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THE PROSPECTS OF PROGNOSEOLOGY—THE SCIENCE OF FORESEEING THE FUTURE

This essay is intended to present a programme for studies of man's prognosticating activities and to indicate the urgent need to take up systematic researches in this domain as well as to secure an adequate institutional framework for them.

1. THE PROGNOSTICIST AND THE PROGNOSEOLOGIST

Let me start with introducing a fundamental conceptual distinction. I want to distinguish between two types of men in view of their specific action at a specific moment, namely between the prognosticist and the prognoseologist.

To my mind, a *prognosticist* is one who prognosticates, that is foresees the future, or attempts to know what it will or may be like (with a definite or indefinite probability), that is, he attempts to inquire what future events will, or may, occur.

As such, the prognosticist may foresee the most diverse events in the future and for this purpose he may employ the most diverse procedures. Whether someone inquires into what the world will be like in the year 2000, or how long (how many thousands of million years) our Sun will continue to shine, or what will be the weather tomorrow, or what will be served for dinner today, or when she is going to marry and if she is going to marry a fair or dark-haired boy—all these people I would call prognosticists. And it is inessential whether in their attempts to learn something about the future they make use of the achievements of science, or merely of their own or other people's practical experience, or even take recourse to magic or mystical procedures (as long as they are sure of the reasonableness of such actions). Evidently, then, I apply a very

broad definition to the concept of prognosticist and thus to prognosticating or foreseeing the future.¹

The concept of prognosticist is closely linked to those of prognosis and of prognostics; let me proceed to a definition of them.

I call *prognosis* the product of the operation of foreseeing the future, that is, a prognostic judgment or prognostic proposition, or a proposition concerning the occurrence or non-occurrence or the possibility of occurrence of a definite future event; furthermore, I would also call prognosis a whole set (e.g., in the form of a book) of such prognostic propositions.

Prognostics, on the other hand, is a domain of human activity, a certain kind of this activity consisting in anticipating the future and formulating prognoses. To put it differently, prognostics is exactly what is done by prognosticists.

To conclude this explanation of the concept of prognosticist, let me add the rather obvious remark that the prognosticist's fundamental subject of interest is the future.

The prognoseologist's subject of interest, on the other hand, is the phenomenon of foreseeing the future by men. Accordingly, it is not the future as such but a definite domain of human activity that interests the prognoseologist.

Thus, if one inquires into why people are at all interested in the future and attempt to foresee it, or how does it happen that they succeed in finding (better or worse) answers to their questions about the future, or why a fairly correct (in some fields, even very correct) foreseeing of the future is at all possible, or what do those who endeavour to formulate their opinions on the future, or what should be advised them to make their prognoses more correct—in each of these actions is he a prognoseologist.

As the concept of prognosticist is closely linked to that of prognostics, the concept of prognoseologist is closely linked to that of prognoseology.

Prognoseology, in its narrower, stricter meaning, is a scientific discipline studying prognostics; thus, prognoseology is the science of prognostics.

This discipline does not yet exist in institutional form: there are no research centres specifically dealing with it, nor is it lectured as a separate subject at universities. It is at present both a demand and an anticipation, that is, I maintain that independently of such or other demands this discipline will emerge sooner or later (sooner rather than later), for it has to emerge. This opinion, which is a gnosiological prognosis (from the field of the science of science), will be justified in the next chapter.

¹ In this point I diverge from the theoreticians of prognosticating known to me; they confine their interest as well as the concepts they build to anticipating the future in some domains only (e.g. in the social sciences only) or to foreseeing the future by some procedures only (e.g. what is called scientific methods).

But prognoseology can also be spoken of in a more comprehensive meaning, just as we speak of pre-scientific popular astronomy or medicine. In this sense, prognoseology comprises all reflections concerning prognostic activities, that is the foreseeing of the future. Such prognoseology has been practised for several thousand years, and at present it goes through a particularly rapid development.

It may be remarked that the mutual relationship between prognostics and prognoseology is analogous to that between music and musicology: as music is the only subject of study of musicology, prognostics is the only subject of study of prognoseology.

2. THE OUTBURST OF INTEREST IN THE FUTURE AND ITS CONSEQUENCES

Prognostics has been practised commonly and always, it has been practised by everyone: man has always been practising it. For, the foreseeing of the future is a necessary condition of man's existence; if people did not foresee the future, they would be simply unable to exist. Thus, prognostics is as old as mankind itself.²

However, the story of mankind witnessed numerous and diverse developmental changes in practising prognostics. Some motivations of prognostic activities were changing, as were the kinds of future events of interest to men and foreseen by them, or the ways of foreseeing the future, or the degree of correctness and efficiency of this prognostication and such like.³

One of such considerable changes taking place in our time is the specific explosion of interest in the future. Rather suddenly, people started being vividly interested in some fields and aspects of the future, which previously had been of scarcely any interest to them. This growth of interest refers to many fields of the future existence of man.

Without halting at the causes of this phenomenon (which, incidentally, are very interesting),⁴ it may be said that it results in an equally "explosive" development of social prognostication, that is, of foreseeing the future development of man's social life, of its different aspects, conditions and consequences. This means the foreseeing of the whole of this

² The common character of man's interest in the future and the commonness of its foreseeing by men are attested if only by the nearly universal occurrence of the future tense in the natural languages. This fact, which seems to be too obvious to be noticed, has been pointed out by Bertrand de Jouvenel. Cf.: B. de Jouvenel, "De la conjecture", *Bulletin SEDEiS Futuribles*, No. 27, Paris, 1962; also the same author's book: *L'art de la conjecture*, Monaco, 1964, p. 13.

³ A general outline of the evolution of prognostics in the history of mankind is attempted in my paper "Ewolucja prognostyki" (The evolution of prognostics), *Kwartalnik Historii Nauki i Techniki*, vol. 15, 1970, No. 3.

⁴ I attempted to do that in my paper on "Prognostication and Prognoseology. On the Need of Systematic Inquiries about the Prognostic Activity of Man," in: *Mankind 2000*, Universitetsforlaget, Oslo, 1969. It was submitted to the International Future Research Inaugural Congress in September 1967 at Oslo.

life on world scale as well as on those of its particular regions, countries and localities, of the nations and other human communities. This means also the foreseeing of the particular domains and trends of this development, such as population developments, economic advance, technological progress, the development of education, of culture, of the particular aspects of the latter. This means, finally, the foreseeing of changes in the natural environment in which people live and which is co-determined by themselves.

These problems are becoming a major subject in journals and specialistic periodicals, on the wireless and in television, and in table-talk. Thousands of books and hundreds of thousands of articles are written and published on the future. Hundreds of institutions are being founded to work in this field, such as research centers, scientific societies and publishing offices. The financing of these works uses up steadily growing percentages of the national incomes of the particular countries. The institutionalized foreseeing of the future, that is, its foreseeing for public use, is being taken up by more and more people of different professions or scientific specializations. New professions of prognosticists of different fields are emerging. Even a new discipline of inquiries known as "futurology" (by some of its representatives considered as "the science of the future") has emerged and is rapidly developing.

Moreover, the development of prognostics, especially that of the institutionalized forms of social prognostics and the growing number of persons engaging in it induces many people to reflect not only on the future but also on the operation of foreseeing itself—on the methods and procedures of foreseeing the future, on the adequacy, effectiveness and operativeness of these methods and procedures, as well as on many fundamental questions of philosophical, sociological, psychological, or praxiological nature which this methodological reflection must in turn refer to. This *prognoseological* reflection is undertaken in nearly all prognosticating centres and is occasioned by nearly all more important prognostic actions, or even within nearly each more extensive prognostic work.

Meanwhile, however, this prognoseological reflection yields theoretical works of rather immediate usefulness and fragmentary ambitions, the theoretical scope of these studies being usually limited to the problems involved directly in the particular prognostic actions or in the particular relatively narrow domains of prognostication. Moreover, almost each of these studies employs a specific set of concepts and its own terminology, which causes difficulties in the mutual comprehension of their authors. But more ambitious studies with a more comprehensive scope are more and more frequent.

There are indications, though, that the mutually isolated and dispersed prognoseological studies will soon start integrating into a cohesive,

regular and institutionalized scientific discipline. This seems to result primarily from the growing difficulties faced by the practice of prognostication in its vehement development; it fails to solve these difficulties as spontaneously as before, without a solid scientific apparatus. Another indication is the existence of difficulties and imperfections emerging in the development of these prognoseological studies themselves. The discipline simply meets a growing demand and this demand becomes more and more indispensable and must be satisfied.

The observation of the demand of this discipline enables us not only to outline the future of prognoseology as a *postulated* discipline but also as an *anticipated* discipline, that is one whose emergence we forecast more or less like the weather or the future growth of the population number of a country.

With such an approach, let us now outline the most essential features characteristic of this future discipline and the manner in which these problems ought to—and certainly will be—treated.

3. THE TASKS OF PROGNOSEOLOGY

The whole body of the tasks as well as the functions actually performed by principally each science can be roughly divided into two kinds: first, the *directive* or normative tasks, and second—the tasks that can be defined as descriptive-analytical-nomological or, briefly, *descriptive*. The former consist in suggesting what ought to be done and how. The latter consist in informing what is and what it is like. For instance the normative functions of logic consist (mainly) in showing how one ought to reason to secure the effectiveness of reasoning, whereas the descriptive functions of this science consist (among others) in showing what relationships hold between the truth of some propositions and the truth or falseness of some other propositions. Both types of functions are closely intertwined and their mutual interdependencies in different disciplines are of different nature.

Though actually each scientific discipline performs both functions, the mutual interdependencies between the descriptive and normative functions are very different in different scientific disciplines. Thus there are sciences of predominantly normative, i.e. practical, orientation, and there are also such that are of more descriptive, i.e. theoretical, orientation.

Prognoseology develops as a discipline of primarily *practical*, i.e. directive, tasks. These tasks are the following: informing how to anticipate the future, that is how and what ought to be done to secure the possibly highest correctness to our prognoses and the highest effectiveness to the prognostication itself; to provide the prognosticists with suggestions as to what to do or what not to do in order to improve the formulation of

correct prognoses; to outline, to straighten and to illuminate the paths of prognostics.

But the fundamental condition of an adequate practising of this normative activity consists in basing it upon a firm ground of reliable descriptive efforts, on research work, consisting in the description and analysis of prognostication processes and in disclosing the laws governing them. Neglecting this fundamental condition would result in the degeneration of the normative activities, to its relapsing into subjectivism, into an arbitrary decreeing of directives⁵.

4. THE PROBLEMS OF PROGNOSEOLOGY

In accordance with its definitely practical, normative tasks, the central and most important sector of prognoseology ought to be the *methodology of prognostication*. Strictly speaking, a general methodology of prognostication, for the particular methodologies of prognostication, i.e., for instance the methodology of economic prognostication or the methodology of meteorological prognostication ought to be conceived of as belonging to the economic sciences or to meteorology, respectively.

The central problem in this central sector (and thus in all prognoseology) is of course that of the *correctness* of the prognoses, that is, what ought to be done for the anticipation of the future to be true. From the point of view of scope, the concept of the correctness of anticipation is subordinate to the more comprehensive (praxiological) concept of effectiveness of action. Thus it can be said that the problem of the correctness of prognostication is simply one of the effectiveness of prognostic actions.

The problem of the correctness of prognostication, though central and most important, is not the only methodological problem of prognostication. For, not only is it important that the prognoses be correct but also that they be sufficiently rapid, that they should not consume too much effort, that the ratio of the contribution of prognostic efforts to the prognostic results be optimal etc., briefly—that the prognoses should be marked by all features of efficient work, that they be effective. Thus the problem of correctness of prognostication is but a fragment (but the most important fragment) of the more comprehensive problem of the *effectiveness* of prognostication.⁶

A further methodological problem of prognostication is that of the *validity* of prognostication. Whether a prognosis is correct can be ultimately checked only at the moment to which this prognosis referred. But it is possible to examine earlier its validity, that is, how it is justified

⁵ Unfortunately, the previous prognoseological studies often failed to pay adequate attention to this condition-requirement.

⁶ On the concepts of effectiveness of action and efficiency of action see T. Kotarbiński, *Praxiology*, Pergamon Press, Oxford, 1965.

and what is the value of this justification and in virtue of this it can be judged if, and to what extent, the prognosis deserves our confidence. The validity of prognoses depends mainly on two issues. First, it depends on what were the foundations of the foreseeing (e.g., on the disclosing of the causes of an event and the application of corresponding causative laws, or on the observation of a developmental trend, or on intuition, or on fortune-telling and such like), these foundations being better or worse, or even fully worthless. Second, the validity of prognoses depends on the correctness of transforming the information serving as the foundation of foreseeing into information constituting its result, i.e. into the prognosis. From the elementary course of logic it is known that from the most valid premisses evidently false conclusions can be drawn, if mistakes are made in the reasoning.

Finally, the last of the major practical problems of this sector of prognoseology is that of the *verification* of prognoses, that is the checking of their correctness. Of course, this can be done only after the moment to which the prognosis referred. But how ought it to be done and what criteria must be employed?

To sum up what has been said it may be observed that the speculative efforts within the general methodology of prognostics tend to the development of a *theory of effective construction of prognoses, of their justification and verification*. Thus the general methodology of prognostics seeks a practical solution of the above-mentioned problems, i.e. the enhancement of the correctness and the effectiveness of prognostication as well as the improvement of the modes of justification and verification of prognoses.

The point of departure of the whole body of these studies ought to consist in a critical analysis of the modes of prognostication actually employed, i.e., their registration, description, classification and criticism.⁷ For it is only the knowledge of the modes of arriving at prognostic views and their justification actually employed that makes possible a rational improvement of these modes, as well as rational studies of projective, directive, of normative character.

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But the general methodology of prognostication, as the central sector of prognoseology from the practical point of view, could not be cultivated with sufficient rationality if it were not based on another more fundamental sector of this science, which could be called the *ontology and gnosiology of prognostication*.

⁷ A survey of the whole body of prognosticating the future has been attempted in my article: W. Rolbiecki, "Refleksje nad metodologią prognozowania" (Reflections on the methodology of prognostication), *Kultura i Społeczeństwo*, vol. 12, 1968, No. 4.

In this sector, the central problem is the following: is the correct foreseeing of the future at all possible, and if so, then why and how? ⁸

That a correct foreseeing of the future is possible is known from everyday experience. But is it possible with reference to all fields of activity (e.g., with reference to human decisions not yet made or to the history of mankind)? The opinions of the students of this problem are different (and they depend on their respective ideological tenets). A rational answer to this question is closely connected with answers to the following questions: Why is the foreseeing of the future at all possible? Why is it not absolutely valid (which is also known from everyday experience)? How does it come about when people foresee events that have not yet occurred and thus the anticipators can have no empirical contact with those events? What is the "mechanism" of foreseeing the future, that is, what does it actually consist in?

All answers to these questions must refer to the general properties of all being, to the overall order of all occurrences, and that is why the study of these issues may be called the ontology of prognostication. The answers must subsequently refer to the general properties of human cognition, and that is why the study of these issues may be called the gnosiology of prognostication.

The study of the methodology of prognostication is in fact impossible without taking a definite stand on these issues. But it is desirable that the respective opinions be formed in effect of thoroughgoing analyses rather than of a whim, or fancy, or persuasion, or even unwittingly—which unfortunately happens to many prognoseological studies where incidentally the fundamental philosophical problems are solved in passing, and sometimes they may even not be solved at all but rather foreclosed by an arbitrary determination of other questions. In order to secure firm philosophical foundations for prognoseology, we have to approach its specific ontological and gnosiological problems frontally and systematically.

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The third sector of prognoseology is *the pragmatics of prognostication* and, closely connected with it, *the psychology and sociology of prognostication*.

The central problem of the pragmatics of prognostication is the following question: Why do people foresee the future? What makes them do that?

The answer to this question is in fact also an answer to the question:

⁸ A most general answer to this question has been attempted in my article: W. Rolbiecki, "O trafne i sprawne prognozowanie. Zarys ontologii i gnoseologii przewidywania przyszłości" (For a correct and effective prognostication. An outline of the ontology and gnosiology of the foreseeing of the future), *Zagadnienia Naukoznawstwa*, vol. 6, 1970, No. 2.

What functions does the foreseeing of the future perform in the life of individuals and in that of communities?

Undoubtedly the most important function in this respect is the preparatory function. It consists in that the foreseeing of the future is an indispensable element of preparation of most human actions (especially actions in changing situations).⁹ But it is not the only function of the foreseeing of the future. These functions are numerous. There are more and less important among them, and a good knowledge of them may render great services to the prognostic practice.

The question of the functions of prognostication and of prognoses is closely linked to the problem of utilizing the prognoses, i.e. the problem: For what purposes and how do people make use of them?

As far the psychology and sociology prognostication are concerned, it must primarily be borne in mind that the foreseeing of the future (like any other domain of human activity) is governed not by the methodological directives (in this case of the methodology of prognostication) but primarily by definite objective factors and regularities, predominantly of psychical and social nature. These factors play an essential role in the process of foreseeing the future formulating prognoses, amongst others by increasing or decreasing its efficiency and correctness of the prognoses made. To these factors belong the above-mentioned social and individual functions fulfilled by prognostics and the corresponding motivations determined by them. The knowledge of these factors ought to play a great role in the implementation of the fundamental tasks of prognoseology, that is, in the practice of prognostics.

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The three sectors of prognoseology presented here should constitute the basic bulk of this discipline, but they do not exhaust all the problems involved in the foreseeing of the future. There are numerous other problems that could be classed within either the problems of prognoseology itself or within those of the subsidiary disciplines and the disciplines more closely connected with prognoseology. Out of the broad range of these disciplines, or rather research directions, let mention but a few in this place:

First, *the history of prognostics*, that is, the study of the historical development of man's prognostic activities.

A similar direction of research work would be the history of the

⁹ The preparatory function of prognostic actions with respect to other human actions has been presented in more detail in my study: W. Rolbiecki, "Działania prognostyczne w kierowaniu rozwojem nauki w skali państwowej" (Prognostic activities in the management of science on national scale), *ibid.*, 1969, No. 1.

prognoseological thought, that is *the history of the theoretical considerations concerning prognostication*.

One of the important subsidiary sciences of prognoseology would become a poorly developed sector of logics, namely *the logic of prognostic propositions* (the logic of propositions concerning the future). Among its tasks there are the determination of the norms of correctness of transforming the respective information for prognostic purposes, a correctness that is of utmost importance from the point of view of correctness and validity of prognostication.

Of paramount importance to prognoseology would also be the *physiological and cybernetic study of prospective behaviours*, for all human action is one or another kind of prospection.

The foreseeing of the future is also connected with different *moral*,¹⁰ *legal* and other problems.

It must also be remarked that the prognostic studies require a clarification of many concepts used in them and a strict delimitation of the terms corresponding to these concepts. This refers primarily to the concept of the future and that of foreseeing (which are only apparently obvious and commonplace), but furthermore to many other concepts. The attempts to furnish a *conceptual-terminological prognoseological apparatus*, the development and improvement of this apparatus, will not only facilitate the mutual communication between theoreticians but will also contribute to an improved, clearer and more correct formulation of the prognoseological problems, and thus to a more effective solution of them. These studies ought to be undertaken in all sectors of prognoseology.

5. THE GENERAL CHARACTER OF PROGNOSEOLOGICAL APPROACHES

One of the characteristics of prognoseology deserves specially strong emphasis, namely its maximum generality.

There are scientific disciplines whose principal value consists in their generality, in the general validity of their concepts. To such sciences belongs, for instance, formal logic, which, in establishing norms of correct reasoning, does not do it separately for reasonings in scientific studies and for reasonings in the work of the solicitor, but at once for all kinds of reasoning. Also, praxiology is such a science, for, in formulating the principles of effective action, it does not do it separately for office activities and for actions on the battlefield, but does it generally for all kinds of effective action. To such sciences belongs also cybernetics, which, in studying the processes of steering does not confine itself to studying

¹⁰ Cf.: M. Massenet, "Études méthodologiques sur les futuribles", *Bulletin SEDEIS Futuribles*, No. 52, Paris, 1963.

them in mechanical devices only, merely in living organisms, or exclusively in human communities, but it endeavours to provide its conceptions with the possibly most general, universal character.

But there is another "face to this coin": the high generality of these conceptions involves a high level of their abstractedness and non-concreteness. Meanwhile many people are rather strongly opposed to abstract considerations, to general considerations and speculations, whereas concrete approaches, directly applicable in practice, are very appreciated: the latter are not, as a rule, of general or universal nature but refer to relatively narrow specialized domains.

It ought to be observed that these tendencies are not always rational or reasonable. Occasionally they are but a manifestation of a narrow short-sighted utilitarianism. For instance, they make some people prefer something like a "technical cybernetics" to cybernetics proper, that is general cybernetics. They also demand something like a "social prognoseology" conceived of narrowly as the methodology of what is called prognostic social studies, or else the methodological sector of what is called futurology.

Although the development of prognoseology is primarily a consequence of the development of social prognostics, and the achievements of prognoseology will serve (at least in the nearest future) mainly this social prognostics, prognoseology as such ought to be a science of maximum generality, comprising by its studies and propositions not only prognostication in the domain of the social problems, nor "scientific" prognostication only, but all prognostication: including prognostication in the domain of the natural problems, e. g. meteorological problems, prognostication in everyday life, in productive labour, and even such evidently non-scientific procedures as fortune-telling and prophecies.

This is supported primarily by practical exigencies, especially by *the economy of scientific effort*. There are of course many important problems specific for the particular domains of prognostics (i. e., referring only to those domains), but there are also very many problems referring to all prognostics, and moreover some specific questions appear, after closer examination, to be merely particular cases of certain general problems. The solution of these essentially identical problems several times within different particular theories, within different "particular prognoseologies" (i. e., theories of social prognostication, theories of meteorological prognostication, theory of technological prognostication etc.) would be merely a waste of time and energy.

Besides, such a general, all-embracing approach to prognostics gives the possibility to utilize the results of studies on simple domains of prognostics in studies on more complex domains. To such simple domains of prognostics belongs natural (e. g., meteorological) prognostics or technological prognostics, whereas social prognostics is relatively

more complex. Consequently, the study of the relatively simple problems of prognostics of the phenomena of nature or of the problems of prognostics of technological phenomena may, in a sense, fulfill the function of a preparatory school introducing the student into the investigation of more complex of social problems.

Such a conception of prognoseology is also supported by reasons of theoretical nature, that is, the fulfilment of the demands put to all theories and inquiries claiming the status of being scientific. One of these demands is the requirement of *adequacy* (formulated already by Aristotle): namely, any correctly built scientific theory must be composed of propositions that are not only true but also adequate, that is such that comprise both a not too broad and not too narrow scope. Propositions of too extensive formulation are simply false. Propositions formulated too narrowly are in fact true, but inadequate.

Thus, any particular, that is, non-general theory of prognostication built without taking recourse to a general theory of prognostication, that is, a theory of all prognostication, would necessarily have to contain either a large number of such inadequate propositions or would have to encroach upon the field of the general theory and thus, in a sense, substitute it, and that at a constant danger of too rash, false propositions.

Let us imagine some such "autonomous" theory, for instance, the theory of economic prognostication or the theory of what is called scientific foreseeing. Could such a theory avoid inadequate propositions stating something that would be true not only with reference to economic prognostication but to all prognostication and not only to scientific foreseeing but with reference to all foreseeing? Or would the general propositions referring to all prognostication, but formulated within the particular theories in virtue of studying but a single selected domain of what prognostication not be too rash, false, generalization? Such cases need not be guesswork only, since the current development of theoretical works concerning prognostication furnishes many such propositions.

6. THE RELATIONSHIP OF PROGNOSEOLOGY TO FUTUROLOGY

Having presented a general conception of prognoseology, some attention ought to be paid to the relationship of this, so far postulated and anticipated, discipline to another, which is developing very vehemently, namely to futurology.

This is not the place for a more detailed analysis of different actually occurring and possible conceptions of futurology.¹¹ But the fundamental

¹¹ I have attempted to do that in my article: W. Rolbiecki, "Prognozyka — futurologia — prognozologia" (Prognostics—futuresology—prognoseology), *Zagadnienia Naukoznawstwa*, vol. 3, 1969, No. 2-4.

difference between the subjects of both disciplines must be emphasized. The subject of prognoseology is prognostication, *the anticipation of the future*, whereas the subject of futurology is either the future itself or something more indefinite, something like a "foretoken" of the future that is "inhrent" in the past and in what is called the present.

This fundamental difference in the subjects enjoins considerable differences in the research methods, or rather methods of study specific for both disciplines. I use the word inquiry on purpose, for whereas in the case of prognoseology we can simply speak of studies it is impossible to speak of studies in the strict sense with reference at least to some variations of futurology. The future is something that does not exist by definition, or rather something that has not yet occurred, something that is going to occur. Thus, the future can be a subject of inquiries but not (I should disagree with some students of the problem here) of studies.¹² On the other hand, the subject of prognoseology, i. e. the prognostic activities of man, is an empirical fact and thus cannot be a subject of study in the basic sense of the word, as other domains of human activity already are (e. g., economic, educational, intellectual activities etc.).

Accordingly, I define prognoseology simply and unreservedly as *a science* (a scientific discipline or specialization), whereas futurology is defined as a science by some of its own representatives only ("the science of the future"), while others are seeking other definitions (e. g., "art").

Thus, prognoseology and futurology cannot be treated as more or less identical disciplines but moreover they differ rather essentially by their very character—both considered as processes and considered as products, that is, systems of propositions.

I confess to cherish the hope that the development of prognoseology and the critical scientific analysis of prognoses based on it will greatly contribute to showing up many humbugs and tendentious frauds cultivated at present in abundance under the pseudoscientific slogans of futurology.

7. THE ROADS OF ADVANCE OF PROGNOSEOLOGY

Intent on a rational and conscious construction of the discipline presented here, let us in conclusion say a few words about the possible roads of its advance. It seems that there ought to be at least three paths.

The first and fundamental one is obviously the abovementioned *study of the actual prognostic activity of man*. This would embrace studies of different nature and diverse subject-matter. One direction of research, however, deserves mentioning here.

¹² In view of this, the now fashionable and common term "study of the future" seems to me a gross misunderstanding.

From the point of view of the correctness of prognoses—the central problem of all prognoseology—a very significant trend of those studies would be the confrontation of previously elaborated prognoses referring to moments or periods now already in the past with the latter actual course of events, and an analysis of the mistakes made in these programs. Particularly important here ought to be prognoses worked out by people once recognized as outstanding experts in the respective field.¹³ For instance at present, after mankind has already witnessed the first team space flight with a landing on the Moon, it should be rather informative to analyse the older and more recent prognoses concerning this flight—its date, ways of preparation etc.

The second principal road of advance of prognoseology should be the creative *adaptation of the collected achievements of such scientific disciplines that consider more general problems with respect to those of prognoseology*. There are very many such disciplines. Let me mention here the most important ones.

First there is praxiology, i. e. the general theory of efficient action, which as such is the most general methodology, that is, the methodology of all activity, and thus also of prognostic activity. Praxiology has already considerable achievements, primarily as far as the construction of the fundamental conceptual-terminological apparatus is concerned and in raising a number of essential problems. These achievements ought to be utilized in the development of prognoseology.

Another discipline to which prognoseology must take particularly frequent recourse is logic, especially that sector of it that is called logical methodology or general logical methodology of the sciences, and which is actually a methodology of intellectual operations. To be true, this discipline cannot be regarded simply as more general with respect to all methodology of prognostication, for prognostication is not exclusively an intellectual activity (the exercising of intellectual operations) even in that sense in which scientific inquiries or researches are. Nonetheless intellectual operations play an outstanding role in foreseeing the future and creating prognoses, and the methodological problems of those operations are of course particular cases of problems considered by logical methodology, that is, by the general methodology of the sciences.

To those scientific disciplines that must be adapted to the needs of the development of prognoseology belong of course sociology and psychology as well as different philosophical disciplines.

¹³ Such prognoses are analysed by Jouvenel, *op. cit.* They are prognoses made by Rousseau, Maistre, Condorcet and Tocqueville. As an appendix to his work Jouvenel includes Émile Faguet's *Comment le XX^e siècle était imaginé en 1899 par Émile Faguet* suggesting the reader to analyse it.

Finally, the third principal road of advance of the prognoseology ought to be the critical *utilization of the achievements of studies made within the particular theories of prognostication*—and that both those relatively established, as for instance the theory of meteorological prognostication and the most recent attempts belonging to the “futurological” trend. These studies contain an abundance of valuable observations and ideas, which, however, requires some reasonable ordering, as if reducing to a common denominator, and subsequently an integrating and generalization.

Incidentally, it is not the point here to make an individual action of taking over the achievements but rather to put up between the general theory of prognostication and different particular theories of prognostication (demographic, economic, sociological, educational, cultural etc.) relations of the “mutual services” type. This refers primarily to the central methodological sector: the particular methodologies ought to serve the general methodology primarily by a more direct contact with the empirical, concrete prognostic practice. The general methodology, on the other hand, ought to serve the particular methodologies primarily by providing them with the theoretical foundations and correctly generalizing their particular results obtained.