Draft Version of

Engineering Ethics in France : a historical interpretation

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Until recently, there has been no research programs, courses in engineering ethics and no code of ethics for engineers in France. For cultural and historical reason, the question of being or not being a profession is not an issue in France. Therefore, professional ethics have not been developed as in English-speaking countries. If we consider that a code of ethics is a relevant, if only partial means to study the engineers ethos, where should we start our investigation on French engineers ?

An historical investigation shows that the engineering profession did not succeed in organizing itself in France. The scattering of the profession has led to the absence of a discourse representative of French engineers. Even if French engineers adopted through this professional association their first code of ethics, more than in other countries, the perception that engineers have of ethical issues within their profession needs to be studied elsewhere.

Introduction

To Talk about the development of « Engineering Ethics » in France is almost an impossible task. Firstly, the academic subject doesn't exist in any state university : philosophy departments as well as the engineering departments take little interest in it. Nevertheless, there are small groups of teachers and researchers dealing with this issue in the Catholic universities and in a few schools of engineering, but they are a minority[1]. Secondly, there is almost no ethical education within engineering curricula. More and more time is given to non-technical subjects, but rather to epistemology, human sciences or art than to professional ethics[2]. Thirdly, there are almost no academic research programs on « engineering ethics » although ethics - but not « professional ethics » - has been a growing concern in France over the last few years. The first French text-book on engineering ethics was published by the *Centre d'Ethique Contemporaine* of the Catholic University of Lille in 1998[3]. One of its authors came in contact with engineering ethics when taking some courses on « Science, Technology and Society » MIT after his engineering education in France.

The word « ethics » does not appear in any professional organizations or trade-unions' publications until the 90's. The UCC-CFDT (one of the most representative salaried union among the engineers socio-professional group) recently published a charter concerning the autonomy of engineers toward managers (1992)[4] and about the societal control of the new information technology (1995)[5]. This union is a member of the International Federation of Commercial, Clerical, Professional and Technical Employees (known by its French acronym FIET) whose congress in 1995 dealt with the professional, social and ethical responsibilities of its members. FIET worked together with the International Network of Engineers and Scientists for Global Responsibility (INES) in 1996 on a report called « code of ethical, social and professional responsibility ». On 13 May 1997, the FIET-Committee for Professional and Managerial Staff (P&MS) adopted its own code.[6]

[1] Christelle Didier, *Pour un questionnement éthique des choix techniques : une ouverture dans la formation des ingénieurs*, collection « dossier à fenêtre », Editions Fondation Charles-Leopold Mayer, Paris, 1999.

[2] To read more about non-technical subjects in engineering curriculum in France, *Humanités et Grandes Ecoles,* actes du colloque organisé par la Conférence des Grandes Ecoles, Lyon, 13-15 Novembre 1996.

[3] Christelle Didier, Annie Gireau-Geneaux, Bertrand Hériard Dubreuil, *Ethique industrielle. Textes pour un débat [Text-Book on Engineering Ethics]*, Editions De Boeck Université, Bruxelles, 1998.

[4] « Charte des libertés des cadres en entreprise [Charter for the Freedom at Work of Engineer and High Level Employees]» (adopted by the national committee of UCC in 1992)

[5] « Vivre et travailler avec les autoroutes de l'information [To Live and to Work with Information Technology]»

[6] http :ethics.cwru.edu/codes/FIET.html

On the other hand, the National Council of Engineers and Scientists of France (*Conseil National des Ingénieurs et Scientifiques de France*, CNISF), a federation of engineering and scientific associations, that encompass most alumni associations and scientific societies has recently started taking an interest in ethics as well. CNISF adopted the first French code of ethics for engineers in 1997[7].

French engineers are no less concerned than others by the claim for autonomy so clearly brought to light by « whistleblowings » (or organizational disobedience in general), which remains a major issue in engineering ethics in the United-States. They might face in their career dilemmas between their loyalty to their company and their responsibility toward society as a whole. In Europe, Technology Assessment has been a major issue for more than twenty years in *Verein Deutscher Ingenieure* (VDI, German association of engineers) : shouldn't it concern French engineers as well as the German ones ? Even if every nation has its own culture, its own history and traditions, engineers are nonetheless facing some common ethical issues on the micro-social level (what does it mean to be an ethical engineer ?) as well as on the macro-social level (what is the specific responsibility of the engineering profession toward society ?) This is even more relevant in our global world. Why are there so few books and articles on these issues in France ?

1. **Some comparisons**

1.1 The USA

The first codes of ethics were adopted by engineering professional associations in the USA at the beginning of the 20th century. Those documents do not give an exhaustive picture of the ethical values shared by all the members of the profession, but they do give a good idea of the main concerns of engineers on that matter. These codes were developed within the context of professionalization of American engineers. They can be considered as a means of obtaining the social recognition due to the « Professions » that John Ladd calls the « first secondary objective of codes ». Another secondary objective would be to protect the monopoly of the profession in question. The last one would be, according to him to serve as a status symbol. [8]

Engineering ethics codes and discussions in American engineering professional associations marked a turning point in the 50's and 60's. Society had changed : technology was no longer considered value-free, small could be beautiful as well, engineers were invited to take into account their social responsibility. Most codes before the 70's put more emphasis on developing the prestige of the profession rather than protecting the public. New topics appeared in the codes, such as environmental issues. Engineers like Stephen Unger contributed to make engineering ethic codes more meaningful. He tried to make more explicit what should not be an ethics code if its aim was to be « thought of as a collective recognition of the responsibilities of the individual practitioners »[9]. Engineering education changed as well. Since the 80's, multidisciplinary teams were created. Funds were raised to develop engineering ethics research programs : philosophers and engineers started to consider together the ethical issues of engineering. *Ethics in Engineering*[10], published by a philosopher (Martin) and an engineer (Schinzinger) and *Engineering Ethics*[11], published by two engineer s (Harris and Rabins) and a philosopher (Pritchard) are two good examples of what can come out of such collaborations.

1.2 Germany

[7] « Code de déontologie de l'ingénieur [Code of Deontology for Engineers]», adopted by the CNISF on 26th February 1997. See http://www.cnisf.org.

[8] John Ladd, « The Quest for a Code of Professional Ethics : an Intellectual and Moral Confusion », in Deborah G. Johnson, *Ethical issues in Engineering*, Prentice-Hall, 1991, pp. 134-135.

[9] Stephen Unger, « Codes of Engineering Ethics », *in Controlling Technology : Ethics and the Responsible Engineer*, Holt, Rinehart and Winston, 1994 (2nd ed.), pp. 106-135.

[10] Mike W. Martin, Roland Schinzinger, *Ethics in Engineering*, McGraw-Hill, New York, 1983. [2ème éd. 1989].

[11] Charles E. Harris jr, Michael S. Pritchard, Michael J. Rabins, *Engineering Ethics. Concepts and Cases*, Wadsworth Publishing Company, Belmont, 1995

Following WW II was a time of deep soul searching within German society. The engineering profession which was accused of cooperation with the Nazis during the second world war started to think about the social and ethical responsibilities of engineers. Engineering ethics research is more recent in Germany than in the United-States, but it has already reached a certain maturity. In 1947, the refunding of the German Association of Engineers VDI was inaugurated by a conference with the motto « *Technik als ethische und kulturelle Aufgabe* » [Technology as an Ethical and Cultural Task][12].

A deep interest has been developed by the whole of society for environmental problems and for public debates on the social impact of technology in the 70's. In this context, engineering ethics as it was discussed by philosophers and engineers in VDI has become part of Technology Assessment. This topic was even introduced in Germany by VDI in 1970 during a conference on *Wirschaftliche und Gesellschaftliche Auswirkungen des Technische Fortschritts* [The Economic and Social Consequences of Technical Progress]. The ten years work (1970-1980) of the *Philosophie und Technik* [Philosophy and Technics] sub-committee led to the writing of a guideline for technology assessment policy that covers technical and economic efficiency, public welfare, safety, health, environmental quality, personal development, and quality of life[13]

1.3 France

There is little which can be compared to the American codes of ethics and the German guideline for Technology Assessment : the first code of ethics adopted in 1997 by the CNISF or some work on the social control of IT carried out by a trade-union. This makes it difficult to know how the ethical issues of engineering are considered within the profession. Since the development of engineering ethics seems to be associated with the history of the profession in the United-States, as well as in Germany, perhaps some explanations for this absence of a formalized engineering ethics in France will be found in the history of the engineering profession.

The following section of this paper tries to find some explanations for the scattering of the profession over the two-centuries history of engineering education. But some other clues can be found in the history of the profession itself. Until now, French engineers (graduates as well as the others) have never managed to organize themselves as a professional group (rather than a « profession », whose meaning in the USA is different from in French). Even if the history of engineering education and the history of engineering professional associations are linked together, it would be better to separate them in order to distinguish between the group of men and women who work as engineers from the graduate engineers who are only a part of this group. The graduates are indeed the most easy to identify but since a lot of them turn to management, they are not representative of the profession.

Another reason of this choice is to be found in the double meaning of the word « engineering profession » in French. In France, « engineer is a title and a job. To be an engineer means *to exert a profession* that requires a good level of technical expertise. He or she differs from a lower technician by his or her ability to discuss technology and methods being used or argue about if need be. To be an engineer has a second meaning : earning the engineering degree after a rather long training period, with a curriculum that includes a balance of scientific, technical and even economic studies ».[14]

2. Some characteristics of engineering education in France

Engineering education is open in France to good or very good students. According to Bouffartigues and Gadea, sociologists of professions, France is the one country in the world where the social status conferred to the engineer is the highest[15]. The title exerts a fascination on high school

[12] Alois Hunting, Carl Mitcham, « The Historical and Philosophical Development of Engineering Ethics in Germany », *Technology in Society*, vol. 15, p. 430.

[13] Carl Mitcham, *Thinking through Technology. The Path between Engineering and Philosophy*, The University Chicago Press, Chicago, 1994, p. 69.

[14] A very good explanation of the French educational system in English can be found on the official Ministry of Education WWW server at http://cri.ensmp.fr/mesr/

[15] Paul Bouffartigues, Charles Gadea, « Les ingénieurs français.[French Engineers] Spécifictés nationales et dynamiques récentes d'un groupe professionnel », in *Revue Française de Sociologie*, XXXVIII, 1997, 301.

students. It evokes the value of excellence, successfully passing a very selective competitive examination (whereas there is no selection to enter university), « surviving » a very tough two or three years spent in preparatory classes with almost 40 hours of mathematics, physics and chemistry a week. It evokes as well high social standing. Indeed, some French engineers proceed up the career ladder faster that do engineers in other countries, but this is true only for the graduate from the best known schools. In any case, the most prestigious and oldest schools of engineering are still an unavoidable and deep symbolic reference for anyone choosing this career.

2.1 *Engineering education in France : two-centuries old*[16]

The first engineering schools which were founded in the second part of the eighteenth century had a strong influence on the profession and on the engineering education. L'Ecole des Ponts et Chaussées (bridges and roads construction) is the oldest of theses : founded in 1747, it was followed by the Ecole du Génie de Mezières (military engineering) in 1748 and l'Ecole des Mines (mining engineering) in 1783. The ones that have most influenced the engineering educational system are L'Ecole Polytechnique, (founded in 1794 on year after the dissolution of universities) on the symbolic level, and more concretely, l'Ecole Centrale des Arts et Manufacture founded in 1829. These colleges with a formalized theoretical curriculum contributed to the establishment of a high scientific and technical education outside of faculties of sciences. Their status was reinforced by the high position of their alumni who joined the Civil service in the technical State Bodies, i.e. high technical administrations (mainly graduates from Polytechnique and also of one of the Schools of applied technologies, such as the Mining Engineering School). On the other hand, many graduates from l'Ecole Centrale became managers of big corporations.

The creation of the Ecole Centrale in 1829, which is the first school to give an education for civil engineers only was followed by other small private institutions. Some were created by industrial businessmen and scientists, like Centrale, many were founded at the end of the 19th century within faculties of sciences. After WW I, in the context of the economic crisis, engineers graduated from the oldest institutions feared that the increasing number of colleges giving an engineering diploma would be prejudicial to the profession and to their privileges. Some alumni associations gathered and formed the Federation of Engineers' Associations and Unions (*Fédération des Associations, Syndicats et Sociétés d'Ingénieurs,* FASSFI).

[16] On the history of French engineering educational system, see Robert Fox, George Weisz, *The Organization of Science and Technology in France (1808-1914),* Cambridge University Press, 1980 ; Terry Shinn, « From 'Corps' to 'profession' : The Emergence and Definition of Indutrial Engineering in Modern France », in Robert Fox, George Weisz, *Op. cit*.; Charles Rodney Day, Education for the Industrial World : the Ecoles d'Arts et Metiers and the Rise of French Industrial Engineering », MIT, Cambridge, 1987.

2.2. The 1934 law to protect the title of engineer[17]

One of the first actions of the new born Federation was to ask the government to promulgate a law to protect the title of engineer. (only a few specific titles such as « *Ingénieur Agronome et Agricole* » or « *Ingénieur des Travaux Public de l'Etat* » had already been protected by law). After years of discussions, the law was voted on July, 10, 1934. But only the title of « graduate engineer » from a higher education college accredited by the Committee for the Title of Engineer was protected, the title « engineer » alone was not. This is still true today where almost half of the people working as engineers in corporations are not graduate engineers, but self-taught. The practice of an engineering profession is neither controlled nor regulated by French law.

The Committee that was created by the law of 1934 appears to be the main basis of the French engineering education system. Its role is to give accreditation to new private schools and to make recommendations for an accreditation to the Ministry of Education for the public ones. It also gives advice and controls the quality of the curriculum by organizing regular inquires. It is composed of two groups of 16 people : one from the education world (school directors, teachers, scientists, members of the Ministry of Education) and the other from the professional world (8 representatives of the main employers organizations and 8 from professional associations or unions). The historian Ribeill made clear that during the first few years, the aim was always to achieve an equal distribution of seats between the most prestigious schools at the Committee. This fact shows the importance that has always been placed on the which school an engineer graduated from - more than the area where he or she worked[18].

2.3 Consequences on Engineering education in France today

It is important to note that in France the engineering degree given by 232 schools in 1998 is not a national degree like the ones that the university gives. This system founded in 1934 a led to a reinforcement of the existing hierarchy in the engineering schools. It also contributed to standardizing engineering education. Today, the classical model includes two stages : two years of preparatory classes after high school, where students prepare for competitive examinations in order to enter an engineering school ; then three years of higher technical education within these schools. The better known schools follow this model. However over the last forty years new engineering programs have been developed : some schools recruit students after high school and offer a 5 year training course ; others recruit two years after the end of high school students who have already obtained a two-year academic degree instead of being selected from a competitive examination.

The standardization of engineering education explains in part why France is the one country were the distinction between technicians and engineers is emphasized the most : the engineering degree is at *Baccalauréat* plus five years. *Baccalauréat* is the national examination taken at the end of high school at the age of 17/18. It leads to entry into higher education colleges. The short university-level technical curricula lasts two years only and leads straight to employment. There is a discussion between sociologists and historians to find out if the emphasis placed on the classical model has not been an obstacle for the engineering schools to meeting the needs of the industrial world[19]. Last but not least, one of the consequences of the law is to reinforce the organization (and the identity) through their alumni associations rather than through their work. In France, a graduate is from his or her school of engineering before being a computer engineer or a chemical engineer.

In 1998, 232 accredited engineering schools gave an engineering degree to more than 20 000 students. Most schools are small colleges with less than 100 graduates a year, only eight of them have

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[17] On this important period for the French engineering profession, André Grelon, *Les ingénieurs de la Crise. Titre et profession entre les deux guerres* [Title and Profession of Engineer Between the two World Wars], Edition de l'Ecole des Hautes Etudes en Sciences Sociales, Paris, 1986.

[18] Georges Ribeill, « Une institution quinquagenaire : la Commisssion des Titres des Ingénieurs. [A Fifty Year Old Institution : The Committee for the Title of Engineer] : Revolution et permanence », in André Grelon, *Op. cit.*, pp. 228-229. On the Committee today, see the website of the Centre d'Etude sur la Formation des Ingénieurs (CEFI), http : //cri.ensmp.fr/cefi .

[19] Paul Bouffartigues, Charles Gadéa, Op. Cit., pp. 302.303.

more than 300-students per year (Centrale and Polytechnique are among them). Almost 25 % of the students study in a private college. Half of the schools follow the classical model. Most public colleges are under the responsibility of the Ministry of High Education. The others are under the responsibility of other Ministries (Agriculture, Industry, Telecommunication, etc.) especially those preparing the former members of the technical State Bodies. Obviously the protection of the title and the standardization tendency has not lead to an homogenous engineering educational system.

3. The failure of « professionalization » of French engineers

3.1. « Civil engineers » versus civil servants : the Civil Engineer Society (1849)

In the process of professionalization, the Association of German Engineers, VDI, looked for its social recognition by demanding the possibility of having the prestigious title of *Doktor* from German universities, which they managed to obtain in 1899[20]. American engineers looked to their professional associations for the recognition due to the professions. French civil engineers had first to fight the corporative tendency of state engineers, who benefited from the recognition of the public and the protected status of civil servants.

A clarification may be needed here : a « civil engineer » in France does not mean an engineer doing civil works and not a mere non-military engineer. A « civil engineer » is an engineer who is not a civil servant and works in a private corporation where he or she can do civil works as well as mechanics, electronics, etc. This expression was at the center of the fight between civil engineers and the members of the technical State Bodies, but is not commonly used any more. At that time, « civil engineers » chose this name because of the fierce competition with the state engineers for civil works. Civil engineers reproached sate engineers for holding on to their administrative tasks while at the same time obtaining contract work from private corporations. They considered that the state engineers were abusing their position in order to prejudice any projects that did not come from one of their peers, and in general to « damage the reputation of civil engineers »[21]

In the process of the creation of l'Ecole Centrale in 1829, and in a more liberal political context, some alumni created the Civil Engineers Society (*Société des Ingénieurs Civils*, SIC). Another explanation of the French use of « civil engineer », given by Jacomy may be found in the influence of the English Institution of Civil Engineers, created in 1818, that was used as a model for the founders of the French Civil Engineer Society.[22] The aim of this society, which is the oldest in France and has been the only one for a long time, was to increase the prestige of the industry, and to define more precisely the role of engineers in industrial development. The first members were only alumni from l'Ecole Centrale, but the Society soon opened its membership to self-educated engineers and graduates from schools other than l'Ecole Centrale ; only state engineers were not accepted.

The scattering of the engineering colleges and the difficulty that the Civil Engineers Society had in defining its mission and in representing the concrete interests of the civil engineers explain partially why the alumni associations took control of it, especially alumni from the oldest schools. Each school through its alumni association tried to have its own title protected by law. The rivalries between the schools were reinforced. As a consequence, engineers did not pay much attention to the ethical issues of their profession as was the case in American professional engineers associations. Firstly, because it would not contribute to increasing their prestige, as it did for American engineers ; secondly, because they were more preoccupied with the legal issue of protection of their title.

3.2 A profession divided into many groups

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[20] Heiner Stück, « L'émancipation des écoles supérieures techniques et la professionnalisation des ingénieurs en Allemagne au 19ème siècle [Technical High Education Colleges and the Engineering Profession in Germany in the 19th Century] », in A. Grelon, *Op. Cit*, pp. 271-289.

[21] Emile Thomas, *Histoire des Ateliers Nationaux*, Paris, 1848, p. 42, quoted by Bruno Jacomy, « A la recherche de sa mission. La Société des Ingénieurs Civils [The Civil Engineer Society in search of its Mission] », in *Culture Technique*, n°12, 1984, p. 211.

[22] Bruno Jacomy, *ibid.*

At the beginning of the century, in order to meet the needs of the industrial world, many new higher education colleges were opened, particularly in the field of chemistry and electricity. While the number of graduate engineers grew, the profession started to organize itself outside the alumni groups. The Civil Engineer Society that had little influence at first, in comparison with the alumni associations, reached a total of 6 000 members in 1914. (In 1892, it had 1 500 member in a time where 3 500 civil engineers had graduated from Centrale and there was 8 000 state engineers.) But the activities of SIC remained limited to those of a scientific associations, avoiding political commitment.

3.2.1 Catholic Engineers and the « Social Teaching » of the Church

In 1891, Pope Léon XIII published an encyclical called *Rerum Novarum* where « the Social Teaching of the Church » was developed for the first time. In order to make it known, a Jesuit father founded the Catholic Union of Engineers (*Union des Ingénieurs Catholiques*, UIC). In 1902, it was transformed into a professional trade-union for graduates from l'Ecole Centrale. In 1905, it opened its doors to all graduate engineers, state engineers as well as civil engineers and became the Social Union of Catholic Engineers (*Union Sociale des Ingénieurs Catholiques*, USIC). Two years later, when self-educated engineers were allowed to join, USIC became the first movement that gathered all sorts of engineers, (employers and employees, graduates and self-educated, state and civil engineers), but they had to be good Catholics. In ten years time, it became an active engineering trade-union whose influence spread beyond the catholic world where it was born. From 500 members in 1900, the union had almost 10 000 members in 1939.

3.2.2 The first engineers trade-unions[23]

After the legalization of professional organizations in 1884, the first French worker trade-union, the General Labor Confederation (*Confédération Générale du Travail*, CGT) was founded in 1895. Engineers unions appeared a few decades later. The first of them were affiliated to industrial sections : the Trade-Union for Electricity Engineers in 1918, the Trade-Union for the Steel Industry, Mechanics and Public Works Engineers, and the Trade-Union for Chemistry Engineers, both in 1919. They gathered to form the French Engineers Trade-Union (*Union Syndicale des Ingénieurs Français*, USIF). The Engineers Trade-Union contributed to creating the Intellectual Labor Confederation that was linked to the left wing party. The Intellectual Labor Confederation obtained a representative seat on the National Economic Council. The French Engineers Trade-Union had 4 000 members from 1920 to 1936. Engineers who were employers could be members but they were not allowed in the board of directors. Most members considered that an employer could not represent the interests of the salaried engineers who were in majority.

3.2.3 The 1934-law : a common goal for the profession ?

The period between the two World Wars was very important for the profession : the Civil Engineer Society, the Social Union of Catholic Engineers, alumni associations of some prestigious engineering schools gathered to create in 1929 the Federation of Engineers Associations and Societies (FASFI). One of the most common goals of these organizations was to protect the title of engineer. A few engineers trade-unions joined the Federation later. The French Engineers Trade-Union (USIF), created in 1920, did not, but was involved in discussions with the Government. Another goal of the Federation was to obtain a seat in the National Economic Council as did the Intellectual Labor Confederation. Discussions between the Federation of Engineers Associations and the French Engineers Trade-Union with the government lasted 12 years before the law of 1934 was passed.

The common interest in protecting the title cannot hide the deep-seated tension between the different tendencies among the engineers associations and within each of them. The question of defining what an engineer really was continued to be an issue for the profession : can a state engineer be considered as a real engineer ? and an employer ? and what about a self-educated engineer ? The law of 1934 did not provide answers to these questions. It did not clarify what an engineer was since the title « engineer » on its own was still not protected. The law protected only the title of « graduate

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[23] On the unionization of engineers, Marc Descotes, Jean-Louis Robert, dir., *Clefs pour une histoire du syndicalisme cadre* [The History of Unionization of Executives], Editions Ouvrières, Paris, 1984, pp. 81-88.

engineer » and made it compulsory to add to the title the name of the accredited engineering school where the engineer had graduated.

3.3 <u>The middle-class movement and the invention of a new socio-professional group : the executives</u>

3.3.1 Emergence of a salaried consciousness among engineers

While engineers were fighting for their recognition, the consequences of the economic situation led to an increasing number of strikes in France. In 1934, socialists and communists became allied. The movement that they formed in 1935 obtained the majority of seats in Parliament in 1936. In order to put an end to the strikes, President Léon Blum organized discussions between the workers trade-unions and the employers which proved successful.

The engineers felt excluded from the debate between blue collar workers and the managers. They realized more than ever the increasing distance between them and their employers. They wanted their interests to be taken into account, but were afraid of being assimilated into the workers' larger group. However, more and more engineers joined the workers trade-unions : CGT or the French Confederation of Catholic Workers (*Confédération Française des Travailleurs Catholiques*, CFTC, created in 1919). From 1936 to 1938, many non-affiliated small unions of engineers signed « collective contracts » with their industrial sections. When engineers joined unions, their aim was to reinforce the specific status of the high-level employees who started to organize themselves as a new social group after the economic crisis of the 30's. At first, this new group was mostly composed of engineers, nowadays only 20 % of them are engineers. But among their trade-unions, engineers are still the more active.

3.3.2 Counter-reaction of employers

Employers reacted to the unionization of engineers in traditional labor unions by promoting unions of engineers only : the French Engineers Trade-Union and two other ones, both created in 1936. The first one was founded by the Social Union of Catholic Engineers, the other one by the Federation of Graduate Engineers Associations. The three unions merged into one in 1937 : the National Federation of Engineers Unions. During WW II, this Federation has been attracted by the pro-German government's support to the professional corporations. This Government created the Order for the Medical Doctors which still organizes and controls the profession today. Some engineers dreamt of a similar Order for the engineering profession but it did not happen because of their difficulty in finding a unanimous definition for the term « engineer ».

At the end of WW II, engineers and other high-level employees who were affiliated to workers unions and those who were members of the National Federation of Engineers Unions looked for a common base, but they failed. The non-affiliated engineers of the national Federation associated to other high level employees created their own confederation : the General Confederation of Executives (*Confédération Générale des Cadres*, CGC) : this is a very specific aspect of French unionization. The CGC has been the most representative union among engineers for some times also more recently labor unions have attracted engineers by creating sub-committees for engineers and management staff.

4. Engineers associations and unions today and what they say about ethics.

4.1 <u>A single professional association since 1992</u>

4.1.1 From the Civil Engineers Society (CIS) to the National Council of French Scientists and Engineers (CNISF)

For the first time in 1992, scientific societies and alumni associations that had always remained separate merged into a single association. The CNISF is a combination of three groups : the Society of Engineers and Scientists (ex Civil Engineers Society created in 1848), the Federation of Graduate Engineers Associations (ex Federation of Engineers Associations and Trade-Unions, created in 1929) and the National Council of French Engineers created in 1957.

The Civil Engineers Society had become the Society of Engineers and Scientists after the merging in 1978 with the Union of Scientific and Industrial Societies, (*Union des Associations*

Scientifiques et Industrielles, UASIF), a post-war creation of the Civil Engineers Society. It is interesting to note that the new Society of Engineers and Scientists started to accept state engineers, as well as institutional members (whereas there had only been individual memberships before). The fight between civil engineers and state engineers was no longer an issue after WW II. Since 1957, the Federation of Graduate Engineers Associations and Societies had federated the alumni associations of most school of engineering in order to represent the graduates only (the engineers' trade-unions and the Social Union of Catholic Engineers had left in 1936 for that reason). The National Council of French Engineers had been created in 1957 in order to coordinate the scientific societies, the alumni associations and the Civil Engineers Society. The National Council of Engineers and Scientists created in 1992 became the sole representative of the engineers and scientists in France. In 1997, It was made up of 180 national associations, has 160 000 members, and represents 450 000 engineers and high-level technicians[24].

4.1.2 The first French code of engineering ethics

After ten years work that had started in 1987, CNISF produced a code of ethics for engineers. This code - the first one ever written in France - was considered by Jean Perrin, Vice-President of CNISF, as a step towards a « Code of deontology » whose violation ought to be sanctioned.[25] This code is an adaptation of the « Code of professional duties » adopted a few years earlier by the European Federation of National Engineering Associations (*Fédération Européenne des Associations Nationales d'Ingénieurs,* FEANI). The FEANI code had been written by a French team of engineers who had studied some codes adopted in English speaking countries : Australia, United-States and Canada).

Apart from an analysis of the content of this code that is still to be done, a quick look at the institutional environment of the code reveals some of its weaknesses. First, there are neither sanctions nor enforcement procedures. Second, in the membership structure of CNISF, institutional membership is the rule : most members are not direct members but through their alumni association, which has a group membership. How did engineers take part in the writing of the code ? To whom can they propose amendments ? How do CNISF's active members make the code known to the professionals ? What do they expect from it ? These questions still need to be answered. For the time being, the National Council of Engineers and Scientists of France is creating an official register of all French engineers, each of them being supposed to accept and respect the code of ethics[26]. But it seems, when looking at the membership structure, that the impact of the code will depend mainly on the alumni interest in it.

<u>4.2 The Catholic engineers</u>

4.2.1 From The Social Union of Catholic Engineesr (USIC) to the Christian Movement of Engineers, High-Level Employees and Managers (MCC).

The Social Union of Catholic Engineers carried on its social mission but its status has changed over time. It had contributed towards the creation of the Federation of Engineers Associations in 1929, but, the Federation controlled by the alumni associations tended to defend the graduate engineers only. The Social Union of Catholic Engineers which has always wanted to represent the interests of self-educated engineers as well as graduates (even if 50% of its members came from the best-known schools)[27] left the Federation in 1936. On the other hand, until 1928, the board of directors of the Social Union was composed of non-salaried engineers only. Confronted with the growing number of

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[24] « 12ème enquête socio-économique sur la situation des ingénieurs et des scientifiques », [12th Inquiery on the Situation of Engineers and Scientists] *Ingénieur Diplômé*, numéro spécial, n°33, janvier 1997, newsletter published by CNISF and CEFI, p. 62.

[25] Jean Perrin, « Le code de déontologie de l'ingénieur [A Code of Deontology for Engineers] », in R. Moch (dir.), *Ethique et société : les déontologies professionnelles à l'épreuve des techniques* [Professional Ethics and Society in a Technical World], Armand Colin, collection « Références », Paris, 1997, p. 194.

[26] The register informs on how the engineer obtained its title (from an accredited school or by a special CNISF-committee that gives the title to some self-educated engineers under specific conditions). It gives also the address of the alumni association but nothing on the engineer's work, competence and career.

[27] Marc Descotes, Jean-Louis Robert, *Op. Cit.* p. 89.

salaried engineers among its members, the Social Union created in 1936 a trade-union for salaried engineers. Most of the members of this union joined the General Confederation of Executives (CGC) created just after WW II.

In 1964, the Social Union of Catholic Engineers and another Catholic movement of engineers and managers (created by the Catholic Church in 1937) merged into a single one called Movement of Christian Engineers, Executives and Managers (*Mouvement des Cadres Chrétiens*, MCC). Neither a trade-union nor a professional organization, MCC is meant to be a spiritual movement of people having a high level of responsibility in corporations and who wants to live their Christian faith within their work.

4.2.2. Engineers ethics and the Social Teaching of the catholic Church.

Many ethical issues had been developed within the Social Union before 1964, such as workers' dignity (1949), the engineer's freedom (1951), social responsibility of executives and management staff (1953) and the building of a more human future (1962). They have been carried out by MCC, but this new movement has become more oriented towards spirituality and personal commitment than towards social issues. The Catholics who were more interested in social issues than in deepening their faith left the movement to join trade-unions. Nowadays MCC has 10 000 members. Half of the male members are graduate engineers from the best known engineering schools. They are organized into small groups who meet very regularly to talk about the spiritual questions raised by their professional responsibilities in their corporation. Some issues - sometime including common engineering ethics issues - are discussed on a national level and in the Movement's newsletter, *Responsable*.

For 20 years, from 1958 to 1978, a Jesuit father called Jean Moussé was the national chaplain of USIC and then of MCC from 1964 on. He has taught for years business ethics in schools of management and he published some of the few French books on professional ethics in the 80's[28]. He also took part in the first works on professional ethics within the Catholic University of Lille before the Ethics Center was born in 1991.

<u>4.3 Engineers within trade-unions</u>

4.3.1. Engineers in Unions in the 90's.

In France engineers who are unionized nowadays are a very small minority and they are divided into two groups whose cultures are very different. On the one hand, there is a corporatist culture which is best expressed in the CGC (Confederation of Executives) created after WW II, which as always avoided political debates : its publications show little if any interest for ethical issues within the professional activities of its members.

On the other hand, there is an ideological culture. It is found among engineers who are unionized in workers trade-unions. But there again, there are divisions between different groups. There were two workers trade-union before WWI : the anti-clerical one (CGT created in 1895, eleven years after the legalization of trade-unions) and the Catholic one (CFTC, created in 1919, 27 years after *Rerum Novarum* that allowed the unionization of Catholic workers). Today there are four worker unions : the Catholic Workers Confederation, the Democratic Labor Confederation (continuation of the Catholic Workers Confederation from 1964 on, when members didn't have to be Catholic anymore), the General Labor Confederation (CGT) and Workers' Strength (*Force Ouvrière*, FO, which separated from CGT in 1947).

Each of them welcomes engineers sometimes in a separate sub-committee within the confederation, for example in General Union of Engineers and Technicians (UGICT) within the CGT. These sub-committees are more concerned by the status and specific interests of engineers and the management staff, like the Confederation of Executives. But because of their position within a larger workers' union, they also work on questions that concern other groups than their own. On the other hand, workers and engineers who are members of the Democratic Labor Confederation (CFDT) are

[28] Jean Moussé, *Fondements d'une éthique professionnelle* [Fondements for a Professional Ethics], Les Editions d'Organisations, 1989 ; *Ethique et entreprises* [Ethics and Corporations], Vuibert, Paris, 1993.

grouped together in their local committees. They put more emphasis on the common interests of engineers and the other employees. In this confederation, the sub-committee for engineers, called UCC-CFDT is more reflection-oriented than action-oriented and has a main influence on the whole Democratic Labor Union.[29]

4.3.2 Ethics and Technology Assessment : the case of UCC-CFDT

Guy Groux has led an inquiry on the role and importance of engineers within the Democratic Labor Confederation (CFDT). According to him the engineers' place and status in the division-of-labour hierarchy transformed their relationship towards trade-unionism. It also led to new trade union policies on technological innovation in industry at least within the Democratic Labor Confederation, through its engineers within their sub-committee. Until the 80's, trade-unions were not used to negociating the technical choices with the bosses, but only their consequences. In 1979, UCC-CFDT made nine proposals concerning computer investments. After the 1981 election of François Mitterand, some of them were chosen as a basis for a new series of law on the technical change in corporations and on the salaried participation to the choice of new technologies.

In the other hand, UCC adopted in 1992 a charter concerning the autonomy of engineers towards their employers. The union considered that the engineers should be « able to refuse for conscious reasons or inform where need be if dangerous actions were taken, especially those that do not respect the environment or public security ». The text also states that « the human dimension as well as ethical aspects should be integrated into the search for solutions so as to improve the social work relationship and the salaried participation »[30]

More recently, in 1995, UCC wrote a report on the information technology. A systemic analysis covered nine issues : technical, industrial, economic, political and military, social, cultural, legal and moral, ecological and medical and European. The description was followed by 20 concrete proposals. In 1996, after the publication of a « Green book » by The European Union called : « live and work in an information society : priority to the human dimension », the UCC sent to the European Commission its commentaries, included where it agreed or disagreed and some of the 20 proposals as a conclusion. Even if the word « ethics » did not appear, there seem to be some common insights with the Associations of German Engineers VDI to face macro-level engineering ethic issues.

Conclusion

An historical investigation of the engineering profession in France shows that the definition of engineers has been an issue for two centuries. Civil servants working for the technical State Bodies slowed down the recognition of civil engineers ; graduates from the best-known schools who gathered to protect their title, were opposed to self-educated engineers and even to engineers who came from new kinds of schools ; the salaried consciousness born between the two wars divided salaried engineers and employers. Each group that has tried to represent the profession has chosen its own definition of « engineer » and excluded from membership those who didn't fit into it. The 1934-law put an emphasis on the « title » and reinforced the hierarchy between French engineering schools. The Committee for the Title of Engineer, created in 1934, has become the main place for discussions towards a definition of an « engineer ». But since the Committee was in charge of controlling the quality of the engineering curriculum, the issue was defining the graduate engineer, i.e. the required curriculum to become an engineer is. The question of the engineer's rights and duties was not at stake.

The history of the various engineers' associations provides a starting point when searching for the French engineers' ethos. Although there has been for a few years a formalized code of ethics adopted by one of them (CNISF), it seems that French engineers have developed other ways to face ethical issues within their profession than adopting a code of ethics. The existence of this code and the absence of « engineering ethics » as an academic subject in France should not prevent us from looking at other ways of expressing and discussing ethics among the professionals. The reflections that have

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[29] Guy Groux, « Unions and Technology », in *The French Movement : Economic Crisis and Political Change*, Allan-Unwin, Londres, 1983.

[30] See hppt :// persoweb.francenet.fr/~ucc-cfdt/22_04_02.html

taken place since the beginning of the 20th century among the catholic engineers on their social responsibilities is one example. The discussions and proposals on Technology Assessment done by the Democratic Labor Confederation (CFDT) another. This historical investigation is the starting point of a work which should be more sociological and whose aim could be to build a typology of French engineers ethos.