SCIENCE AND SOCIAL MOVEMENTS: TRADE UNION ORGANIZATION AND POLITICAL TRENDS IN BRITISH SCIENCE, 1917-1945

by Rainer Rilling (FGR)*

Dr. Rilling describes the development of the concept of social responsibility in science and the organisational form that it took in Great Britain in the first half of our century. Indirectly, he describes the origins of the World Federation of Scientific Workers, since the Federation would not have taken its existing form had it not been for the initiative and activity of the British Association of Scientific Workers during and immediately after the war when the foundation meeting of the WFSW was held in London.

IF ONE EXAMINES the relation between science and social movements, the path of the *scientist* to the *scientific worker,* the stage from *scientific community* to *scientific factory,* professionalization, institutionalization and the organization of scientists themselves in scientific societies, professional associations and finally trade unions, it becomes apparent that in the period 1917 to 1945 a wide range of problems, processes and conflicts were anticipated in Great Britain which are widely thought only to have played a role since 1945, or only since the mid-sixties.

One example of this is the discussion on the social responsibility of scientists for the social and political consequences of their activities, which certainly began before Nagasaki and Hiroshima or before Vietnam and Campuchea.

Nor should it be forgotten that a substantial and rapidly expanding group of scientists was in the forefront of the move to the left of a large section of the British intelligentsia in the 'thirties movement', not only taking its bearings from the working class but also organizing itself in the same political and union forms. After the First World War the first trade union of scientists in the world was formed, developing in the thirties into an influential and militant organization.

Finally there was discussion on how to achieve the most sensible mode of organization and control in the scientific system, which ended in serious controversy, unprecedented in the capitalist world, about the meaning and possibilities of scientific planning.

The NUSW and the AScW

In 1917/18 a series of attempts had been made in Britain to solve the interrelated problems of economic deprivation, job insecurity and the political impotence of science by forming organizations and associations.

The National Union of Scientific Workers (NUSW) was founded towards the end of 1917 primarily on the initiative of a group of Cambridge scientists. They did not want to found a trade union. However it was only when pressure was applied by members of the National Physics Laboratory (NPL), the largest state research institution in Britain, which had already experienced a series of bitter wage conflicts since it was founded in 1898, that a professional trade union was formed.

The NUSW, which recruited a membership of 500 in one year, and 700 by 1921 — there are said to have been a total of about 13,000 scientists in Britain at that time — saw itself as a protective organization which sought to improve the bargaining power of scientifically qualified labour. As a political professional association it also argued for the use of science to solve the political and economic problems of Britain in the post-war era. From 1918/19 to 1920 the NUSW attempted to complete its development from what might be called a trade union of professional groups into a professional trade union by attempting a merger with the BAC (British Association of Chemists) and STE (Society of Technical Engineers). However, it did not succeed even in creating an integrated umbrella organization in the long term. The NUSW became isolated and entered a period of crisis: it refused to associate itself with the TUC.

In 1927 the organisation dropped the 'union' from its title and renounced its status as such. It now became known as the *Association of Scientific Workers.* Membership numbered 800. In view of the defeat of the British working class in the General Strike of 1925 and the general tendency towards deunionisation — trade union membership fell from 8.35 million in 1926 to 3.3 million in 1934 — this political turn, achieved against the will of a considerable minority of the NUSW, looked promising. And yet the AScW stagnated.

This stage of development ended only in 1935 after a three-year transitional phase — once again at the instigation of Cambridge. The leadership was almost totally changed. A new, militant, trade union programme concentrating on socio-economic problems was elaborated by John Desmond Bernal. The point of departure of this programme was now clearly that scientists had to sell their labour as a product on the labour market in order to live.

The AScW rapidly developed on the basis of this evaluation of scientists as being dependent on a salary.* The membership rose to 1,319 (1939), 4,500 (1942), 11,000 (1943) and 17,211 (1946). (It may be of interest to learn that the AScW amalgamated with another white-collar union in 1968 into the *Association of Scientific, Technical and Managerial Staff,* which has currently some 400,000 members).

In 1940 the AScW was recognized as a trade union and registered. In 1942 it was accepted into membership of the TUC. Whereas a large section of the British scientific intelligentsia had, as the Cambridge Magazine wrote in mid-February 1918, *'made acquaintance with Power (and). . . shaken hands with money',* the scientists organized in the AScW discovered themselves to be a social force, alongside the workers' movement, or even a part of it.

At the same time, it had been the decisive organizational platform of the British scientific left since the mid-thirties, from which were made demands on

— the application of science to solve social problems in British society.

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**The outbreak of war created a new situation: scientific workers were mobilized in relatively large numbers into expanding governmental laboratories, and their realisation of collective identity and the need for collective representation led to a remarkable growth in organisation.*

—scientific planning and increased financial support for science.
—strengthening the scientific nature of politics and production.
—the myth of scientific neutrality in face of the fascist threat.

Three very different currents were united in this movement over ten years: an antifascist-state-monopoly-reform fraction aiming to reorganize the system of productive forces and to modernize politics and production within the British ruling class, represented scientifically by the 'Nature' journal and its influential editor Gregory; another antifascist, liberal, bourgeois current within academic science as the offshoot of the original main force in British science, which had increasingly lost in significance as the representative of the 'liberal ethos' in science with the collapse of political liberalism; and finally, a current which took its bearings from the working class and was organized in a trade union in both *high science* and *rank and file science.*

At the centre of this third movement of the *Social Relations of Science Movement* were: 1. John Burdon Sanderson Haldane, a biochemist in Cambridge and London, geneticist, evolution theoretician, human physiologist and biometrician, FRS; 2. Joseph Needham, biochemist in Cambridge, embryologist, evolution theoretician, scientific historian, FRS; 3. Hyman Levy, mathematician at London Imperial College; 4. J. G. Crowther, the foremost scientific journalist in Britain (Manchester Guardian, 1928-1948); 5. Patrick Blackett, physicist, Nobel prize-winner (1948), 1965 President of the Royal Society; 6. Julian Huxley and Lancelot Hogben (biologists), as well as Waddington, Powell, Wooster, and finally *'The man at the centre of it all'* (S. Toulmin); 7. John Desmond Bernal, crystallographer in London and Cambridge, FRS.

They were the mouthpiece and the leading ideologists of the national left in all questions of science, representing hundreds of British scientists and technicians in the thirties. They entered the political arena with poets and novelists, artists and actors. They optimistically believed that their poems, their organizations and associations, their writings and speeches woulc prevent war, defeat reaction, crush fascism and create a new — socialist — society in Britain. In the midst of political and economic crisis, the 'Social Relations of Science' movement tried to develop a comprehensive philosophy, history and sociology of science which attempted to bridge the gap between scientific thought and political action in an appropriate manner. Its conceptional credo can be summarized in the following theses:

1. Science is a socio-historical phenomenon.
2. Therefore science is also political.
3. Scientists must therefore consider the effects of science and technology on society, but also the effects of politics and society on science.
4. Science which is conscious of itself as a result of scientific reflection is capable of social responsibility. This means attempting to associate theory and practice.
5. In doing so, socially conscious and responsible science has no alternative but to examine the role of science in capitalism, where this role has changed fundamentally. Never before has such a comparatively comprehensive and radical criticism of the capitalist method of socializing science developed. Starting with the anthology 'The Frustration of Science' from 1934 and culminating in Bernal's historical argumentation for scientific research (in 'The Social Function of Science', 1939) there is a consistent attempt to demonstrate and interpret the constructive and the destructive role of science. This movement blames social relations for underfinancing and underequipping, secrecy and the repression of science, monopolization and insufficient research coordination, alienated specialization and the abuse of science for purposes of war.
6. The second part of Bernal's book 'The Social Function of Science' is entitled 'What science could do'. This is a collection of proposals which were elaborated in the course of a decade on the organization and reorganization of the British scientific system. They range from breaching the educational privilege and supporting amateur scientists, the synthesis of theory and practice by teachers involved in research work and the democratization of scientific and political decision processes, to the reorganization of scientific communication and the key concept of the movement: the demand that the science process be planned, as a precondition for free science and the concrete transformation and reorientation of science to meet social requirements.
7. According to the credo of the majority of the movement's members, there can be no socialism without science, no free and unrestricted science without socialism, no future, but only fascist barbarism, without science and socialism. They thus go far beyond trade union statements based merely on furthering their interests, and focus their attention on what science is capable of achieving — if the necessary initial social conditions exist.
8. Science as a social force, which aims to change the conditions of its socialization, becomes active and consciously pursues this socialization: it turns to the nation. All members of this movement are united in their desire to popularize science. It is the heyday of scientific journalism as an instrument of enlightenment. All of the leading representatives of the movement wrote articles in British daily and weekly newspapers, publish works, made recordings for the BBC, established libraries and made speeches in educational institutions; for 13 years after 1938 Haldane published a scientific column, week in, week out, for the 'Daily Worker', the central organ of the British Communist Party.
9. Radicalization of the popularization concept is found in theory and practice amongst those members of the movement who relate to the organization of the workers' movement in the course of the thirties.
10. This points to one consequence of the theses collected together here: the organization of scientists in conjunction with the organization of the workers' movement is a necessity.

The event which resulted in the provision of a theoretical framework and on whose basis a concept for the group or the movement could be elaborated, is easily recognizable and found a certain echo in literature: it was the appearance of the Soviet delegation at the second international Congress of the History of Science and Technology on 4th July 1931 in the Science Museum in South Kensington. Hyman Levy characterized the congress as *'epoch making; for the standpoint consistently adopted by the (Soviet) delegates crystallized out in remarkable fashion what has been simmering in the minds of many for some time past. What became clear was not only the social conditioning of science and the vital need for planning, for anticipating the social effects of discovery, but the impossibility of carrying this through within the frameworkers of a chaotic capitalism'* (Modern Science, 97).

The seven members of the Soviet delegation included Buckharin who called for *'a social synthesis of science and practice'* and the *'social selfrecognition'* of science in his contribution, the leading Soviet physicist A. F. Joffe and — apart from N. I. Vavilow, the most famous Soviet geneticist, even in Britain — a completely unknown historian and physicist called Boris Hessen, whose paper on the 'Social and economic roots of Newton's 'Principia' ' is still recognized today as the foremost work of Marxist scientific history.

What Levy termed in retrospect *'a revolution in thought'* requires an explanation. Two questions must be answered:

- —Why was the creation of wage-earner status in scientific work at least partially transformed into trade union organization in Britain, in contrast to other capitalist countries?
- —How can one explain the singular phenomenon that a not inconsiderable section of the British scientific élite, who could without doubt be numbered among the ruling class in Britain, created dissent, deviated from the norm, broke out and abandoned the ruling functional pattern?

Economic and social changes

Even theoreticians in the SRS movement pointed out, certainly with justification, that the socio-economic status of science had begun to change dramatically.

Quantitatively, this development cannot be traced precisely; Bernal's book in 1939 represented the first attempt to create the conditions for national scientific statistics. In 1900 there were about 2000 graduate scientists in Britain, about 50% of whom were schoolteachers. By 1914 the number of graduates had quadrupled to 7000-8000; in other words, in these 12 years more scientists came onto the labour market than in the previous half century[1].

In Britain, the problems of professionalization for university graduates were considerably greater and more acute than in the other capitalist countries, as employment openings for university graduates increased only slowly in industry and the public services sector. As could be expected, one factor which was closely connected to the restricted nature of the labour market was that the income of salaried scientists in Britain lay considerably below that of their German counterparts, increased at a below-average rate or stagnated and was extremely hierarchic.

In the thirties the effects of the most serious economic crisis which capitalist Britain had ever experienced and the related problem of unemployment were added to this. Even in 1938 general unemployment in Britain lay at 13.3%.

It is safe to say that in Britain in the thirties one in ten academics was affected by unemployment. This was both an above-average figure and a new experience. It would be fair to assume that these problems also expressed themselves in the organizational behaviour of the academics.

Apart from these economic peculiarities of the situation in Britain, the social ones should also be mentioned; namely, the obviously extreme social stratification which developed in the second half of the 19th century.

This development in Britain had far-reaching effects: in a number of countries, similar organisations were discussed and, in some, such as the USA and France, formed.

The BAAS

The *British Association for the Advancement of Science* (BAAS) developed in the same direction (if more moderately and unevenly). This was the national scientific society of British natural scientists and scientists of the humanities, founded in 1831, and as such the most representative scientific organization in Britain.

As late as 1931 the 100th anniversary of the society was celebrated in the spirit of 'pure science'. Mass unemployment, financial crisis, governmental collapse, were ignored. Yet one year later a lay member spoke up at a meeting of the Economic Section of the BAAS with the passionate accusation: *'There are millions of unemployed and of people suffering privation. If this is what economics and politics can do, I say damn them.'* In a resolution the Section demanded closer cooperation between society and the government so as to bring about an effective policy through the channels of scientific consultation. An important U-turn then followed in 1932/33. The Cambridge biochemist and Nobel prizewinner Hopkins became President of the BAAS. It was mainly through his influence that a resolution, unique among learned scientific societies, was passed in 1933 to the effect that each of the 13 sections of the society should deal with the immediate problems of society as far as they related to their branch of science. In 1938 a decision was even made to create a 'Department for Social and International Relations of Science', which was to study the effects of science on society.

'Nature' and the SSSRS

A shift in behaviour and consciousness is also apparent in the reaction to a survey by the leading scientific journal 'Nature' at the beginning of 1938 which asked the foremost British scientists for their position with regard to the project of founding a *'Society for the Study of the Social Relations of Science'* (SSSRS).

The forty answers received, almost all of which were positive, dealt with three problem complexes: the effects of science on *society* (economic crisis, genetics, etc.), the effects on *politics* (abuse for purposes of war, insufficient influence of science, etc.) and with problems of *scientific development* itself (divisions between arts and science, the individual disciplines, natural sciences and social sciences). Here it was apparent that the relationship science-society had come to the attention of a considerable number of the British scientific élite for the first time and had, at the same time, become problematic. An even clearer indication of this shift is gained by analyzing the leaders of the aforementioned 'Nature' magazine, which has, quite justifiably, been called the 'Times' of scientific journalism. . .

Changes

What is shown by these processes is primarily no more than the emergence and development of a relatively coherent ideological, political and social group, a social network within the British *scientific community,* a 'visible college' (Werskey) of leading scientific and political figures and journalists, an organizational skeleton, a number of publications which went into thousands in the course of the decade, a scientific strategy centred around the concept of scientific planning, a scientific conception developed from the union viewpoint which developed its own social theory.

Until the thirties the recruiting basis for *high science* at university was completely homogenous — unlike Germany, where university science courses recruited students increasingly from the middle class. *High science* at British universities enrolled students exclusively from the economic bourgeoisie and the aristocracy. *Rank and file science,* that is, the mass of scientific workers from the state research institutions and provincial universities, however, were recruited from the middle strata and partly from the working class. Thus although professionalization of science led to the tradition of the amateur scientist being swept away, it did not lead to the elimination of the *gentlemen scientist* in the science departments of the older universities.

Changes in professional bodies

The minor significance and public disregard of science in Britain, especially accentuated in contrast to Germany, led professional and political ambitions to promote respect for the

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[1] *In his book, Bernal stressed that this thrust of socialization would not automatically mean that scientists would take a trade-unionist line, or one critical of capitalism. He wrote, 'If the capitalist system could manage without war or fascism it could safely count on the continued support of the rank and file of scientific workers, and even on many of the greatest scientists of the time.'*

(The Social Function of Science, 389).

He saw the reason for this in the nature of scientific work, which 'itself is an eminently satisfactory occupation'.

profession to play a particularly important role at an early stage. The result was that the trade unions and many other professional forms of organization which grew up between 1900 and 1919 in Britain among the intelligentsia plugged a gap in political organization which had been created as a result of the poor adaptability of the British scientific societies.

Because of the low general level of science application in Britain at the end of the 19th and beginning of the 20th century and because of the stubborn resistance of *high science* to attempts at political organizations in the profession, professional associations emerged from the scientific societies in Britain not at all, very late (as in chemistry and physics) or with a certain bias from the outset towards a 'professional trade union' (e.g. Association of University Teachers — AUT).

There were four such lines of tradition: the economically and, in particular, industrially bourgeois, utilitarian, Baconist and liberal tradition; the social imperialist and corporative line of tradition which advanced greatly at the end of the 19th century; the lines of tradition of aristocratic *high science,* which was scientifically optimistic but hostile to application and industry, and the tradition of *rank and file science,* which provided a social contrast to high science.

Changes of political direction

Of course, in the syndicalization of scientific workers different general political and party political currents were reflected. The NUSW was first controlled mainly by Fabians and the Labour Party. Its reversal into a permanent professional association and its renouncement in 1927 of trade union status was connected with the Mondist period[2].

The dissolution of Mondism led to a change of direction by the AScW at the end of the 30s' to the extent that antifascist and anti-militarist as well as socialist and communist currents gained in significance. The political orientation of the AScW was essentially determined by them: it is interesting to note that at no time did Labour have any decisive political influence on the AScW. However, more important, without doubt, was the fact that this orientation towards the left and this syndicalization reflected the disillusionment of a large section of the scientific intelligentsia about the helplessness and half-heartedness of liberalism, not only academic liberalism, in the fight against fascism, a liberalism whose social prophesy and moral code had failed in the face of the world economic crisis and the threat of fascist barbarism.

The British scientific élite

If one now turns to the second problem of élite dissent, the picture gained of the British intelligentsia or their elite in the 19th century makes it particularly difficult to explain why an influential group should take its bearings from the working class in the thirties. For the British intelligentsia was not a critical strata distanced from the state and society. It was neither alienated, like that in Russia, nor 'free' such as part of the intelligentsia in the Weimar Republic, nor was it technocratic and state-supported, as in France.

The intelligentsia in Britain had three main characteristics: it was unusually coherent, reproduced itself almost completely and, at first, more or less excluded the economic bourgeoisie from its gentlemanly culture. The bourgeoisie introduced its repressiveness and puritanism, the aristocracy its arrogance and amateurism. In both cases, science and technology were thrown overboard. The neo-aristocratical culture of the *old universities* was hostile to industry. This milieu was reflected in the scientific practice of the scientific élite, for which Werskey has introduced the appropriate concept of *high science.*

- —pure, non-applied, non-utilitarian research;
- —hard and experimental research with a tendency towards discriminating only theoretical work;
- —*fashionable,* 'hot' science: in other words, frontier research.

'High science' was a social group whose membership was restricted to:

- —one class, namely the bourgeosie;
- —one sex, namely men;
- —one race, namely white;
- —one income group, namely wealthy. . .

High science is therefore ultimately pro-capitalist: it creates the basis for the science-based industries, is integrated into the bourgeois political consultative system (even if only in an initial stage) and controls the *scientific community.*

The focal point of view, hard, 'hot' expert science was Cambridge. This science was centred in the *Cavendish Laboratory* under Rutherford and the *Sir William Dunn Institute of Biochemistry* under Hopkins. Anyone who worked there belonged to a coherent subculture which imagined itself to be in the Golden Age of science.

What explanations can be found as to why the consciousness and behavioural patterns of this scientific élite of Britain in the thirties changed and became differentiated, while a considerable group became more radical and split off.

Five theses

In order to understand the development of the British scientific élite in the thirties, it is expedient to take as one's basis the joint influence of cognitive and social circumstances. Five theses can be established:

1. The Cambridge scientists revolutionized science by establishing new disciplines and affecting others.

   1932 was not the only year of politicization, but also the year of scientific revolutions: Cockcroft and Walton split the atom, Chadwick discovered the neutron and Blackett the positron — and all in the Cavendish Laboratory. While the revolution in physics was being continued in this laboratory, the crystallographer Bernal was the first to introduce physics and chemistry into biology. By applying X-ray crystallography to large organic molecules, Bernal founded an important crystallographical school which made a decisive contribution to explaining the structure of proteins and the founding of modern molecular biology.

2. The cognitive processes resulting from this can be specified in sociological terms: they tend to stand at the centre of basic social conflicts or are, at least, strongly influenced by them. Nuclear physics and biology were potentially at the centre of the basic social conflicts of the times. In the thirties it became quite clear that if the First World War was a chemical war, then the second was a war of physics. But it was not just in the field of physics — or for that matter in nuclear physics with the dawning prospect of atomic extermination — that the question of the application and use of scientific knowledge for peaceful or belligerent purposes forced itself upon people, up until the point where fascist militarism was increasing arms production. The crimes of Italian and Spanish fascism in Ethiopia (where poison gas was used) and in the Spanish Civil War 1935/36 (air warfare) forced many British natural scientists to take up a standpoint on the problem of responsibility which they had always evaded in the past.

   The biologists too, found themselves involved in basic ideological conflicts: the eugenic group, which brought

[2] Alfred Mond, chairman of the giant ICI combine, strove hard after the defeat of the British working class in the General Strike of 1926 to obtain the necessary 'economic rationalization' through a corporative economic organization. The NUSW or AScW became a propagandist of Mondist social corporativism. This was hardly surprising insofar as Mond, the representative of the most powerful British monopoly, was a member of the NUSW. In this phase, at least four currents were represented in the NUSW: professional, industrial bourgeois and trade union currents along with the interests of **high science** *(30 fellows of the Royal Society were in the NUSW).*

together a future Prime Minister, Neville Chamberlain, a scientific theoretician, Keynes, and a socialist, Laski, believed that economic poverty and social deprivation, unemployment, lack of education and slum housing were the results of inborn factors of heredity.

If poverty and unemployment were, in the final analysis, the expression of poor intelligence dependent on genetics, then after a certain time the unemployed would have to be prohibited from bearing children. The most adequate social policy, then, was birth control, sterilization of the unemployed and even forced sterilization of troublemakers, who would in any case never reach the level of intelligence required for socialism. The leading representatives of the SRS movement — but not, as one might have expected, Gregory's 'Nature' — sharply criticized the social Darwinism of this group and denounced them increasingly as following a Nazi line, particularly as the group was finding it increasingly difficult to disassociate itself from fascist race and heredity doctrines. By way of these discussions, biology found itself tied up in two basic social and political problems of the times:

overcoming the deep-seated economic crisis and unemployment on the one hand, and fighting fascism and its related race doctrine on the other hand.

3. The leading representatives of the Social Relations of Science movement each have different divergent social traits which act as catalysts in the socialization of science.

Often the eccentric behaviour, the very nonconformism of scientists responsible for major discoveries and inventions is described. In this way, an attempt has been made to find a link between these innovations and the most varied personality features. The leading representatives of this movement were normally of the same generation as each other (35 at the time of the depression), had bourgeois backgrounds, were educated in Oxford or Cambridge and had pushed forward the frontiers of physics or biology. They all exhibited different social traits other than those of the economic élite at an early stage.

Levy was an Edinburgh proletarian and a Jew. Haldane, whose parents were bourgeois, gained an insight into the working conditions of miners when still young, thanks to his father — an Oxford physiologist — and became a pacifist in the First World War.

Hogben came from an extremely religious family of Evangelists ad became an atheist in Cambridge under the influence of Bertrand Russell. He was a conscientious objector and his wife a feminist and from an early stage he was involved in workers' education. Bernal was a wiry, red-headed Irishman with lively intelligence, naturally enough a nationalist, social rebel, atheist and, at the end of his studies, a communist. Only Joseph Needham fitted into the *mainstream* of science culture in Cambridge.

4. Dissent amongst the élite is a subjective reaction to the increasing acuteness of a contradictory structure between the science system and the élite which represented it on the one hand, and between the insufficient introduction of science into production and politics, poor recognition of science and the abuse of or threat to science by fascism and war on the other hand.

But the very belief in scientific method was incompatible with a social and political reality which seemed far removed from application of this method: it resulted in mass unemployment and deprivation and even, like fascism, threatened to reverse any first steps of social application.

Politicization had a lot to do with the fact that the scientists loved their profession. Reaction, crisis and fascism posed threats, as did the philosophy to which they were committed. If they became insignificant, than so did their lives.

Once the scientists finally became aware of this contradiction, they were faced with a choice: the path to fascism (although unlike in other countries, no leading bourgeois scientists became fascists. Conservatives, such as Ernest Rutherford, were anti-fascist). Then there was the path to technocratic, utopian reformism: this was the way which was marked out in Julian Huxley's 'If I were a Dictator' (1934), which proposed that Parliament be replaced by a scientific council. This was, however, principally the path taken by the liberal reform wing of the *high science* members of the SRS movement, which based its thinking on the solvability of this contradiction in the context of the capitalist social order and was therefore by principle, anti-socialist and anti-Soviet. In 1938 — as leading articles in 'Nature' show — they even went so far as to equate fascism and communism and even before the war they tried to equate socialism, totalitarianism and repression by means of the Lysenko affair — without this wing, of course, stopping its practical political cooperation with the socialist and communist forces in the SRS movement.

But there was also the path of the workers' movement, which was taken by a large part of the SRS movement's members. They saw here the social force which seemed capable of solving this contradiction.

5. Syndicalization and politicization as collective processes require a high level of development in the socialization of science.

Solving problems on the path of collective syndicalization and political activation was a strategy in which the different currents of the movement were united. If this strategy was to be realistic, it would have to build on a minimum of science socialization and political organization. With its some 500 scientists, Cambridge concentrated more than 20 times as many scientists in one place as other British scientific institutions at the beginning of the thirties.

On the basis of this framework of socialization, a successful transition was made from socio-political dimensions of scientific work linked with general basic social or political conflicts (especially the fight against fascism and the threat of war) to organization: the anti-war group, not only of Cambridge scientists, the numerous antifascist people's front committees, the CP and Labour, the AScW, organizations through which, for the first time in the history of a capitalist country, a large number of scientists organized the socio-theoretical reflection of their mode of production and promoted the conscious commitment of science to the fight against fascism and war in conjunction with an antifascist, state monopoly reform fraction and academic *high science,* with its liberal traditions.

Apart from this, and perhaps even more importantly, was of course the fact that even in the thirties the SRS Movement, in taking its bearings from the workers' movement, concentrated on the constitution of this alliance, whose permanent objective and subjective foundations only exist today. In problems of scientific self-examination, scientific planning and the popularization of science, it caused conceptions and demands to emerge which even now remain forward-looking.