



Buenos Aires, 27 de octubre de 1970

Distinguido Profesor Leloir,

Ha sido una verdadera satisfacción para mí el haber tenido el gran honor de transmitir a usted personalmente esta mañana las felicitaciones de mi Gobierno y de la Real Academia de Ciencias de Suecia por haberse hecho acreedor al Premio Nobel de Química 1970.

Me complace en acompañar el texto de las

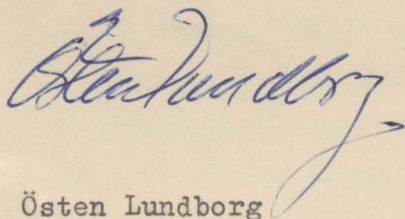
Al Profesor Doctor Luis F. Leloir

BUENOS AIRES

motivaciones de la Academia en esta decisión,
que el Instituto Nobel me ha hecho llegar en
su versión inglesa.

Quiero con estas líneas reiterarle mis felici-
taciones y expresarle que abrigo la esperanza
de verlos, a usted y a su señora, en mi casa
antes de su partida para Suecia.

Le saludo con mi más cordial y distinguida
consideración.

A handwritten signature in blue ink, written in a cursive style. The signature is 'Östen Lundborg' and is positioned above the typed name.

Östen Lundborg

Premio Nobel de Quimica 1970

Motivaciones de la Real Academia de Ciencias de Suecia

PROFESSOR LUIS FEDERICO LELOIR IS THE THIRD ARGENTINIAN NOBEL PRIZE WINNER. THE FIRST WAS C SAAVEDRA LAMAS, WHO WAS AWARDED THE PEACE PRIZE IN 1936, AND THE SECOND WAS B A HOUSSAY, WHO RECEIVED THE PRIZE FOR PHYSIOLOGY OR MEDICINE IN 1947.

LELOIR STUDIED MEDICINE AND GRADUATED IN 1932. AFTER THAT, HE WORKED FOR SOME TEN YEARS AS A RESEARCH ASSISTANT IN THE INSTITUTE OF PHYSIOLOGY, HEAD OF WHICH WAS THE NOBEL PRIZE WINNER HOUSSAY, LELOIR'S EARLIER WORK WAS CONCERNED CHIEFLY WITH MEDICAL PROBLEMS, BUT AS TIME WENT ON HE DEVOTED MORE AND MORE OF HIS TIME TO RESEARCH IN BIOCHEMISTRY. HE ALSO WORKED FOR SOME TIME IN FAMOUS BIOCHEMICAL INSTITUTES IN ENGLAND AND THE UNITED STATES OF AMERICA.

FROM 1941 TO 1947, LELOIR WAS ASSOCIATE PROFESSOR OF PHYSIOLOGY AT THE BUENOS AIRES UNIVERSITY, AND IN 1947 HE WAS APPOINTED HEAD OF THE INSTITUTION FUNDACION CAMPOMAR FOR BIOCHEMICAL RESEARCH WHICH BELONGS TO THE FACULTY OF MATHEMATICS AND NATURAL SCIENCES. IN THE YEARS THAT FOLLOWED, HE MADE THE REMARKABLE SERIES OF DISCOVERIES, THE MERITS OF WHICH HAVE NOW REVOLUTIONIZED OUR KNOWLEDGE OF OPERATIVE MECHANISMS ESPECIALLY IN THE FIELD OF CARBOHYDRATE METABOLISM.

THE CARBOHYDRATES, AS EVERYBODY KNOWS; FORM A COMPREHENSIVE GROUP OF SUBSTANCES INCLUDING INNUMERABLE SUGARS AND SUGAR DERIVATIVES, AS WELL AS HIGH-MOLECULAR CARBOHYDRATES (POLY-SACCHARIDES) LIKE STARCH IN PLANTS OR GLYCOGEN IN ANIMALS, ETC. THE IMPORTANCE OF THE CARBOHYDRATES, AS FOR INSTANCE IN FOOD, IS OBVIOUS: THE BIOLOGICAL BREAK-DOWN ("COMBUSTION") OF CARBOHYDRATES SUPPLIES THE PRINCIPAL PART OF THE ENERGY THAT EVERY ORGANISM NEEDS. WHILE, FOR SEVERAL DECADES, WE HAVE BEEN WELL INFORMED ABOUT THE PROCESS OF BIOLOGICAL

CARBOHYDRATE BREAKDOWN AND ITS CATALYSTS, IT WAS NOT UNTIL LELOIR'S DISCOVERIES THAT THE MECHANISMS OF ALL THE SYNTHESSES OF COMPOUNDS BELONGING TO THE CARBOHYDRATE GROUP, WERE CLARIFIED.

AT THE END OF THE FORTIES, LELOIR FOUND THAT IN A BIO-CHEMICAL REACTION WHICH RESULTS IN THE TRANSFORMATION OF ONE SUGAR TO ANOTHER SUGAR, THE PARTICIPATION OF A SO FAR UNIDENTIFIED SUBSTANCE WAS ESSENTIAL. HE ISOLATED THE SUBSTANCE AND DETERMINED ITS CHEMICAL NATURE. IT TURNED OUT TO BE A COMPOUND OF AN UNKNOWN TYPE, A SUGAR-NUCLEOTIDE. LELOIR UNRAVELED ITS FUNCTION IN THE SUGAR TRANSFORMATION STUDIED AND, MOREOVER, INGENIOUSLY REALIZED THAT IN FACT HIS DISCOVERY WAS THE KEY TO UNDERSTANDING THE NATURE OF AN IMMENSE NUMBER OF METABOLIC REACTIONS. HE THEREFORE SET HIMSELF TO EXPLORE THE VAST FIELD WHICH HIS DISCOVERY HAD MADE ACCESSIBLE TO WORTHWHILE SCIENTIFIC INVESTIGATION. HE QUICKLY ACHIEVED REMARKABLE SUCCESS.

OBVIOUSLY, OTHER SCIENTISTS WERE NOT SLOW TO GRASP THE FUNDAMENTAL IMPORTANCE OF LELOIR'S DISCOVERIES AND STARTED INVESTIGATIONS ALONG THE ROAD WHICH HE HAD OPENED. LELOIR'S WORK THUS INITIATED RESEARCH ALL OVER THE WORLD, THE VOLUME OF WHICH HAS GROWN EVER SINCE. LELOIR HAS BEEN THE FORERUNNER AND GUIDE THROUGHOUT: HE MADE ALL THE PRIMARY DISCOVERIES WHICH DETERMINED THE PROGRESS AND THE WHOLE DEVELOPMENT.

(continua p. 3.)

LELOIR SOON FOUND THAT BESIDES THE SUGAR-NUCLEOTIDE FIRST ISOLATED SEVERAL OTHERS OF THE SAME TYPE APPEAR IN NATURE. AND MANY HAVE ALSO BEEN ISOLATED BY OTHER RESEARCH WORKERS. TODAY MORE THAN ONE HUNDRED SUGAR-NUCLEOTIDES, WHICH ARE ESSENTIAL PARTICIPANTS IN VARIOUS REACTIONS, ARE KNOWN AND WELL CHARACTERIZED. SOME OF THEM HAVE AN ACTION SIMILAR TO THAT OF THE ONE FIRST ISOLATED, NAMELY IN THE TRANSFORMATION OF SIMPLE SUGARS TO OTHER SIMPLE SUGARS OR SUGAR DERIVATIVES. OTHER SUGAR-NUCLEOTIDES HAVE ANOTHER ROLE IN NATURE, VIZ., IN THE SYNTHESIS OF MORE OR LESS COMPLICATED COMPOUNDS, CONTAINING SUGARS OR SUGAR DERIVATIVES, SUCH AS CERTAIN SUGARS, FOR INSTANCE CANE SUGAR, MILK SUGAR, ETC., OR POLYSACCHARIDES SUCH AS STARCH, GLYCOGEN AND CELLULOSE, OR SUBSTANCES CONTAINING COMPONENTS OF ANOTHER CHEMICAL NATURE BESIDES CARBOHYDRATE. IN ALL THESE SYNTHESSES THE SUGAR-NUCLEOTIDES ACT AS "DONORS" OF THE SUGAR MOIETIES.

THE FIRST EXAMPLE OF THE FUNDAMENTAL ROLE OF THE SUGAR-NUCLEOTIDES IN POLYSACCHARIDE SYNTHESSES WAS FOUND BY LELOIR IN 1959 IN THE CASE OF GLYCOGEN: UNTIL THEN NOTHING WAS KNOWN WITH CERTAINTY ABOUT THE BIOSYNTHESIS OF THIS VERY IMPORTANT SUBSTANCE. THE SYNTHESIS WAS DESCRIBED DOUBTFULLY AS A "REVERSAL" OF THE KNOWN BREAK-DOWN. THROUGH LELOIR'S WORK IT BECAME CLEAR THAT NATURE USES QUITE DIFFERENT MECHANISMS FOR SYNTHESIS AND FOR THE BREAK-DOWN OF HIGH-MOLECULAR CARBOHYDRATES. THE SAME, EXTREMELY IMPORTANT PRINCIPLE HAS LATER BEEN SHOWN TO BE VALID ALSO WITH OTHER GROUPS OF SUBSTANCES, FOR INSTANCE WITH PROTEINS AND NUCLEIC ACIDS.

FEW DISCOVERIES HAVE MADE SUCH AN IMPACT ON BIOCHEMICAL RESEARCH AS THOSE OF LELOIR. HIS WORK, AND THE WORK INSPIRED BY HIM, HAS GIVEN US REAL KNOWLEDGE IN WIDE FIELDS OF BIOCHEMISTRY, WHERE EARLIER WE HAD TO RESORT TO VAGUE HYPOTHESES. IT CAN BE READILY APPRECIATED THAT HIS WORK ALSO HAS EXTENSIVE CONSEQUENCES IN PHYSIOLOGY AND MEDICINE.