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Successful Road to the 3rd General Assembly of the IUGG in Prague, the Facts and Subsequent Developments in Geodesy

Petr Holota



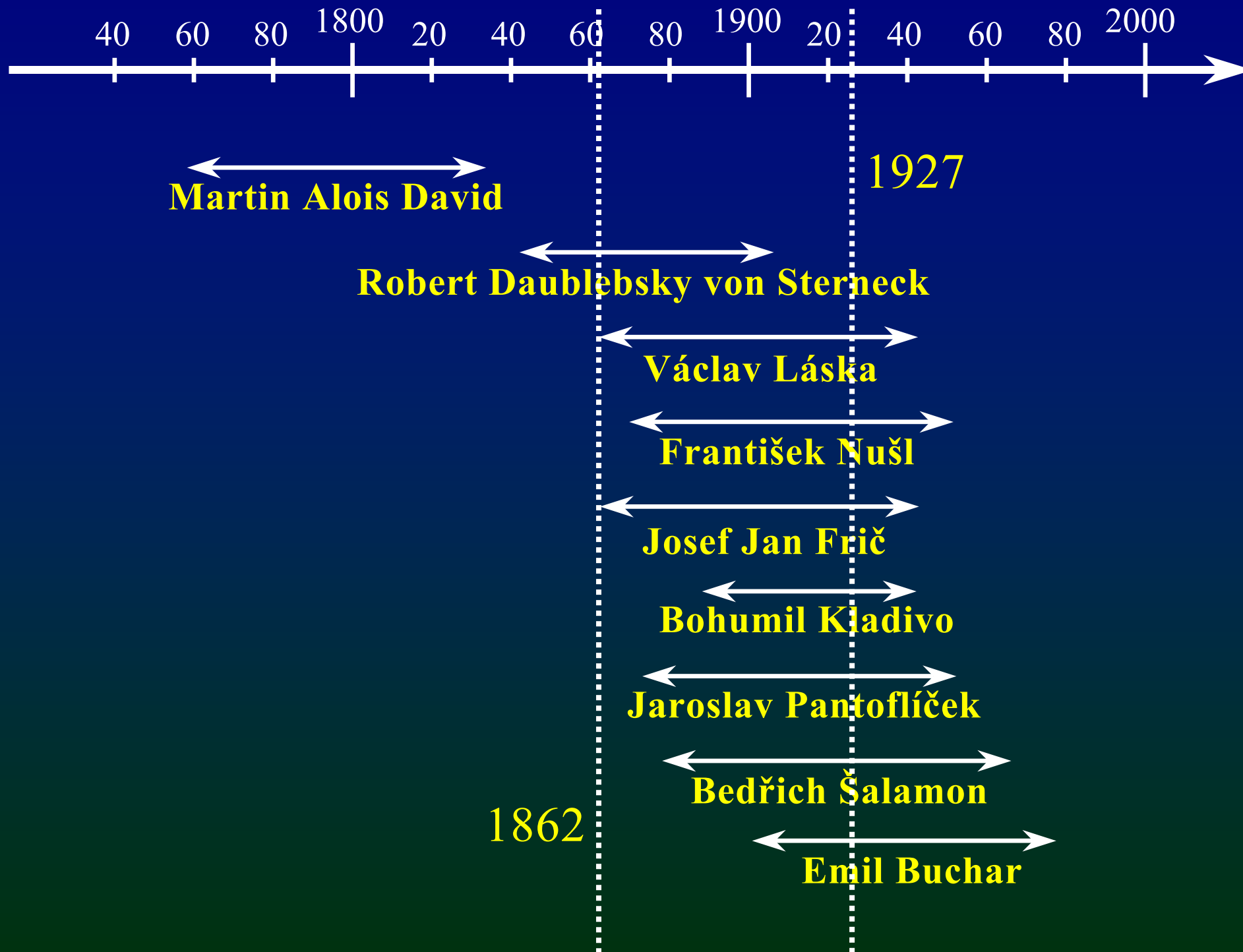
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Zdiby, Prague-East, Czech Republic

Introduction

Historical considerations in this contribution are motivated by the start of the work concerning the Central European Grade Measurements. This time and its trace are briefly described with a particular view to the Bohemian Crown Lands.

The contribution then focuses on the period after 1919 and an international scientific cooperation on a non-governmental level, mainly within the International Union of Geodesy and Geophysics. The Czech National Committee of Geodesy and Geophysics was quite active and already the 3rd General Assembly of the Union was held in Prague in 1927 (after Rome and Madrid). Number of historical documents concerning this meeting is presented in this connection, including topics discussed and photographs. Also the international and Czech national protagonists and figures of that time are mentioned. Particular attention is paid to geodesy section of the Union later known as the International Association of Geodesy.

The national organizational structure in geodesy is outlined too as an important factor that affects the level of country involvement in the international scientific cooperation. The considerations extend to the International Geophysical Year in 1957 and the advent of artificial satellites. This progress together with a new interest in mathematical and physical foundations of geodesy is clearly apparent in the subsequent development of geodesy. For that reason some examples are given concerning gravitational field and figure of the Earth, orbital dynamics, physical geodesy, mathematical methods etc.



Martin Alois David (1757-1836)

Biographie

des

Martin Alois David,

regulirten Chorherrn des Prämonstratenser-Stiftes Tepl,
Doktors der Philosophie, k. k. Rath und Astronomen, k. k.
Professors der theoretischen und praktischen Astronomie,
Vorsteher der prager Sternwarte, Seniors der philoso-
phischen Fakultät, Inhabers der großen goldenen Verdienst-
medaille, der k. böhm. Gesellschaft der Wissenschaften, wie
auch der k. k. patriotisch-ökonomischen Gesellschaft ordentl.,
der Gesellschaft des vaterländischen Museums in Böhmen
wirkenden, dann korrespondirenden Mitgliedes der k. k.
mährisch-schles. Gesellschaft des Ackerbaues, der Natur-
und Landeskunde, der k. preussisch-schles. Ges. zur Beför-
derung der Kultur, der k. Akademie der Wissenschaften zu
München, der naturforschenden Gesellschaft zu Aargau, der
ökonom. Gesellsch. zu Leipzig u. der k. dänischen
für nordische Alterthumskunde.

Entworfen von

Dr. Jakob Philipp Kulik,

ord. Mitgl. der k. böhm. Ges. der Wiss. und der Landwirthschaftsges.
in Steiermark, k. k. Professor der höheren Mathematik, und suppl.
Prof. der Astronomie an der k. k. prager Universität.

Für die Abhandlungen der k. böhm. Gesellschaft der Wissenschaften.

Prag, 1837.

Druck und Papier von Gottlieb Haase Söhne.

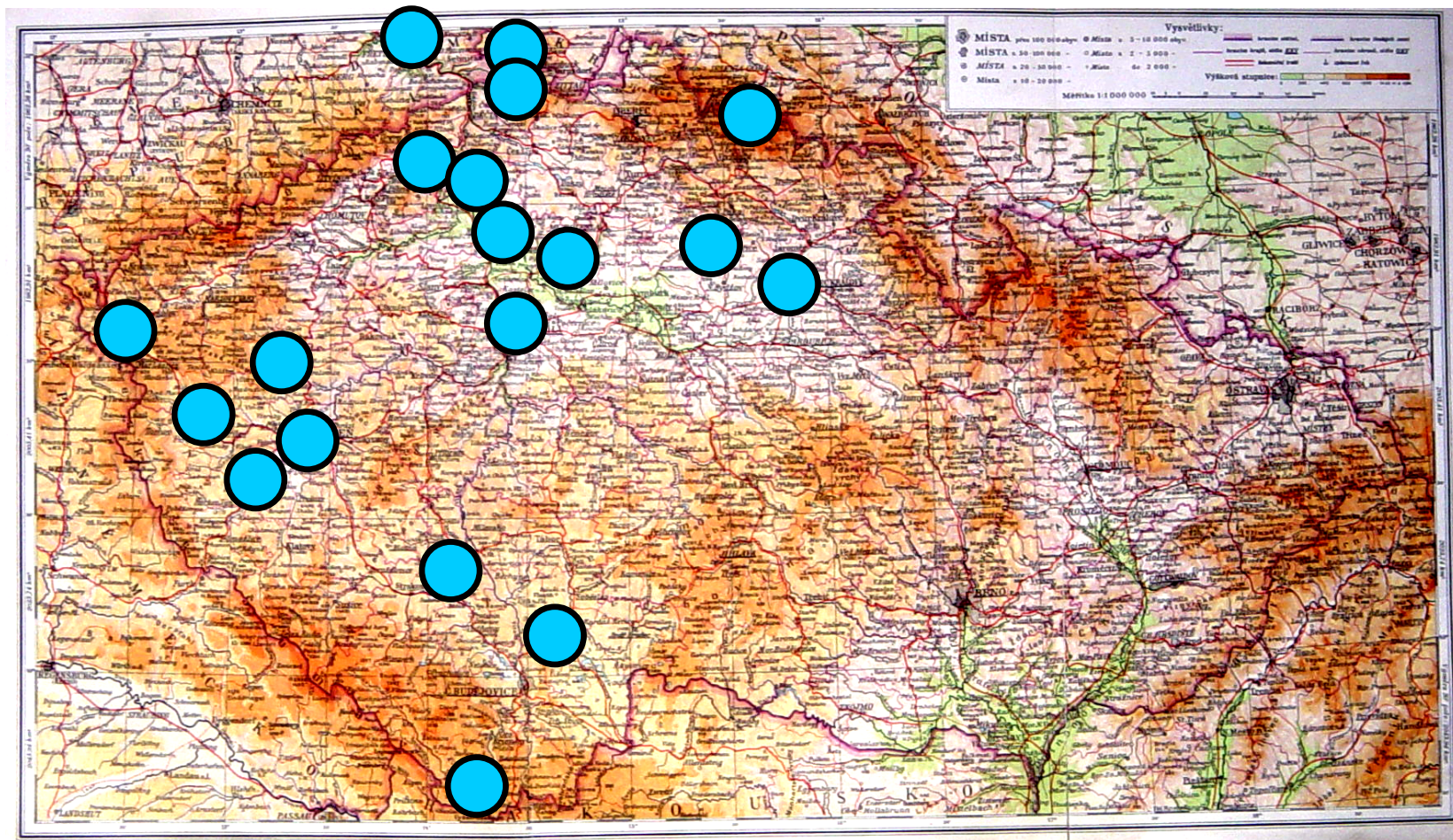


David was born in a small village of Dřevohryzy near Mariánské lázně

- and in his life was a member of premonstratensian order at the cloister in the town of Teplá near Mariánské lázně.

David's main work consisted of determining the geographic coordinates of different places within the Czech Kingdom.

David was a founder of geodetic astronomy in Czech Lands



Until that time, the geographic coordinates had been measured only by *Tycho Brahe* for the Prague area and the castle in the town of Benátky nad Jizerou, and by Stepling for the Clementinum Observatory.

1806 - David became an elected *Dean of the Philosophical Faculty* at Prague University.

1809 - David was elected *member of the Academy of Sciences in Munich* and in **1815** at the *Economic Society in Leipzig*.

1816 - He joined the *Moravian-Silesian Society of Agriculture and Natural and Geographic Sciences*.

1820 - David traveled to Linz to participate in longitude differences measurements between *Vienna* and *Bogenhausen* near Munich by means of charges detonated at Schneeberg (Steiermark borders) and Untersberg (near Salzburg).

1824 - He joined the *Patriotic Museum of the Czech Lands* and in **1829** the *Danish Society for Nordic Historical Studies*.

For his merits in determining certain geographic locations, the Royal Czech Society of Knowledge enabled David to become an exceptional member in **1795** and a standing member in **1800**.

Added to all these honours, it remains to be mentioned that he was also elected to the post of Rector at the Charles Ferdinand University in Prague in **1816**.

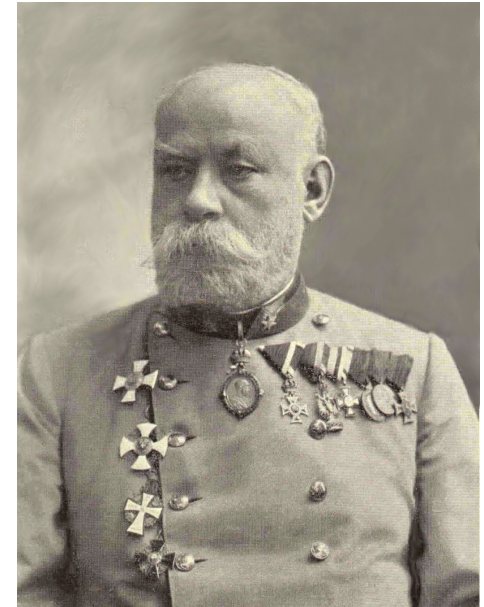


David's name on the wall of National Museum in Prague.

Robert Daublebsky von Sterneck (1839-1910)

Sterneck was born in Prague and belonged to Czech nobility.

- He was a *member* of the Kaiserliche Akademie der Wissenschaften in Vienna (1893),
- *Dr. h.c.* of the George-August University in Göttingen (1899),
- Generalmajor of the Austrian Army (1905)
- Since 1862 Sterneck was active in k.u.k. Militär-Geographisches-Institut in Vienna

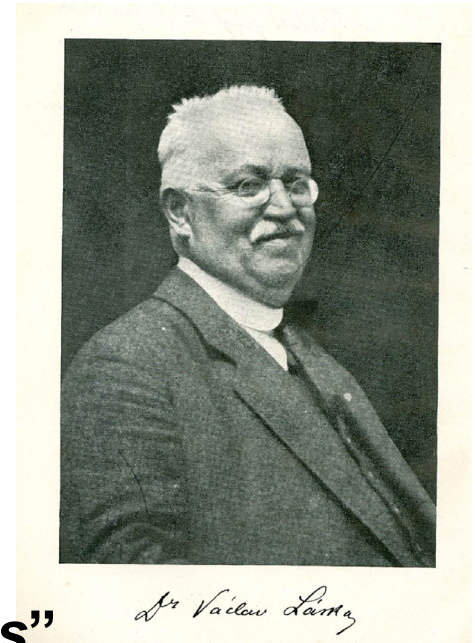


1882-1909 - member of the Austrian Commission for Grade Measurements, headed by *Theodor Egon Ritter von Oppolzer*, *Michal Franciszek Ignacy Karliński* and *Wihelm Tinter von Marienwil*

He conquered world recognition in gravity research.

Prof. Dr. Václav Láška (1862-1943)

Václav Láška was born in Prague.



- 1883** - He started his studies of mathematics and physics at the University in Prague.
- 1884** - Still as a student he wrote his article titled *“Note zur Lösung des Keplerschen Problems”* and published it in *Astronomische Nachrichten*.
- 1885/6** - He enrolled to study *Higher Geodesy* (by *Knight Prof. Karel Kořistka*) at the **German Technical University** in Prague.
- 1887** - He finished his university studies and got a doctorate. Topic of his dissertation was. : *“Die Theorie der linearen partiellen Differentialgleichungen in ihrer historischen Entwicklung”*.

- 1890** - Láska *habilitated* at the Czech Technical University in Prague. Topic of his Habilitation: “*The role of higher geodesy in the future*”.
- 1891** - As an associate professor he applied for a travel support to study the great measurements in Germany and astronomical and geodetic instruments in Germany and France. Nevertheless the old regime monarchy gave him only half of the desired sum with the recommendation to go to study conditions and institutions in astronomy and geodesy to Vienna, which at the time Láska really did.
- 1895** - Láska was appointed associate member of the Czech Society of Science. Nevertheless there was no place for Láska at universities in his home country.
- 1895** - Láska accepted invitation to Lvov (Lemberg) and **1898** he became Professor of astronomy and higher geodesy at the Technical University in Lvov.

During his stay in Lvov Lásky became known and respected in the world. Among others he:

- worked in the *Oesterreichische Zeitschrift für Vermessungswesen*,
- became a titular member of the *Société Belge d'Astronomie*,
- was an officer of the *Earthquake Commission* and of the *Zentralinstitut für Meteorologie und Geodynamik* in Vienna,
- participated in the *International Conference on Seismology* in *Strasbourg, 1901*.

Internationale seismologische Konferenz Strassburg 11.–13. April 1901.



Prof. Omeri Tokyo.	Prof. Wiechert Göttingen.	Dr. Schütt Hamburg.	Prof. Schmidt Stuttgart.	Dr. Hecker Potsdam.	Prof. Rudolph Strassburg.	Prof. Gerland Strassburg.	Prof. Weigand Strassburg.	Prof. Oddone Pavia.	General Pomerantzeff St. Petersburg.	Staatsrat Lewitzky Jurjew (Dorpat).	Prof. Günther München.
Geh.-Rat Wagner Göttingen.	Geh.-Rat Helmert Potsdam.	Assist. Ebell Strassburg.	Dr. Tetens Strassburg.	Prof. v. Kövesligethy Budapest.	Dr. Schafarzik Budapest.	Bauinspektor Jähnike Strassburg.	Dir. Womnessensky Jrkutsk.	Dr. Ehrismann Strassburg.	Prof. Belar Laibach.		
Prof. Straubel Jena.	Oberstleutnant Harboe Kopenhagen.	Prof. Láska Lemberg.	Prof. Futterer Karlsruhe.	Dr. Polis Aachen.	Prof. Leutz Karlsruhe.	Prof. Kobold Strassburg.	Geh.-Rat Lewald Berlin.	Prof. Forel Morges.			

Step by step Láška intensified his engagement in geophysics.

1911 - Already as a well-know scientist he accepted an offer from Prague and became professor of the newly established department of applied mathematics at the Charles University, Prague. Later he also led departments of Statistics, Insurance Mathematics and Earth Magnetism.

After World War I, in the new stat – Czechoslovak Republic, Láška was engaged in a number of various commissions and ministerial meetings. His experience was used in organizing statistics, geodetic and cartographic institutions and especially in geophysical research in the country.

1920 - He founded *Geophysical Institute* and became, equally as in the *Czechoslovak National Committee of Geodesy and Geophysics*, *its first President*.

Prof. PhDr. František Nušl (1867-1951)



František Nušl was born in Prague

- *and studied mathematics, physics and astronomy at the Charles University in Prague.*

1898 - *He acquainted with Dr. h.c. Josef Jan Frič - the factory owner - and together with him he build an observatory in Ondřejov (near Prague).*

1904 - *Nušl habilitated in practical astronomy and geometrical optics at the Charles University.*

1908 - *He became Professor of mathematics at the Czech Technical University in Prague.*

1922 - *He was appointed Director of the State Observatory in Prague and president of the Czech Astronomical Society.*

1928 - Nušl became Professor of astronomy at the Charles University.

Nušl was particularly interested in measuring the Earth, time and in geometrical optics. He constructed a number of interesting instrument.

For his Circumzenithal, which uses mercury mirror, he together with Josef Jan Frič got a golden medal at the World Exhibition in Paris, 1937

On the far side of the Moon there is a crater bearing his name, similarly as an Asteroid No. 3424.

Since **1938** the Czech Astronomical Society awards a price of František Nušl

Further important figures are:

Dr. h.c. Josef Jan Frič (1861-1945)

Prof. Dr. Bohumil Kladivo (1888-1943)

Prof. Ing. Dr. Jaroslav Pantoflíček (1875-1951)

Prof. Dr. Bedřich Šalamon (1880-1967)

Prof. RNDr. Emil Buchar, DrSc. (1901-1979)

Period after World War I

With the figures such as V. Láska, F. Nušl, J.J. Frič, B. Kladivo, J. Pantoflíček, B. Šalamon, E. Buchar and others we entered the period after World War I.

- **IUGG**, non-governmental, non-profit organization was established in Brussels on July 28, 1919.
- Constituent members were: Australia, Belgium, Canada, France, Italy, Japan, Portugal, Great Britain and USA.
- The first IUGG president was Charles Lallemand (1857-1938), geodesist and since 1910 a member and later the president of the Paris Academy. He was in office in the period 1919 - 1933 and was followed by William Bowie (1933 - 1936).
- The 1st IUGG General Assembly was held in **Rome, 1922** and the 2nd GA then in **Madrid, 1924**.

Historical materials say that, following prewar traditions, the Italian King opened the 1st General Assembly in Rome (1922) and the King of Spain the 2nd General Assembly in Madrid (1924).

Recall that it was Vittorio Emanuele III and Alfonso XIII.



Czechoslovak Republic joined the IUGG in **1924**.

- Most probably, the Czechoslovak National Committee of Geodesy and Geophysics was very active at that time.
- One can deduce it from the fact that immediately in Madrid the Committee was awarded the mandate to organize the 3rd IUGG General Assembly. It was held in Prague in **1927**.
- In addition, one can find in the historical materials that the invitation to Prague was also from the side of the government of the republic (and competed with the invitation from Poland, Portugal and Sweden).

The president of the Committee was **Václav Láška**
The vice-president was **František Nušl**.

- The official IUGG material (Year Books) do not indicate the exact number of participants of the 3rd IUGG GA in **1927**. Only a rough estimate of 300 is offered.

Nevertheless the materials of that time give more information.

For instance the newspapers “Národní Politika” (National Policy) of Sept. 7, 1927 published an article titled:

“Foreign scientists in Prague”

*Národní Politika - Praha,
7. IX. 1927.*

Zahraniční vědci v naší Praze.

Jak se čtenáři již ze zpráv dosavadních dočetli, zasedá od pondělka minulého týdne v budově parlamentu kongres Mezinárodní unie geodetické a geofyzikální. Příslušníci tohoto vědeckého oboru sjeli se do Prahy v počtu mimořádně četném. Jsou mezi nimi delegáti Belgie (3), Finska (4), Peru (1), Argentiny (2), Italie (18), Japonska (6), Jugoslaviie (4), Mexika (1), Nového Zélandu (1), Egypta (2), Tunisu (1), Indie (2), Španělska (25), Švýcarska (5), Spojených států severoamerických (10), Švédska (4), Řecka (4), Siamu (2), Polska (3), Holandska (8), Norska (5), Francie (32), Anglie (29), Dánska (5), Portugalska (4), a sovětského Ruska (1). Sjezdové porady řídí prezident Unie Charles Lallemand (Francie) s generálním tajemníkem Unie plk. Henrym Lyonsem (Anglie), duší sjezdové kanceláře je generální tajemník československého sjezdového komitétu prof. dr. Salomon.

Pro porady sjezdových komisí vyhradilo sněmovní předsednictvo jednací síně v druhém patře výborové budovy, generální shromáždění, z nich závěrečné bude v sobotu odpoledne, konají se v zasedací síni sněmovní. Jednací řečí sjezdovou je francouzština, ve které sepsány jsou veškeré orientační nápisy na chodbách. Také ve sněmovní restauraci, kde zahraniční hosté o polednách obědvají, předkládají se jídelní lístky, v téže řeči.

Účastníci sjezdu neomezují ovšem svůj pobyt pouze na budovu bývalého Rudolfinu, nýbrž věnují svoji pozornost také pamětihodnostem a krásám naší republiky. Prohlídkou naší matičky Prahy byli přímo uneseni. V neděli navštívili v počtu 120 osob Lázně Poděbrady, kde se jim dostalo od lázeňské správy pohoštění a kde se mnozí také v lázních vykoupli. Druhý proud (asi 80 účastníků) byl hostem Turnova, kde po uvítání zástupci města i okresu prohlédnuta ožbořná škola a „Český ráj“. Nadšeně byli zahraniční hosté pozdraveni také v Železném Brodě, kde shlédli sklárskou školu a přes Turnov vrátili se do Prahy. Jak nám bylo sděleno, nemohli se přírodním skvostům našeho Pojizeří ani vynadiviti.

Na dnešní dopoledne chystána je projížďka Prahou, o půl 11. hod. dop. prohlídka vojenského zeměpisného ústavu. Odpoledne vypraví se hosté jednak na Karlův Týn, jednak do Ondřejova k návštěvě známé hvězdárny českého selfmademana Friče. Večer dává hostinu na počest zahraničních delegátů ministr školství dr. Hořá, ve čtvrtek bude slavnostní přijetí u pana presidenta republiky. V pátek o 6. hod. odpoledne přítomní budou hosté cvičební hodině v pražském „Sokole“, v 8. hod. večer uspořádá pro ně „České kvartetto“ v „Umělecké besedě“ koncert za spoluúčinkování pí Pěničkové-Rochové.

From the article one can get the respective numbers concerning participation:

Belgium	3	USA	10
Finland	4	Sweden	4
Peru	1	Greece	4
Argentina	2	Siam	2
Italy	18	Poland	3
Japan	6	The Netherlands	8
Yugoslavia	4	Norway	5
Mexico	1	France	32
New Zealand	1	Great Britain	29
Egypt	2	Denmark	5
Tunis	1	Portugal	4
India	2	Soviet Union	1
Spain	25		
Switzerland	5		

All in all, 182 participants from 26 countries.

In the Archive of the Library of the Astronomical Institute we can also find the Programme of the Assemble in Prague:

UNION GÉODÉSIQUE ET GÉOPHYSIQUE INTERNATIONALE
TROISIÈME ASSEMBLÉE GÉNÉRALE
PRAGUE (3–10 SEPTEMBRE 1927)

Comité tchécoslovaque d'organisation: Secrétaire: B. Šalamon, Albertov 6. Praha VI.

PROGRAMME PROVISOIRE.

Le Congrès se tiendra dans le PALAIS DU PARLEMENT (SMETANOVŮ NÁMĚSTÍ – PRAHA-I)

I

Dès le lundi 29 Août, le Palais du Parlement sera à la disposition des Sections qui voudraient inaugurer leurs travaux avant la date officielle d'ouverture du Congrès.

II

- JEUDI 1^{er} Septembre – A 15 h: Réunion préparatoire des Bureaux de l'Union et des Sections.
- VENDREDI 2 Septembre – A 10 h: Suite de la réunion préparatoire des Bureaux.
A 17 h: Réception chez le Ministre des Affaires étrangères.
- SAMEDI 3 Septembre – A 10 h: Ouverture officielle du Congrès, en présence des membres du gouvernement et des autorités locales.
A 11 h 1/2: Première Séance plénière de l'Union.
A 15 h: Séances de Sections et de Commissions.
A 19 h: Représentation de gala au Théâtre national.
- DIMANCHE 4 Septembre – Excursion à Poděbrady-les-Bains – Départ de Prague à 10:30 h par chemin de fer, gare Denis. (Des voitures spéciales seront réservées pour les membres du Congrès et leurs familles.) Déjeuner offert aux Membres du Congrès à l'Hôtel des Bains par l'Administration des Bains. Au retour, Départ de Poděbrady à 18:12 h. Arrivée à Prague à 20:28 h.
- LUNDI 5 Septembre – Matinée: Séances de Sections et de Commissions.
Après-midi: Visite de Prague et de ses monuments (Galleries de tableaux, Château Hradčany, etc.).
- MARDI 6 Septembre – Matinée et après-midi: Séances de Sections et de Commissions.
A 17 h: Garden party chez le Ministre du Commerce au Palais Valdštýn.
- MERCREDI 7 Septembre – Matinée: Visite de Prague et de ses monuments (Galleries de tableaux, Château Hradčany, etc.) Visite du Service géographique de l'Armée.
Après-midi: Excursion en auto-cars à Karlův Týn ou à l'Observatoire de Ondřejov, au choix des congressistes.
- JEUDI 8 Septembre – Matinée et après-midi: Séances de Sections et de Commissions.
A 21 h: Réception chez le Président de la République.
- VENDREDI 9 Septembre – Matinée et après-midi: Séances de Sections et de Commissions.
A 20 h: Concert de musique tchécoslovaque.
- SAMEDI 10 Septembre – Matinée: Séances de Sections et de Commissions.
A 15 h: 2^e séance plénière de l'Union et clôture du Congrès.
Le Soir à 21 h: Banquet offert par le Ministre de l'Instruction publique.

**Réception chez
le Ministre des
Affaires étrangères**

**Réception chez
le Président
de la République**

At the Assembly in Prague :

- **Charles Lallemand** was approved **to continue the presidency.**
- The **secretary** was **Sir Henry Lions** (London)

The chairman of the section were as follows:

- **William Bowie, C.G.S., Washington** (**Geodesy**)
vice-chairman (**Geodesy**): **Raoul Gauthier, Geneva**
secretary (**Geodesy**): **Col. Georges Perrier, Paris**
- **H.H. Turner, Oxford** (**Seismology**)
- **Sir Napier Shaw, London** (**Meteorology**)
- **Louis Agricola Bauer, Washington** (**Geomagnetism and Geoelectrics**)
- **Odón de Buen, Madrid** (**Physical Oceanography**)
- **Alfred Lacroix, Paris** (**Volcanology**)
- **E.B.H. Wade, Geneva** (**Hydrology**)

In Geodesy Section general reports were presented:

- on baselines and triangulation by Col. Georges Perrier
- on precise leveling by Charles Lallemand
- on geodetic astronomy by H.L.P. Jolly (O.S., Southhampton)
- on plumbline derivations by G. de Graff-Hunter (Dehra Dun, not present in Prague)
- on gravity by Emilio Soler (Padua)
- on isostasy by W. Bowie
- on changes of geographical latitudes by Kimura (Japan) (reported by Tanakadate, Tokyo)
- on cartography by H. Roussilhe (Paris)
- on Earth's tides by Walter D. Lambert (Washington)

At the business meetings, within other topics:

- a report on gravity measurements at sea was presented by *Felix Andries Vening Meinesz*. It was recommended to continue and extend these measurements.
- With respect to the Wegener's theory it was recommended by *Gen. Boskovič* as well by *William Bowie* and *Henri-Alexandre Deslandres* to repeat the measurements of geographical longitudes at main stations occasionally.
- A short communication was presented by *Carlo Somigliana* (Tortona) on the generalization of Clairaut's Theorem.

On the occasion of the General Assembly :

- **Charles Lallemant**, the IUGG President, was awarded **honorary doctorate** at the Technical University in Prague and in Brno (Moravia).



Obr. 1. Charles Lallemant.

Finally, we have also a group photograph of participants of the 3rd IUGG General Assembly in Prague.

Příloha ke článku Dr. B. Kladiwo: III. obecné shromáždění mezinár. geodétické a geofysikální unie v Praze.



The 3rd General Assembly of the IUGG in Prague (1927) was followed by

Stockholm **1930** with **(91/240)** **331 participants**

Lisbon **1933** **(40/160)** **200**

Edinburgh **1936** **(80/264)** **344**

Washington **1939** **(580/225)** **805**

After World War II the 8th General Assembly of the IUGG was held in

Oslo **1948** **(46/322)** **368 participants**

Period after World War II

We already remember the period. Therefore, allow me to add just a few remarks.

(.) In geodesy - explicitly discussed and very close contacts to: spherical astronomy, celestial mechanics, differential geometry, mathematical analysis, functional analysis (e.g. Nash implicit function theorem)

(..) In Prague - *Prof. RNDr. Emil Buchar, DrSc., Corr. Member of the CS Acad. Sci. (1901-1979)*

- In 1927 he was awarded his doctor's degree in celestial mechanics and went to work at the Algerian observatory of Buzareah.
- Habilitation (1945): Deflections of the vertical and the geoid in Czechoslovakia
- From the orbital dynamics of the first satellites - Sputnik I and II he derived the polar flattening of the Earth (*Nature*, 1958).



(...) Internationally:

- IUGG Symposium U1 - Quo Vadimus, Vancouver, 1987
- Birmingham 1999, IAG-Review 2000-2001 and Reorganization in 2003: An idea was ventilated - “geodesy may be viewed as an “auxiliary science” by other scientists” (like mathematics from the point of view of physicist)
- Related example: The attitude of the famous *Wolfgang Pauli* to *Pascual Jordan*: “Herr Jordan was always a formalist”, he once told, meaning that Jordan was not a true physicist but only a mathematician - a lower form of life.

Note, however, that of the triumvirate (with *Born* and *Heisenberg*) that formulated quantum mechanics in the famous Dreimännerarbeit of 1925, *Jordan* was the *principal architect of the theory*.

- Interview with the new IAG president for GIM International (25-07-2011).

Prof. Dipl.-Ing. Dr.h.c.mult. Dr.techn. Helmut Moritz
at the Geodetic Observatory of the RIGTC in Ondřejov, 2010



***Thank you
for your attention !***

