Vous avez dit Prix *Nobel* ?

François Jacob
Prix *Nobel* de Médecine 1965

Biologiste à l'Institut Pasteur et au Collège de France, de l'Institut

François Jacob, vous aviez vingt ans en 1940, vous êtes Compagnon de la Libération et Chevalier des Arts & Lettres. Comment devient-on Prix *Nobel* de médecine et de physiologie à quarante-cinq ans ?

Au départ ce n'est pas évident, mais on sent quelque chose d'irréductiblement exigeant en soi. J'avais à peine commencé mes études de médecine que je me suis embarqué le 21 juin 1940 clandestinement à Saint-Jean-de-Luz, sur un des deux derniers bateaux qui transportaient en Grande-Bretagne les restes de l'Armée polonaise. J'ai suivi le colonel Leclerc en 1941, en Libye jusqu'en Tunisie et ma première blessure. Je l'ai suivi dans la 2è DB. Quatre ans de guerre plus un an d'hôpital pour cause de seconde blessure pendant la bataille de Normadie de l'été 1944, c'était un très lourd handicap. Je voulais être chirurgien, j'ai alors demandé à passer directement le concours de l'internat en shuntant celui de l'externat, ce qui m'a été refusé. J'ai effectué mes études de médecine en trois ans. Indécis, j'ai bricolé dans différents petits boulots dont l'un dans une boite qui fabriquait de la tyrothricine et j'ai envisagé d'être acteur de cinéma. Quand, stagiaire au CNRS, j'ai décidé de me lancer dans la recherche médicale, j'ai voulu aller d'emblée au meilleur de l'époque, c'est-à-dire l'Institut Pasteur. Il y avait deux Chefs de service, l'un avait une réputation exécrable, l'autre était charmant, André Lwoff. C'est donc celui-ci que j'ai choisi mais il m'a d'abord refusé sous prétexte qu'il n'avait pas de place. Tous les mois pendant un an, j'allais le voir pour me heurter à la même réponse. Jusqu'au jour où il m'a dit *"Vous savez qu'on vient d'identifier le phage ?"* Je ne savais bien évidemment pas de quoi il s'agissait, les dictionnaires que j'ai immédiatement consultés non plus, d'ailleurs. C'était en 1950. Du coup, Lwoff m'a enfin accepté et j'ai dirigé le département de génétique cellulaire cinq ans plus tard. Vous connaissez la suite, avec notre *Nobel* partagé avec Jacques Monod. J'étais le seul médecin du trio.

Vous illustrez donc la pertinence de ne pas se laisser abattre par l'échec. En vous remettant le Prix *Nobel,* le professeur Sven Gard a également rendu hommage à la complémentarité de vos compétences: Lwoff représentant la microbiologie, Monod la biochimie, vous la génétique cellulaire. Quelle autre leçon à tirer de votre expérience ?

Le plus dur à encaisser, c'est le succès des autres, surtout quand vous êtes sur le même créneau et au bord de la découverte, disait Lwoff. Chacun de nous était au contraire très content du succès des deux autres.

Si vous aviez vingt-cinq ans aujourd'hui, dans quel domaine vous investiriez-vous ?

Dans les neurosciences, sans aucune hésitation. C'est là que se trouveront les Prix *Nobel* des décennies à venir.

Pourquoi, élu à *l'Académie française*, cette prise de position en faveur du darwinisme dans le pays qui vit naître un lamarckisme qui a encore ses partisans ?

Parce que le lamarckisme est une erreur à laquelle les Français se sont trop longtemps accrochés.

Votre épouse, Geneviève Barrier, pense que, quel qu'eût été votre choix initial d'une autre profession que la médecine, vous seriez arrivé à son sommet le plus élevé ?

Ça, seul Dieu pourrait le dire !

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"Pendant la période où félicitations et honneurs pleuvaient sur moi, des impressions nouvelles effaçaient inconsciemment les anciennes, mais une réflexion est restée très vivante dans mon esprit : c'est le souvenir de la satisfaction que je ressentais quand mes manipulations étaient terminées. C'est la joie qui découle des efforts réussis et du progrès réalisé. Vous tous, vous pouvez jouir de ce bonheur dans votre vie et chacun peut et doit atteindre ce but qui, en principe, ne dépend que de ses aspirations. Je souhaite à tous ce bonheur, cette satisfaction profonde. Que les circonstances vous permettent d'atteindre ce but après un parcours pas trop difficile."

Wilhelm Conrad Röntgen

Discours aux étudiants de l'université de Würzburg au cours de la fête qu'ils lui offrirent après l'annonce de l'attribution du premier prix *Nobel* de physique en 1901 pour sa découverte des rayons X.

Beruj Benacerraf, par lui-même, prix *Nobel* 1980 (www.Nobelprize.org)

I was born in Caracas, Venezuela, on October 29, 1920 of Spanish-Jewish ancestry. My father, a self-made business man, was a textile merchant and importer. He was born in Spanish Morocco, whereas my mother was born and raised in French Algeria and brought up in the French culture. When I was five years old, my family moved to Paris where we resided until 1939. My primary and secondary education was in French which had a lasting influence on my life. The second World War caused our return to Venezuela, where my father continued to have a thriving business. It was decided that I should pursue my education in the United States, and we moved to New York in 1940. I registered at Columbia University in the School of General Studies, and graduated with a Bachelor of Science Degree in 1942, having also completed the pre-medical requisites for admission to Medical School. By that time, I had elected to study biology and medicine, instead of going into the family business, as my father would have wanted. I did not realize, however, that admission to Medical School was a formidable undertaking for someone with my ethnic and foreign background in the United States of 1942. In spite of an excellent academic record at Columbia, I was refused admission by the numerous medical schools I applied to and would have found it impossible to study medicine except for the kindness and support of George W. Bakeman, father of a close friend, who was then Assistant to the President of the Medical College of Virginia in Richmond. Learning of my difficulties, Mr. Bakeman arranged for me to be interviewed and considered for one of the two remaining places in the Freshman class. I was accepted and began my medical studies in July 1942. While in medical school, I was drafted into the U.S. Army with the other medical students, as part of the wartime training program, and naturalized American citizen in 1943. I greatly enjoyed my medical studies, which at the Medical College of Virginia were very clinically oriented. I received what I considered to be an excellent medical education in the relatively short time of three war years. This busy time was rendered very happy by my marriage in 1943 to Annette Dreyfus, a French student, also a refugee from Paris, whom I had met at Columbia University. I trained as an intern at Queens General Hospital in New York City in 1945 and was commissioned First Lieutenant in the U.S. Army Medical Corps in 1946. After the usual six weeks of basic training at Fort Sam Houston, Texas, I was shipped to Germany with several thousand other physicians. I was happy to be assigned to France, first in Paris, then in Nancy, where my wife had joined me. I stayed there nearly two years, as the head of a medical unit where I enjoyed practising what today would be called community medicine. I was discharged in 1947 and, motivated by intellectual curiosity, decided upon a career in medical research at a time when such a choice was not fashionable. My interest was directed, from my medical student days, to Immunology, and particularly to the mechanism of hypersensitivity. I had suffered from bronchial asthma as a child and had developed a deep curiosity in allergic phenomena. I sought the advice of many scientists, among whom René Dubos at Rockefeller University, John Enders at Harvard Medical School, and Jules Feund at the Public Health Research Institute in New York, to whom I had been recommended by members of the faculty in Richmond. I was strongly urged to work with a dynamic young immunochemist, Elvin Kabat, whose laboratories were at the Neurological Institute, Columbia University School of Physicians and Surgeons. Following an interview with Elvin Kabat, who offered me a Fellowship in his laboratory, I started my research career in February, 1948. Training with Elvin Kabat was one of the significant experiences in my development as a scientist. Elvin Kabat is a hard task-master with rigorous standards and an absolute respect for the quantitative approach to science. He felt that if a phenomenon could not be quantitated, it did not deserve to be studied. He taught me Immunochemistry and basic Immunology, but more importantly, I learned the significance of experimental proof, the need for intellectual honesty and scientific integrity. I was fortunate also that my first two years as a scientist were very productive and my initial goal of understanding experimental hypersensitivity mechanisms was in part fulfilled. My life for the next six years was very much influenced by family considerations. A daughter, Beryl, was born in 1949, and my parents had returned from Venezuela to their home in Paris. My father had suffered a severe stroke and was now a cripple. My wife's family also lived in Paris. The attraction of moving to France and settling close to our respective families was very strong. Accordingly, we moved to Paris in mid-1949 and I accepted a position in Bernard Halpern's laboratory at the Broussais Hospital. This position permitted me also to make frequent trips to Venezuela where my father's business interests now required my personal involvement. During this period I was privileged to form a close relationship with a young Italian scientist who had also joined Halpern's laboratory, Guido Biozzi. For six years we operated as a team and engaged in the study of reticuloendothelial function in relation to immunity. We developed the techniques to study the clearance of particulate matter from the blood by the RES, and formulated the equations that govern this process in mammalian organisms. After six years in Paris, I began to realize that as a foreigner to France, in spite of my French education, I would experience continuous difficulties in pursuing a scientific career and establishing an independent laboratory. This was made painfully clear to me by the chief of the laboratory, Dr. Halpern. The significance of this message was heightened by my unhappy discovery that I could not find another laboratory in Paris in 1956 that would give me a chance to work and establish myself. I decided therefore to return to the United States. I am deeply grateful to Lewis Thomas who offered me an appointment as Assistant Professor of Pathology at New York University School of Medicine and helped me develop my own laboratory and research support. I returned to my earlier studies on hypersensitivity mechanisms, but this time also developed an interest in cellular as well as humoral hypersensitivity. From 1956 to 1961, I worked on cellular hypersensitivity with Philip Gell, immune complex diseases with Robert McCluskey and Pierre Vassalli, anaphylactic hypersensitivity with Zoltan Ovary, tumor specific immunity with Lloyd Old, and the structure of antibodies, in relation with their specificity, with Gerald Edelman. The years at New York University were very happy ones, and it was soon apparent that I had made the correct choice in returning to the United States. The scientific atmosphere at New York University during that period was particularly favorable to the development of Immunology. (...)

ROSALYN YALOW'S SPEECH at the Nobel Banquet, December 10, 1977

Your Majesties, Your Royal Highnesses, Ladies, Gentlemen and you, the Students, who are the carriers of our hopes for the survival of the world and our dreams for its future. Tradition has ordained that one of the Laureates represent all of us in responding to your tribute. The choice of one among the several deemed truly and equally distinguished must indeed be difficult. Perhaps I have been selected for this privilege because there is certainly one way in which I am distinguishable from the others. This difference permits me to address myself first to a very special problem.

Among you Students of Stockholm and among other students, at least in the Western world, women are represented in reasonable proportion to their numbers in the community; yet among the scientists, scholars and leaders of our world they are not. No objective testing has revealed such substantial differences in talent as to account for this discrepancy. The failure of women to have reached positions of leadership has been due in large part to social and professional discrimination. In the past, few women have tried and even fewer have succeeded. We still live in a world in which a significant fraction of people, including women, believe that a woman belongs and wants to belong exclusively in the home; that a woman should not aspire to achieve more than her male counterparts and particularly not more than her husband. Even now women with exceptional qualities for leadership sense from their parents, teachers and peers that they must be harder-working, accomplish more and yet are less likely to receive appropriate rewards than are men. These are real problems which may never disappear or, at best, will change very slowly.

We cannot expect in the immediate future that all women who seek it will achieve full equality of opportunity. But if women are to start moving towards that goal, we must believe in ourselves or no one else will believe in us; we must match our aspirations with the competence, courage and determination to succeed; and we must feel a personal responsibility to ease

Prix *Nobel* de Physiologie ou de Médecine français

AIHP

Charles Richet (1913)
André Cournand (1956), USA
Jean Dausset (1980)

N.AIHP

Alphonse Laveran (1907)
Alexis Carrel (1912)
Charles Nicolle (1928)
François Jacob, André Lwoff, Jacques Monod (1965)
Roger Guillemin (1977), USA

the path for those who come afterwards. The world cannot afford the loss of the talents of half its people if we are to solve the many problems which beset us.

If we are to have faith that mankind will survive and thrive on the face of the earth, we must believe that each succeeding generation will be wiser than its progenitors. We transmit to you, the next generation, the total sum of our knowledge. Yours is the responsibility to use it, add to it, and transmit it to your children. A decade ago during the period of world-wide student uprisings there was deep concern that too many of our young people were so disillusioned as to feel that the world must be destroyed before it could be rebuilt. Even now, it is all too easy to be pessimistic if we consider our multiple problems: the possible depletion of resources faster than science can generate replacements or substitutes; hostilities between nations and between groups within nations which appear not to be resolvable; unemployment and vast inequalities among different races and different lands. Even as we envision and solve scientific problems - and put men on the moon - we appear ill-equipped to provide solutions for the social ills that beset us.

We bequeath to you, the next generation, our knowledge but also our problems. While we still live, let us join hands, hearts and minds to work together for their solution so that your world will be better than ours and the world of your children even better.

Biographie anglophone d'André Frédéric Cournand, prix *Nobel* 1956

French-trained physician whose medical career in the United States culminated in a Nobel Prize for physiology and medicine. André Frédéric Cournand was born in Paris on September 24, 1895. He studied physics, chemistry, and biology at the Faculté des Sciences in Paris, graduating in 1913. The following year, he began his medical studies, but upon the outbreak of World War I he volunteered for the French army, where he served as a battalion surgeon until the end of the conflict. On leaving the army, he resumed his medical studies and became an intern at the Hôpitaux de Paris in 1925. During the next few years he gained clinical experience, especially in internal medicine, under Professor Robert Debré, head of the pediatric service of the Children's Hospital in Paris. In the 1930s, anxious to study and work in the United States, Cournand secured a residency in the tuberculosis (later chest) service of Columbia University at Bellevue Hospital in New York. He became chief resident of this service and conducted research on the physiology and physiopathology of respiration under the guidance of D. W. Richards. Cournand also began his own work on the development of physiologic methods of exploration of the cardiopulmonary system. By using the catheter technique developed by W. Forsmann, Cournand and D. R. Richard Jr. succeeded in measuring the blood pressure in the lung artery. This discovery was crucial for the surgery of patients affected by silicosis, and eventually it was recognized by the 1956 Nobel Prize. During World War II Cournand was an investigator for the U.S. Office of Scientific and Research Development, working in the Chemical Warfare Service. Although Cournand became a U.S. citizen in 1941, he never cut his ties with his home country. Throughout his career, he stayed in close contact with his former teacher, Robert Debré. In the spring of 1945, as the war was ending in Europe, Cournand proposed a plan to the Rockefeller Foundation to assist French medical research. In 1947, with the support of the French government and the Rockefeller Foundation, a Medical and Surgery Relief Committee (MSRC) was established in New York to provide grants to French clinicians eager to learn the new techniques of biomedicine then in use in North America. The MSRC also provided scientific equipment (centrifuges) and new medicines (cortisone) to Louis Bugnard, director of the French Institut National d'Hygiène. In 1950, Debré attempted to lure Cournand back to France, where he could help with the renewal of medical research. When Debré suggested Cournand for a chair at the Collège de France, however, his candidature was blocked by academic rivalries. Cournand decided to stay in New York, where he was appointed professor at Columbia University's College of Physicians and Surgeons in 1951. A few years later, when Cournand was awarded the Nobel Prize as a U.S. citizen, Debré characterized this as *"a severe warning for French medical research."* Professor André F. Cournand died in 1988.

André Lwoff Prix *Nobel* 1965

C'est la recherche qui m'a conduit ici et la recherche, on le sait, est un jeu. Montaigne déjà faisait mention de *"cette passion studieuse qui nous amuse à la poursuite des choses et de l'acquêt desquelles nous sommes désespérés"*. En général, il faut bien le dire, ce n'est pas la découverte qui engendre le désespoir, mais bien plutôt son défaut. La recherche étant un jeu, il importe peu en théorie tout au moins, que l'on gagne ou que l'on perde. Mais les savants possèdent certains traits des enfants. Comme eux ils aiment gagner et comme eux ils aiment être récompensés. (...) Si j'ai prononcé le mot de sacrement c'est que la recherche scientifique est une religion qui demande la foi, une foi rationnelle. Comme toute religion, elle exige des prophètes, un collège d'apôtres, l'âme et le cœur de tout un peuple. Elle exige également des martyrs. Le grand inquisiteur a fouillé dans le passé du chercheur. On le charge de crimes : il a goûté le fruit vénéneux de la connaissance et a enfanté des visions étranges. Il est condamné. On l'immole sur l'autel de la gloire transcendante. Pour affirmer sa passion désintéressée on lui donne beaucoup d'or. Pour fortifier sa modestie une machine infernale projette son image à travers l'espace et le monde entier le regarde. La victime prend à la cérémonie un plaisir évident et il y a beaucoup de candidats au martyre. Car tout savant, au fond de lui-même, désire être reconnu. Cependant, la célébrité conférée au lauréat par une distinction si rare, si enviée, et si éclatante, le sépare quelque peu arbitrairement de ses pairs, l'oblige à se considérer, à se juger. Elle l'oblige aussi à méditer sur les prix en général, sur la générosité du sort, sur les charmes et les contraintes de la notoriété.(...)

Jean Dausset, prix *Nobel* 1980

Au nom des 3 Lauréats du Prix de Physiologie et de Médecine 1980, George Snell, Baruj Benacerraf et moi-même, je veux exprimer à la Fondation *Nobel* toute notre reconnaissance. En nos personnes vous avez récompensé tout un domaine, de plus en plus exaltant, de la biologie contemporaine: la définition biologique de l'individu qui conditionne sa réponse immunitaire, donc sa défense devant toute agression. Cette définition est importante sur le plan philosophique. Elle débouche, en effet, sur la notion que chaque homme est différent, que chaque homme est unique, ce qui magnifie sa dignité. Jamais sur la terre il n'y a eu et il n'y aura jamais, en dehors des vrais jumeaux, deux individus strictement identiques. La différence est non seulement utile mais nécessaire, voire indispensable à la défense de l'individu et de l'espèce. Pour chaque homme la différence génétique entre ses parents est un gage de survie. Pour chaque population, pour l'humanité toute entière les différences génétiques sont une nécessité pour évoluer et pour survivre. Les différences physiques sont des richesses inestimables. II en est de même des différences morales, intellectuelles ou religieuses que nous devons non seulement tolérer mais cultiver. (...) Qu'il me soit aussi permis de rappeler que la génétique de l'homme et les lois de la transplantation humaine n'auraient pu être établies sans la participation bénévole de nombreux et admirables volontaires, hommes, femmes, et enfants qui doivent tous être associés à cet hommage. Ils ont montré par leur dévouement, par leur générosité qu'il existe au fond de chacun de nous un profond désir de solidarité. En ce monde désenchanté où les valeurs humaines sont en péril, leur geste désintéressé est un inestimable réconfort. Votre choix a permis de projeter sur eux les lumières de l'actualité et de la vérité. (...)

Biographie anglophone de Jean Dausset, prix Nobel 1980

His mother originated from Lorraine, his father from the Pyrénées, two French provinces very distant from one another and with vast cultural differences. His parents met in Paris. During the First World War, his father, a doctor and captain in the army, sent Jean Dausset's mother and the first three children to Toulouse. It was there that Jean Dausset was born, on 19th October 1916, and this region has held a strong attachment for him ever since. After the war, his father worked as a physiotherapist and radiologist, dividing his time between Paris and the spa towns. Jean Dausset spent his early childhood in Biarritz, until the age of secondary school. Then, when he was 11 years old, his family came to settle permanently in Paris. He pursued his secondary studies at the Lycée Michelet and obtained his baccalaureate in

mathematics.His choice of career was almost dictated by that of his father, Henri Dausset, who pioneered Rheumatology in France. His medical studies progressed without incident until the advent of the Second World War, when they were interrupted. He was mobilized in 1939 and returned from the French Campaign in 1940 to a Paris occupied by the Germany Army. He began to devote his time ardently to the preparation of a competitive examination for the title of Intern of the Paris Hospitals. Upon receiving this title, he immediately left to join the fighting forces in North Africa. During the Tunisian Campaign, he performed blood transfusions in the army. This was his first introduction to immunohaematology. While training in Algiers, he performed his first laboratory experiments and carried out his first scientific study on blood platelets. On his return in 1944, to a liberated Paris, he was given the responsibility for collection of blood samples in the Paris area, working from the Regional Blood Transfusion Centre at Hôpital Saint-Antoine. As soon as the war was over, he undertook his first real research study, in collaboration with Professor Marcel Bessis. Professor Bessis had just developed exchange-transfusion in new-born babies and adults. It is impossible to say how much time he spent treating, with this method, women who had become anuric following abortion manoeuvres resulting in septicaemia due to Clostridium perfringens - this was his first contact with kidney failure! His clinical years oriented towards haematology and pediatrics, with a constant attraction to the laboratory. In 1948, he was sent, as a French trainee, to the Children's Hospital in Boston (Professors L. K Diamond and Sydney Farber) where he worked in one of the Harvard Medical School laboratories. (...)

Roger Guillemin, prix Nobel 1977

(...) A few days ago, thinking ahead about what I would say on this rather unique occasion, I was listening to the voice of Albert Camus in the Nobel Lecture he gave 20 years ago. Camus gave a moving description of what he considered to be the mission of an artist, a writer as he was and also of his understanding of the role of the artist in his responsibility to society.

I was as surprised as moved to realize that what Camus was describing were my own views of the scientist in his ethics of science and his role to society. Yes, the commitments are the same for the scientist as they are for the artist, when both are worthy of the name. That must already have been in the mind of Alfred Nobel who chose to associate literature and Science in his legacy. Please see us here tonight, as the representatives of modern medicine either as an art or as a science or better still, as both art and science. (...)

Biographies et extraits des discours de réception : www.Nobelprize.org

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Docteur Claudie Haigneré, sous ce titre et ce nom, vous avez été une seconde fois cosmonaute et deux fois ministre, recherche et affaires européennes, du Gouvernement Raffarin. Vous êtes en ce moment Conseillère du Directeur général de l'Agence Spatiale Européenne (ESA). Vous vous appeliez auparavant Claudie André-Deshaies, ancienne attachée de rhumatologie à l'hôpital Cochin. Vous êtes devenue la première cosmonaute française en 1996. Quelle enfant étiez-vous à l'âge où Sophie Marceau allait en boum et Isabelle Adjani, jeune carabine en émoi, recevait une baffe de son Lino Ventura de père pour avoir préféré un jouvenceau hippie à ses études et un gendre idéal ?

J'ai été une enfant bourguignonne très axée sur ses études scolaires au Creusot, bien et sérieusement éduquée par des parents libéraux et sportifs. Une polarde, dit-on. En boum, à supposer que j'y sois parfois allée, je traduisais mes versions grecques ou latines pendant que mes copines s'amusaient. J'ai eu un bac AC, le plus difficile et le plus complet, avec une mention très bien, à quinze ans. N'allez pas croire que j'étais une pure cervelle, j'ai aussi été championne scolaire de gymnastique aux agrès. J'ai fait mes études de médecine à Dijon et découvert alors le jazz et les sports de ballon par équipes, hand-ball et volley notamment. Il faut vous dire que j'ai toujours été fascinée par le corps en mouvement. Cela explique pourquoi, très tôt docteur en médecine, je suis *"montée"* à Paris pour être FFI à Corbeil-Essonnes et me spécialiser en rhumatologie, principalement mécanique. J'ai alors exercé la fonction d'attachée de consultation à Cochin, chez Bernard Amor et Michel Revel. C'est là que j'ai été accrochée, un jour de 1985 tout à fait par hasard, par une affiche annonçant le recrutement de cosmonautes français pour des missions spatiales. Il y eut un millier de candidatures. Chanceuse, j'appartiens aux sept qui furent sélectionnés à la suite de tests spécialement éprouvants mais j'y étais bien préparée physiquement et mentalement. J'ai toujours aimé travailler dur pour découvrir, en exploratrice en quelque sorte, des domaines nouveaux. De ce fait, j'ai préparé un DEA de biomécanique corporelle puis validé une thèse de neurosciences sur le thème du regard et le déplacement de la tête, au Collège de France chez le Professeur Berthoz également Directeur de Recherche au CNRS.

L'idée de la conquête spatiale par l'homme a été lancée il y a cinq siècles par Cyrano de Bergerac et reprise par Jules Verne, HG Wells, Hergé et plus récemment par les films de Kubrick, Spielberg, Lukas... Auriez-vous été influencée par des séries télévisées comme *Star Trek*, pour ne pas parler de l'homme bionique ou de *Mac Gyver* ?

Il faut donner à l'humanité des raisons de rêver et que les jeunes puissent vivre des utopies. Ce que vous citez est utile et nécessaire car il est souhaitable de développer cette bonne culture de l'anticipation qui excite l'imagination. En ce qui me concerne, le grand frisson est venu du débarquement de Neil Armstrong sur la Lune le 21 juillet 1969. Mais il ne suffit pas de rêver, il faut acquérir un gros *"package"* de connaissances diverses avant d'imaginer