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## SCIENCE AND THE DESTINY OF MAN *

by JOHN D. BERNAL

WE ARE now faced by the tragic paradox that in spite of the fact, that science rose during the last 30 years te a level undreamed of before, it never before, too, was esteemed less and used for worse ends. One of the reasons of it may be found in the fact that science has become too professional and that laymen have stopped taking an interest in it. Such an ignorant attitude towards science is fatal. We should make science more popular by stressing its relationship to the present ever-changing world. Science has grown to be more than just a disinterested search after truth, or the source of enjoyment to some scholars; it has become the chief employment of thousands of investigators all over the world. The problem of a right relationship of science towards human matters should be solved as quickly as possible, so as not to allow science to become an instrument of destruction, instead of being a help in achieving progress. At any rate it should stop serving the interests of a small group instead of being at the service of mankind in general. Technology and scientific methods might solve that problem. Science could awaken the general consciousness to the fact that humanity really consists of one working community. The scientists should therefore remain in a close and constant touch with the state. And the community must realize the possibilities and limitations of science.

BIRBECK COLLEGE, UNIVERSITY OF LONDON

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## ON THE SOCIAL TYPE OF SCIENTIST

by STEFAN OŚWIECIMSKI

IN SCIENTIFIC WORK usually two factors only, seemingly contradictory in the evolutional stream of tendencies, are playing an important part: namely science regarded as a treasury of knowledge and the scientist. The former factor is apt to render scientific work mechanical, and the latter — to look upon science as upon a means towards his own spiritual and intellectual development. However, we keep, forgetting the third important factor, namely the recipient of the results of scientific achievement, i. e. the society. Here lies the cause of the disharmony between the real needs of the society and the things it gets from the world of science. Society wants to possess in science a source of energies helping with its spiritual and material development; science again persists in enriching its own world or in answering the needs and interests of an individual scientist only. Scientists should therefore be socially educated by having the communal point of view stressed in connection with their work and by making more sound their relationships towards their own material needs, towards science, towards society in general, towards their colleagues and their students and co-workers. The social attitude of a scientist should be the basis of „scientific humanism", which makes us regard science not as an end in itself, but as a means towards making the world and all individuals better. Though science is international, it shouldn't be super-national; the scientist, by having, first of all, the needs of his own society in view, will thereby work towards the progress of mankind in general. Science should also advance together with the times and should understand the spirit of the time, which it ought to help creating. These general statements lead to numerous more specific postulates connected with the scientists themselves and with scientific publications. These postulates stress the social character and the social responsibility of a scientist's work.

CIRCLE OF THE SCIENCE OF SCIENCE, KRAKÓW

## ABOUT THE „PARLIAMENT OF POLISH SCIENCE" AND THE „GROUP OF IMMORTALS"

by TADEUSZ KOWALSKI

IN THE number 7/8 of LIFE OF SCIENCE there was published the article of Prof. J. Mydlarski in which the author proposes a reform of the Polish Academy of Sciences and Letters. But this is rather a project of annihilating this institution. According to Prof. Mydlarski the Academy shows some organical faults and therefore doesn't fulfil its task as a central scientific institution of which there is such a great need. So he thinks it must be dissolved and in its place there ought to be a new organization in the form of a parliament composed of two houses, one consisting of representatives of scientific societies,

and the other of well deserved scientists. The scope of this new Academy of Sciences would enclose all matters connected with science, including the competency of a trade union for scientific workers. But his reasoning doesn't stand the point. We must not forget that the Polish Academy is a scientific institution but it never wanted to infringe the privileges of the Board of Education. The reproaches concerning the structure of the Academy are not essential either. In particular Prof. J. Mydlarski is not content with the manner of choosing new members. However, the Academy as every scientific society has the right of casting the vote in the election of its own members. Besides, if there is any deficiency in the activities of the Academy, it is common to all scientific societies abroad as well as at home. Thus not a reorganization but only an increasing nuber of highly educated scientific workers can change it for the better. The Academy which has been growing steadily for 75 years is based on its statute — the result of a long evolution. It permits the Academy to meet the forthcoming needs. Doubtlessly many changes will be necessary, yet one cannot cancel easily an institution which is the outcome of our entire cultural development.

JAGIELLONIAN UNIVERSITY, KRAKÓW

## THE PROBLEM OF THE YOUNGER GENERATION OF SCIENTISTS IN POLAND

*by* KAZIMIERZ LEPSZY

THE YOUNGER GENERATION of Polish scientists is rather disappointing. Even now many chairs are vacant or are occupied by stop-gaps. But a distinct lack of assistant workers in the realm of science is particularly noticeable to-day. This phenomenon is not the result of the war, we met with it before the war too, but the after-war conditions have magnified it out of proportion.

There are various causes, which have brought about this sad change. The most important are of a social and economic character. There is an unequal flow of future, potential scientists from the peasants' and workers' class, and from the ranks of the impoverished intelligentsia. The main prewar reservoir of university intellectuals was to be found within the class of clerks and officials of the big cities, but as a result of their present impoverishment they now turn to the more lucrative practical professions. We should begin the training of future scientists very early, as far back as the elementary school. A system of scholarships should make it possible for ambitious and gifted, though needy pupils, to go on with their studies from primary school up to the university, where they should be the object of particular care. But scholarships and the solicitude centred upon gifted young students ought not to be stopped the moment they have finished the university. As shown by experience, the moment of finishing the university course is often a crucial mo-

ment when special help is needed to induce potential scientists to turn to the scientific career. The system of assistantships and other auxiliary duties at the university, as existing at present, is insufficient and often deceptive. Young scientists should be enabled to go on with their training, particularly by means of studies abroad, which cannot be dispensed with. It is almost impossible to reconcile a scientific career with that of a secondary school teacher without material loss to either the one or the other. The Ministry of Education has now been busy with the project of introducing so-called scientific aspirants, *i. e.* a scientific worker who would receive a salary for three years without having to perform any duties, of an assistant, but devoting his time to scientific researches solely.

SEMINAR OF HISTORY, JAGIELLONIAN UNIVERSITY, KRAKÓW

## THE ORGANIZATION OF UNIWERSITY STUDIES IN THE FIELD OF HISTORY OF ART

*by* TADEUSZ DOBROWOLSKI

THE NEED to plan the study of the history of art more efficiently made the following problems very actual: 1. The problem of lectures which should be of 2 types: those having a more general character and the more specific ones. The relation to seminars is also of importance. 2. The promlem of seminar classes: questions of their methodology and of their technique. 3. The problem of introducing the theory of art and aesthetics into the study plan. 4. The necessity of making students acquainted with some scientific disciplines, particularly those connected or correlated with the main field of their study. 5 The problem of a rational use of auxiliary disciplines in relation to the examined subject, history of art being considered a science dealing with art and life. 6. The problem of the so-called practical disciplines, connected with history of art, such as: museology, conservation of historic remains, etc. which are rough essential to students, wishing to acquire a thorough knowledge of their profession, but not intending to devote themselves to scientific research. All these problems should be discussed more fully, the above article therefore does not pretend to have thoroughly or finally dealt with them.

SEMINAR OF HISTORY OF ART, JAGIELLONIAN UNIVERSITY, KRAKÓW

## THE NEED OF COOPERATION BETWEEN ORIENTAL STUDIES AND POLISH HISTORY

*by* BOHDAN BARANOWSKI

THROUGHOUT her history Poland always had to do with the peoples of the East, both upon battlefields, settling neighbourly disagreements, or within

the scope of trade or diplomatic relations. When we study Polish-Oriental relations, we must, first of all, turn our attention to historical sources and Oriental documents. The previously existing close collaboration of the Oriental studies and of the Polish history became gradually loosened, because Oriental specialists turned their attention rather to universal history. Some improvement was noticeable in the last years before the war, but these researches had been of a rather sporadic and uncoordinated character. Such a collaboration has become quite urgent now, in view of Poland's continued relations with the East, and in view of a fair number of students, familiar with the Oriental languages. They could be trained to form teams of future scientific workers within that realm.

SEMINAR OF POLISH HISTORY, ŁÓDŹ UNIVERSITY

## DOCUMENTATION AND DOCUMENTOLOGY

by JAN MUSZKOWSKI

THE MODERN movement in documentology demands a coordination and a standardization of research work, but the first thing to be done is to establish a fixed terminology. Besides the term *documentation* and *documentology*, it is important to establish the meaning of the word *document*, i. e. what a document is, and what we should regard as such. This term may embrace both the products of man's brain and hands and the works of nature. Documentary methods are not new and were used thousands of years ago, but the conception of documentation has recently changed considerably. To-day, in accordance with the democratic spirit of the age and the tendency to international collaboration, the conception of documentation implies the need of making science more universal and of organizing it on an international scale. The tasks of documentation are very important. They can be divided into 5 groups: 1. The production of documents; 2. the collections of documents and their use; 3. the documentary activities; 4. the administrative and technical organization; 5. the world-wide net of documentation.

Documentation is a practical activity, but there exists at present the tendency to create the foundations of a new scientific discipline, called documentology, the role of which would be to represent the theoretical side of that practical activity.

UNIVERSITY OF ŁÓDŹ

## THE SCIENTIFIC ACHIEVEMENTS OF POLISH ASTRONOMERS

by JAN MERGENTALER

THE HISTORY of Polish astronomy begins with Copernicus, whose memorable achievements testify to the high level of astronomical researches in the

Kraków of Copernicus' time. Later centuries do not claim Polish astronomers of a similar greatness. Among those belonging to the XVII century we should mention Hevelius from Gdańsk, who made observations of the topography of the moon, and Stanisław Lubieniecki, who examined comets. But the XIX century abounds with eminent astronomers: Jan Śniadecki, Poczobut, Jan Kowalczyk, and Adam Prażmowski, who was the first to ascertain the polarization of the light of the solar corona. The following conducted their researches abroad: Dembowski (in Italy), Marian Kowalski (in Russia), the author of the method, used even to-day, of calculating the orbits of double stars, and Leon Hufnagel (in Germany). The achievements of the Polish astronomers in the XX century were considerable: the works of Professor Banachiewicz, the creator of a new calculation method (the so-called Krakowiana); the calculations of the planetoid orbits, connected with Wolf's comet, by Michał Kamieński. Further, F. Kępiński observed Kopff's comet, foretelling its return in 1945 with the greatest accuracy. The planetoid orbits were also the subject of the works of Wł. Dziewulski and K. Kozieł. New comets were discovered by A. Wilk, L. Orkisz and W. Lis; J. Gadomski elaborated a new and better formula of the brightness of comets. Observations of the moon, conducted by Banachiewicz and Kozieł were not without importance. Speaking of planets, we should mention the calculations of J. Witkowski tending to correct the value of the diameters of Jupiter and Venus. K. Kordylewski achieved also a correction of the sun's diameter during his observations of the sun's eclipses. E. Stenz and W. Zonn had also very good results in that field. The paper of St. Piotrowski dealt with the planetary system and it was concerned with the problem of the dispersion of radiation in planetary atmospheres. Systematic examinations of new variable stars were conducted by Zonn and J. Mergentaler, who discovered about 30 of them. The Kraków Observatory collected some forty thousand observations of these stars, fixing for many of them new periods of their variations in brightness. W. Iwanowska observed pulsating stars at Wilno, calculating the variations in their radius. E. Rybka worked in the field of the fundamental and precise photometry; he prepared a very valuable catalogue of photovisual magnitudes of the stars around the pole. W. Iwanowska achieved important results in spectro-photometry by fixing the criteria of the spectrum, thereby making it possible to ascertain the real brinhtness of the super-giant stars. Czesław Białobrzeski had very important results in theoretical astrophysics in his investigations of the internal constitution of stars. He was the first to point to the importance of the role of light pressure in the interior of stars, which problem was later on independently taken up by Eddington in England. The general formula of M. Rudzki is to day being used in connection with problems of star structure. Some improvements in the realm of practical astronomy were introduced by J. Grabowski, M. Kamieński, F. Koebcke and others. In problems of geodesy and geophysics M. Rudzki, the director of the Kraków Observatory, achieved the most important results.

A steady development is the most characteristic trait of Polish astronomy. After the first World War many new institutes vere created, and to-day, their students are already within the ranks of the best Polish astronomers. But they meet a great obstacle in their work, namely an almost catastrophic lack of instruments. This lack deters many able minds from the pursuit of astronomical researches, making them devote themselves to other branches of science or causing them to go abroad, where they find better conditions for their work.

ASTRONOMICAL OBSEVATORY OF THE WROCŁAW UNIVERSITY AND POLYTECHNIC

## FACTS AND VIEWS

THE IDEA OF THE UNIVERSITY. *By Bogusław Leśnodorski.* A book of the German professor of the Heidelberg University, Karl Jaspers, appeared under the above title. This book gives rise to the question, whether German science is willing to and able to liberate itself from under the yoke of Hitlerist mania and aberrations, which were already noticeable as far back as the first years of the Hitler regime. According to the author, it is a question of the spiritual existence or non-existence of the German nation; the idea of a university consists, for him, in the traditional quest after truth. Besides certain undoubtedly valuable ideas, this book also contains theses, which must be accepted with reservations. Articles dealing with the same subject, appearing in Switzerland (Gustavo Colonetti, UNIVERSITE 45, No. 2) and Poland (Tadeusz Czeżowski, professor of the Toruń University, in his book upon the university in general and upon academic studies), present more positive, lucid and progressive views upon that problem.

REALISTIC PLANNING OF THE DEVELOPMENT OF UNIVERSITIES. The role of science in communal life together with the lack of scientists and men with an academic education existing at present make an increase of the number of university students most desirable, which again necessitates the reconstruction of the universities. But such a reconstruction ought to be carefully planned and realistic, that means, it should eliminate wishes and dreams, and be solely based upon statistics and concrete biological and intellectual possibilities of the nation. The cycle, composed of 3 articles, entitled *University Prospect*, which appeared in THE ECONOMIST (Nos. 5346-7, February 1946), contains an essay in such realistic planning.

THE NECESSITY OF PRINTING THE HABILITATION THESES. The Ministry of Education issued a decree, permitting to submit habilitation theses in manuscript till the end of 1948. But the strictly scientific character and the high level of these papers make it most advisable to allow the public to get acquainted with them, both with the view of promoting science and of control-

ling those who aspire to the habilitation. Paper economy, which was at the base of that decree in June 1945, should no longer be obligatory to-day.

ON RATIONALISM. *By Mieczysław Choynowski.* Prof. Konrad Górski's article (TYGODNIK POWSZECHNY, 1946, Nr 37) about the role of the Catholic writer in the contemporary world contains some misunderstandings which demand an explanation. First, one cannot confound the Polish philosophical school which opposes the irrationalism in the name of the scientific empiricism with the representatives of the Marxian thought, because dialectical materialism itself is more metaphysical than scientific doctrine may be. The next misunderstanding, no less important, concerns the epistemologic value of the so called inward experience which is deprived of scientific value because it is unverifiable. The last question worth explaining is the unallowed mingling of scientific truth with literary „truth".

SCIENCE AND THE WIRELESS. The Kraków Broadcasting Station of the Polish Radio will soon transmit the first cycles of lectures from various domains of science. This is hardly a novelty, similar events having taken place already in the B.B.C. within the programme of promoting science, with a particular participation of the British Association for the Advancement of Science. In connection with these programmes the problem of science in the wireless has been the subject of many discussions. Of particular interest were the speeches at the conference of the above mentioned Association, held in March 1943, and also the discussions at the conference organized at Cambridge by the Association of Scientific Workers, and particularly the most interesting speech of Professor J. D. Bernal.

STRUGGLE AND COOPERATIVE WORK. In the article about the Educational Role of Science by M. Choynowski (LIFE OF SCIENCE Nr 7—8) there was left out among other educational values of science the understanding of the value of cooperative work. It is connected with the character itself of scientific work which again is based on the inheritance of past generations and the collaboration of all scientists all over the world, in contrast with the politicians, whose activity is always directed *against* someone and based on struggle.

## SCIENCE AND LETTERS IN POLAND

### CONFERENCE OF SCIENTIFIC WORKERS

A CONFERENCE of scientific workers took place in Warsaw on the 28th and 29th of September. It was organized by the General Board of the Workmen Universities Association, and its chief object was to formulate democratic postulates in connection with the academic education. The isolationist character of the academic schools, the need for their readjustment to new social and political conditions, together with the urgent matter of

connecting science more closely with the state, these were the main themes of discussion. Prof. S. Leszczycki and Prof. M. Jaroszyński read papers dealing with the organization of academic schools. Prof. Z. Szymanowski and Prof. A. Szafl discussed the problems of the students, while the professional organization of scientific workers was discussed by the editor of THE LIFE OF SCIENCE, M. Choynowski and Assistant Professor J. Żukowski. After a long and exhaustive discussion, the conference adjourned, having passed resolutions, demanding the reorganization of academic schools, the planning of scientific pursuits, the revision of the bill dealing with academic schools, particularly of those parts of it, that have to do with the composition and the rights of academic authorities, the duties of scientific workers and the question of filling up vacancies at the universities. Further, the securing of a minimum of existence for scientific workers and the extension of the scholarship system were demanded as indispensable.

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THE ACTIVITIES OF THE ETHNOGRAPHICAL MUSEUM IN KRAKÓW. Ever since the middle of December 1945, systematic ethnographical investigations of the entire Kraków province were being conducted and are still in progress. Special questionnaires for each problem are used. A more detailed report, discussing achieved results, has been published in vol. XXXVI. of the ethnographical periodical THE FOLK (LUD).

THE SCIENTIFIC AND LITERARY CONGRESS IN COMMEMORATION OF B. PRUS. On the 29—30 th of September, 1946, a scientific and literary congres took place in Warsaw, attended by the most eminent historians, critics and theoreticians of literature from all over he country. The congress had been organized by the Literary Society of Adam Mickiewicz, which was celebrating its 60th anniversary that year (founded in 1886). The congress had other important aims besides celebrating this anniversary. Its first aim was to bring together Polish scientists and give them an opportunity to discuss many problems, hitherto undiscussed, connected with the continuity of the Polish cultural life. The programme of the congress consisted of 3 parts, the first and the last being of a general nature, while the second contained meetings devoted to the discussion of particular questions. The amount and the valuable character of the material collected during the war years were imposing, and the papers read at those meetings and the problems discussed there, were on a high level and aroused a deep interest among the participants. Professor Julius Kleiner presided at the congress, the following professors contributed papers or lectures: Julian Krzyżanowski, St. Adamczewski, Borowy, Pollak, Saloni, Wyka. The congress passed a series of resolutions of a general, and also of a more specific nature.