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idiomatic or educational differences in all countries and at all eras. Space law at least has this essential quality of a sole language derived from a sole conception and an identical evaluation of concepts.

Finally, a happy event has been foreseen, if not yet demonstrated: doctrine tends to acquire, with the development of space and interplanetary law, the great importance that Roman law possessed, that is, the value of the norm when it is uniform. Perhaps by this unused path the jurist once again will take an active part in the life of the State and reinstate a power usurped by the politician and apply his opinions as bases for decisions, in the same manner as jurisprudence or the law itself.

THE INTERNATIONAL ASTRONAUTICAL FEDERATION AND THE USE OF SPACE FOR PEACEFUL PURPOSES*

BY ANTONIO FRANCOZ RIGALT†

MAN'S study of space is age-old.

However, until very recently these studies were confined to observations and measurements of celestial bodies in their relation to earth.

Gigantic telescopes, aerostatic balloons and airplanes have played an important role in these scientific studies. The long-range rocket, equipped with instruments, was developed in Germany, Russia, the United States, France, Italy, Japan, Israel and the UAR as a means of exploring and providing valuable data on radiation, temperatures, gravity and space phenomena. In 1957 the first artificial satellites appeared, circling the earth in increasing numbers and bringing about great advances in electronics and space navigation, for purposes of space research, communications, meteorology, navigation and geographic reconnaissance. 1959 was the year in which the vehicles which had been launched were able to become free of the pull of gravity, and 1961, with the orbital flights of Gagarin and Titov, and the ballistic flights of Sheppard and Grissom, saw man carry out the spectacular feat of travelling at high speeds in that region beyond airspace, away from the distorting action of the earth's atmosphere and deep into inter-planetary space. In 1962 some of the outstanding space feats included the extra-atmospheric flights of Glenn and Carpenter, and the orbiting of the satellite "Telstar," built under the auspices of the American Telephone and Telegraph Company, launched and tracked by the National Administration of Space Aeronautics of the United States (NASA) which will open the way for a world system of telecommunication by means of artificial satellites. This last year has been one presenting unsuspected perspectives, due to the efforts of an ever-growing number of technicians, engineers and researchers who work with the great tools at their disposal in order to extend the scope of human knowledge.

Astronautics and its progress are more than an adventure. They are great historical experiences in regard to space, the solar system and perhaps, in the future, to other galaxies. Each step, each discovery, each new

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goal, changes with the passing of time and new horizons of knowledge are placed before the spirit of man. Until the present time it has been difficult to predict what will be the ultimate end of the race to conquer the cosmos. We do not know if it is an objective or if it is the beginning of a new era, nor do we comprehend fully the fundamental scientific reasons that have so dramatically opened before us such a remote and uncertain, absorbing and multiformed horizon. What seems highly in order at this time is to adjust technique and science, including social science, to this new reality. Particularly in regard to telecommunications and aviation, the economic, juridical and political problems which have arisen by virtue of advances in space technology demand careful consideration and immediate solution.

With respect to telecommunications the appearance of communication satellites has given rise to many important matters, among which are the imperative need for assigning radio frequencies to satellites, apportionment of the electromagnetic spectrum which is indispensable to space telecommunications, determining the frequency needs of satellites with a fixed position and with an equatorial orbit for determined services, as well as their relation to the systems used in direct radio transmission, establishment of the requirements of radio dissemination and curbing disturbances and atmospheric sound loss. Also, the conditions according to which telephonic, telegraphic, reproduction services, transmission of data, sound television, alert, radio transmission and space and telex order services are rendered at the time when the network of these communication satellites begin operations, complementing the international telecommunications network. The regions of optimum frequencies for space communications would seem to require the determination of such regions in conformity with international conventions on assignment of radio frequency bands to services, the determination of the band range necessary for long-range communications and agreement on sharing earth-space frequencies with those used for other services. These questions have been on the agenda since 1958 through the International Telecommunications Union (ITU) and in particular, the International Consultative Committee (ICC), and in 1963, at the ITU conferences, the world network of communications using artificial satellites will be discussed.

Space telecommunication has been emerging from the exclusively governmental sphere into that of private enterprise, since telephone and telegraph business in certain countries have been concerned with telephonic and visual radio-space transmission by means of orbiting satellites. It is necessary to protect, on an international plane, the national patrimony of each country with regard to telecommunications so that no exclusive concessions may be granted for the exploitation of space in favor of certain nations or private organizations to the detriment of internal systems operating through the medium of space. A general participation should be planned for world use, demanding that the capacity of each nation be respected concerning future utilization of international lines of communication.

Many governments such as those of France, Italy, the United Kingdom, Argentina and Brazil, among others, through recent specific national organisms are considering these and other possibilities, such as sharing information given out by meteorological satellites now orbiting

the earth, in order to improve weather forecasting techniques. They act through the World Meteorological Organization (WMO), affiliated with the U.N., which stresses the research of physical forces affecting the weather and weather forecasts.

On the other hand, in the field of aviation, it is urgent that certain aspects of its relationship to space flight be studied, especially as the launching of objects and vehicles into outer space has as its first step, the passage of these vehicles through airspace. Such objects or vehicles may later re-enter airspace. Hence, taking into consideration the fact that they reach speeds in excess of 3,500 kilometers per hour thereby possibly causing sonic booms the patterns of air navigation on upper or lower space levels should be reconsidered, especially as to certain types of transatlantic and international flights, where airplanes may fly at altitudes of 15,000 meters. If a space vehicle or pieces thereof should cause any damage in airspace and on the surface of the earth, be it to an airplane, to property or to persons, juridical problems will arise which must be resolved immediately.

Thus from all of these space activities, products of the unbounded development of astronavigation, there emerges the result of the generous work of many men of science—an international organization of great import—the International Astronautical Federation (IAF). This organization was founded in Paris in 1950 at the instigation of the Society for Space Research of Germany in order to promote technical development, education, justice and peace in space. The concrete objectives of the International Astronautical Federation—which must not be confused with the Aeronautic Federation—are among others, to encourage astronautics for peaceful purposes; dissemination and propagation of techniques and other related information; to stimulate public interest and to give support to the development of all aspects of astronautics through various media of joint communication; to promote participation in astronautical research or in any other related projects by national or international organizations, universities, commercial enterprises or individual experts. In addition the IAF creates as its own activities committees, institutes, academies and work groups dedicated to the research and encouragement of astronautics; it participates in and cooperates with the United Nations and its specialized organisms, with appropriate national governmental agencies, with other international non-governmental agencies and with scientific societies and organizations and societies of higher education, in all phases of natural and social sciences related to the peaceful use of outer space.

The IAF is a non-profit association with educational and scientific objectives, organized according to the laws of Switzerland. It has temporary offices in Baden and is governed by a Council composed of representatives from each of its member societies, Board of Directors made up of a president, four vice-presidents, one general counsel and one secretary.

By a resolution of the VIIth General Assembly of the International Council of Scientific Unions, the Committee on Space Research was established in 1958 as a means for continuing international cooperation in space science after the end of the International Geophysical Year (IGY), which was initiated and sponsored by the ICSU. The IGY was an example of world cooperation of great import as to its organization, programs and results obtained through the establishment of centers of

information and through exchange of data on rockets and satellites with reference to the earth's magnetic field, its extent and intensity. Information concerning the depth, characteristics and strength of the radioactive regions in outer space, the phenomena relating to earth gravitation, the dimension and frequencies of the impact of micrometeorites and other scientific data of immeasurable value was also exchanged.

Associations from 40 nations take part in the International Astronautical Federation, working toward one of man's greatest ideals. To the nations we must now add Mexico, Rumania and Cyprus, which were elected in 1961. Mexico is represented by the Mexican Society of Interplanetary Studies, founded in 1955 and having as its president Dr. Manuel Sandoval Vallarta.

Mexico is a member of the Juridical Committee of the Special Commission on the Utilization of Outer Space for Peaceful Purposes of the U.N., and has also cooperated in space navigation matters through a Mexican-American Committee in which Mexico is represented by Jorge Suárez Diaz and Ricardo Monges López, both engineers. This Committee, formed for scientific, not military, purposes, has no relationship to programs of atomic energy. It has concerned itself with the joint Mexican-American establishment of a Tracking and Communication station in Guaymas, in accordance with the program of launching a man into space, provided by Project Mercury, uniting with stations in East Africa, Australia, Spain, U. S., Nigeria and the United Kingdom.

Mexico has undertaken technical experiments in the field of rockets, meteorology and communications through the praiseworthy efforts of Mr. Walter C. Buchanan, a distinguished teacher of two generations of Mexican engineers, with excellent practical results. Furthermore, other studies are being made under the auspices of the National Autonomous University of Mexico, the National Polytechnical Institute and other private organizations. Their modest efforts have already given indisputable results that will benefit communications and especially Mexican telephone, radio and television enterprises, national passenger transportation and other no less important public and private endeavors.

The International Astronautical Federation relies on three organisms which are fundamental in the interest of peace: the International Astronautical Academy; the International Institute of Space Law; and the Committee for the Science of Living.

The International Astronautical Academy was formally organized by the XIIth Congress of the IAF. The first meeting was held on August 16, 1960 under the new Academy regulations. The Academy, which is an organization of the highest scientific caliber, is composed of the most outstanding experts and sociologists in the world. It is concerned with the different aspects of space navigation as a basic auxiliary to engineering and other sciences such as astronomy, physics, chemistry, mathematics, aeronautics, meteorology, electronics, the law and even medicine and other fields such as physiology, which are concerned with the subject of survival in space. At this time there are approximately 76 members from some 18 countries. The powers and principal duties of the Academy are the following: to advise the President of the IAF when it is so required; to call scientific meetings and to plan scientific studies; to issue an international technical publication devoted to astronavigation; to

award medals and prizes with the object of promoting progress in this field; and to undertake other endeavors which are deemed necessary to promote progress in space travel.

The Academy has organized various Work Committees to take care of special projects. These include financing, scholarships and international lunar laboratories. The work groups of the Academy deal with: space-propulsion; astrodynamics; transformation of energy; trends in research of combustion resulting from space exploration; exploration of the solar system by means of radar; vehicles; structures; recent results and international astronomical plans. Round tables have been set up on radioastronomy, space communications and equipment, and there is also a special group working on systems of high quality combustion. The Academy puts forth considerable effort toward international cooperation.

The Mexican, Argentine and Brazilian Societies, following the example of Italy who in 1963 is expected to launch a small communications satellite at Perdasdefogu, in Sardinia, have presented a project for the joint use of an inter-American satellite for the purposes of scientific research. This research plan is to be carried out by the Institutes and Universities of Latin America.

At this time the Director of the Academy is discussing with UNESCO the feasibility of calling a Conference on the scientific and technical problems of "Man in Space."

The International Institute of Space Law was founded in 1959 as the culmination of a decade of work carried out by various preceding juridical organizations. Its offices are in Washington. Its great importance stems from the times in which we live. Now that anarchy, despotism and contempt for humanity are shaking international order, weakening established institutions and violating the rights of man, thwarting peace and justice, wasting the endeavors, efforts and aspirations to freedom such as those underlying this Institute, the dogma and disciplines to be followed by governments and the peoples of the world must be provided. This Institute is presided by Professor John Cobb Cooper, whose knowledge and experience in the juridical sector of astronautics are widely recognized. Due to the vision and energy of its illustrious President, the Institute devotes itself unreservedly to the fulfillment of its obligations regardless of nationalities and with an objectivity of thought and programing beyond international delimitations.

In fact, it was on January 5, 1951, at the Free Law School of Mexico that Professor Cobb Cooper delivered his historic lecture on "High Altitude Flights and National Sovereignty," which was highly praised in space law study circles. There were other publications on the subject, to be sure, but without detracting from the literary or juridical merits of such works, it was Professor Cooper's conference monograph, articles and other later publications which promoted research, methodization, and the sum total of ideas prevailing in this field of the law.

The International Institute of Space Law has sponsored various talks which have served to synthesize that which is universal and sometimes even cosmic. These talks on space law held at The Hague (1958), London (1959), Stockholm (1960), and Washington (1961), were useful in helping the Institute when dealing with the juridical problems within its province and in fulfilling its purposes, functions and aims.

Among the problems of space law and politics within the scope of this organization, we find, among others, those problems relating to juridical principles applicable to outer space; the juridical regime which must govern space vehicles; state responsibility in space and other experiments relating to man's activities in outer space which may or may not raise juridical questions. Since the basic purpose of the Institute is to promote space flights and exploration for peaceful purposes among all nations it not only must cooperate with all scientific astronomical associations, but it must also facilitate the development of the political and legal systems which lead to such international cooperation.

The functions and objectives of the Institute are to advise the president of the IAF when so required; to undertake other works which may be deemed necessary in the promotion of the social aspects of astronomical science; to promote outer space flights and explorations; to publish records and data and a periodical review; to award prizes; to hold sessions and talks on the juridical and sociological aspects of social sciences and to prepare studies and information, and to adopt, add to, or amend the statutes applicable to internal matters of the Institute, without prejudice to the constitutional provisions of the IAF or to the resolutions relating to the Institute.

The International Institute of Space Law has the support of a Directive Council composed of twelve members, and of eleven work groups to which subjects of the greatest interest have been assigned. In view of the diversity of opinions regarding the regulation of space law matters on an international level, and of the lack of juridical definition of air-space or of the limitation of the altitudes in which the States may exercise jurisdiction, the work of the Institute is extremely arduous and complex.

The development of space techniques has proved that State territories comprise a three-dimensional domain, thus giving rise to three laws—terrestrial law, maritime law and space law. In this sense space law is the expression of the territorial limits of national sovereignty with reference to all States and the efficacy of the law within a part of its territory regarding one State only.

It should be noted that when we speak of space we do not do so in terms of Kant's theory, that is, regarding it as an a priori form or category of perception, which exists only in the mind of the individual or states. Nor do we speak of it in an exclusive form according to the calculations of the German mathematicians Moebius, Riemann and Gauss, who radically substituted the Euclidian and Kantian concepts of space for the so-called pure fourth dimensional space concept, since we do not agree with the description of space as only explainable by means of numerical formulae. We prefer to accept the traditional conception according to which space consists of bodies with real and objective existence, as a zone of the universe of undetermined form, expressed in terms of atmosphere with an ethereal covering.

Newtonian space is the basis of the law of universal gravity, a field in which masses attract each other, and perhaps a space such as conceived by the Argentine jurist Aldo Armando Cocca in his book "Toward Interplanetary Law." In that work Dr. Cocca would seem to say that space law should operate on Einstein's theory of relativity, according to which space is fourth-dimensional, curved, closed, finite but unlimited and

closely connected with the idea of space-time, as a unit or universe with four dimensions: three coordinate space dimensions and one temporal dimension.

It is a space which should not be identified with the idea of place or portion of the earth's surface governed by an autonomous juridical system, since that is identified with terrestrial law. It corresponds to the space where the event, the effects or extent of one or more events related to aviation, electronics, astronavigation and other technical or scientific phenomena take place, such events, by necessity, being situations governed by law.

Its principles are not metajuridical in the presence of the normative constructions of juridical science; therefore we will briefly express our opposition to the idea of metalaw as expounded by Andrew Haley, a distinguished North-American lawyer. The idea of space should be adjusted to legal norms, since it represents, substantially and on a phenomenological level, a material body and, within the juridical order, a common property. Furthermore, State sovereignty is conceptually unique although its exercise can be distinct whenever it refers to land, seas or space. However, this sovereignty is constitutionally one: its exercise in space can vary with respect to its exercise on land or on the seas. In space, however, it cannot have different forms nor can it be subject to material bases which are not completely verifiable.

One basis is that although cosmographically speaking space may be divided into atmospheric or terrestrial space, interplanetary or solar space, and intersidereal or astral space, with respect to the effects of man's activities in space, and for the juridical consideration of such space activities space is one, unique and indivisible. Therefore national sovereignty and space must be conceived as a unit.

National sovereignty cannot be limited, and it should be obvious that if this delimitation on the high seas has been the cause of constant conflict, (the determination of territorial sea today is still a matter of grave concern to maritime law) it is to be presumed that an agreement on space law will be difficult to reach, besides being unnecessary. In fact, the movements of the earth rotating on its axis and revolving around the sun in relation to national territories and heights at which flights take place at the present time or at which electromagnetic waves are used, demonstrate that this is correct not only from its technical aspect but from the juridical point of view as well.

We also assert that the division of space is unnecessary for we have had international civil aviation for more than fifty years and use of the magnetic spectrum in telemechanics for over one hundred years without the need for dividing space into jurisdictional zones. We must use an enlightened approach to the establishment of the laws of operation, making possible the juridical regulation of aviation, electronics and outer space navigation in a manner similar to that used in the establishment of the freedom of the air and distribution of frequency radio and television bands.

If the eight freedoms of the air refer to the exercise of commercial laws in international civil aviation we cannot see why these freedoms cannot be added to the new space freedom regarding the permissibility of the activity of missiles, artificial satellites, space ships and space stations, not only as to the altitude and vertical position of such vehicles but also

as to trajectory, flight missions, instruments in use and functional characteristics of the vehicle or object. We could also identify such vehicles by means of an agreement regarding the assigning of individual designations to each apparatus. These indications could be agreed upon at regular pre-determined intervals at least until identification could be established by means other than, for example, orbital characteristics or trajectory of the vehicles. International agreements could set forth a system controlling the launching of space vehicles, their respective calling codes, visual markings, elements, orbiting currents and trajectory.

More especially, because of the close ties existent among all the techniques that have been developed concerning space, techniques which are actually interdependent, one cannot conceive of a space law independent of air, aeronautics, aviation, radio-electric, interplanetary law. To the contrary, one must think of a law tending to completeness, a law which contemplates the possibility of establishing a system embracing phenomena of an indisputable organic novelty, even to the point of man's leaving the earth and establishing himself on another planet, breaking the juridical nexus linking him to earth.

At the present time and in all nations of the world the unbounded development of astronautics brings forth new demands for human freedom and respect for the norms of rights of peoples, which constitute the dominant traits of the world in which we live. Without them the justification of international life must be considered frustrated.

The Committee on the Sciences of Life of the IAF which considers imperative the protection of human life on earth is presided by Mr. Carl Johan Clemedson and is concerned with various matters related to space medicine. Two sessions have been held on bioastronautics, the first one presided by Dr. W. Randolph Lovelace II and the second by Mr. R. Grandpierre. Among others, the following subjects were studied: lunar influence and lack of gravitational pull in relation to the germination and growth of plants; probable existence of reasoning human beings in other planets; psychophysiological reactions of weightlessness observed during recent bioballistic and biosatellite experiments and effects on the cerebral centers of equilibrium and orientation in the uniform magnetic field. Furthermore, wide studies have been carried out on the analysis and missions of multi-crews in space; security systems on manned space flight missions; results on the physiological reaction under space flight conditions and other similar missions of great importance to space medicine.

With the firm purpose of contributing to the maintenance of peace, the IAF has cooperated outstandingly in the increase of joint projects relating to the simultaneous launching of probe rockets, in the utilization of launching pads, equipment and instruments for satellites, exploration of outer space, tracking and telemeasurement, elaboration, interpretation and exchange and weighing of information on space activities.

The contribution of the IAF is doubtless very important in the organization of space science through the encouragement of scientific astronomical activities, and the development of the capacity of each nation as well as the application of the results of space science and the development of its activities in an open and orderly manner.

This scientific research should be applied exclusively to the benefit of humanity. It must tend to improve weather forecasts, to perfecting radio