Ziemski, Stefan

Jakub Górski : Logician and Philosopher

Stefan Ziemski (Poland)

JAKUB GÓRSKI: LOGICIAN AND PHILOSOPHER

In the history of the Polish science of the Renaissance period, one of the most eminent although relatively unknown and underestimated personages is Jakub Górski. His scientific activity fell during the reign of Sigismund Augustus, Henry de Valois and Stephen Bathory. It can be divided into three main periods, namely: the first period from 1554 to 1563 comprising the time of the lectures at the Faculty of Philosophy of the Jagellonian University, the second period from 1563 to 1567 during which he made a journey to Italy and obtained a degree of the doctor of law, and the third period from 1567 to 1585 devoted mainly to public activities. In his scientific work the most interesting was the first period during which he wrote his treatises on rhetoric and logic.

The first published work of Jakub Górski was a treatise on rhetoric devoted to the period: *De periodis atque numeris oratoriis*, issued in 1558. Next year the treatise *De generibus dicendi* was written (published in 1559), and further, in 1560, the work *De figuris tum grammaticis tum rhetoricis libri quinque*. The above mentioned works are a collection of the rhetorical, grammatical, and syntactic, rules and principles which were of importance in rhetoric. Most probably, the works were a summary of Górski's lectures delivered in that period. They included definitions and explanations of the different concepts applied in the Ancient and Renaissance rhetoric, enriched with the author's own ideas regarding an approach to the problems of rhetoric. The definition of the rhetorical period presented by Górski raised a long-lasting scientific dispute with Benedict Herbest, another famous expert in rhetoric at the Jagellonian University.

This passionate scientific dispute, similar to the discussions which were carried on at Italian universities of the Renaissance period,

distracted Jakub Górski for some time from the task of publishing his handbooks. Not earlier than three years after his last regular work on the figures of speech had been published, he prepared a vast study in logic which was one of the most mature of his scientific works. Due to the efforts of the eminent humanist Joachim Camerarius, the work appeared in Leipzig in 1563 under the title: *Commentariorum artis dialecticae libri decem.* [1]

There is no passion for reformatory action in this work, the passion revealed by Peter Ramus or Francis Bacon. The author made no attempts to reconstruct logic, no efforts to completely reject Aristotle and the whole heritage of the ancient Greeks, no endeavours to present an entirely different, modern point of view. His attempts were much more modest. And he resisted the illusion which everwhelmed the great reformes of logic who imagined that they were able to disregard completely Aristotelian logic. Peter Ramus, the great admirer of Cicero, was deceived by this illusion. While criticizing an early approach to Aristotelian ideas, he, as a matter of fact, based his lectures on dialectic on the *Topics* of Aristotle, adding some principles of the Stoical logic of sentences. Later on, Francis Bacon was also fascinated by the illusion of a complete novelty of his own doctrine. As we know at present, after the treatise of Philodemos has been discovered, Francis Bacon was following the trends of inductive logic and Epicurean philosophy. It was only an insufficient knowledge of the Epicurean logic at that time that made this famous reformer of logic judge that his theory of induction, otherwise much more developed indeed than the Epicurean logic, was, in comparison with Greek philosophy, quite a new tool for science.

In comparison with the achievements of the outstanding personalities in modern logic, Górski contributed a very specific and valuable idea, namely he gave an outline of the logic for humanists, including methods and topics taken from history, rhetoric and linguistics. At the same time, in his work different branches of formal logic were discussed in a more extensive way than in the famous *Dialectic* written previously by Ramus. His treatise, preceding the work of Bacon, was also devoted, although in a much more modest way, to the question of experimentation and direct inquiries into the matter of the causal relations which occur in empirical researches.

Jakub Górski was one of those scientists who, only on the basis of a vast knowledge of the achievements of a given epoch, create their

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[1] Lipsiae in Officina Vogeliana, 1563.

own works taking as a point of reference the independent and well considered ideas of their contemporaries. In his treatise on logic he showed a vivid interest in history, rhetoric, and also in mathematics and astronomy, this being revealed by the choice of examples, the way of reasoning and the methodological problems taken into consideration.

In Górski the interest in the Renaissance science was accompanied by a great love of the classical world, combined with the vast knowledge of belles-lettres, philosophy and ancient rhetoric. Numerous examples of reasoning were taken from the works of Greek and Roman philosophers. Their choice reveals a profound classical education. In his *Dialectic* Górski also proved to be familiar with the problems of ethics, methaphysics and ancient logic.

Apart from the comprehensive discussion on scientific methodology, reliability of historical sources, mathematical proofs, forms of reasoning applied in natural sciences as well as in law and social sciences including ethics, Górski presented a very interesting approach to the problems of formal logic, such as, for example, the concept of consequence represented in the variations of formal and material implication, and attempts to reduce syllogistic moods to the rules of the logic of sentences, which means—speaking in modern terms—to the theses of functional calculus. In his work Górski mentioned different forms of reasoning based on relations and developed according to the notions present in the ancient sources, such as the *Topics* of Aristotle and works of Cicero.

In the second period of his scientific activities, namely during the journey to Italy (1563–1567), Jakub Górski studied law and in June 1566 he was conferred a degree of the doctor of both laws, similarly as his famous compatriot Nicolas Copernicus had been granted one in 1503.

Immediately after coming back home in autumn 1567, Jakub Górski resumed his lectures at the Faculty of Philosophy, and since 1571 he was professor of the Novum jurium at the Faculty of Law. What deserves most attention during the third period of his activities, when Jakub Górski returned to Poland from Italy, is his work at a reorganization and modernization of studies at the Jagellonian University. In 1573 Jakub Górski was elected deputy chancellor of the Jagellonian University, and next year he was nominated rector of this university. He held this post for many successive years until the school year 1582/83. During that period, due to his efforts, a reorganization of the outdated curriculum took place. The reform consisted in introducing a number of new handbooks of physics, mathematics and grammar, as

well as new lectures on Arts. Reading of classical writers was also considerably extended.

At the time of the reforms made by Jakub Górski, that is in the years 1578–1580, for the first time in the history of science, regular lectures on the theory of Copernicus were introduced. In this respect the Academy of Cracow was far ahead of all other universities. [2] The lectures were delivered by the astronomer Walenty Fontani. [3]

RELATION OF LOGIC TO OTHER SCIENCES

In the introduction to his treatise on logic, ornamented with beautiful figures of speech, Górski discusses the significance of logic in other sciences and in life. The introduction starts with a reference to different branches of philosophy, followed by an appraisal of ethics which is the science teaching about life and customs, the science due to which it is possible to remove the very source of vicious deeds (*quae radicem vitiorum ex animis nostris extrahit*). Extremely fertile is this branch of philosophy—says the author—overflowing with fruits, many of which are bestowed upon the Polish Republic and the life of her citizens. As the next most eminent branch of philosophy, Górski mentions the art of holding a dispute which teaches how to bring the truth from darkness to the light, how to fight against calumnies, and how to differenciate between the false and the sincere.

All arts and sciences are based on the principles of logic and there is no sphere of life, no office, where the knowledge of logic would not prove to be necessary. At the same time, Górski shared the opinion of many of the Renaissance philosophers who thought that the principles of logic are not of a conventional character but they are inherent in the constitution of the human mind. Together with the creation of mankind one logic was created, the logic rooted in the very nature of our mind. [4]

Speaking about the development of logic, the author mentioned, first of all, the Stoics, "those worshippers of virtue" who contributed so much to the above mentioned discipline (*illi unius virtutis cultores multum laborarunt*). Further, he stressed the importance of the works of Aristotle, due to whom logic became a science and who consolidated many of its branches. He also praised very highly the merits of Cicero who

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[2] Cf. H. Barycz, *Uniwersytet Jagielloński w życiu narodu polskiego* [The Jagellonian University and Its Role in the Life of the Polish Nation], Warszawa, 1948, p. 34.
[3] Cf. E. Rybka, P. Rybka, *Mikołaj Kopernik i jego nauka* [N. Copernicus and His Science], Warszawa, 1953, pp. 195–196.
[4] Górski, *Commentariorum...*, p. 15.

had a share in the development of logic and in its application to rhetoric. [5]

Among the most famous logicians of the Renaissance epoch, Jakub Górski mentioned Peter Ramus, Rodolphus Agricola, Philipp Melanchthon, George of Trebizond, Johannes Sturm and many other German and Italian logicians. In his lecture he quoted their works when discussing particular problems of logic.

ONTHOLOGICAL CATEGORIES AND THE CONCEPT OF RELATION

While reading the first few chapters of the work of Jakub Górski, the reader may suppose that he will find a stereotyped and traditional interpretation of the ten categories of Aristotle and five types of logical predicates (*quinque voces*) of Porphyrius, the presentation of which in the subsequent ages was losing its original meaning, becoming only an empty pattern. But, on the contrary, we face quite a novel approach to the subject, enlivened with the spirit of empirical thinking and containing valuable remarks on modern logic.

In the discussion on the categories of Aristotle, the author underlined, first of all, the problem of a relation and the significance of this category in reasoning. The author was, however, unable to force a large variety of the forms and means of reasoning encountered in rhetoric, and also in the historical, mathematical and natural sciences, into the frames imposed by syllogistic. The question of syllogistic was treated by him as a secondary subject. The main part of his *Dialectic* (Books III to VII) was devoted to the considerations concerning different forms of reasoning based on the interrelations which occur between the persons, their characteristics and the things. Only in connection with the logical aspect of the relation was Górski discussing different forms of reasoning encountered in his contemporary science and rhetorical practice, pointing to these types of the relations which occur in a given form of reasoning. He expressed the idea that the concept of relation is superior to the six categories mentioned by Aristotle, namely the categories of place, time, action, sensation, possession and location. [6]

Within the frame of a logical characteristic of the relation, the author mentioned two- and three-term relations. He discussed the main types of two-term relations; he was also familiar with three-term relations, such as a relation between the moral virtues and the fault of insufficiency and excess, like, for example, a relation of generosity to

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[5] Cf. ibid., pp. 15–23.
[6] Cf. ibid., p. 161.

wastefulness and avarice, of courage to cowardice and bravura, etc. When discussing the structure of two-term relations, the author denominated, according to the terminology accepted by Renaissance logicians, the first term, "from which the relation originates," a base of the relation (*fundamentum relationis*), while the second term, "at which the relation aims," was called an end of the relation (*terminum relationis*). [7] Both terms of the relation are interdependent, for example, the father is a father in relation to his son, the son is a son in relation to his father, the husband is a husband in relation to his wife, the wife is a wife in relation to her husband. However, the relations of a paternal, filial, etc., character occur only if there are both terms and if they are interconnected with each other. In other words, an indispensable condition for the relation to occur is a co-existence of its terms. In the author's opinion, the direction of a relation depends on which of the terms forms its base.

In a further passage Górski distinguished irreversible relations, which exist, for example, between the father and the son, the hand and the body, reversible relations, such as similarity (*simile similis simile est*), and transitive relations, such as similarity 'and equality. In this respect, the author was of the opinion that the relations occur not only between the objects (*substances*) but also between the characteristics of the objects and between the qualities of the sentences, their truthfulness and falseness.

Speaking about the origin of the relations known from experience, the author says that relations are due to the action of nature, for example, a relation between the father and the son, the ancestor and the descendants. Next, they result from the choice made of man's own free will, for example, a relation between the teacher and the pupil, or from the action of fortune (*fortunae*), for example, a relation between the victor and the victim, the soldier and the leader. [8] We use these relations in our reasoning when comparing (*comparatio*), contrasting, when looking for logical relations between the terms of a definition, between the sentences, concepts, etc. For the sake of rhetoric, the author also considered in detail different types of the empirical relations which occur between the persons and the objects. [9]

Inquiries into Górski's logic confirm the opinion of V. Filkorn that the logic of relations is one of the most representative concepts of the Renaissance logic. [10]

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[7] Ibid., p. 147.
[8] Cf. ibid., pp. 148–149.
[9] Cf. ibid., pp. 435–662.
[10] V. Filkorn, *Przedheglowska logika* [Pre-Hegelian Logic], Brno, 1953.

LOGICAL CATEGORIES AND THE CONCEPT OF INDIVIDUALS

In his approach to the problem of logical categories, Górski discussed, in the first place, the category of individuals which he considered to be of primary importance in the process of creating a science based on the experiments. Due to this belief, he extended the range of the logical categories which previously included only general predicates, such as species, genera, differences in species, and characteristics.

There was a tendency in the 16th-century logic to go beyond the limits of the universalism imposed by the old way of thinking which dominated in the Mediaeval Ages from the 9th to the 14th century, and according to which knowledge was constructed basing on the assumption that species, genera and their general characteristics are real, but ignoring the importance of the existence and cognition of some specific individual objects. It is, however, to be noted that before Jakub Górski some of the 16th-century logicians, for example Spangenberg and Melanchthon, mentioned in their compendiae on logic the category of individuals to be the principal one. Jakub Górski also availed himself of earlier achievements of the modernized logic of the Scotistic and Ockhamistic schools [11] which, on the grounds of a widespread discussion of the relations between the individual and the general, prepared a basis for further development in the methodology of empirical sciences.

In his lecture on logical categories (*categoremata*), the author stressed the fact that, apart from the general categories of species, genus, difference in species, characteristic and affection, it is also indispensable to distinguish another category, namely the category of individuals and of the predicates which correspond in the language to these individuals and which cannot speak of numerous objects ("*quod non potest de pluribus dici*"). [12]

From the epistemological point of view, Górski underlined that nature creates only individuals which may be called beings of nature, [13] and it is only the human mind that combines these products of nature into species and genera. Thus, Górski was of the opinion that the only real beings in nature are individual objects. [14] Each object which can be distinguished by means of senses is an individual. The individuals were then divided by the author into persons (*personae*) and things (*res*).

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[11] Cf. T. Kotarbiński, *Wykłady z dziejów logiki* [Lectures on the History of Logic], Łódź, 1957, pp. 62–65.

[12] Cf. Górski, *Commentariorum...*, pp. 51–52.

[13] "*Natura enim sola individua parit: quae ob id entia naturae dicimus apellari, nullam speciem, nullum genus natura procreat, aut interimit,*" ibid., p. 72.

[14] "*Tota machina mundi individuis constat, quicquid in orbe terrarum cernis individuum est,*" ibid., p. 53.

This division was taken from rhetoric. Individuals are the objects which either exist self-subsistently, "by themselves" (*per se*), or they are not self-subsistent and exist in something else.

GENERAL CONCEPTS. PROBLEM OF TYPES

The next problem discussed by Górski in his *Dialectic* referred to the formation of general concepts which he regarded as concepts related to species, or forms and images. Although he gave no general theoretical formula for a difference between the species, forms and images, the examples given by him are varied and interesting; they refer to minerals, plants, animals, man's capabilities and characteristics.

In experimentation—says Górski—our mind distinguishes particular pieces of magnet which are characterized by this common property that they attract iron. This very property—as a permanent one—our mind starts to attribute to every magnet, and in this way, basing on a permanent characteristic, magnet becomes classified as a species.

The second example is taken from the world of plants. And thus, we see roses in flowers, we admire their smell, and we also observe that the flowers do not remain on the shrub all the year round. Basing on these observations, we come to the formulation of a "dynamic" form of the developing flower of a rose, the form which is characteristic of the whole species of roses. Similarly, we also arrive at the forms characteristic of the species of horses, sheep, oxen, lions and other animals.

Górski underlined that when describing the nature of plants or animals, it is necessary and sufficient only to give a characteristic of the typical properties common to all the plants and animals of a given species. Greek naturalists acted in a similar way; for example, Aristotle, when he described the nature of animals, or Theofrast, when he described the nature of plants. They took into consideration the characteristics of a given species and not of particular, innumerable, or even infinite in number, individuals belonging to this species (*species, non individua quae infinita sunt, descripserunt*). These characteristics appear to the same degree in the plurality of specimens in a given species of plants.

In another passage in the *Dialectic* we find an example of the perfect orator. [15] Namely, we are familiar with the examples of good orators known in history, such as: Demosthenes, Crassus, Antonius and the others. Knowing the qualities of those orators described in literature, we

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[15] Cf. ibid., pp. 59–60.

can formulate an idea, an image of the perfect orator who has developed to the highest degree possible the qualities of a good speaker. As a result of this induction, we arrive at the point when we start expressing not the qualities which are encountered in average orators but when we create an image of what can be the highest achievement in rhetoric, viz. the model of a perfect orator. This model can either be only an imagination, an idea of the perfect orator, and this was the opinion of Cicero, or it may be a real personality, like, for example, Demosthenes or Cicero, who gained his fame among some of the ancient experts in rhetoric.

From the point of view of modern logic, it may be noted that in the example described by Jakub Górski he discussed the problems of ideal and real types. Following his way of reasoning, we come to the example of the perfect orator, assuming that no one has gained so far the qualities of perfect eloquence. If, on the other hand, there are persons who have reached the highest level of eloquence, then the personage of a perfect orator is an example of the real type. [16]

Similarly, says Górski, as the teachers of rhetoric were creating for didactic purposes an image of the perfect orator, basing on the well--known qualities of famous orators of the ancient world, so attempts were also made to find an image of the perfect man, the image which would serve as a model for the development of human characteristics, the model which, in its potential form, everybody bears in his mind. The point of departure for the formation of this image is, according to Górski, to get familiar with the life of many different persons, such as, for example, Cicero, Cato, Caesar, Pompeius and some others, knowing at the same time the qualities of their character (individual nature).

LOGIC OF SENTENCES AND OF PREDICATES

In Górski's lecture on the principles of deductive logic we find a few interesting approaches to this problem. Logical consequence is presented by Górski in the form of formal implication used by the

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[16] The ideas of Jakub Górski, the 16th-century philosopher, are identical with the description of the formation of types in modern science. While discussing the formation of ideal types basing on the empirical data, the modern philosopher Heinz Remplein says: *"Das Egebnis ist kein Begriff, sondern ein Bild von optimaler Prägung, ein Urbild, kein Real — sondern ein Idealtypus, der im vorhinein den Anspruch auf tatsächliches Vorkommen nicht erhebt, Vielmehr ausschliesslich Mass für die wissenschaftliche Bearbeitung der empirischen Wirklichkeit sein will. Nur wer das gebührend berücksichtigt, bleibt davor bewahrt, die Idealtypen als lebensfremde und unwirkliche Konstruktionen abzutun; zu dem Zwecke brauchen es keiner statistischen Massenuntersuchungen, keiner Messungen und Korrelationarechnungen, sondern nur der Wahl exemplarischer Fälle und ihrer intuitiven Betrachtung...,"* Psychologie der Persönlichkeit, Basel, 1954, p. 427.

author while discussing the question of moods of the Stoical logic. It is also interesting to note the remarks of the author on the problem of reducing syllogistic moods to the principles of the logic of sentences, and—as a matter of fact—to certain theorems of the functional calculus, corresponding to the appointing mood, refuting mood, etc. Material implication is in the works of Górski included into the examples of comparative sentences.

Taking into consideration the deductive forms of reasoning (*ratiocinatio*), the author of the *Dialectic* brings into the foreground the problem of the types of sentences and their logical interrelations. In this case, all sentences are divided into simple and complex ones. Complex sentences, joined by the conjunction "if—then" (*si*), form hypothetical or conditional clauses. [17] The first member of a complex conditional clause is called by Górski an antecedent (*antecedens*), while the second member is called a consequent (*consequens*). Another type of complex sentences, which include the conjunction "and" (*et*), is named a copulative sentence. The third type of the sentences mentioned by Górski includes complex sentences called disjunctive clauses, which means sentences joined by the conjunction "or—or" (*vel—vel*).

Following the principles of the Stoic tradition, Górski is of the opinion that disjunctive sentences are true only when one member is true and another false. In modern logic they correspond to alternative assertive sentences.

When dealing with the problem of logical consequence, Górski based his remarks on the principle of resulting events: "if someone is a scientist, he is a human being;" the form of this consequence approaches that of a formal implication. Conditional clauses are also presented by the author as a formal implication, for example, "if justice is an ethical virtue, then justice is desirable." [18]

Górski was also familiar with the form of the consequence corresponding to material implication, for example, in the statement: "if grammar is a science of correct writing, pronouncing, and studying of sentences, then rhetoric is a science of skilled and ornate speaking." [19] According to the conception of Stoics, a relation of two clauses may exist in the material implication only in respect to their value, i.e. their truth or falseness. A relation of this type can be expressed in the following way: if the first clause is true, then also the second clause is true. In the works of Jakub Górski, the relation of material

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[17] "*Hoc genus proprie hipotheticum et conditionale vocatum...*," Górski, *Commentariorum...*, p. 835.
[18] Ibid., p. 804.
[19] Ibid., p. 800.

implication occurs in the complex conditional clauses which include comparisons, for example, in the asserting mood: "if virtue is to be praised, then errors are to be condemned, and virtue is to be paraised, so errors are to be condemned."

As an example of correct deductive reasoning, the author quotes four moods of the Stoical philosophy, the law of hypothetical syllogism, the law of simple transposition and other contemporary principles of reasoning, known in the logic of sentences. [20]

In his remarks on the form of reasoning called *a repugnantibus*, the author also mentioned the errors such as negation of antecedent and assertion of consequent.

PROBABLE REASONING

A. BASED ON SIMILARITY

Górski was of an opinion that in everyday life, in arts and in some branches of science, the most often encountered form of reasoning is probable inference. Probable inference includes reasoning based on similarity and divided further into a number of different types (so called *loci a similitudine*). In the first place he mentioned inductive reasoning; next, reasoning named *collatio* (collation) which is based on the similarity of relations and not of characteristics as such. The author gave the following example of this reasoning: in the nation law assumes the role similar to that which the mind plays in our body, and like the body which without the control of the mind goes astray, so the nation deprived of proper laws falls into anarchy. Further observations concern reasoning from examples (named in short *exemplum*) which consists in concluding about all objects in a given species from one or several typical examples. If this reasoning is based on numerous examples, it becomes an induction. [21]

Górski also pointed to certain forms of reasoning in which, basing on the general characteristics of a given nation, country, family, profession or education, we draw conclusions regarding a given person who belongs to this nation, country, or family, who practises a given profession and has acquired a given education. These are not necessary conclusions but only probable ones. [22] The characteristics that are ascribed as a probability to certain people basing on the general information concerning their national status, family status, and professional position, are called by the author

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[20] Ibid., p. 813.

[21] "*Quod tamen quia plurium exemplorum congerie constat, inductionis vim habet*," Górski; *Commentariorum...*, p. 567.

[22] "*Est enim eorum ea vis et natura, ut nulla necessitate, sed probabili tantum ratione, rem ipsam... praecurrant...*," ibid., p. 434.

adjunctive characteristics (*adiuncta rerum et personarum*). The forms of reasoning which include different types of inference about adjunctive characteristics, are further called by Górski reasoning about adjunctive characteristics (*loci ab adiunctis*).

These forms of reasoning are divided, according to the principles of rhetoric, into reasoning about persons (*loci personarum*) and reasoning about things (*loci rerum*). [23] Examples of reasoning about persons are taken from the rich treasury of the Ancient and Renaissance rhetoric. For example, the author quotes the following type of reasoning: Peter belongs to a given nation and family, so he may possess certain characteristics typical of this nation and family; for example, Peter is a Roman, so he may possess the virtues of a good citizen.

The second type of probable reasoning consists in concluding about certain unknown people and their characteristics (qualities of character, interests) basing on their relation to other persons. Górski quotes the following examples: Socrates held in high esteem young Alcybiades (and it is well known that what Socrates esteemed most were moral virtues), so (probably) young Alcybiades possessed seeds of moral virtues (*semina virtutis*). Another variation of this reasoning is contained in the following example: Jacob is fond of Cicero (and Cicero was an eminent expert in rhetoric), so (probably) Jacob is fond of rhetoric. [24]

In general terms, the structure of this type of reasoning can be presented in the following way: If somebody holds in high esteem person A who possesses virtues $b, c, d \dots n$, then, most probably, he holds in high esteem virtues b or c, or $d \dots n$ (in the sense of an inassertive alternative). Obviously, this may refer not only to the characteristics of a person but also to certain qualities pertinent to his artistic and scientific activities, painting, sculpture, writing, etc.

B. COMPARATIVE REASONING

As a separate category of probable inferences Górski considered a comparison of the relations between the objects (people, things) as well as a comparison of certain characteristics of the objects and their values. In order to establish what is valuable, we compare various goods, capabilities, and talents. Górski gave a number of the examples concerning the estimation of value. Basing on the comparison, we hold some goods in higher esteem than the others, viz. those that are great are preferred to those that are small, the more abundant ones to the scarce ones, the long-lasting ones to the short-lasting ones, the unchanging ones to the changing ones. Thus, by means of a comparison and estimation

[23] Ibid., p. 435.
[24] Ibid., p. 436.

of value, we start to differenciate between the more valuable and the less valuable, in the aspect of both the individual values and the social ones.

Making a comparison we determine, according to Górski, what is better in relation to the worse, what is superior in relation to the inferior, more useful in relation to more harmful (in other words—what is more useful and what is less useful, what is more harmful and what is less harmful). [25]

The form of reasoning concerning values was illustrated by Górski with a number of examples taken from the Ancient and Renaissance rhetoric combined with ethics. This type of reasoning is denominated by a common name of *comparatio* which may be translated as "comparative reasoning." The author mentioned that he found some data in the Ancient literature, mainly in the works of Aristotle, in Book III of the *Topics* and in the *Rhetoric*. He also made references to the rhetorical works of Cicero, Quintilian and to other Ancient and Renaissance writers.

Górski divided comparative reasoning into three categories, namely: 1. reasoning based on the relation of equality, when the objects are equal to each other in respect to a given characteristic (*locus a paribus*), 2. reasoning based on the relation of superiority, when one of the objects is superior to other objects in respect to a given characteristic (*locus a maiori*), 3. reasoning based on the relation of inferiority, when one of the objects is inferior to other objects in respect to a given characteristic (*locus a minori*).

The author quoted some interesting examples of the *locus a paribus* reasoning, namely: What is improper for the wife to do because of the matrimonial union, is also improper for the husband to do because of this very union. According to this opinion, in a matrimony both parties are equally bound up with the responsibilities assumed (e.g. care for the family which they create). In this case, both people represent the same relation against a third person, that is, the relation of the duties that they have mutually agreed to take upon themselves. [26] Another example was taken from Cicero: If the senator as a citizen is not allowed to do something, then the imperator is also not allowed to do it (in view of the same relation of a citizen to the republic). The author also quoted another example, namely the rule which might be called "a principle of the good master:" to that degree we may share in the rule over a country, to what degree we cherish our love for this country. [27]

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[25] Cf. ibid., pp. 597–607.
[26] Ibid., p. 590.
[27] Ibid., p. 590.

The logical principle of the above mentioned types of reasoning can be formulated in the following way: if two objects (A and B) are equally entitled to possess a characteristic M in view of the relation to C, and if one of them is not entitled to possess a characteristic N in view of the relation to C, then (undoubtedly) also the second one is not entitled to possess a characteristic N; if one of them is entitled to possess N, then (undoubtedly) also the second one is entitled to possess N. (J. Górski presented a shortened version of the formulation of this principle.) [28]

In terms of the examples of evaluating reasoning quoted by Górski, the above mentioned principle might also have been expressed in the following way: if two objects (A and B) are entitled to possess the same value W (in view of a third member C) and the first object is entitled to possess a value W_1 (in view of C), then, undoubtedly, also the second one is entitled to possess the value W_1.

Further on, the author remarked that in the reasoning based on the "greater-to-smaller" relation only the negative principle is valid; that what is not given to the "greater," (undoubtedly) is also not given to the "smaller." In its developed form, the principle of reasoning based on the greater-to-smaller relation may be expressed in the following way: if x is more Q than y, then, if x is not entitled to something because of Q, y is also not entitled to it because of Q. In complex empirical cases, this reasoning has only a value of probability; for example, if a good pupil does not know something, there is only a probability that the bad pupil will not know it because the bad pupil might have just got acquainted with this very problem which the good pupil has not learned.

Górski underlined the fact that in the reasoning based on the "greater--to-smaller" relation there is simple and complex way of arriving at the conclusion. The first possibility was illustrated by the author with the following example: if the bad pupil knows something, then (undoubtedly) a good pupil is also familiar with it. The complex way of reasoning was based on the following examples:

—If pleasure is something good, then greater pleasure is something better;

—If what is wrong is evil, then if something is more wrong, it is more evil. [29]

In this type of comparative reasoning we can observe the following principle of inference: If there are two characteristics P and Q which

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[28] "*Si duo pari iure in una re valeant et unum non valeat, ne alterum quidem valere, oportere; quod si unum valeat, alterum etiam valeat oportet*," ibid., p. 591.
[29] Ibid., p. 595.

can be graduated, and if the occurrence of the first one P results in the occurrence of the second one Q, and the first characteristic P occurs to given degree A in the object of a given type, then the second characteristic Q will also occur to the same degree A in the same object.

Analyzing the above mentioned type of reasoning described by Górski, attention should be paid to the fact that if the occurrence of the first characteristic to an arbitrary degree is a condition sufficient for the occurrence of the second characteristic to the same degree, then the above reasoning assumes a value of certainty. If, on the other hand, the occurrence of the first characteristic to a given degree is only a condition indispensable for the occurrence of the second characteristic to given degree, then the above reasoning has a value of probability.

These types of reasoning aroused great interest among the Renaissance logicians and were of importance not only for the Arts but also for the sciences which inquired into the laws of nature. In the principle of those types of reasoning one can easily find a germ of the future Bacon's table of grades and Mill's canon of the concomitant changes.

FORMS OF REASONING AND SCIENTIFIC METHODOLOGY

According to Górski, causal relations result from the unidirectional, asymmetrical relation between the causes (in the sense of an adequate condition) and the effects, while the relation between the effects (resp. signs) and the causes is not a necessary prerequisite, although it may be so in some cases.

In the author's opinion, there are two types of "signs," i.e. of the phenomena which serve as a starting point for the reducing inference; the necessary signs (*signa necessaria*) enable us to draw unfailing conclusions about the causes of some phenomena (e.g. the sun eclipse is an unmistakable proof of the fact that the sun disk was covered by the moon); the signs of the second type are probable signs (*signa probabilia*) which enable us to draw only a probable conclusion about the causes (e.g. in medicine, judging from the symptoms of their causes).

Górski mentioned some of the Renaissance works on the theory of proofs, namely the works of Johannes Sturm, Bartholomew Viot and Joannes Philoponus. "From these sources—says he—one can get more information on the art of argumentation; if we have more time, we shall devote to this theory the whole work in the future." [30]

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[30] *"Scripserunt et alli multa de ea parte disserendi: extat Joannis Sturmii ingeniosus de demonstratione liber, extat Bartolomaei Vioti de eadem re disputatio docta, ac libris quinque explicata doctrina, copiosus est Joannes Grammaticus Phi-*

The treatise, which was thus originally planned by Jakub Górski, was written several years later by the famous Italian Aristotelian Jacob Zabarella (1532-1589) who was invited by Stephen Bathory to the Jagellonian University. Zabarella could not come to Poland; nevertheless, his works on logic (*Opera logica*), which included an excellent treatise on demonstration (*De demonstratione*), were all dedicated to the King Stephen Bathory.

PHILOSOPHICAL CONCEPTS OF JAKUB GÓRSKI

One of the most typical notions of Górski's logical and philosophical concepts, the concepts which were also typical of that epoch, was their empiricism. Górski was of the opinion that knowledge begins with the cognition of individuals, persons and things. Therefore, he ascertained that a cognition of the world is based on the cognition of the individual, particular objects which form the world given to us empirically. It is but our mind that develops and adds general ideas, today we would say—general concepts, which Górski denoted as species, genera (in the sense of a content of our intellect related to the set of objects), forms and images. Some of these mental forms refer to the studied objects of nature or human works, while the others form, as we would say today, some ideal images as for example, an image of the perfect orator.

General concepts are created by a generalization of the characteristics of individual objects. Some of the concepts are simple generalizations of the characteristics of the objects belonging to certain species or types, while the others define some ideal types which possess empirical features but imagined to be at the highest possible level of development. The author explained this on an exemplary relation between some historical personages, like Cicero, Caesar, Cato, and this what is an ideal image of the man, the said image being simultaneously a form still in development but pertinent to every human personality.

And so, in Górski's opinion, a good treatment of the barbarians or heretics consists in that we see (in each of them) an ideal image of the complete human being although developed to a lower or higher degree.

In respect to the problem of development of man's ethical qualities, Górski thought that what is good in one's behaviour results from the actions full of moderation, avoiding the fault of excess and insufficiency.

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loponus in ea doctrina apud Aristotelem explicanda: inde, ut ex fontibus, perfecta cognitio huius generis hauriatur; nos prima rudimenta tradidisse, ut promissimus, satisfuerit; posterius, si futura nostrum gregem suppleverit, temporisque liberioris plus nacti fuerimus, doctrinam hanc suo volumine copiosius tractabimus...," Górski, *Commentariorum...*, p. 959.

He generally remarked that ethical conduct (*virtus*) is based on appropriate moderation of all virtues, the lack of which is an ethical fault, similarly as their excess is also to be condemned.

Being engaged in education, Górski pointed to some good aspects of human nature. He who possesses wisdom—says the author—observes not only what people are doing, what their customs and habits are, but he also tries to see what sort of people they could be if they reached a higher level of culture. The true image and model of the man who is esteemed by everybody is always connected with ethical qualities.

The development of ethical qualities is based on the choice of a proper measure between the extremes. Thus, for example, discretion consists in overcoming the fault of imprudence, on one side, and of cunning, on the other. Courage is developed overcoming fear and audacity.

Apart from the problems of individual ethics, which were discussed by Górski to some extent in his treatise on logic, in his later work he also took into consideration the question of social ethics. The work was entitled *Rada Pańska*. The author discussed different qualities necessary and useful in public life with particular reference to the relations which existed in Poland in the 16th century.

In his treatise on statesmen, Górski underlined the importance of education, especially in the field of history which comprises the experience gained during centuries, next, the knowledge of foreign languages and foreign countries. Among different mental virtues he most esteemed acute intellect, perspicuity, and ability of quick understanding, otherwise called "wit." The whole of this treatise is dominated by a moralistic attitude. He says: there are no other people but either bad or good, either worthy or unworthy. [31]

He recommended to estimate people basing not on the prejudices of class systems, ancestry and district divisions, but taking into consideration, first of all, their ethical qualities. He says: "Not the blood relationship, or the innate family kinmanship should be taken into consideration, but these qualities that by virtue and justice their value have attained. In the latter ones, however, more attention should be paid to those that more righteous are, that in their worth over the others dominate, and that a higher virtue contain in themselves. Among the evil men, though each one of them deserves to be condemned, still worse is that one who in his anger the others surpasses." [32]

In the middle of the 16th century, in the period of strong class

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[31] J. Górski, *Rada Pańska* [Lord's Council], 1571, p. 87.
[32] Ibid., p. 83.

differences in Poland, when an attitude full of contempt towards people of plebeian origin was reigning in this country, Górski wrote that "everybody not after his parentage but after his conduct [behaviour] merits to be loved or not." [33]

Górski also discussed some of the epistemological problems. When dealing with the importance of the sciences necessary in public life, he underlined the role of experience. First of all, he spoke about experience as the basis of medical art. He said: "For the medical art—this is in what experience consists, and experience—this is a knowledge of the past events, and according to this knowledge the present matters can be solved and the future ones can be prevented. They say that a good doctor has experience and skill in many a thing; he saw a lot, he read a lot and he treated various diseases. And it is true what they say. But a lot of time must pass before this experience can be acquired." [34]

Next, he stressed the importance of the historical experience. He said: "History is nothing else but a collection or a set of different things experienced at all times and by different nations. All dignities and all affairs with no other thing can better be supported than with the knowledge and experience, or, as the Latin scholars say, with *experientia* which is the doctor of all good and rational things." [35]

In the beautifully written rhetorical passage Górski says: "history is like a crystal mirror in which all human actions are reflected, and there we can see with our own eyes the bygone events, and looking thus into the past we can see what is right and what is wrong, what should be followed and what should be avoided." [36]

History is not only a descriptive science but, first of all, an explanatory one, and its great advantage is that we can grasp its development: "[...] history tells us not only that what happened in the past but also why, when and how it happened. It shows who won and with what, who lost and with what, what saved him and what injured him [...]." [37]

In the field of philosophy, the interests of Górski were mainly concerned with practical philosophy into which he included, following Aristotle, ethics and politics as main branches, and rhetoric, poetry and economics as secondary branches of minor importance.

Practical philosophy was the main trend of interest in the 16th century, in the scope of both rhetoric, poetry, and the development of

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[33] Ibid., p. 38.
[34] Ibid., p. 54.
[35] Ibid., p. 51.
[36] Ibid., p. 53.
[37] Ibid., p. 53.

ethical problems. Theoretical philosophy was developed rather during the period of systems in the 17th century.

In Górski's works on logic there is also a brief outline of the theory of goods. The author described different types of goods and their hierarchy, approaching in his axiological ideas those of stoicism.

SUMMARY

Like Ramus, Agricola and Sturm, Jakub Górski also adhered to Ciceronian views, thus enlarging the scope of logic beyond the frames of the traditional Aristotelian reception, and contributing to its enrichment with the ideas of stoicism. In his works he combined the logic of the Stoics with that of Aristotle. He also developed his own studies of the forms of reasoning based on various types of relations, and inquired into the problem of probable inference and reasoning in ethics. Jakub Górski promoted further advance in inductive reasoning, analyzing the forms of reasoning based on empirical, and especially on causal relations. He also discussed the problems of deductive logic, paying due attention to the connection between the logic of sentences and that of predicates. His activities brought about a remarkable increase in the level of logical culture in Poland, this being mainly due to his work which corresponded to the achievements of the contemporary European science and became a basis for teaching logic at the Jagellonian University. In his treatise Jakub Górski made references to the novel concepts of logic developed by Peter Ramus, Rodolphus Agricola, Johannes Sturm and Joachim Perion, whose efforts aimed at the application of practical logic (as an art of good argumentation) mainly in the humanistic and jurisdical branches of science. In comparison with the modest outline of the Renaissance logic included in a handbook of Joachim Caesarius (published in Cracow in 1538), the work of Górski was a great step forward, providing the reader with a much more complete picture of the Renaissance logic.

As the most eminent representative of Ciceronian views in the Polish logic of the 16th century, Jakub Górski showed the way for a new reception of Stoical logic, the reception which was later on expressed in the famous work of Adam Burski.

In European philosophy, the treatise of Górski was one of the most comprehensive compendia of the Renaissance logic, enriched with the original and creative contributions of the author. After the works of Agricola, Ramus, Caesarius, Perion and Sturm, the treatise of Górski meant a further step in the development of the 16th-centry logic which

linked this branch of knowledge not only to the humanistic sciences
but also to the natural ones. Studying empirical relations, and mainly
different types of causal relations with the respective forms of reason-
ing, Górski was an advocate of the tendencies observed in his epoch—the
tendencies which in the next age found their most full expression in
the works of Francis Bacon, aiming at the construction of a new "tool"
for science.