most adequately expressed in practice." [52] The performance of a certain practice is considered to be the primary mode of expression of a given concept. Taking the concept of chair as an example, according to the pragmatic view of concept, Johannessen argues, the mastery of the concept lies not so much in the ability to produce propositions with the linguistic expression "chair" as in the ability to deal with real chairs in an adequate way, for instance, sitting on them with ease, taking them as furniture in our actions, etc.[53] The mastery of a concept has a built-in element of tacit knowledge. Johannessen claims:

> Against the outlined background it should no longer represent a problem to talk about rules or concepts which can be formulated only incompletely as regards content, at least when it is a question of formulating the content by verbal means. We have noted that the criterion of their adequate mastery is in their application. The knowledge which is built into that mastery can consequently be considered to have a partial and non-reducible expression in action. Therefore it is not possible to put into words this aspect of action in which the intellectually explicable part of the concept is necessarily embedded. [54]

The mastery of a concept (a rule) cannot be completely formulated by verbal means. It has a "partial and non-reducible expression in action." This is a beautiful expression which indicates that the built-in knowledge in the mastery of a concept is tacit in the strong sense.

With the pragmatic view of meaning and concept, we are at the threshold of the pragmatic view of knowledge. Johannessen points out that an important presupposition of the traditional propositionally oriented conception of knowledge is that "knowledge only makes sense as some sort of *product*."[55] Obsessed with knowledge as a finished product, the mainstream conception of knowledge in Western philosophy loses sight of the process-perspective on knowledge which takes knowledge also as a part of an ongoing process embedded in particular kinds of human activities aiming at certain goals. In contrast, the pragmatic view of knowledge underlines the process-aspect of knowledge: [56] ¨Conceptions of knowledge incorporating the process-perspective are normally called pragmatic—derived from the Greek word *pragma*, which among other things mean *action*." [57]

According to Johannessen, our practically acquired knowledge about reality has a complex structure. He takes pains to spell out in four respects the important factors involved in human knowledge from a pragmatic process-perspective: (1)The *linguistically articulatable content* of our practically acquired conceptual hold on reality. To the extent that this content is verbally articulated *de facto*, it is legitimate to talk about *propositional knowledge*. It is a product which is abstracted from our practical hold on reality. (2)The *performative aspect* of the enacted practice which encapsulates certain conceptual content. It constitutes the basis of the above-mentioned abstraction. Johannessen suggests calling it the *skill* aspect of knowledge, or simply *competence knowledge*.(3)The *familiarity aspect* of our practically acquired conceptual hold on reality. It is achieved by means of specific encounters with the conceptualized phenomena. Johannessen calls it the familiarity aspect of knowledge, or *familiarity-knowledge*. (4)The *judicious* aspect of our practically acquired conceptual hold on reality. By this expression, Johannessen means the judgmental power employed in the establishing, application and mediation of knowledge.

The pragmatic analysis of knowledge reveals that our knowledge of reality is not a purely intellectual affair. Our practically acquired conceptual hold on reality cannot be exhausted by propositions. Factors like

"the *skills* involved in *handling* the conceptualized phenomena, our reflective *familiarity* with them, expressed in the *sureness* in our behaviour towards them, and the *judgmental power* exercises in applying or withholding a given concept on a particular occasion . . . . are all relevant to the establishment of knowledge, but they cannot themselves be fully and straightforwardly articulated by verbal means."[58] We have seen that the linguistically articulatable aspect is a product of the abstraction of the non-linguistic aspects of our practically acquired knowledge of reality. It is the competence-knowledge, familiarity-knowledge and judgment that make propositional knowledge possible.

> Propositional knowledge is not something that can be acquired independently of other elements of knowledge. A whole group of considerations are indissolubly interwoven and will always be more or less present in all situations leading to the formation of knowledge. …Propositional knowledge simply cannot be established in the absence of competence-knowledge, familiarity-knowledge and a certain degree of judgment. …We could therefore take as our motto the claim that all propositional knowledge rests on an inescapable foundation of competence-knowledge, familiarity-knowledge and judgment. [59]

Johannessen accepts Polanyi's term "tacit knowledge" to designate the non-linguistic aspects of our practically acquired conceptual hold on reality. On another occasion where he discusses the mastery of natural language, he reformulates the above insight of pragmatic view of knowledge in the following way:

> There is more to our language mastery than can be expressed in a system of rules or propositions. This tacit, "surplus" knowledge is displayed in the very acts of *applying*—or abstaining from applying—language in all sorts of contexts. …In fact, we have now set the stage sufficiently to realize that the following reasoning represents a cogent argument: since propositional knowledge is essentially verbal, and since tacit knowledge is involved in any kind of linguistic mastery, it follows that propositional knowledge is essentially dependent on tacit knowledge.[60]

Two points, in my view, merit special attention, with respect to the pragmatic view of knowledge that Johannesses elaborates: 1) It is quite clear that Johannessen argues not only for the existence of tacit knowledge in the strong sense, but also for the primacy of tacit knowledge over propositional knowledge. Tacit knowledge is the foundation of propositional knowledge. All propositional knowledge is rooted in tacit knowledge. Here Johannessen, from a Wittgensteinian perspective, reaches a point about human knowledge that is shared by Michael Polanyi, Gilbert Ryle and Michael Oackeshott. 2) It is impressive that Johannessen differentiates various types of tacit knowledge in the strong sense, namely, competence-knowledge, familiarity-knowledge and judgment. The discussion of tacit knowing/knowledge makes a great contribution to epistemology by digging out the tacit dimension of human knowledge. This is where the inspiring secrecy of human knowledge is embedded. The concept of tacit knowing/knowledge discloses a very fertile field that needs to be carefully explored. In this regard, the Wittgensteinian case-oriented approach will show its strength in capturing different varieties of tacit knowledge. Johannessen's differentiation of tacit knowledge may not be complete, but it certainly points in the right direction of deepening the study of tacit dimension of human knowledge.

Concluding Remarks

In my view, a prominent merit of the Wittgensteinian approach to tacit knowing/knowledge is that

it alerts us to some distinctions concerning the problem of articulation of knowledge. Firstly, it is the distinction between what is articulatable and what is unarticulatable. As Grimen rightly points out, the theory of tacit knowledge has no interest in anything which is completely unarticulatable. The object domain of the theory of tacit knowledge is knowledge, and knowledge can always find a mode of articulation, though not necessarily verbal articulation. Secondly, it is the distinction between what can, in principle, be articulated by verbal means and what cannot. On the side of what cannot be verbally articulated, we find tacit knowledge in the strong sense. Thirdly, it is the distinction, within what can be articulated by verbal means, between what is articulated and what is not articulated. On the side of what is not articulated, we find tacit knowledge in the weak sense, no matter it is understood in terms of the Gestalt thesis of tacit knowledge or of the thesis of epistemic regionalism. In other words, the discussion of tacit knowledge is not concerned about the distinction between what is articulatable and what is not in the absolute sense; the strong thesis of tacit knowledge is concerned with the distinction between what is in principle verbally articulatable and what is not, while the weaker theses are concerned with, in the domain of knowledge which is in principle verbally articulatable, what is verbally articulated and what is not. In summary, with regard to the problem of articulation, at least the aforementioned three distinctions should be taken into consideration. The Wittgensteinian approach to tacit knowing/ knowledge strongly enhances our theoretical sensitivity towards these distinctions.

We have seen that the focus of the Wittgensteinian approach is on tacit knowledge in the strong sense, namely, knowledge which is hard to fully articulate by verbal means and which has a non-reducible expression in actions or practices. In my view, this focus on knowledge in action can be traced back to Wittgenstein himself, who claims in *Philosophical Investigation*:

> The grammar of the word "knows" is evidently closely related to that of "can," "is able to."
> But also closely related to that of "understand." ('Mastery' of a technique.)[61]

> But there is also *this* use of the word "to know": we say "Now I know!"—and similarly "Now
> I can do it!" and "Now I understand!"[62]

Obviously, by interpreting "to know" in terms of "I can do it" or "I understand," Wittgenstein emphasizes here action-inherent knowledge, or action-constitutive knowledge, or knowing how, to use Gilbert Ryle's terminology. Wittgenstein not only holds but also lives this action-oriented conception of knowledge. Some biographical materials attest to it.

In his "Biographical Sketch," G. H. von Wright says the following about Wittgenstein:

> Knowledge, for Wittgenstein, was intimately connected with doing. It is significant that his
> first studies were in the technical sciences. He had a knowledge of mathematics and physics
> not derived from extensive reading, but from a working familiarity with mathematical and
> experimental techniques. His many artistic interests had the same active and living
> character. He could design a house, make a sculpture, or conduct an orchestra. Perhaps he
> would never have achieved mastery in those fields. But he was no "dilettante." Every
> manifestation of his multi-dimensional spirit came from the same earnest drive to create.[63]

Norman Malcolm also says:

He has an obvious relish for a mechanical problem. …He always had a keen appreciation of sound workmanship and a genuinely moral disapproval of the flimsy or the slipshod. He liked to think that there might be craftsmen who would insist on doing their jobs to *perfection*, and for no reason other than that that was the way it *ought* to be. [64]

Allan Janik points out that in the Western philosophical tradition since Socrates, craftsmanship has been discredited.[65] Wittgenstein's appreciation for craftsmanship and his relish for technical issues constitute a challenge to this tradition. This intellectual orientation also explains why the Scandinavian Wittgensteinians feel so congenial to what is going on in the Swedish Center for Working Life in Stockholm.

Endnotes

[1] One may find that in the discussion of the theory of tacit knowing/knowledge, terms like "the propositional" and "the verbal" are used interchangeably. This is justifiable to the extent that the propositioal is taken as a paradigm case of the verbal. However, one should also bear in mind the difference between them. Evidently, the extension of the verbal is much broader than that of the propositional. There are cases of non-propositional expressions which are still verbal expressions. For instance, in my discussion of modern Chinese metaphysics, I emphasize two forms of non-propositional expressions that modern Chinese philosophers deployed to articulate metaphysical Truth, namely, poetic expressions and metaphysical statements. Cf. Yu Zhenhua, "How to Say What Cannot Be Said?—The Reponses of Two Chinese Philosophers to Wittgenstein's 'Silence'," Bergen: SVT working paper, No.1, 1996; also Yu Zhenhua, "Reflections on the Controversy of Science vs. Metaphysics in Modern China," Bergen: SVT working paper, No.7, 1998.

[2] Cf. Harald Grimen, "Tacit Knowledge and the Study of Organizations," Bergen: LOS Center (Norwegian Research Center in Organization and Management), working paper, 1991. The paper was originally published in Norwegian. The English translation was first prepared by Bjoern Wikner, then improved by Judith Larsen. Later it was revised by Harald Grimen. My discussion of Grimen's ideas is based upon the English text.

[3] Plato, *The Collected Dialogues of Plato*, edited by Edith Hamilton and Huntington Cairns, Princeton: Princeton University Press, 1961, p. 133.

[4] Plato, *The Collected Dialogues of Plato*, p.137.

[5] Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowledge," in *Essays in Pragmatic Philosophy*, II, Oslo: Norwegian University Press, 1990, pp. 104-5.

[6] Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowledge," p.105.

[7] In addition to the interpretations listed here, Grimen also mentions an interpretation of tacit knowledge which is interesting sociologically, but not quite relevant epistemologically. It is called the thesis of conscious under-articulation. In this view, tacit knowledge is something that we consciously attempt to conceal, to under-articulate, or even try to avoid articulating. For example, in marriage or political compromise, it is wise for the partners not to tell all they know about each other. This conscious under-articulation helps maintain a good relationship in marriage or political compromise, which might collapse because of over articulation. Grimen argues that this un-articulation or under-articulation of what one knows is in a sense tacit, because nobody talks about it. In my view, Allan Janik's discussion of trade secrets also falls under this category. "Guildmasters from time immemorial have been acutely aware of the ways in which their status, power and standard of living often depended upon keeping the tricks of the trade from the uninitiated."[7] (Cf. Allan Janik, "Tacit Knowledge, Working Life and Scientific Method," in Bo Göranzon and Ingela

Josefson eds. *Knowledge, Skill and Artificial Intelligence*, London: Springer-Verlag, 1988, p. 54). Guildmasters' manipulation of knowledge in the form of the tricks of the trade is a typical case of tacit knowledge in the sense that it is consciously under-articulated or even un-articulated.

⁸ Allan Janik, "Tacit Knowledge, Working Life and Scientific Method," p. 55.

⁹ Harald Grimen, "Tacit Knowledge and the Study of Organizations".

¹⁰ Kjell S. Johannessen: "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality," in *Uniped*, Vol.22, No.3, 2000. The article was originally published in Norwegian. I am referring to the manuscript of the English translation.

¹¹ Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowledge," in *Essays in Pragmatic Philosophy*, II, pp. 105.

¹² Allan Janik echoes Grimen in this respect in discrediting Hubert Dreyfus' suggestion of using the term "intuition" instead of "tacit knowledge." Cf. Allan Janik, "Tacit Knowledge, Rule-following and Learning," in Bo Göranzon and Magnus Florin eds. *Artificial Intelligence, Culture and Language: On Education and Work*, London: Springer-Verlag, 1990, p. 48.

¹³ Cf. Gunnar Skirbekk, "Wittgensteinian Influence on Norwegian Philosophy," in *Wittgenstein and Norway*, eds. Kjell S. Johannessen, Rolf Larsen, Knut Olav Åmås, Oslo: Solum Forlag, 1994. pp.181-195.

¹⁴ Wittgenstein, *Philosphical Inverstigations*, translated by G.E.M. Anscombe, second edition, Oxford: Blackwell Publishers, 1958, &78.

¹⁵ Wittgenstein, *Philosophical Investigations*, & 610.

¹⁶ Kjell S. Johannessen: "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality".

¹⁷ Harald Grimen, "Tacit Knowledge and the Study of Organizations.".

¹⁸ Allan Janik, "Tacit Knowledge, Working Life and Scientific Method" , p. 56. It is interesting to note that, in his discussion of this type of examples, Allan Janik's emphasis is on non-visual qualities rather than on visual qualities. He sees the difference between the two as the following: "My initial claim was that machines, i.e. digital computers, could not *experience* non-visual sensations. I would not claim that they could have visual sensations either but that, since vision, unlike other sensory experience, is essentially multi-dimensional, it can be described with the sorts of coordinates which permit simulation by a machine; whereas tastes, smells, etc., can only be described metaphorically to those who have not actually experienced them. To say this, however, is to say that they can be described only by comparison with other sensations which is to say that they can only be experienced by the human body." Cf. Allan Janik, "Tacit Knowledge, Rule-following and Learning," p. 46-47.

¹⁹ Kjell S. Johannessen, "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality".

²⁰ Harald Grimen, "Tacit Knowledge and the Study of Organizations.".

²¹ Kjell S. Johannessen, "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality."

²² Harald Grimen, "Tacit Knowledge and the Study of Organizations".

²³ Harald Grimen, "Tacit Knowledge and the Study of Organizations".

²⁴ Johannessen, citing Morris Weitz and John Rawls as examples, criticizes this rule-focused approach in philosophy of language, aesthetics and political philosophy. Cf. Kjell S. Johannessen, "Language Art and Aesthetic Practice," in *Wittgenstein and Transcendental Philosophy*, eds. Kjell S Jonhanessen and Tore Nordenstam, Vienna: Verlag Hoelder-Pichler-Temsky, 1981, pp.113-119.

²⁵ Kjell S. Johannessen: "Rule-Following and Intransitive Understanding" in *Aritifical Intelligence, Culture and Languange: On Education and Work*, eds. Bo Göranzon and Magnus Florin . London: Springer-

Verlag, 1990. p.38.

[26] Kjell S. Johannessen: "Rule Following, Intransitive Understanding, and Tacit Knowleldge," p. 109.

[27] Compare Gordon Baker, "Following *Wittgenstein*: Some Signposts for *Philosophical Investigations* Paragraphs 143-242" in *Wittgenstein: To Follow a Rule*, eds. S. Holtsman and C. Leich, London: Routledge and Kegan Paul, 1981, pp.31-71.

[28] Kjell S Johannessen, "The Concept of Practice in Wittgenstein's Later Philosophy," *Inquiry*, Vol. 31, No. 3, 1988, pp. 357-69.

[29] Kjell S. Johanessen, "Rule-Following and Intransitive Understanding," p. 40.

[30] For the textual evidence of this interpretation of Wittgenstein, I would suggest &84, &85, and &86 of
Wittgenstein's *Philosophical Investigations*.

[31] Kjell S. Johanessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 122.

[32] Kjell S. Johanessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 109.

[33] Kjell S. Johanessen fully acknowledges Jörg Zimmerman's contribution in drawing our attention to intransitive understanding in Wittgenstein's philosophy. Cf. Kjell. S. Johannessen, "Philosophy, Art and Intransitive Understanding," in *Wittgenstein and Norway*, pp. 220-221.

[34] Wittgenstein, *Philosophical Grammer*, edited by Rush Rheese, translated by Anthony Kenny, Oxford: Basil Blackwell, 1974, p. 79.

[35] Wittgenstein, *Philosophical Investigations*, &531.

[36] Kjell. S. Johannessen, "Philosophy, Art and Intransitive Understanding," p. 244.

[37] Wittgenstein claims: "Here it occurs to me that in conversation on aesthetic matters we use words: 'You have to see it like this, this is how it is meant'; 'When you see it like this, you see where it goes wrong'; 'You have to hear this bar as an introduction'; 'You must hear it in this key'; 'You must phrase it like this' (which can refer to hearing as well as to playing). " Cf. Wittgenstein, *Philosophical Investigation*, p. 202. Johannessen makes much out of this passage. He points out that it is typical of our talk about aesthetic matters to have this "like this"-element.

[38] Kjell. S. Johannessen, "Art, Philosophy and Intransitive Understanding," p. 232.

[39] Kjell. S. Johannessen, "Art, Philosophy and Intransitive Understanding," p. 233.

[40] Kjell S. Johannessen, "Rule Following, Intrasitive Understanding, and Tacit Knowledge," p. 109.

[41] Kjell S. Johannessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 109.

[42] Wittgenstein: *Philosophical Grammar*, p.50.

[43] Kjell S. Johannessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 118.

[44] Kjell S. Johannessen, "Rule Following, Intrasitive Understanding, and Tacit Knowledge," p. 110.

[45] Wittgenstein, *Philosophical Investigations*, translated by G.E.M. Anscombe, Blackwell, 1967, &201.

[46] Wittgenstein, *Philosophical Investigations*, &198.

[47] Wittgenstein, *Philosophical Investigations*, &201.

[48] Wittgenstein, *Philosophical Investigations*, &202.

[49] Wittgenstein, *Remarks on Colour*, edited by G.E.M.Anscombe, translated by Linda L. McAlister and Margarete Schättle. Oxford: Basil Blackwell, 1978, &317.

[50] Kjell S. Johannessen, "Rule Following, Intransitive Understanding, and Tacit Knowledge," p. 126.

[51] Kjell S. Johannessen, "Action Research and Epistemology," in *Concepts and Transformation*, Vol.1, No. 2/3, 1996, p. 292.

[52] Kjell S. Johannessen, "Action Research and Epistemology," p.293.

[53] Kjell S Johannessen ,"Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality."

[54] Kjell S. Johannessen, "Rule Following, Intrasitive Understanding, and Tacit Knowledge," pp. 112-3.

[55] Kjell S Johannessen, "Knowledge and Reflective Practice," in *Dialogue, Skill and Tacit Knowledge*, edited by Bo Göranzon, Maria Hammarén and Richard Ennals, John Wiley & Sons, 2006, p.232.

[56] In my conversation with professor Kjell S Johannessen, he emphasizes that we should give credit to Michael Polanyi for giving prominence to the process-aspect of human knowledge.

[57] Kjell S Johannessen, "Knowledge and Reflective Practice," p. 233.

[58] Kjell S Johannessen, "The Concept of Practice in Wittgenstein's Later Philosophy," *Inquiry*, Vol. 31, No. 3, 1988, p.357.

[59] Kjell S Johannessen, "Knowledge and its Modes of Articulation: A Sketch of Certain Characteristics of Our Tacit Hold on Reality."

[60] Kjell S Johannessen, "Action Research and Epistemology," pp. 294-5.

[61] Wittgenstein, *Philosohical Investigation*, & 150.

[62] Wittgenstein, *Philosohical Investigation*, & 151.

[63] G. H. von Wright, "Biographical Scketch," in *Wittgenstein*, Oxford: Basil Blackwell, 1982, p. 20.

[64] Norman Malcolm: *Ludwig Wittgenstein: A Memoir*, Oxford: Oxford University Press, 1958. pp. 85-6.

[65] Allan Janik: "Tacit Knowledge, Working Life and Scientific Method," pp. 62-3.

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