Needham, Anglo-French Civilities and Ecumenical Science

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NEEDHAM, BRITISH-FRENCH SOCIABILITIES, AND INTERNATIONALISM IN ECUMENICAL SCIENCE

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For scholars who are not specialized in studies about "Science and China", but who are concerned with science transfers between different cultural areas, Needham's prominent text is undoubtedly "The Roles of Europe and China in the Evolution of Oecumenical Science"[1]. Which intellectual and institutional trajectory lead to this text ? To elucidate some aspects of this question, the paper will be mainly focalised upon Needham's specificity among what Gary Werskey called "the visible college"[2], this group of leading British scientists who dedicated themselves to science and socialism; and, more particularly, about Needham's institutional commitment in Unesco, including the project of an "Scientific and Cultural History of Mankind" (called hereafter in this paper SCHM). To that purpose, the paper will try to understand the manifold connections which existed between the "visible college" and the French scientists with whom Needham and his friends shared many commitments.

Both these points are not much analysed in Werskey's book. His project was to write a collective biography of a small group of British scientists who, in the 1930s, claimed also for socialism, and he was then inclined to overestimate what these 5 scientists (JD Bernal, JBS Haldane, L Hogben, H Levy and J Needham) shared together, and to underestimate their differences and individual originalities, their relations with other colleagues (for instance PMS Blackett, EHS Burhop, M Wilkins, J Huxley, JN Pirie or JG Crowther) and their participation to international institutions or networks. Needham's worldview deserved a specific analysis for itself, and not as a mere variant of Bernalism.

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[1] Published in the Journal of Asian History, 1967, **1**,1.

[2] Gary Werskey : The Visible College. A Collective Biography of British Scientists and Socialists in the 1930s. London, Free Association Books, 1988.

"The Visible College" is mainly turned towards the participation of this social group within the British society. But what about the international networks with which Bernal worked since the 1930s, and which will be his main commitment in the 1950s (for instance the World Federation for Scientific Workers, WFSW) ? What about Needham at the Sino-British Scientific Commission during the War ? His struggle for an International Scientific Service ? What about professional sociabilities: visits and stays to foreign laboratories, International Council of Scientific Unions (ICSU) meetings, congress, etc. ? Such laboratories as in Cambridge in the 1920s and in 1940/42, or the French "College de France" in 1936/39 were intellectual melting pots, not only for an effective international scientific practice, but also for the emergence of new conceptions about the international fonction of science. Unesco, with Huxley and Needham, played the same part. Such places helped strongly Needham and others to change their views about science and about society.

Three sets of questions are discussed in this paper, though its frame is too restricted to pretend to be a systematic an exhaustive British-French collective biography.

Which are the various levels of international sociabilities between scientists, particularly for international cooperation and exchanges ? For the scientists under our scrutinity, how institutionnal and professional sociabilities combined with more ideological proximities and common participation to political or social organisations or international networks ? Which are the relative parts of social determinations, political wills, professional and intellectual interests, and historical contingencies ? Which is the root of the coherence (if any...) of their various commitments ? How to be involved in various networks may have produced new intellectual or political agendas ? What about the question of anti-Eurocentrism (in science as, more generally, in civilization), which was so much favoured by Unesco's atmosphere, and which has been the landmark of the encounter of Needham and Febvre ?

No collective biography has ever been written for the French scientists and socialists in the 1930s. Such a work would have tried to analyse the globality of the social, political and professional commitments of these scientists, and, using also Werskey's book, would have allowed us to perform a fruitful comparative British-French study. Some relevant books do of course exist, but either they analyse intellectuals (among which some scientists) as a whole and put forward their political commitments[3], or inversely they are mostly concerned by the fight of some phycisists for the

[3] See David Caute : The Fellow-Travellers. Intellectual Friends of Communism. New Haven and London, Yale University Press, 1988. - Christophe Charle : La République des universitaires, 1870-

institutionalisation of science[4]. Notwithstanding this absence, which similarities and convergences could be unvealed between the various commitments of prominent scientists from both sides of the Channel. Can we consider traditional explanations to be sufficient, such as social determinism (the growing part of science under capitalism drove in the 1930s some scientists - as a social group - to become politically active in order to gain their part within power) or political activism (the organised propaganda of communists among scientists to gain fellow-travellers for USSR and the Communist Parties) ? Our main interest is to follow the networks to which Needham participated with Bernal, Rapkine or F. Joliot-Curie. This is the way to evaluate the exact weight of crossed influences, to bring into light some possible common features of those scientists.

Among the "visible college", Needham has been the only one deeply involved in the building of an international scientific organisation (Unesco) and in various international professional activities, in opposition to Bernal, whose international commitments relied more on political basis. His Anglican devotion is well-known, as well as the way he always managed to conciliate spiritualism and marxism. It should be added that he appeared sometimes to be closer to Julian Huxley's "scientific humanism" than to Bernal's scientism. Huxley was the one who called Needham for Unesco, and they went on cooperating together with Unesco many years after the end of their official responsibilities. Their proximity lasted far longer than the alliance between socialist and liberal scientists, as described by Werskey. Needham has been also the only one among the "visible college" to participate to the Society for the Freedom of Science[5], a typical liberal association. Was he a liberal among the Marxists, or a Marxist among the liberals ?

Why Needham was the only member of the "visible college" who did not satisfy himself with a general rejection of European colonialism, but who effectively fight against Eurocentrism in science and in history of science ? Which part played his institutional activities in his intellectual trajectory and in the coherence of his commitments ? Another issue to be questionned is the attitude of Needham towards the Radical Science Movement[6] of the 1970s, as a consequence of his conception

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1940. Paris, Seuil, 1994. - Pascal Ory : La Belle illusion. Culture et politique sous le signe du Front Populaire, 1935-1938. Paris, Plon, 1994.

[4] See Spencer Wyart : Scientists in Power. 1979, Harvard University Press.

[5] William McGucken, "On Freedom and Planning in Science. The Society for the Freedom of Science, 1940-1946". In Minerva, 16, 1 (1978), pp.42-72.

[6] See for instance: - Hilary & Steven Rose, "Radical Science movement into the 80's", in Science for the People n°47, Autumn 1980, pp.10-13. - Hilary & Steven Rose (eds), The Radicalisation of Science. Ideology of/in the Natural Sciences. 1976, The MacMillan Press Limited, London and

of science. Even if in its first years the BSSRS thought to be some kind of a continuation of the "visible college", it appeared soon that the radicalisation of the 1970s was based on the criticism of science in itself, and not on the uses/abuses of science schemes (science being neutral-valued) which were underlying Bernalism. These movements were also a radical rejection of, socio-economism, the main ingredient of Bernalism. Some radical critics of the 1970s found echoes in some Needham's papers, even if science in China was spared from such criticism. He, at least, understood partly these radical critics, and cooperate with these movements[7].

My paper does not pretend to analyse all issues raised herebefore. I will concentrate upon the various levels of British-French connections and some of their consequences.

British-French Connections

The paper will follow individuals through their scientific and political, personal and institutional, official or unionist, commitments. In both British and French sides, stand mainly phycisists and biologists, with socialists commitments. J. Needham, J.D. Bernal, L. Rapkine, P. Langevin and L. Febvre are our main characters, with J. Huxley, J.G. Crowther, F. Joliot-Curie, P. Rivet and P. Auger in second line, and with many others in the backstage. Combining characters and chronology, nine scenes are introduced.

1- Needham and Rapkine: Professional, personal and intellectual connections (1925)

Joseph Needham, being at the center of this story, he is our first character, jointly with Louis Rapkine who was his main French partner. Their first encounter took place in summer 1925 at

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Basingstoke. - Hilary & Steven Rose, "The Two Bernals: Revolutionary and Revisionist in Science?" In Fundamenta Scientiae, vol.2, n°3/4, 1981, pp.267-286. - Gary Werskey, "Making Socialists of Scientists: Whose side is history on ?" In Radical Science Journal, 1975, n°2/3, pp.13-48.

[7] BSSRS stands for the British Society for Social Responsability in Science, founded in 1969. Joseph Needham adressed the BSSRS 10th aniversay meeting in 1979, about his movements in the 1930s. See also the chapter 5 (written by Needham) in Roses (1976), op. cit., and Joseph Needham, "An Eastern Perspective on Western Anti-Science", in Joseph Needham, The Moulds of Understanding, New York, Saint-Martin's Press, 1976, pp.295-304.

Roscoff[8], where Dorothy and Joseph spent their holidays and met physiologists, among whom Louis Rapkine[9], René Wurmser, Marcel Prenant, etc.

Needham[10] has been initiated to Marx through Rapkine, discovering new perspectives: "Our discussions considerably opened the perspective of people who grew up in the somehow insular, or at least cramped atmosphere, typical of England in general and Cambridge in particular. He gave us some indication of what could be life for people who, by accident, came into the world in East-Europe countries where living standards were much lower than in the West"[11].

As Needham, Rapkine never joined the CP, and always claimed for a "spiritual" (or ethical) dimension of his commitments, refering to Spinoza as a Jewish philosopher[12]. During the 1926 general strike in Britain - when Needham substituted train drivers on strike - Rapkine[13] expressed his horror behind the risks of a bloody revolution. If the rotten social system should be changed, he refused the streams of blood: "to kill one's fellow-being is never justified". According to Needham, Rapkine has been always sympathetic to the British "science and society" movements[14]. Bernal's, Needham's and Rapkine's roads will crossed many times till 1948.

After Rapkine's death, two memorials were organized in London[15] (09/03/49, by SVS) and Paris[16] (13/10/49, by ATS[17]), gathering the main characters to be met in our story, official

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[8] See Henry Holenrenshaw, "The Making of an Ordinary Taoist", in Mikulas Teich & Robert Young, Changing Perspectives in the History of Science: Essays in Honour of Joseph Needham, London, 1973, p.8. Roscoff is a marine biological station in Britany.

[9] Many dozens of letters from Rapkine to Needham, since 05/09/25, are conserved in the Pasteur Institute in Paris (Rapkine archives).

[10] Joseph Needham, "Science and Politics", in Ben & Viviane Karp, Louis Rapkine, 1904-1948, North Bennington, Vermont, The Orpheus Press, 1988, pp.91-94. Born in a labour family, which emigrated from Bielorussia to Canada, Rapkine went to France in the 1920s with a Rockefeller grant and took French nationality in 1939. He kept in close relations with Needham until he died in december 1948. He visited Needham's laboratory in Cambridge for the first time in january 1926.

[11] Joseph Needham, speech delivered to the memorial meeting for Louis Rapkine, Association des Travailleurs Scientifiques, Paris, 13/10/49 (Needham archives, Cambridge Library, J184).

[12] Needham in Karp (1988), op. cit., pp.91-94.

[13] Needham to Rapkine 05/05/26 and Rapkine to Needham 17/05/26. Rapkine archives, Pasteur Institute.

[14] Joseph Needham in Karp (1988), op. cit., pp.91-94.

[15] Needham archives, Rapkine Fund, J180/J182. SVS is the Society for Visiting Scientists; see hereafter.

[16] Needham archives, Rapkine Fund, J184. ATS is the Association des Travailleurs Scientifiques; see hereafter.

[17] In the physiologist connection we should notice Brachet (from Belgium), who worked with Needham, then co-operate with him in Unesco, and joined the Belgian CP in 1944. Two other

representatives of scientific institutions like the French CNRS, etc. A Rapkine Fund has been instituted after London memorial.

Going from one ground to another, from professional to personal, from social to intellectual, and opening to new connections with other scientists, the relations between Needham and Rapkine have probably the most inventive of our story.

2- Langevin: International and institutional connections, and China (1931)

Moving to another scene - international institutions - the next characters to be called for are Paul Langevin and JBS Haldane who attended in may 1933 a meeting in Madrid to discuss about "High Culture and the Emergence of an Universal Moral". Marie Curie, Miguel de Unamuno, Paul Valery were among other participants. The function of science was discussed there, and replying to Haldane who denounced the negative effects of science, Langevin explained that science brings also remedies to the harm[18].

Madrid meeting was organized by the "Intellectual Cooperation Organization"[19], the Unesco antecedent between the wars, attached to the League of Nations. But for Gilbert Murray, the British participation to ICO was week: it was French-dominated, either by the personnalities involved, but even more by its general conceptions about intellectual, cultural and scientific international cooperation. The IIIC was the main channel for activities: regular meetings, books, anuaries (about education, litterature, museums), etc., so as to develop a "Society of Minds", as Paul Valéry called it, independent of all governments. Such a Society should be a strong incitation for peace. Science was not much considered, but as an intellectual activity. Needham, in his general survey of scientific international relations[20], drew, in a few lines, a very severe appraisement of the ICO action.

French physiologists regularly crossed Needham's route: Wurmser (especially in helping scientists escaping from Nazism) and Henri Laugier (for Unesco).

[18] Manuscript of Langevin's talk in Langevin archives, ESPCI-CHR (179/22), Paris. As soon as 1933, two years after his mission to China, Langevin put into light some ideas which will become familiar with the "Scientific and Cultural History of Mankind" project: no culture can escape from mutual influences; the planet is becoming smaller and smaller because of the new means of communication; China is an "admirable country: There is between China and us, and more generally between Far-East, including India, and us possibilities of mutual enrichments".

[19] ICO was mainly composed of a Commission within the League of Nations, the International Institute for Intellectual Cooperation (IIIC), and the International Bureau for Education. The Commission was composed by high intellectuals, such as Marie Curie and Albert Einstein.

[20] Joseph Needham, Science and International Relations, Blackwell Scientific Publications, Oxford, 1949, p.14, which is a revised version of the 1948 Boyle Conference. See also Unesco/Prep. Com./Nat. Sci. Com./12, july 1946 "Taches et fonctions de la section des sciences", p.24. Some authors are more indulgent: see Brigitte Schroeder-Gudehus, Les scientifiques et la paix, Presses

The Institute was terribly elitist, and mostly concerned with Western intellectuals. Western civilization was the model. This has been criticized in the 1920s by Bannerjee[21], its Indian member: the Commission's conception of culture was supposed to be universal, but was in fact purely European, and Bannerjee proposed, without success, that the Commission should pay much more attention to non-European people. The only significative action undertaken by ICO was the mission to China in 1931 (october to december) in ordre to expertise the educational problems, with Langevin, C.H. Becker (Berlin), M. Falski (Poland) and R.H. Tawney (London)[22]. Langevin has been particularly in charge of the universities and their laboratories. This mission was followed for some years by exchanges of University professors[23].

Langevin came back with enthousiastic descriptions of Chinese civilization and people. He was worried about the risk of a cultural colonisation, mainly by North-America. He insisted upon the necessity of a new kind of civilization, a Chinese road making a synthesis of traditional civilization and modern science, a road that refuses the American way as well as the European way. Chinese pupils must take the time to assimilate their own culture and to return to the origin of knowledge, without limitating themselves to the useful applications of modern science. For Langevin, China has to learn how to use "the powerful instrument for material and spiritual liberation that scientific methods constitute"[24].

Introducing Langevin into our story gives the way to Lucien Febvre with whom he cooperated within the CIS, the "Semaines de Synthese" and the Revue de Synthese (1930). Febvre was in charge of social sciences and Langevin of exact sciences. The unity of natural and social sciences, together with the conception of science as the basis for a general intellectual synthesis, were the two main guide-lines of CIS. Berr and his colleagues engaged the edition of a general

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Universitaires de Montreal, 1975. For her, the IIIC did not want to concurrence the International Council of Scientific Unions, with which an agreement was only signed in 1937.

[21] Schroeder-Gudehus (1975), op. cit., ch.V.

[22] See the mission's report, 1932, IIIC publications.

[23] L'Année de la Coopération Internationale, 1932, onwards. See also Pham-ti Tu, La Coopération intellectuelle sous la SDN, Droz, Genève, 1962.

[24] See the report. See Bernadette Bensaude-Vincent, Langevin. Science et vigilance. Paris, Belin, 1987. His ideas about the Chinese road to modern science and civilization were not so common in 1931, the year when colonialism was at its zenith in France with the great colonial exhibition. See also "European Scientific Thought", manuscript of a conference delivered in Pekin (1931). Langevin archives, ESPCI-CRH (178), Paris. About the evolution of civilizations, Langevin was still influenced by the discussions in the "Centre International de Synthèse" (CIS), founded by Henri Berr (1925), with Lucien Levy-Brühl (The Primitive Thought) and Henri Berr.

history of humankind, many years before Unesco's project. This history valued science, but only as the higher intellectual activity, the so-called Greek miracle founding a new (European) civilization.

Significatively, Langevin also cooperated with the Encyclopédie française, managed by Febvre since 1933. Two other characters of our story were among the main collaborators: Paul Rivet and Jean Perrin. The model was Diderot's Encyclopaedia. Science had the main part as the unifying factor. The aim was to emancipate the masses by a cultural and scientific training, to awake a critical sense. Langevin and Febvre shared the same cult for living science and humankind[25].

With Unesco, institutional international cooperation will take another direction. Needham will symbolise a triple move: from the French to the British , from intellectuals to scientists, from Eurocentrism to World-views. Two branches of knowledge became closer, Langevin moving from science to philosophy, and Febvre moving symmetrically. Ten years after, in another institutional frame, in another political context, Needham and Febvre moved similarly one towards the other, giving birth to a new Encyclopaedic project, SCHM.

3- Against war and fascism. Political connections (1934/1936)

Now is the time for John Desmond Bernal, Paul Rivet and Federic Joliot-Curie to join our company. To fight against the rise of fascism, the "Comite de Vigilance des Intellectuels Antifascistes" (hereafter CVIA) was founded in april 1934, on a basis of an "appeal to workers". But it rapidly functioned as the "popular front" of French intellectuals, with Langevin (representing the communist influence, though he only became a party member in 1944) and Rivet (for the socialist influence). CVIA immediately rose a big interest among British left scientists who just came into power in the Assocation of Scientific Workers (herefater AScW) and launched the Cambridge Scientists Against War Group (hereafter CSAWG)[26]. Bernal's first travel to Paris to meet Langevin[27] and F. Joliot-Curie took place in 1934. Refering to CVIA, back to London, he participated to the constitution of the "Society for Intellectual Liberty", more turned towards writers[28] (Virginia Woolf)

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[25] Selon Bensaude-Vincent (1987), op. cit., ch.X.
[26] Werskey (1988), op. cit., pp.234-236.
[27] Bernal, preface to: Pierre Biquard, Paul Langevin, scientifique, éducateur, citoyen, Paris, Seghers, 1969, p.5.
[28] Biquard (1969), op. cit., p.5. See also the speech delivered by Bernal to the memorial meeting for Langevin (London, 23 and 25/05/1947, organized by the AScW, the SVS and the WFSW), pp.16-19. Langevin archives, ESPCI-CRH (112/16), Paris.

and less politically committed than CVIA. In november 1934, in their letter[29] to Nature, C.B.O. Mohr and N. Wooster referenced CVIA as an example to fight against war and to analyse science relations with war. In 1936, a delegation was sent to Paris to establish a common fight against fascism and war.

CSAWG gained audience and credibility in testing the evacuation plans in case of bombings, and the efficacity of gaz[30] masks provided by the army. Such a scientific expertise lead CSAWG to become an official partner for governmental agencies. In that, CSAWG referred to the scientific part played by Langevin during the 14/18[31] war: population has to be protected as much as possible from the effects of massive destruction weapons. In that also, CSAWG prepared left scientists to participate to the national effort for war: as for Langevin, J. Perrin or F. Joliot-Curie, there were no ideological or political bareers providing them to join the national efforts.

In 1936, Langevin was sent to London by the "Comité mondial de lutte contre la guerre et le fascisme" to develop solidarity with Spain, and to try to convince British authorities to intervene on the Republican side. The "Society for Intellectual Liberty" relayed his action[32]. The "Comité mondial..." organized (Paris, september 1936) an international conference for solidarity with Spain, for which Bernal was chosen as co-président[33]. Langevin introduced Bernal to this Committee[34].

With other associations - among which the Royal Society - the AScW also helped to receive in Britain European scientists flying from fascism expansion. In Paris, Rapkine founded the "Comité d'accueil des savants étrangers" in august 1934, et got in touch in 1937 with the British Academic Assistance[35]. He also met Bernal several times in 1938/39 for these actions[36].

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[29] This letter is quoted by EHS Burhop, "Scientists and Public Affairs", in Maurice Goldsmith & Alan MacKay, The Science of Science, London, Souvenir Press, 1964, p.34. Mohr and Wooster were active members of AScW.
[30] Werskey (1988), op. cit., pp.234-236.
[31] Speech delivered by Bernal to the memorial meeting for Langevin (London, 23 and 25/05/1947, organized by the AScW, the SVS and the WFSW), pp.16-19. Langevin archives, ESPCI-CRH (112/16), Paris.
[32] Langevin archives, ESPCI-CRH (30), Paris.
[33] Langevin archives, ESPCI-CRH (32), Paris.
[34] Bernal, preface to: Michel Rouze, Frédéric Joliot-Curie, Paris, Les Editeurs Français Réunis, 1950.
[35] Needham, speech delivered to the Rapkine memorial meeting, ATS, Paris, 13/10/49 (Needham archives, J184).
[36] Louis Rapkine to Sarah Rapkine, Rapkine archives, Paris.

This period had two main characteristics: - political connections were deeply attached to professional links, and rooted into professional associations or institutions; - it gave birth to "popular front" movements[37], like AScW, the Division for Social and International Relations in Science (within the British Association for the Advancement of Science- hereafter DSIRS-BAAS) or, in a way, Nature, in Britain - or CVIA and "Jeune Science" in France.

4- "Palais de la Découverte" (1937). Building scientific institutions. Scientism and Bernalism.

Now, the phycisist Pierre Auger and J.G. Crowther make their first appearance in our story, where Bernal and Langevin are standing in front. French and British scientists acted simultaneously for the defense of science, for its popularization and for its organisation. These three levels were present with the creation of the "Palais de la Découverte", which followed the same tradition than the French Encyclopaedia, or than Langevin's activities in the popular education movements. IICI, CIS and the Encyclopaedia were the main partners. Dedicated to the popularization of science and built for the International Exhibition of 1937, the Palais was actually the temple of science and modern rationalism . At this occasion, a large scientific conference, with many disciplinary congresses, was organized. Among the Official Committee, we found Langevin, J. and P. Perrin, Wurmser, Auger and F. Joliot-Curie. Needham for the biology congress[38], Bernal and Crowther were among invited British scientists. A "month for intellectual cooperation" was also organized: meeting of the "Society of Minds", conference of national commissions for intellectual co-operation, etc.

Propaganda for science was the main task of the Rationalist Union[39], a movement to which Langevin and Bernal participated. Langevin was to deliver three conferences in 1939 for the Union, the first having for subject "relations between science and general activities". He began by saying that he just received "the beautiful and voluminous book from my friend Bernal. (...) I started reading it, and it looked so important to me that I held for bringing your attention to it. I found its introduction

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[37] Werskey (1988), op. cit., pp.237-248. F. Joliot-Curie joined SFIO (Socialist Party) in 1934, the left it in 1936 because of the Party's refusal of an intervention in Spain. He joined the Communist Party in 1942. See Pierre Biquard, Joliot-Curie, Seghers, Paris, 1961.

[38] Needham archives (H32-H34). See also Bensaude-Vincent (1987), op. cit., ch.X.

[39] Founded in 1930 by Henri Roger, Ernest Kahane et Henri Laugier. Langevin has been the Président. Bernal was member of the Honorary Committe. The Union paid its tribute to Bernal after his death with a special issue of Cahiers rationalistes, december 1971, n°287, with various papers from Bernal and a biography by Alan MacKay.

so interesting and so linked with what I intended to speak of, that I took it as my guide"[40]. And Langevin went on his conference by translating Bernal's introduction.

French scientists actively participated to the political struggle[41] for the organization of scientific research. Their British colleagues, who were confronted with shortage of money since the 1929 crisis and governmental desinterest, admired the results of this struggle[42], especially Irene Joliot-Curie's participation (for some weeks; then substituted by J. Perrin) to the Popular Front Government: the presence of a Nobel Price within the governement appeared as a unreachable dream for British scientists.

Bernal often claimed for sharing the same ideas as Langevin[43]: "As far as social implications of our work were concerned, Langevin and I followed identical roads, and I always remembered his words: if we are not doing our scientific work, somebody else will do it, but if we neglect political action, soon science will disappear". Langevin has been long known in Britain, since he worked in the Cavendish laboratory at the end of the 19th century. His scientific results being famous, his British colleagues were attentive to his social and political commitments. Langevin's influence upon Bernal "was decisive. It was a considerable help to see such a notorious and famous scientist to express so definite social ideas (...). Langevin's ideas became progressively a gathering point for British and French intellectuals fighting against Fascism"[44]. Langevin's influence concerned also the national organization of science, and the articulation that he made between scientific and social or political commitments.

A national homage to Langevin and J. Perrin was organized in Sorbonne and in Pantheon on the 15/11/1948: Bernal was the only foreign scientist to talk there. Besides, another colloquium was held in the "College de France", about the organization of scientific research[45]. Bernal presided the

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[40] Conference manuscript. Langevin archives, ESPCI-CRH (179/15), Paris. Bernal's Social Function of Science (1939) has never been translated in french, which is a strong limit for the influence Bernal and his friends claimed to have had in France. Passages from the translation (by Langevin himself) of the introduction have been published in Cahiers rationalistes n°75, 1939, pp.114-134. Langevin translate also another Bernal's paper, "La Science et le sort des hommes", in La Pensée, n°5, octobre-decembre 1945, pp.129-132.

[41] Jean-François Picard, La République des savants. La recherche française et le CNRS, Paris, Flammarion, 1990.

[42] JG Crowther, Fifty Years with Science, London, Barrie & Jenkins, 1970, pp.183-187.

[43] JD Bernal, preface to: Pierre Biquard (1969), op. cit., p.6

[44] Ibid, p.7

[45] Langevin archives, ESPCI-CRH (112 for the official session, and 112/28 for the colloquium), Paris.

first session, and F. Joliot-Curie the second one: a symbol of the British-French connections for the organization of science.

5- Scientific mobilisation for war, and national unity (1939/1945).

The stage of our story moves now to London, and more precisely to a "dining club", the "Tots and Quots"[46], in which since the 1930s, Solly Zuckerman gathered some twenty young scientists from various ideological horizons, "a stimulating society for exchanging scientific ideas and news, and deepening scientific friendship"[47]. Among guests: Bernal, Crowther, Waddington, etc. The scientific mobilisation was the scientists' agenda for both sides of the Channel in 1939. The CNRS[48] is constituted for that. The "Tots and Quots" concentrated upon war and science and, when a French delegation (with Langevin and Auger among others) arrived in London on february 1940 in order to strengthen scientific cooperation during the war, it is naturally invited to the Club. The impreparation of French scientists to war left a desastrous impression. The French scientific attache gained a permanent invitation to the Club. As "the anxiety among the younger scientists was even greater"[49], Crowther is sent to Paris to constitute a British-French scientific co-operation committee. At the turn of April 1940 Crowther met in Paris the Joliot-Curies, Langevin, F. Perrin, Laugier, Auger... The Anglo-French Society of Sciences was then founded and completed at Crowther's return to London. Dirac and F. Joliot-Curie were co-presidents, Crowther and Auger general secretaries; and Langevin, Laugier, Rapkine, F. Perrin, Wurmser, I. Joliot-Curie, Bernal, Haldane, Blackett, Zuckerman were among committee members[50]. Physicists from both sides were dominant, with a few physiologists brought by Rapkine, but neither Needham nor Huxley seemed to have participated, and Haldane joined later. Bernal presented this society as a result of the will of "young scientists who began to think that science should play its part in the resistance against the military strength of Nazis"[51], and thus to supply official but dying out relations which were dominated by conservatives. Rapkine is

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[46] Solly Zuckerman, Scientists and War. The Impact of Science on Military and Civil Affairs, London, Hamish Hamilton, 1966. Crowther (1970), op.cit.

[47] Crowther (1970), op. cit., p.211

[48] CNRS was founded in october 1939 and assumed all tasks for scientific mobilisation, as defined in july 1938 and precedently assumed by the "Haut Comité de Coordination" which J. Perrin presided. See Picard (1990), op. cit., pp.72-84.

[49] Ibid, pp.213-215.

[50] ibid, p.218.

[51] Rouze (1950), op. cit., preface.

sent to London in may 1940 to organize the reception of French scientists, but the French defeat in june stopped the action of the Anglo-French Society.

Professional connections brought Joliot-Curie's collaborators, Halban and Kowarski, to leave France for London on the 18th of june, with the French heavy water stocks. Laugier and other scientists sought refuge in London. But after the Anglo-French naval battle of Mers-el-Kebir, Rapkine and Laugier left London for the USA. With the help of Laugier for some months, and with fundings from the Rockefeller Foundation, Rapkine helped to save 40 from the 57 French scientists who were considered being in danger[52]. "The great figure that emerged in that time was Louis Rapkine"[53]. A few months before D'Day, the British-French stage revived with the same characters.

Rapkine is back to London in september 1943. According to Crowther[54], he was the one who called for Rapkine, to help in the animation of the new "Society for Visiting Scientists", dedicated to support exiled scientists or visitors, among them the French Londoners. But Rapkine soon took the direction of the French scientific bureau in London, in charge of the rehabilitation of French science. After Liberation, he organized exchanges between laboratories and sent many British scientists to Paris to deliver conferences[55] (Dirac has been the first lecturer and Crowther the second one, in december 1945) for raising the academic level of French scientists emerging from isolation.

During summer 1944, F. Joliot-Curie plied again between Paris and London, and Crowther tried to revive the Anglo-French Society, which held its first conference[56] in London (january 1945) with Rapkine, Auger, F. et I. Joliot-Curie, F. Perrin, Bernal, Haldane, Blackett, Crowther, etc. But, as many of such Anglo-French societies launched with the enthousiasm of the end of the war, this Society had no future. Rapkine went definitely back to Paris at the end of 1945 to create his own laboratory at Pasteur Institute. After having obtained from Rockefeller Foundation a 350,000$ gift for the reconstruction of CNRS, Rapkine concentrated upon his professional activities[57]. F. Joliot-

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[52] Obituary of Louis Rapkine in Nature, n°191, by Crowther
[53] Crowther (1970), op.cit., p.218.
[54] ibid, pp.241-242
[55] ibid, pp.264-270
[56] ibid, pp.261-262
[57] Rapkine to Biquard, 30/10/46, in which he explains his will to limitate to his scientific activities. Biquard archives (8/1), ESPCI-CRH, Paris.

Curie has also been deeply engaged to the reconstruction of French science, CNRS in 1945 and the newly born CEA in january 1946[58].

Science at war, and the national reconstruction, drove the left scientists to a complete integration within the State scientific institutions, where they played a major role. Bernal with Moutbatten, Needham in China, Crowther at the British Council, Rapkine in French bureaus abroad, F. Joliot-Curie, Febvre and Laugier in CNRS. What was left as a socialist perspective ?

6- Putting an "S" in Uneco (1943/1945)[59]

Julian Huxley is the last one to join our company and he stays in front line with Needham and Febvre till the end of our story.

Between 1943 and 1945, Needham published three memoranda[60] about international scientific co-operation, which he had the opportunity to put into practice with the science division which he headed between 1946 and 1948. CAME[61] was trying to built a post-war organization dedicated to the reconstruction of education in former occupied countries, which enlarged to culture. But science was only considered as part of education and cuture, without specific approach. Applications of science were left to another UNO's agency. Needham opposed these conceptions, and argued for the inclusion of science in the future organisation.

Needham refused to split applications from pure science, and refused also a separate science agency which would lack all credibility[62] facing governments and which would weaken the scientific unions itselves. Needham proposed for the first time to include an 'S' in UNECO in some letters[63] he

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[58] Biquard (1961), op. cit., p.85. The orientation was the same as in 1939: scientific research is the basis for both knowledge and industrial development. CEA: Commissariat à l'Energie Atomique.
[59] About Science and Unesco, the most recent reference paper is: Aant Elzinga, "Unesco and the Politics of International Cooperation in the Realm of Science", in Patrick Petitjean (ed), Les Sciences coloniales, figures et institutions, ORSTOM Editions, Paris, 1996. This is the second volume of the proceedings of the ORSTOM Conference "Twentieth Century Sciences: Beyond the Metropolis" (Coordination: Roland Waast)
[60] Memorandum I, Chungking, July 1944: "On an International Science Cooperation Service" - Memorandum II, London, December 1944: "Measures for the Organization of International Cooperation in Science in the Post-War Period", addressed to the British Parliamentary and Scientific Committee - Memorandum III, Washington, 15 March 1945, revised Chungking, 28 April 1945: "The Place of Science and International Scientific Cooperation in Post-War World Orgnization".
[61] CAME: Conference of Allied Ministers of Education (British dominated).
[62] Needham (49), op. cit., p.21.
[63] Needham archives (D8, D9, D10). First version is in D10. Kefauver has the responsibility for the UNECO project.

sent at the end of february 1945 from the USA, before leaving on march 19 for China. Among addessees were H. Dale, F. Joliot-Curie, Kefauver, etc. He wrote then the first short draft of his third memorandum, on march 15. CAME only created a science commission, whose general secretary was Crowther. Various CAME commission or plenary meetings[64] refused this 'S' during spring 1945, as well as the San Francisco conference. From China in april and may 1945, Needham sent the final version of his third memorandum to hundreds of scientists and politicians through correspondents like Crowther and F. Joliot-Curie. In his way from China to Moscow, in june 1945, for the 220th aniversary of Moscow Science Academy, he met the American delegation on Teheran Airport. This encounter was, according to Needham[65], essential to convince his American colleagues. In Moscow, F. Joliot-Curie was also there with an important delegation of French Academicians, Huxley and Bernal[66] with British ones. Probably Hiroshima bombing has been the decisive argument for the 'S'. Rapkine, in London, received the first and the third memoranda, but F. Joliot-Curie was the one[67] chosen to dispatch it in France.

Needham's strategy clearly appeared in a letter to Joliot-Curie[68]: After having met him in London, when arriving at the beginning of 1945, Needham realized that UNECO project was closed to come. He was consulted about the ability of such an organism to act as the international scientific service he proposed in his memoranda, and answered positively with two conditions: that science appears in the name, and that applications of science should be considered as well as pure science. And he transmitted to authorities a complete list of scientific activities to be included in the future organism. But Needham felt that many difficulties were present in Britain, and asked Joliot-Curie for some help. "Lately, I tried to influence politicians and scientists in order to obtain a full and fair participation of science in this organisation. I rely on you to do whatever you can in the same purpose (...) I am writing on the very same day to Sir Henry Dale, Sir Richard Gregory, Pat Blackett and Darlington with the same demands. But I have one more thing to say. An organisation for international scientific co-operation, which would gave us this supra-national loyalty we are all

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[64] Needham archives (D11 and D16).
[65] Needham (1949), op. cit., p.21
[66] Maurice Goldsmith : Frederic Joliot-Curie, Laurence & Wishart, London, 1976, pp.174-180. Goldsmith argues that the WFSW has been conceived during Moscow festivities.
[67] Needham to F. Joliot-Curie, 19/05/45. Needham archives (D25)
[68] Needham to F. Joliot-Curie (letter in French), 01/03/45, from Washington. Needham archives (D9). The following quotations are taken from this letter.

looking for, is here now in statu nascendi. But to this initiative from Washington, don't we prefer other initiatives to be added ? I mainly thought of USSR. I think that active co-operation with Russians is one of the main problems we have to face. With the Washington "leadership", we hope another "leadership" from Moscow. For this point, you appear to me to have a special position. Your relations with Russians must be excellent. You also represent the West continental science. I am wondering whether it would not be possible for you and me to travel to Moscow, invited by Russians, to explain the historical opportunity for an important "leadership". We will have to explain to Russians all the advantages they will drew from their participation to Unesco. I already gave to M. Paniushkin, their ambassador, a copy of my first memorandum. But a personal contact is now necessary. Without it, Unesco would become as uneffective and limited as the UNRRA.

As you may have noticed, British opinion is somehow divided between youngsters and elders. Sir Henry Dale, A.V. Hill, and alike, whatever they formerly say for the international scientific co-operation, are so sceptical about any organisation that they do not actually favourish my proposal of an international service. On the opposite, Blackett, Darlington, and all the group of scientists under 50, who besides are beginning to dominate the Council of the Royal Society, completely agree which such a service. (...) Meanwhile our Louis Rapkine will always inform you of what is happening in London".

It is true that Dale did not seem to value Needham's activism for international scientific co-operation: he judged poorly the telegram that Academia Sinica sent to CAME to support Needham's proposals; he encouraged Needham to better stick to his scientific activities in China, rather than trying to be the Maestro for international science[69]. After receiving the third memorandum, Ernest Baker also kept Needham at a distance: yes to his service, but only outside Uneco[70]. Huxley[71] supported Needham's thesis and even proposed the British government to call for him as scientific adviser. What Werskey called the scientific popular front, the alliance between radicals and liberals, was effective, through Needham and Huxley, for Unesco foundation, and will last some years.

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[69] Sir Henry Dale to JG Crowther, 24/05/45. Needham archives (D17).

[70] Sir Ernest Baker to Crowther, 10/08/45. Unesco archives, CAME Correspondence IV

[71] Huxley to the Foreign Office, 14/08/1945. Letter reproduced in Le Courrier de l'Unesco, 36e année, n°10, oct.1985, pp.23-26. Huxley explicitely supports Needham's idea for the 'S', for science has to irrigate education and culture, et has not to constitute a separate organization. "I would venture to suggest that Dr. Joseph Needham, FRS, now head of the British Mission to China, could be secured for a few months for this purpose" (scientific adviser to the Government to prepare the conference).

During the London Conference, Nature[72] published a file about Uneco (still the official title), with papers from EF Armstrong, Huxley, Crowther, Bernal and Needham. Sometimes before, Gregory, the Editor, showed his support to Needham after the first memorandum[73]. Nature[74] have also pubished an editorial and a sumary of this memorandum.

Notwithstanding Needham's speculations, F. Joliot-Curie has not been much involved in Unesco. Though member of the French delegation to the London founding Conference, and then Vice-President the French National Commission, he did not seem to have been an active participant. He considered Unesco to be too much under the dependence from USA. For him, the international unity of science was expressed through WFSW far better than through the inter-governmental cooperation within Unesco[75].

The French delegation to the London conference was headed by Leon Blum, former Prime Minister of the Popular Front Government, leader of the SFIO. Laugier as the deputy and Febvre as member, were among the delegation. Laugier opposed the American-British project, and proposed to keep the former IIIC as an autonomous body of intellectuals, to reform it and to give it much more fundings (which was seen as the main problem). The balance of power after the war was not in favour of French proposals, and the American-British project was kept, with minor modifications.

Being in China, Needham was unable to participate to this conference, though he tried hard to be invited[76]. But his ideas about the function of science in such an international organisation triumphed. Without surprise, he was called by Huxley (who took his position as President of the Preparatory Commission on the 01/03/46, and was elected as the General Director at the first assembly) when he was still staying in China, to organize the Science division in Unesco. It

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[72] Nature, n°3967, 10 Novembre 1945, vol.156, pp.553-561. Needham's paper is a sumary of his 3rd memorandum, with the title "The Place of Science and International Scientific Cooperation in Post-War World Orgnization". The editorial in Nature of 06/10/45 already upported Needham's proposals.

[73] Needham archives (D4).

[74] Nature, n°3917, 25 November 1944.

[75] Goldsmith (1976), op. cit.

[76] Needham to Crowther, 05/08/1945. Needham archives (D19). Neeedham just learned the decision to hold the Uneco conference on November the 1st. He wants to attend it to provide science an important part in Uneco. He is sure that Dale and Hill will do every thing to prevent him to participate to the conference. He asks to Crowther to call for the support of Huxley, Blackett, Darrlington, Bernal and some friendly diplomats to help him. Without success...

necessitated plenty telegrams[77] from Dorothy Needham and Huxley in february and march to get in touch with him. Needham only came back to Britain at the end of april 1946.

Unesco moved to Paris in september 1946, just before the first general conference (Paris, november). Febvre, a friend of Leon Blum, actively participated, unlike F. Joliot-Curie, to the building of Unesco from London conference onwards. Febvre was in charge of analysing Huxley preparatory report in october 1946 for the French national commission[78]. He particuarly analysed the 1947 programme for social sciences. Febvre recused the proposed title (Humanités in the plural and in french - the meaning being different in english): To use this word is giving the priority to Greco-Latin sources for culture, and giving the privilege for Western civilization over others. It is "a risk to raise a suspicion", to be "a way to force the perpetuation of Western hegemony in culture[79]". The question of relation between cultures already lead Febvre and the French delegation to propose to London conference to think about the feasability of a "vast comparative enquiry about civilizations: the problem is to understand how, and from which common ingredients, a human culture could be built in the future, a human culture that will not be made of veneering and desguise"[80].

Unesco's orientation has been subject to controverse during its first years: To act directly, or indirectly for peace. Febvre shared the point of view according to which "to help the development of science and the progress of civilization, and to put their services for the disposition of masses by the mean of a good educational system, this is, at the same time, to move away from man the most dangerous of all plagues, war. Now, the ideal climate for an acting science, for an efficient civilization, for a civilization unable to mutilate the human being, it is liberty"[81]. Febvre thus support Unesco's priorities, refusing to limitate to direct propaganda for peace.

7- The Science Division (1946/1948)

Needham organisational program for international science was taking roots both the the scientific unions (ICSU), his model for peace times, and in the various bureaus built during war times. From the scientific unions, he retained the direct participation of scientists, as scientists. From

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[77] Needham archives (D25)
[78] Langevin archives, ESPCI-CRH (60/4), Paris: report, october 1946, to the national commission for Unesco, Lucien Febvre about social sciences. Called hereafter Febvre (1946).
[79] Ibid, p.10
[80] Ibidem
[81] Report by Febvre, in Notes et Études documentaires n°1080, 26 february 1949, pp.9-13, La Documentation française (documents related to the reception on 22/01/49 of Torrès-Bodet by the national commission for Unesco after Beyrouth conférence). Called hereafter Febvre (1949).

war committees, he took the high funding levels, the travelling facilities, the network of bureaus, and added the scientist autonomy from their government.

For Needham, the main utility for such an organization is not for Western scientists. The desire for exchanges grows stronger when one gets away from the main scientific centers. International is very different seen from the "bright zone" or from the peripheries. A laisser-faire policy can solve some problems, but exclusively from an Euro-American point of view. An international organization for science[82] is a necessity before all for less-advanced countries, and it concerns also a large part of Europe after war destructions.

"Together with what could be called the Unesco's "peripheral principle", through which one tries above all to help whom needs the most to be helped, that is the scientists beyond the "bright zone", one has to mention a corollary: no important intervention inside the "bright zone""[83]. According to Needham, it should be absurd to assign funds to help exchanges which may exist without these funds, and Western scientists, who fear bureaucracy so much, will be more at ease like that. The master word for Unesco Science Division is "to facilitate". Detailed proposals came after this general orientation.

According to Needham, the Science Division was then committed to organize scientific exchanges where and when they met difficulties. The Division was not suposed to bother with exchanges between European scientists, but was completely dedicated to organize exchanges between European countries and the Third-World. This was a strong affirmative action conducted by Needham and its collaborators[84], and its impact has been important. This period of Unesco has been a real melting pot of scientists from many cultures, producing a much creative and stimulating atmosphere. The SCHM projet was indeed in this continuity. But at the beginning of the 1950s (Torres-Bodet renouncement in November 1952 with of his staff members being the turning point) Unesco definitely falled into an administration without autonomy from governments.

When at the end of his mission Needham made the balance of what he tried to do, he let appear some bitterness about his colleagues: "I am frankly rather tired of the people who sit in their

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[82] Unesco/Prep. Com./Nat. Sci. Com./12, July 1946 , "Science and Unesco. International Scientific Cooperation. Tasks and Functions of the Secretariat's Division of Natural Sciences", p.8.
[83] Ibid, pp.8-9
[84] Within Science Division, according to Needham, one may encounter 5 Chinese, 4 Indians, 3 French, 3 British, 2 Argentins, 2 Brazilians, 2 Belgians, 2 North-Americans and 12 from other countries. See Needham (1949), op. cit., p.24.

laboratories and never give a thought for their colleagues at the other end of the world who are working in difficult conditions and even desperate need. If they were to travel about the world and visit the places which are really remote, those are the conditions they will find"[85]. It is an appeal for solidarity with far-living colleagues, and to put an end to "parochialism" among European scientists.

In fact, war committees proved rapidly not to be good models for science organisation in peace times, and fundings were far behind what was expected. The Science Division within Unesco did not develop as an international organisation for scientists, but as an inter-governmental agency for science. International idealism did not survive much Needham's departure from Unesco in mid-1948.

8- The "Scientific and Cultural History of Mankind" Project (1946/1951)

At the end of the 1940s, before the cold war, our company splitted into two branches with different kind of sociabilities and political dynamics. J. Perrin and Rapkine having died, Needham, Huxley, Rivet, Auger and Febvre chose a institutional scene, Unesco, when F. Joliot-Curie, Bernal and Crowther chose the communist-influenced WFSW. The SCHM project has been probably the most instructive achievement of Unesco first years. Between 1945 and 1951, in dozens of meetings, papers, letters, one can discover all contemporary debates about science and society, science and civilization, progress and peace, and above all the trial of Eurocentrism. This paper can not go into details, and our story will only catch the main proposals and the turning points.

Needham and Febvre, with Huxley and Rivet, were the main actors for the elaboration of the SCHM project. This idea to publish an history of humankind useful for the reconciliation between peoples, was one of the big project that gave Unesco its identity during its first years, when still existed the hope of a world without war - this hope vanished in the 1950s during the cold war - and when Unesco life was more dominated by intellectuals than by governmental representants. The authorship of such a project has been claimed, more or less strongly by Huxley, Needham, Febvre and Rivet, or have been attributed to them by some of their friends. Unesco official story retained Huxley's name as the one who proposed this history when publishing his intronisation booklet[86] when named president of the Preparatory Commission in march 1946. However, Huxley himself credited

[85] Needham (1949), op. cit., p.29

[86] Julian Huxley : Unesco: Its Purpose and Philosophy. Washington, Public Affairs Press, 1947. (first published in 1946 by the Preparatory Commission).

Needham for the idea[87]. As far as Febvre is concerned, he explained in 1949[88] that the idea came independently into the minds of an historian (himself), an ethnologue (Rivet) and a biologist (Julian Huxley). But Moraze[89] credited in 1956 Febvre for the proposal... It is true that encyclopaedical projects have numbered the years before, et Unesco's has only been the convergence of many former projects.

Febvre considered that the enquiry proposal about civilizations that the French delegation has made to London conference in november 1945 was the starting point of this "very important project, which is the history of pacific relations that, from their origins, human groups and societies maintained one with the other. To show that, from the most ancient times, men associated pacifically with other men, that they communicate one to the other - by exchanges and borrowings - their private wealth, whether tools, technical procedures, domesticated animals, bettered plants; that a whole network of pacifical relations never ceased to cover a world of which we only want to see its tearings; finally that there is no small people, no poor or indigent civilization which, once upon a time, had their moment of invention, and which somehow contributed to the edification of our big arrogant civilizations that, in fact, only live from their borrowings"[90]. Eurocentrism was in Febvre's lign of sight...

Febvre insisted during the meeting of the French national commission in october 1946 preparing the Unesco first general conference. The higher priority for Febvre is still the enquiry about civilizations: "Westerners can not consider to-day their civilizations as capable to conquest as such and without resistance all living groups of men - if such a conquest have ever been possible and legitimate. Entire parts of this civilization have been unsettled, discredited by the Westerners themselves. Because of this unsettlement, one can assist in the world to the awakening of numerous ethnic groups which possess original civilizations to which they did not want to renounce. An immense work of confrontation, or even opposition of these civilizations and of what the West calls the civilization, and which is in fact its own civilization, has begun. Unesco has to take the direction of this work, to organise it on the scientific and desinterested level[91]".

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[87] Julian Huxley, Memories II, London, George Allen & Unwin Ltd, 1973, p.54.
[88] Febvre (1949), op. cit.
[89] Charles Morazé, Lucien Febvre obituary, in Cahiers d'Histoire mondiale (1956), vol.III, pp.553-557
[90] Febvre (1949), op. cit.
[91] Febvre (1946), op. cit., p.18.

The French delegation to Paris conference proposed then to initiate such an enquiry. But in fact it took one more year to see the project adopted by the Mexico conference in december 1947. The decision was taken to launch preparatory studies to publish books for scientists as for ordinary readers, "allowing a better comprehension of scientific and cultural dimensions of the history of humankind and showing the mutual dependency of peoples and cultures, and their respective contribution to humankind commmon patrimony"[92].

Nothing happened before summer 1948 when Huxley organized some internal meetings and called for an expertise group[93] to put the decision into operation. Auger had succeeded to Needham as Head of the Science Division. On october 25 and 27, Unesco direction (among whom Huxley and Auger) met with Needham, Febvre, Taha Hussein, Salles and Burckhardt. Despite of Needham, the group, following Febvre and Auger, gave priority to a synthesis work for scholars from which other volumes may be drawn for the public. Febvre and Huxley refused an encyclopaedia to make the balance of scientific knowledge about civilizations, prefering a work which unitary aspect would be given by a point of view and not by a political doctrine: human fraternity. This would give a sense and an aim to the project. The first draft of a plan is written for the Beyrouth conference, with the will to put into light all that concerns exchanges between nations, their common elements and the interactions produced by scientific and cultural factors. The project would show the tendency of the modern world towards unification and integration into relief.

Unfortunately, the affair turned wrong during Beyrouth general conference (november 1948) when both sub-commissions "exact and natural sciences" and "Cultural matters" met. Despite of the presence of Rivet, Febvre et Needham, and because of USA and Norway obstruction, a compromise resolution was adopted from an Egyptian proposition. The experts' project appeared to be too much political, too much ambitious and too much costful. The situation was more favourable during the general conference itself, and the project finally adopted. Needham, who is sent to Beyrouth by

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[92] Meeting of the SCHM committee, 26/07/48. Unesco archives, SCHM8 (2.31(2)). In the following meeting, on the 29/09/48, Huxley stressed the same idea: the book have to insist "upon the part played in history by discoveries, inventions, new ideas; upon the production of new ideas by new facts, and of new facts by new ideas; upon the consequences of exchanges between peoples in that field". Unesco archives, SCHM8 (2.31(2)).

[93] The session records, the experts' final report and the draft of the document for Beyrouth are in Unesco archives, SCHM7 (2.31(1)).

WFSW and no by his government and who fight for this project, has been disavowed by his British colleagues[94].

In spite of Febvre's and Rivet's enthousiasm, Beyrouth conference[95] (where Torres-Bodet substituted Huxley), did not change significally the situation, and the project went on marking time. Furthermore, a British-French rivalry emerged: Unesco's staff criticized Febvre and Rivet for transforming the collective project into their own, and for refusing Huxley's co-operation[96]. Auger tried to move Needham aside. Finally, the ICPHS would be consulted through Febvre, and ICSU through Needham ("The interest of the Febvre/Needham collaboration is that they are, from the start, decided to agree one with the other"[97]). And Miguel Ozorio de Almeida[98] was asked a stage report upon the project for Unesco executive committee.

In his report[99] to the permanent committee of ICHS, Febvre draw the attention to the special aim of SCHM: "It pretends to influence mentalities to eradicate the war virus"[100]. What is needed is not only school books but a collective scientific history to train the schoolmasters, to synthesize mondial knowledge, a world-wide history. Unesco is the one and only institution for the international co-operation of scientists needed to publish such an history. Febvre presented then his general plan with six volumes: one with general considerations, two with analytical developments, two with synthetic approaches, and one for conclusions. Volume I, for the important questions raised by anthropology and human biology, and after by other human sciences. Volumes II and III, for

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[94] Needham to David X, 01/12/48. Needham archives (D74). Not only the British delegation voted against his report, but one of the delegates - Leigh Aston - publically dissociated himself from Needham.

[95] Rivet published on the 01/12/48 an enthousistic declaration: "History is badly constructed for it is incomplete, and nationalistic in tendency. Textbooks record every war and make no mention of people who did not fight but worked to promote what we call culture. The narrow point of view adopted by these books, which leaves out of account contributions by foreign peoples to the progress of humanity, is erecting formidable barreers to international understanding". Needham archives (D161).

[96] Thomas to Mayoux (philosophy and civilizations division), 14/02/49, and Mayoux to Thomas, 25/02/49. Unesco archives (SCHM8, 2.31(2)).

[97] Ibidem. ICPHS: International Council of Philosophy and Human Sciences. ICSU: International Council of Scientific Union.

[98] He was a Brazilian physiologist, friend of Laugier, Lapicque and Wurmser, and has been pushed into this position by Auger. Published in august 1949, his report was severely criticized by Unesco's staff and Huxley, and forgotten. See his report in Cahiers d'Histoire mondiale. Vol. I, 1953-54, pp.962-985.

[99] Febvre : Report to ICPHS, may 1949. In Cahiers d'Histoire mondiale. Vol. I, 1953-54, pp.954-961.

[100] Ibid, p.954.

exchanges and "all which have been subject to circulation": technical knowledge, systems of ideas, beliefs, material objects, animals, etc. "From all that,will come out the image of a moving humanity since the origin, travelling permanently during a perpetual serie of transcontinental migrations[101]". Febvre found then within Unesco the way to open a new channel for his intellectual agenda, with the benefit of a co-operation with Needham. Volumes IV et V for a synthetic gathering witin a geographical frame: what each part of the globe have received from, and given in exchange to other parts of the glob, beginning with Asia. "From this picture, would emerge the idea that separations in the world are mere illusions, and that the earth never ceases to diversify, to enrich, to to mutually fecundate with streams of peaceful exchanges"[102]. Volume VI, for conclusions and synthesis, essencially the recapitulation of the main stages of the historical development. Febvre had no difficulties in obtaining the ICPHS support for his aims and general plan.

Huxley, who did not renounce to come back into the project, sent to Unesco long comments[103] to Ozorio's report, where he clearly explained his own conceptions for SCHM. Huxley wished to write a Natural History of Civilization, with a strictly scientific approach, and refused the kind of ideological or political aims that, he thought, Lucien Febvre and Miguel Ozorio were proposing. The development of civilization must be understood as the continuation "on the human and social level of the general evolutionary process which had previously lead to the attainment of that level by evolving life"[104]. With such an approach, Huxley did not need an underlying philosophy, but a real theory. "Without some such unifying theory, any such book will end to become colourless, or just a catalogue of facts"[105]. According to Huxley, in a given period of a given civilization, the dominant systems of ideas influence the scientific and technical development, and not only the inverse. One has to draw from the theory of evolution a system of ideas for a scientific approach of history which should not be displaced from "the hard facts of evolutionary reality"[106].

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[101] Ibid, p.960.
[102] Ibidem
[103] Memorandum by Julian S. Huxley on the report of Professor Ozorio de Almeida on the SCHM, July 1949 (Unesco archives, SCHM8, 2.31 (2)).
[104] Ibid, p.3
[105] Ibidem
[106] Ibid, p.5. This evolutionnary humanism seems to be opposed to social biologism, but is very far from Febvre proposals. Needham is not going so far as Huxley, who in those days kept away from Eugenism but who sometimes seemed to share with Teilhard de Chardin the idea than evolution is a rise towards an ultra-humankind.

After Paris conference has confirmed the orientation, a new group of experts[107] was set up, among them again Needham, Febvre and Rivet (for ICPHS). In 1949, from december 12 to december 17, the committee held ten sessions to finalize the aims and the general plan for SCHM. It has been the most interesting committee, where the discussions revealed the various agenda, and where Febvre and Needham appeared to show many convergences and to animate the three main debates:

- What gives this history its unity and homogeneity ? Against Florkin and Shryock who wished to stick to a purely encyclopaedic approach, Febvre, with the committee majority, privileged a more didactical approach: "the only aim is to do good history to peserve peace", but the first volume has to include a "political mental reservation: the peaceful mental reservation that has been Unesco fundamental idea"[108] for SCHM. The various questions have to be studied in order "to eliminate the reasons of misunderstandings between peoples", in particular anthropology and ethnology which, in their origin, favourished to a certain extent racist prejudices, and which have then to be thought differently.

- Is it better a chronological approach, or a problematized one ? On the matter, Febvre, with the support of Needham, opposed Rivet who wanted to start from a chronology of the main discoveries, to put into evidence the main stages crossed by humankind, to show that "no cut stopped this march towards progress", and to establish "successive balances which put so clear rythms into progress"[109]. Rivet's proposals were some kind of a positivist (the stages of humankind towards progress) and Eurocentric history of civilization, which outlet is the Western scientific civilization. Needham, followed by Febvre, refused such a chronology, which is not relevant with other civilizations history. For them, exchanges should be SCHM heart, and they began very soon. Finally, there is a general agreement that "the chief emphasis should be on the exchanges or borrowings between peoples and countries, of the factors which have contributed to human civilisation, including inventions, discoveries, ideas and culture"[110].

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[107] The records of the drafing committee are in Unesco archives, SCHM23, 2.633(1). Other experts are Florkin (Liege) for ICSU, Ciasca (Genoa), Shryock (Johns Hopkins), Piaget (Geneva). The Unesco administration attended the meetings.
[108] Ibidem, 2nd session.
[109] Ibidem, 2nd session.
[110] Ibidem, 3rd session.

- Which is the part played by science and techniques ? Because of his etapist view, Rivet gave them the central part. He is followed by Needham, but with a quite different justification: science and techniques are the vectors, by nature, of much more exchanges and much more comprehension between peoples than fine arts, religions and philosophies which divide more than they unify, and which are more difficult to transfer; subsequently, yhe emphasis has to be put on science, and religion has to be relegated at the end of SCHM. Shryock supported Needham. Febvre, with Piaget, recused science hegemony and asked for an equal share "50%-50%". In spite of Needham's pressure till the 5th session, religion and philosophy gained a full place in the SCHM.

The final plan did not differ much from Febvre's proposals of 1948[111]. Back to London, Needham wrote to Huxley to inform him about the "astonishing progresses" made by the committee and about Rivet and Febvre magnificent performance. He is happy that nothing has been left of Ozorio's hazy plan. Confirming that Huxley has been pushed out of a project he should have the responsibility of, he wrote: "I trust you will not imagine that I look upon your absence from the progress of this work with anything than shame and disgust. I have a good deal that I sould like to tell you about what I have heard concerning your relation with it, and the extreme desinclination of UK officials to agree to your continued association with it"[112].

Cortesao[113] wrote the first draft of the expert report and submitted it to the 7 participants. Only Needham proposed a significative amendment which sumarized his conceptions[114]. The

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[111] Here is the final plan, with their origin according to Needham in his letter to Huxley (see hereafter): Ia: brief introduction of general fundamentals (from Febvre) - Ib: The contribution of the successive ages of man to the growth of civilization (from Rivet) - II and III: The mutual indebtness of all cultures (from Febvre) - IV and V: The special chracteristics of the main historical cultures and civilisations (from Needham) - VI: Synthesis and conclusions (from Febvre). The 7 experts shared the responsibilities for the volume. Needham got n° II, Rivet n° Ib and Febvre n° V.

[112] Needham to Huxley, 17/12/1949. Needham archives (D164).

[113] Close to Torres-Bodet, Cortesao resigned with him.

[114] Needham to Cortesao, 14/01/1950, Needham archives (D165). Stating that "hypocritical things were said at the meeting about perfectly objective history", he considered that nevertheless "we have to adhere to the final sentence about uniting and divisive". For the heart of the project, he proposed an amendment three times longer than the initial redaction: "The committee understood, from the information before it, that the General Conference and the Director General had had in mind the preparation of a work on the history of mankind which should contribute powerfully towards the mutual understanding of all people in the present, on the basis of their achievements and cooperation in the past. The committee therefore elaborated a plan of contents which is presented in this paper. After an opening part, introducing certain fundamental knowledge about Man and the world in which he finds himself, there would be a second part describing the series of chronologically successive stages in the progress of humanity in social organisation and control over, and understanding of, Nature. The third part will be concerned with exchanges and transmissions in all branches of human

evolution of humankind extends the biological evolution: successive stages towards higher and higher levels of organization , along with the progression of the knowledge about, and the control of, nature.

When national commissions were consulted during spring 1951, critics were massive, and support limited. The British commission[115], in spite of the presence of Needham and Cortesao, did not accept the project. France only, Febvre presenting the report, supported experts' conclusions, and pointed the source of difficulties: they are "due to the obstinacy with which so many representatives of so-called 'European' or 'Western' civilization regard the latter - their own - as the only true civilization"[116]. Febvre, as Needham, are determined adversaries for eurocentrism.

Florence general conference (spring 1951) decided however to step on the effective realization of SCHM, and to call for an editorial committee[117]. Huxley is back on the stage[118], together with Paulo de Barredo Carneiro, Turner, Moraze (Febvre's pupil) - the three leaders of the committee - and a dozen members, among which none of the previous experts. The committee is actually international and met for the first time in december 1950[119]. The previous plan is rejected as

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knowledge, practice and experience; demonstrating the mutual indebtness of all peoples, and bringing out the fact that there is no people or culture which has not contributed elements of essential value to the total human patrimony. The fourth part will outline the various patterns of the great cultures and civilisations, their particular world-outlooks which were characteristic of them, and which, though not transmitted in former times, are now fusing into the world-picture of universal man. The fifth concluding part would be of a synthetic character. In so far as the attainment of perfect historical objectivity might be considered to be impossible, the committee felt that emphasis might well be placed on the factors which have united mankind throughout history, rather than on those which have divided the various peoples".

[115] 13/03/50, London: records in Needham archives (D167)

[116] Report 5C/PRG/2, Unesco archives (SCHM7, 2.225).

[117] Needham archives (D170). Needham tried to propose Bernal's name for the committee, recognizing that Bernal "has an encyclopaedic knowledge, but I am afraid it might not be politically wise". In Unesco archives, SCHM7, 2.31(1). Carneiro is a Brazilian biologist, exiled in Paris since 1937, who founded the "Maison d'Auguste Comte" in Paris.

[118] Professor Charles Moraze, whom I met in March 1997 in Paris, insisted upon the part played by the Rockefeller Foundation and by US representatives in Unesco, to change all collaborators supposed to be "red", and to impose Ralph Turner as the leader of SCHM project. He remembered to have resisted with other colleagues (among whom Huxley) and won to elect Carneiro instead. We might infer from that, and from the general situation, that Huxley, as a liberal, was more acceptable for USA than other UK left scientist and historians (like Needham). Huxley, as former General Director of Unesco, was also already linked to the project.

[119] Unesco archives, synthesis report: SCHM8, 2.31(2) - and report to the executive council: SCHM7, 2.31(1).

"both overcautious and unsuitable for the dawning of a world consciousness". Chronology is back, and this is the start for a new story.

In 1951 then, Febvre was pushed out of the project, but received, in december, as a consolation, the direction of a journal, the Cahiers d'Histoire mondiale[120]. However, Torres-Bodet tried to have him back, with Rivet, as correspondents of the editorial committee, but the answer was no[121]. When Febvre died in 1956, Morazé[122] remembered Febvre's participation to the first assembly of Unesco, with Blum at his side, his part in the French encyclopaedia, in the CIS and the Revue de Synthese with Berr, in the organization of scientific research with F. Joliot-Curie and J. Perrin. He remembered his three years' fight for SCHM: " I want to write here was has been his most beautiful victory. In Florence, the retained plan for our history was Febvre's. Inside ICPHS, the retained plan was Febvre's. Then, Unesco has to step from a project to its realization. It might be that non-European representants[123] have been frightened by this character too much in the way, too much European for their eyes. Subsequently the effective launching of our world history apppeared to be conditioned by this 'democratic' measure: Febvre's self-effacement. Who can imagine how hard has been for him this self sacrifice ?"[124].

9- The World Federation of Scientific Workers - WFSW (1946/1951)

In this second international place for scientists sociability after war, we meet Crowther, Bernal and F. Joliot-Curie among our characters. Its origin appears to be largely a British French co-production, for the first contacts in the 1930s as well as the 1945/46 meetings: The debate (organized by SVS)[125] upon social implications of atomic bombs, with F. Joliot-Curie, Auger, Bernal and Blackett in september 1945, the AScW conference in february 1946 upon "Science and the

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[120] The Cahiers d'Histoire mondiale also published the successive Carneiro's reports about the state of the work, and other Unesco documents about SCHM.

[121] Rivet to Torres-Bodet, 14/03/51, and Torres-Bodet to Rivet 30/04/51. Unesco archives, SCHM42, 2.92(1). Rivet wrote: "Being, jointly with my great friend the Professor Febvre, the promoteur of this project, Unesco thought it should choose to realize it a totally new committee, whose intents I ignore. I have good reasons to believe that they completely differ from what Febvre and myself exposed to the Unesco general assemblies in Mexico and Beyrouth. Either I might be driven to accept the new committee ideas, either I would have to criticize them. I have rather to avoid this alternative between conformism and critics".

[122] Morazé, Febvre obituary, in Cahiers d'Histoire mondiale (1956), vol.III, pp.553-557

[123] See footnote n° 118 : Moraze probably referred to US interventions.

[124] Ibid, p.556.

[125] JG Crowther (1970), op.cit., pp.246-247.

Welfare of Mankind"[126], with Huxley, Bernal, Blackett, Dorothy Needham (Joseph is still in China), and a message from F. Joliot-Curie.

The WFSW has been effectively founded in London, july 1946[127]. F. Joliot-Curie, the first President (CF Powell substituted him in 1957), situated this progressist organisation as the follower of the official Anglo-French Society. Bernal, the ideological father, is Depuy-president and Crowther general secretary (Biquard substituted him in 1955). The British AScW, then presided by Blackett, and the French ATS[128] are the two pilars of the new organization, which wish to gather in its ranks all scientists' unions or professional groups to the exception of official scientific unions. Needham was present to the founding meeting, in the name of the Unesco Science Division.

The first difficulties with Unesco appeared as soon as 1947, and North-American political pressures delayed for months an agreement between Unesco and WFSW, to the point that Needham found "unadvisable to conclude an agreement" in april 1947. He then used his ability in lobbying, Auger being his best supporter: "the moral is that if WFSW is to play the part we all believe it should play, an which we all want, a great deal more effort must be put into winning the active support of Executive members beforehand"[129]. The agreement was accepted in july 1947, and Crowther sent to Mexico assembly as an observer. For Beyrouth, Needham himself represented WFSW.

Many memorials were organized: 25/02/47 (Sorbonne) for Langevin. In London, also for Langevin with the War Minister. Again in Paris (Sorbonne) for the 10th aniversary of Rutherford's death in 1947, under the patronage of the "President de la Republique" and of the "Academie des Science", and 3000 participants. These memorials were family meetings for these British and French scientists, and showed how institutionalized they have become, as a result of their commitments during the war . The cold war produced their marginalization: Bernal was expelled from the BAAS council at the end of 1949 and F. Joliot-Curie was pushed out the CEA on 29 april 1950. The pretexts were similar: pro-USSR delarations which were considered as incompatible with their official functions.

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[126] ibid, pp.271-276.
[127] ibidem
[128] The "Association des Travailleurs Scientifiques" (ATS) is a group which has been created during the Resistance as a branch of the "Front national Universitaire".
[129] Needham to Crowther, 20/04/1947. Needham archives (D27).

The first general assembly took place in Prague[130], september 1946, and the difficulties were already numerous: difficulties with Unesco, difficulties to mobilize a new generation of young scientists, difficulties to find its own space between Unesco and ICSU, complicate debates about freedom and planning of science. AScW alone represented in 1948 more than half of WFSW members.

Cold war deepened the crisis between liberal and socialist scientists, and put and end to popular front associations. The World Congress of Intellectuels[131] for Peace (Wroclaw, august 1948), to which Huxley (on his own and not as the head of Unesco), Bernal and I. Joliot-Curie participated, have been the symbol of this rupture. Russian delegates refused all compromises with non-communist intellectuals and forced a resolution aligned with the USSR diplomacy[132]. Huxley did not signed this resolution.

In 1950, WFSW's agreement with Unesco is put to an end. AScW was about to leave the federation[133]. According to Bernal[134], WFSW is criticized for its inaction and its extemist views. F. Joliot-Curie accepted many concessions to prevent the departure of AScW. But after the 2nd assembly (Paris and Prague, april 1951), the adhesion of Soviet unions changed the equilibrium inside WFSW[135]. There a big difference between Eastern Unions (numerous, state-supported and rich) and the Western Unions (not numerous, state-opposed and poor). WFSW was never more in the position to play an important part among Western scientists.

Conclusive Remarks

1- Common features

Almost all our characters were members of the academic elite: Cambridge men, FRS, Paris University professors, fellows of the "Académie des Sciences", even Nobel prizes for some of them.

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[130] Introductory Report by JG Crowther (Needham archives, K329), 10 september 1948
[131] Goldsmith (1976), op. cit., pp.184-187.
[132] Cf. Huxley (1973), op. cit.
[133] Ibid, pp.175-180
[134] Meeting, december 1950, in Paris, between Bernal, Crowther, Biquard and F. Joliot-Curie. Joliot-Curie archives (F4), Institut Curie, Paris.
[135] WFSW claimed for 24,000 members at Prague, 1948, mainly in Britain and France. In 1951, in Paris/Prague, the total amount of members went up to 44,000, with 29,000 Chinese scientists. Only 12,000 members were from non-communist countries. Then, the Sovietic scientists joined the WFSW, increasing definitely the balance. See Needham Archives (K327-K335).

They did go on developping their scientific activities, but they did their best to get a scientific institutional recognition by their pairs. In the 1930s and 1940s, their radical political commitment was not contradictory with their institutional strategy, and this changed only with the cold war in the 1950s.

Most of these scientists have turned into activists for socialism, and not only to ideological sympathisers, during the 1930s. Even more, some of them chose to become official members of socialist and communist parties, which was quite unfrequent till then, even with the French tradition of the political commitment of intellectuals. The symbolic function of an intellectual was gaged upon his critical autonomy, and they participated mainly to periphal left organizations, like the "Ligue des Droits de l'Homme" or the CVIA. Direct participation to political parties (and to elections) was an exception till the end of the 1930s.

Far from being isolated from their colleagues, these scientists became emblematic people for a large part of the scientific community. Their were involved, in Britain as well as in France, in what Werskey calls "scientific popular fronts", like the AScW, the DSIRS-BAAS, the French Union rationaliste and CVIA. In such organizations, socialist scientists were linked with more reformist colleagues, some of them refering to liberalism or to scientific humanism. It should be noticed though that these popular fronts rapidly dispersed after the war, not only because of political affairs: they have fufilled their socio-professional agenda. Further attempts to launch other popular fronts in the 1950s, like the WFSW, presented other agendas, contradictory with this status of large front among scientists.

All our characters have been committed to the defense of science, its development, its fundings and its organization, and to the employment of scientists. In France they were at the head of the main scientific institutions and even went to the Government. In both countries, they were active members of various agencies and ad hoc committees. This defense of science was also an intellectual fight for rationality, against nazism and other so-called anti-science movements.

Most of them had also strong activities dedicated to the popularization of science, through public conferences, books, columns in newspapers, radio broadcastings. They spoke, and wrote for, thousands and thousands of people, and this was part of their social commitment. They participate also to various movements about the renovation of education, or about new ways of teaching.

The historical situation of science was interpretated within the general frame of scientism, and reinforced it. The 1930s have been typical of a resurgence of triomphant positivism. Our progressist scientists were at the head of this movement. The uses / abuses model was unchallenged. To most of our characters, the abuses of science might be suppressed by a socialist organization of society, to which, for some others, should be added the predominance of pure science over material applications and the social responsibility of scientists. Even if differences existed between our characters, and if, for instance, Bernal's position has been subject to evolutions, they believed that science had become the main social force, and that it was pushing in the right direction. Bernal's and F. Joliot-Curie's scientism was a form of strong socio-economism, but Needham's scientism laid more in its conception of science, in itself, as the main source for ethics and moral values, being in that closed to Langevin: For Needham, it was even a biological necessity for the long term : "I always thought that the sociological evolution was the continuation of biological evolution and you should wait centuries and centuries to see the result, and ethics are inside the process itsef" (the scientific development). For Langevin, science is at the same time the daughter and the mother of democraty. It is the chief factor to transform mentalities, and subsequently the only mean to ban war. The spiritual contributions of science are more important than the material aspects. And above all, "science has taken a considerable advance upon justice"[136].

In the 1930s, main critics to capitalism, coming from progressist scientists, laid in its inability to left science realize all its potentialities, for the benefit of humankind. Science was progress, and to fight for science was to fight for socialism. This identification between a fully developped science and socialism was not uncommon in the 1930s among the scientific community. With their roots among their community, our characters' political activities were not strong social commitments. They may go on participating to the the elite institutions and networks, and it was even wished by the Communist parties. Political commitments of elite scientists were compatible with scientific careers.

Most of them officially claimed for Marxist philosophy, but one can ask if it was the actual philosophy underlying their scientific work or their representation of science. M. Prenant and JBS Haldane[137] tried both to combine biology and dialectic materialism in the 1930s and 1940s, but

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[136] Bensaude-Vincent (1987), op. cit., pp.112-117.

[137] See for instance JBS Haldane, La Science en marche, Paris, PUF, 1952, a collection of short articles published in newspapers: "Dialectical materialism is a method fo thinking and action, and not

showed more reserve after Lysenko's case. Needham[138] saw dialectic materialism in the "levels of organisation" of the living world. But for F. Joliot-Curie himself, it was more an ideological proclamation than a pratical tool for his scientific work. Langevin's and J. Perrin's Marxism[139] have been deconstructed elsewhere, and scientific idealism and humanism are more consistent with their actual philosophy. Bernal's ideas in relation with Marxism are probably more controversial[140].

For them, Marxism seems to reduce mostly to some socio-economic determinism underlying their vision of scientific development. For instance, when translating Bernal's introduction to The Social Function of Science, Langevin chose "Science as a factor for the moral and social evolution" as the title of his conference. According to B. Bensaude-Vincent[141], "Langevin keeps unconcerned with Bernal explicit attempt to consider past and present science as an institution depending on existing social order and impregnated with the spirit of dominant classes. After, like before, he goes on saying that science determines the organization of society". Langevin's ardent rationalism is the key to his interest for Marxism, identifying scientific rationalism and dialectical materialism. By developing science, capitalism showed the possibility of an universal welfare, but its social structures oppose the realization of this welfare. Capitalism then created the conditions for its substitution by another social system in which science could develop all its beneficial potentialities. Its social structures (looking for profit) as well as its ideological ones (the apology of individualism) became antagonistic to the plain development of science and techniques[142]. Fortunately, USSR, by showing how science is used by socialism, provides an political alternative for left scientists.

2- Eurocentrism and functionalism.

Only Needham seemed to have made a clear dinstinction between Western (the historically contingent birth region) and modern or universal science (that resulted from the confluence of many small rivers into the sea). As soon as 1937, he proposed to study Chinese contribution to modern

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a dogma. It is difficult to see hoow it coucd influence decision-makings in such controversies" (Lysenko versus Vavilov), p.220.

[138] Needham prefaced Marcel Prenant's book Biology and Marxism, London, 1938.

[139] See Bensaude-Vincent (1987), op. cit. and Mary-Jo Nye "Science and Socialism: The Case of Jean Perrin in the Third Republic", in French Historical Studies, 9 (1975), 141-169.

[140] Hilary and Stephen Rose, "The Two Bernals, Revolutionary and Reformist in Science ?", in Fundamenta Scientiae, vol.2, n°3/4, 1981, pp.267-286.

[141] Bensaude-Vincent (1988), op. cit., p.205.

[142] Rose and Rose (1980), op.cit. Such analysis were not proper to official Communist parties, but were shared by many left movements.

science, when dominant ideas considered Greek science as a "miracle", and the essential change in the course of civilization. After his travel to China in 1931, Langevin seemed to have discerned the same distinction. At the 2nd International Congress of History of Science (London, 1931), the Soviet delegation criticized internalism et put into light the socio-economic conditions which shape the scientific development. But they kept on with the accumulative model for history of science, giving, with the same movement, a superior status to the science produced in Europe. Bernal's affirmation that "Science is a collective entreprise, it belongs to no country or race" was probably the most common thinking among scientists, whether Marxist or liberal. But unquestioning science is a mean to legitimate the imposition of the science which really exists under capitalism, and not an utopic ideal science.

In fact, Eurocentrism is consubstancial to Bernal's socio-economism, as the organization of science-based industrial societies are the model for socialism[143] when liberated from profit. Very few lines are written in The Social Function of Science about science in non-Western countries, and most are relegated into a far-past[144]. Bernal is clearly not exempted from common European prejudices about non-European scientists. USSR sucesses in Central Asia are reputed to happen in scientific vacuum[145]. Modern science can only be diffused from the West. Colonization is not rejected because of its nature (to impose industrial and scientific capitalism and civilization), but because of its modalities and consequences. Bernal denounced in a very conventional[146] way the racism against

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[143] Remember the adoption of Taylorism by USSR.

[144] Bernal (1939), op. cit. Quotations are from the 1967 edition (MIT Press), pp.207-210. Until the end of the 19th century, "the pursuit of science was almost confined to Western Europeans either in their American colonies or at home". Dans les vieilles civilisations, "science was suddenly and abruptly introduced". No science existed in India before the 20th century. Indian scientists want national affirmation, but have to learn science from the British, and to be under their domination, which Bernal analyses as contradictory. The, Indian scientists show "a mixture of submissiveness and arrogance that inevitably affect the quality of the scientific work. Indian science is noted at the same time for the originality of its conceptions and experimental processes, and for extreme unreliability and lack of critical faculty in carrying out the work itself". Consequently, Bernal affirms that the development of science will be possible only after national independence, and that, meanwhile "the best workers for Indian science to-day are not the scientists but the political agitators who are struggling towards this end" (p.208).

[145] "The history of the Soviet Republic of Central Asia shows how rapidly science can be built up and how eagerly it is seized on by a population starting from a medieval standard of culture". JD Bernal, "A Permanent International Scientific Commission", in Nature, n°3967, 10/11/1945, pp.557-558.

[146] Jerome Ravetz, "Bernal's Marxist Vision of History", in Isis, vol.72, 1981, pp.393-402. Because of his economism, Bernal is very week in understanding the origin of modern science (p.397). And he does not see science as a mean of colonial oppression: "the genocidal horrors practised by European imperialism on its conquered lands (what we call now 'Third World'), involving the

Indian scientists, their exclusion from scientific institutions. But science being beneficial, by nature, because of the social dynamics it implies, as well as its material applications, in fine, will oppose colonialism as it opposes capitalism. It is not surprising then that some of our characters, like J. Perrin, played an active part in the development of colonial science. Auguste Chevalier, the chief of French colonial scientists in the inter-war period, joined the"fellow-travellers"[147] in 1944. Analysis about the way colonialism destructed scientific knowledge in occupied countries are not common in those years[148].

Without surprise, and in harmony with their scientism ideology, most of our characters, when talking of, or implying themselves in, international scientific organizations, had what is usually called a "functionalist" approach[149]. The specific intellectual and social status given to science implies that the scientific international community should be a model for international relations; that scientists have to play a specific and imporant part in international relations; and that practicing science and developping transnational scientific organizations are means to develop supranational loyalties, and would help national States to weaken and Peace to get stronger. The aim is to develop functional (scientific, technical) tasks to be delegated to supranational institutions, leading to a progressive erosion of national sovereignties. Scientists, being "naturally world-minded", have to be at the front of such a passing beyond national States. For Needham[150], a world functionally integrated through scientific cooperation will represent a superior level of organization of humankind. "There is no field which has a stronger tradition of international community work than that of natural sciences, and it

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technologies of warfare, of primary-products exploitation and of various addictive poisons, did ot interest Bernal greatly" (p.398).

147 A colonial botanist, Chevalier joined in 1944 the patronage committee of La Pensée, the journal of communist intellectuals and their fellow-travellers. He published an admirative article about agronomy in USSR, in n°1 (october-december 1944, pp.38-43, "La Science agronomique en France et en URSS"): "We will have much to learn from USSR which organization progressed massively since the last 25 years, principally for applied sciences, and above all for the agricultural science institutes". (...) "Science is in the forefront... In no other country science did play such a dominant part and did it contribute in so short a period to general progress. Must not we try now, when we see such a distress in our country to imitte USSR in the applications of research and of scientific methods to give man more well-fare ?"

148 Among exceptions: Pierre Boiteau, Biologie et colonialisme, in La Nouvelle Critique, nov. 1952, pp.76-88.

149 See for instance Brigitte Schroeder-Gudehus(1975), op. cit., where she analyses in her introduction Needham's thesis.

150 Quoted by Schroeder-Gudehus (1975), op. cit.

can indeed be taken as a model for other fields"[151]. When proposing his international service for scientific co-operation, Needham asked that the governments which recognized a space for their scientists in the ntional level, do the same at the international level, because scientists are, by nature, internationally-minded and are not nationally-minded, and because science transcends national boarders[152].

As Needham, neither Bernal[153], nor Joliot-Curie escaped from functionalism. The famous Bernal's quotation "In its endeavour science is communism" is the conclusion of a typical functionnalist approach: "Already we have in the practice of science the prototype for all human common action. The tasks which the scientists have undertaken - the understanding and control of nature and of man himself - is merely the conscious expression of the task of human society. The methods by which this task is attempted, however imperfectly they are realized, are the methods by which humanity is most likely to secure its own future. In its endeavour, science is communism[154]". If science is the model, the practices of scientists are also exemplar, and Bernal lyrically describes scientific activities, with the same words Polanyi should have used.

3- A peculiar historical conjuncture in the 1930s.

For scientists also, the 1930s represented an important political fracture:

- The "science moral crisis" which followed the First World War, and which was due to the abuses of science for war, had mostly faded away, and confidence restored. The growing aspiration for science organization and fundings was the main consequence left in the 1930s.
- The economical crisis, with massive unemployement and misery, showed the unability of capitalism to satisfy minimal social needs, when science appeared to conceal many possibilities for that.
- The image of science in USSR has reached its zenith, for its social and political recognition, as well as for its benefits for people.

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[151] Needham (1949), op. cit., p.23. And again : "In general, it might be said that there is a universal desire among scientists to see better international scientific contacts in the coming years" (in Unesco/Prep. Com./Nat. Sci. Com./12, p.7, July 1946)

[152] Joseph and Dorothy Needham, Science Outpost. Papers of the Sino-British Science Co-Operation Committee, 1942-1946, London, The Pilot Press, 1948 (International science co-operation in war and peace, p.270).

[153] See for instance: "Only science allow to create within humankind the consciousness of its unity as a working comunity" (in JD Bernal "La Science et le sort des hommes", La Pensée, n°5, oct.-dec. 1945).

[154] Bernal (1939), op. cit., p.415.

- The rise of Fascism, and Nazis' abuses of science were analysed as an attack against rationality and science in themselves. Fascism presents a double danger for science: he destroys science in occupied countries and in others, its ideas "reinforce everywhere the forces of obscurantism and injure the spirit of science (...). The development of science in Fascist countries is a clear indication of the fundamental incompatibility between either the theory or the application of science and the tendencies of capilalist economic and political development[155]". Fascism being in the continuity of capitalism, this strengthens the idenfication between the defense of science and the struggle for socialism.

The British "visible college", and the French equivalent are then the produce of two processes: a socio-professional dynamics (the social rise of scientists and their demands for a bigger place in society and for participation to power) and an historical political fracture (Nazism, building of USSR, social crisis) which pushed to political activism for socialism. These two processes combined in the 1930s, giving an historical singularity. With some differences and many similarities, they existed both in Britain and in France, facilitating common sociabilities. In this particular historical conjuncture, the classical French character of a politically committed intellectual applied also to many of their British colleagues. In the name of science, of universalism, of reason, they fought for socialism. More generally, in the 1930s, British intellectuals reacted to political events collectively as a social group, and it might have been the first time. But, according to Stephan Collini[156], the war brought again differences between French and British intellectuals. Due to the position occupied by Britain on the frontline for the fight for freedom and liberty, left (dissident) intellectuals re-integrate the national community in Britain, as opposed to intellectuals in France and continental Europe.

Bernalism gave some kind of an theoretical legitimacy for a political commitment which did not contradict the scientific elitism and hierarchy. This might explain why scientists kept attached to ssocialism and USSR far longer than other intellectuals.

One cannot understand these movements, their deep roots in their communities, without taking into account both dynamics. And this explains also why all attempts to launch such

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[155] Bernal (1939), op. cit., pp.220-221.

[156] Stefan Collini, "Intellectuals in Britain and France in the Twentieth century: confusions, contrats - and convergeces", in Jeremy Jennings (ed), Intellectuals in Twentieth Century France: Mandarins and Samuraïs, London, MacMillan, 1993.

movements after the war failed, in another historical situation, with different political conditions, but also when science and scientists had gained a very different place in society. A radical science movement could no longer be rooted at the top of scientific institutions, scientism had become conservative, and USSR lose all prestige since the 1950s.

The 1930s context shaped a large part of the representation of science and of its part among our characters: - Against nazi obscurantism, to which all critics of science are compared, they had to defend science, a source for social and moral values. - For bigger economical efficiency and to take all the potentialities of science (Bernalism), they wanted a strong organization and sufficient fundings, more especially as war was coming and that science showed its efficiency in 1914/18. - Socialism in USSR, because of the space accorded to science and of its organization, is at the same time a model and a garantee that all potential social benefits will be pulled out of science.

4- Bernalism and WFSW.

One has also to remember that this high status given to science is also an inheritage of Comte's or Spencer's conceptions at the end of the 19th century, which then reflected the ideology of the liberal and colonial bourgeoisie: progress, order and imperialism.

"To derive from science all advantages it can offer, it must exist an intimate linkage, perfectly materialized for each stage, between science and social progress: one has to foresee the needs, to study and modify the structures of society, to solve production and distribution problems, and finally to control the results of its application, so that they do not take unexpected or undesirable directions"[157]. For Bernal "Science will come to be recognized as the chief factor in fundamental social change[158]". What is left then to class struggle or mass initiative ? When science is given such a part, the differences between socialism and capitalism fade away. The scientific revolution is the new social revolution. "Comrades, don't bother, we are constructing socialism through science for you", as Bernalism has been analysed by Radical Science Journal in the 1970s. And Bernal insisted "Science implies a unified and co-ordinated and above all, conscious control of the whole social life"[159]. Such a social control in science-dominated society is not a much pleasant future... Scientism

[157] JD Bernal "La Science et le sort des hommes", La Pensée, n°5, oct.-dec. 1945
[158] Bernal (1939), op. cit., p.414.
[159] Ibid, p.409.

has been the main ideology for the construction of Soviet state under Stalin, and there were no room left for contradictions and differences in such a scientifically organized society.

Science is social order, and this can explain the fascination of the "USSR scientific society" for Bernal and some others[160]. All retained from their visits the organization of scientific research the planified collective work, and the fast scientific development, which Haldane[161] particularly exalted. Even, the 220th aniversary of Moscow Academy of Sciences in june 1945 has been a big social event for all scientists, whether progressive or conservative.

At the end of the war, in a way, Bernalism had triumphed... with capitalism. The social function of science he analysed was not contradictory with capitalist, on the contrary: Further developments of capitalism were based on the innovative processes brought by science and technology. But as far as socialism was concerned...

During the war, the Left merged into official organisms. In the immediate after-war period, one may wonder whether the important left participation in official meetings manifested its general political influence, the personal weight of personalities like F. Joliot-Curie and Bernal notwithstanding their political color, or its ideological alignment on dominant bourgeois ideas about science, as a consequence of scientism. They shared sociability places and ideology. Before cold war, it was easy to pass from WFSW to official institutions, as a consequence of the left participation to the national war effort. Together, scientists contributed to Nazism defeat. After 1948, such sociabilities exploded.

The cold war, the Lysenko's affair, lead to a general ideological withdrawal of left scientists towards a complete neutality of science when not towards the defense of the freedom of science. Science planification was reduced to a mere science policy[162]. If Langevin refused in 1939 to put

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[160] Most of our characters went to USSR in the 1930s, with ten or a dozen visits for Crowther. In 1931, after the congress, he took with him about 20 scientists (among whom Bernal, Haldane, Pirie and Huxley) and about 40 physicians. See Crowther (1970), op.cit., pp.84-85. See also David Caute (1988), op. cit. Langevin travelled to Moscou in 1928 and 1931. Needham himself coordinated in 1942 with JS Davies an apologetic book Science in Soviet Russia, London, Watts and Co.

[161] Haldane (1952), op. cit., p.200. Writing about the success of the Sedov cruise, he explains that "Such a work totally refutes the sometimes uttered affirmation following which Soviet science is only interested in the discorey of immediately useful facts. On the contrary, these discoveries will take place, in the end, within the general knowledge of our planet, a knowledge which, some day, will benefit to every man". After Portuguese and Spanish navigators, after Cook, Livingstone and Scott, "the torch is in the hands of young socialist workers in USSR".

[162] Rose and Rose (1981), op. cit.

ideology in science as Bernal did, he would have shared much of the 1950s' Bernal apology of science neutrality. If WFSW managed to appropriate the war participation prestige, and even Nobel prizes, after Lysenko and 1956 events it did not functioned anymore and did not prevent the marginalization of WFSW. The way WFSW followed USSR thesis, and its absolute weakness in defending its own former leaders (like Malek in 1968 Tchecoslovaquia) victims of repression, completed its discredit.

5- British French sociabilities and Joseph Needham

Within this specific context of the 1930s, various new sociabilities developed which contributed to bring together different group of British and French scientists, far beyond strictly professional relations (unions, international congress, crossed laboratory visits,...). Professional relations went on, and were sometimes reinforced by other sociabilities (see Rapkine, Brachet and Needham). The main characteristic of these scientists sociabilities in the 1930s are their ability to jump from one level to another: connections were often professional and political (in the large meaning of the word), with mixed organizations like the Anglo-French Society, unions, antifacist movements, and so on. International organizations played an important part at the end of the 1940s. This was the case of Unesco and WFSW, which represented, both of them, a political and a professional commitment. This mixture has not to be regretted: such sociabilities lead to creative dynamics, and put into light a muddle between science and politics that one is used to hide. Such a mixture was one of the issues discussed during the preparation of SCHM. But when Febvre and Needham agreed to defend somekind of a political (didactical) outlook, they separated as far as their motivations are concerned: one is going from science to politics, and the other from politics to science.

After the war, two different dynamics emerged that ultimately appeared to be contradictory. The first one channeled through Unesco, and especially the SCHM project, which represented a radical rupture with the pre-war Eurocentrism (and Francocentrism for French intellectuals). But Unesco fruitful period ended with cold war, and with its inter-state and administrative evolution. The second one is WFSW, where the scientists were deeply rooted (even more than Unesco's) in official institutions. It is interesting to notice that WFSW occupied the place refused by Unesco at the end of the 1940s (when it chose to give priority to general educational, cultural and scientific activities, with indirect effects on pro-peace actions - and refused to be confined to peace propaganda): WSFW

occupied mainly the ground of peace campaigns (and also professional demands or promotion of science). But even on that ground, WFSW direct influence vanished rapidly to the profit of wider movement like Pugwash.

The British-French connections appeared to have played an important part, going from one sociability to the other, but the networks included scientists from other countries, like Belgium (Brachet, Florkin), Brazil (Ozorio de Almeida, Carneiro) and probably many others: the story still has to be written.

5- Back to Needham

The present significance of Needham is far beyond its ideological proximities with 1930s scientism and an outdated Bernalism. He shows two main originalities from ordinary scientism: his opposition to Eurocentrism - and his claims for ethics in science. His evolution has been then inverse to Bernal's. And it allowed him to be friendly with radical science movements of the 1970s, and to agree with Febvre.

His reference to Marxism, mainly to historical materialism, allowed him to introduce the idea of historical contingency for modern science. He explained that the universality of science came from its ability to amalgamate the various contributions, even with an accumulative model. Universality is some kind of an historical construction. Doing that, Needham not only rehabilitated the old civilizations in the past, but also, for the present and the future, affirmed their total ability to perform such an universal science. This was the positive side of the scientific optimism of the 1930s, pursued also by Unesco. As Needham said in the 1970s: "In the days when Bernal was writing, there was never any doubt that the natural sciences were essentially beneficial to mankind. The principal gravaman oh the attack of these scientists on capitalism was that it prevented science from exerting its beneficial effect. Naw; the situation has utterly changed. There is widespread fear of science and no longer any conviction that its activities are always for the benefit of mankind, or even would be under socialism"[163]. Inversely, in the 1970s, WFSW was highly deconsidered by its defense of a

[163] Karp (1988), op. cit., pp.91-94. The same ideas are also developped by Needham in a book in French language where he answered questions by Didier Gazagnadou (Joseph Needham (1993), Un Taoïste d'hommeur - autobiographie. De l'embryologie a la civilisation chinoise, Paris, Editions du Felin / Unesco, p.108). Speaking of the conyemporary rejection of science, Needham added: "I understand that when one thinks of the atomic bomb, the questions of the ozon holes and greenhouse effect, the genetic manipulation, etc. One has to be worried and critical, but I am sorry we get there. I still think that capitalism can not reconciliate with science, in the sense that this system is based

neutral-valued science against the radical science movements, appeared to be one of the main support of scientific institutions and social hierarchy.

With his specificity, Needham still appears as a model for a global activism, for science and post-stalinist socialism; his various commitments influenced each other and gave his thought a contemporary fruitfulness.

upon profit and the desire of profit, and that it will always put its money in nuclear weapons and refuse to stop the production of war gaz" (p.108).