K. N. Kornilov, Theoretical and Experimental Psychologist

Konstantin Nikolayevich Kornilov was born in Siberia, 9 March, 1879. He died in Moscow, 10 July, 1957. An idealistic populist (in Russian, *Narodnik*) in his youth, he did not enter a university until after he had paid his debt to society and contributed to the education of the masses by teaching elementary school for several years. He was graduated from the Historico-Philological Faculty of Moscow University in 1910 and was retained at the university as an assistant to G. I. Chelpanov, the leading Wundtian experimental psychologist in pre-Soviet Russia. Kornilov's research interests turned quickly to the study of simple reactions, which he investigated, by means of a specially constructed dynamoscope, with respect not only to speed but also to force and form of movements. Varying the types of reactions and correlating physical measurements with types and with his subjects' introspections, Kornilov arrived at the view that the "product of expenditure of physical and mental energy in human reactions is a constant" and, generalizing, that "mental processes are inhibited will reactions."

After the Revolution, Kornilov's first publications were in the immediate area of service to educational psychology. Yet he continued experimenting intensively on reactions in the laboratory, finally raising such studies to the status of an all-embracing school of psychology, named reactology. "Psychology is the science of the reactions of the individual: their chronometry or speed; their dynamometry or force; their 'motographics' or extent, rate, and form; their psychological complexity [a hierarchy of seven reactions was noted]; their contents or social import; and their inter- and intra-individual differences." To these were added (i) wholeness (in Russian, *Tselostnost'*): organismically, total behavior dominates individual-reaction behavior and, societally, "we must always proceed, not from individual to social psychology, but from social and class psychology to group, occupational, and individual psychology"; and (ii) economic prepotency: "the social aspects (the contents) of man's reactions are a variate function of a particular economic class."

Kornilov's reactology, represented as a Hegelian synthesis of behavior and consciousness psychologies, reflexes and *Bewusstseinslagen,* will and determinism, holism and atomism, and quantitative and qualitative emphases and, allowing generously for Marxian economics, quickly became the dominant school of psychology in the Soviet Union of the 1920's. His *Textbook of Psychology from the Standpoint of Dialectical Materialism* went through five Russian editions between 1926 and 1931 and was translated into a number of languages. He became the director of the country's most important research center, the Moscow Institute of Psychology, in 1923, and the editor of Russia's first pure (unhyphenated) psychological periodical, *Psikhologiya,* in 1928.

However, quick as the rise of reactology was, its demise was even quicker. Soon after the publication of Lenin's *Philosophical Notebooks* (his marginal comments on the philosophical books that he read), in 1929–1930, the Communist cell of the Moscow Institute of Psychology initiated a series of intensive discussions of the basic premises of reactology and reached negative conclusions. The exact text of the discussions and criticisms was not published, but later articles indicate that the charges revolved around the following points. (i) Man as a mere reacting organism is too passive a conception for the actionism of Lenin and Marx and Engels. (ii) The view that the physical and the mental (or the peripheral and the central) in human reactions complement each other implies that psychical processes are "the other side of *physiological* processes," whereas the Leninist position is that the "psyche and consciousness are true reflectors of objective *physical* reality." (iii) Reactology leads to either psychophysical parallelism or epiphenomenalism—the first, reactionary-idealistic, the second, vulgarly mechanistic, and both failing to accord to consciousness its proper activist Leninist role in transforming nature, man, and society. (iv) In practice, reactology has become a variety of behaviorism, and behaviorism is essentially a school in the service of American capitalism—a psychology of man as an automaton permitting more ruthless exploitation and more deceitful decoying of the working class (sic!). At any rate, beginning with 1931, reactology disappeared wholly from Soviet psychological writings, not excepting the writings of Kornilov himself.

Kornilov, however, remained a leading —though no longer *the* leading—figure in Soviet psychology. He lost the directorship of the Moscow Institute of Psychology but continued as editor of *Psikhologiya,* became dean and later head of the department of psychology of the Moscow State Institute of Pedagogy, and was elected vice president of the Soviet Academy of Pedagogical Sciences (established in 1943). Moreover, he continued to contribute a considerable number of significant articles on psychological theory and practice to a variety of Soviet periodicals and continued as a prolific writer of textbooks, which in terms of Soviet psychology, it must be remembered, is a high honor and distinction. His *Psikhologiya* (with Teplov and Shvarts) came out in 1938 (second edition in 1941); *Psikhologiya* designed for secondary schools and printed in an edition of 100,000 copies, was published in 1946; and *Psikhologiya* (with Smirnov and Teplov), which for a number of years was the country's sole college textbook in the field, came out in 1948. Kornilov became the editor of *Semya and Shkola* ("Family and School") in 1946 and a member of the editorial board of *Voprosy Psikhologii* in 1955 (the year of its founding).

The last article by Kornilov that I read appeared in the 1955 July–August issue of *Voprosy Psikhologii* under the title of "Problems of Soviet psychology." The article is strikingly reminiscent of one he wrote in 1925, under the title of "Psychology and Marxism." Soviet psychology has in these 30 years passed through a complete evolutionary cycle—or an expanding Hegelian helix, they might say. It has returned to Pavlov! Accordingly, as in 1925, Kornilov sets out to argue that psychology must not and could not be liquidated by physiology, that it has its own specific scientific laws and methods, and that the unity of the brain and mind does not mean identity. Moreover, though this time Kornilov pays unmis-

takable tribute to the correctness of Pavlov's laws of higher nervous activity, he is, on the other hand, more explicit in his claims that human psychology has supraphysiological status, that it is more a social than a biological science, and that its key concept of human personality involves sociohistorical as well as psychological and physiological factors. Kornilov's concern with basic problems of Soviet psychology was indeed a matter of life-long dedication. And—this should be especially noted—he somehow managed at all times to keep afloat, in fact to be most of the time in the forefront, untoward and adverse trends to the contrary notwithstanding. Soviet sources have it that Kornilov was not a member of the Communist party.

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News of Science

United States Euratom Program

On 23 June the President transmitted to Congress an international agreement between the United States and the European Atomic Energy Community (Euratom). Under the United States Atomic Energy Act, Congressional approval of this instrument is necessary prior to entering into a U.S.–Euratom agreement for cooperation which would embrace a 1-million-kilowatt joint program of nuclear power development.

This program involves the construction by 1963 in the six Euratom countries—Belgium, France, the Federal Republic of Germany, Italy, Luxembourg, and the Netherlands—of approximately six large-scale nuclear power plants based on United States type reactors. This would provide sufficient electrical generating capacity to meet the power requirements of more than 5 million people in the Euratom area. An outline of the proposed United States–Euratom program follows.

Objectives. The aim of the joint program will be to bring into operation in the Community by 1963 about 1 million electric kilowatts of installed nuclear capacity, in reactors of proven types developed in the United States, and to initiate immediately a joint research and development program centered on these reactors. The program would be conducted so as to obtain maximum support of the industries of the Community and of the United States. The active participation of industries is indispensable to the success of the program.

Capital costs. The total capital cost, exclusive of fuel, is estimated not to exceed $350 million. These funds will be provided by the participating utilities and other European sources of capital, such financing to be arranged with the appropriate assistance of Euratom. Up to $135 million would be provided by the United States Government to Euratom in the form of a long-term line of credit from the Export–Import Bank. These funds will be re-lent by Euratom for the construction of nuclear power plants.

Operation of plants. The nuclear power plants will be built, owned, and operated by utilities in the member states. All risks due to uncertainties in construction, maintenance, and operating costs and load factors will be borne directly by these utilities. In the course of the negotiation it was determined that the economic risks associated today with the reactor fuel cycle must be minimized if participation by the European utility industry is to be assured. To this end, the United States, for a 10-year period of operation, will guarantee ceiling costs for the fabrication of the fuel elements required, as well as a fixed life for these elements.

Research program. A research and development program, established for a 10-year period, will be centered on improvement in the performance of the reactors and the lowering of fuel cycle costs. During the first 5 years, the financial contribution of the Community and the United States will amount to about $50 million each, with the sum required for the second 5-year period to be determined at a later date.

Fuel requirements. Under the arrangements proposed, the United States would sell to the Community a net quantity of 30,000 kilograms of contained U^{235} in uranium to cover the fueling and other requirements of the program for such material over a 20-year operating period. The initial operating inventory, which amounts to approximately 9000 kilograms of contained U^{235}, would be sold to the Community on a deferred payment basis. The balance of about 20,000 kilograms—which represents estimated burn-up and process losses over the 20-year period, and 1000 kilograms to provide for research and test reactors associated with the program—would be paid for on a current basis.

The U.S. Atomic Energy Commission will process in its facilities, at established U.S.–domestic prices, spent fuel elements from the reactors to be included in the program.

Special nuclear materials. With respect to any special nuclear material produced in reactors fueled with materials obtained from the United States under this joint program, which is in excess of the need of the Community for such material for the peaceful uses of atomic energy, the International Atomic Energy Agency would have the right of first option to purchase such material at the announced fuel value price in effect in the United States at the time of purchase. In the event this option is not exercised by the agency, the United States would be prepared during the first 10 years of reactor operation to purchase such material at the U.S.-announced fuel value price in effect at the time of purchase.

Data exchange. Technological and economic data developed under the program would be made available to the industries within the Community and the United States under provisions designed to assure the widespread dissemination of the information developed in the course of the program.

Safeguards system. Under the program the Community will assume responsibility for the establishment of a safeguards system which will be formulated in accordance with agreed upon principles. This system will be designed to assure that the materials received from the United States, as well as special nuclear material produced therefrom, will be used only for peaceful purposes. The proposed agreement for cooperation with the Community provides that there will be frequent consultation on the operation of the system. Continuation of the cooperative program will be contingent upon the Community's establishing and maintaining a mutually satisfactory safeguards system.

The Community also has agreed to