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**BETWEEN STALINISM
AND INFRASTRUCTURAL GLOBALISM:
THE INTERNATIONAL GEOPHYSICAL YEAR (1957–8)
IN CZECHOSLOVAKIA, POLAND
AND THE GERMAN DEMOCRATIC REPUBLIC**

Abstract

This article analyses the political, scientific, and social circumstances of the beginning of infrastructural globalism in Eastern Europe, using the example of the International Geophysical Year (1957–8). This research programme led to the establishment of the first large global infrastructures operating in Eastern Europe, i.e. behind the Iron Curtain, under the auspices of international organizations (UNESCO, ICSU). Following the Geneva conference in 1955, large infrastructures and ‘big data’ science were supposed to become part of Soviet science diplomacy. The paper shows that while the Soviet Union and East-European countries accepted the challenge and became part of the global scientific community, nevertheless specific features of data and information control remained under the strict surveillance of the USSR.

Key words: Cold War, Eastern Europe, Cold War science, infrastructural globalism, international geophysical year, GDR, Poland, Czechoslovakia

I
INTRODUCTION

The aim of this article is to analyse the political, scientific, and social circumstances of the beginning of infrastructural globalism in Eastern Europe, using the example of the International Geophysical Year (1957–8). This global research programme led to the establishment of the first large global infrastructures operating in Eastern Europe, i.e. behind the Iron Curtain, under the auspices of the International

Council of Scientific Unions (ICSU) and with official approval by UNESCO. Large infrastructures and ‘big data’ science were supposed to become part of Soviet science diplomacy, re-defined by ‘restricted internationalism’ at a series of international conferences held in 1955 in Geneva.

The first phase of Sovietization in Central Europe certainly left its mark on how international cooperation in science and research was conceived. In this regard, the initial period during which Communist regimes began to be built up, i.e. 1948–53, was a time in which the scientific communities in these countries were isolated from the international community and instead were indoctrinated with Soviet methods and models. The Geneva Summit of the “Big Four” served to confirm the de-Stalinization of Soviet policy, including in the international arena. After the uprisings in Poland and Hungary in 1956, which were part of the de-Stalinization process within Soviet politics, de-Stalinization culminated in 1961 when, at the 22nd Congress of the CPSU, Xruščev’s policies were solidified and reform slowly began.¹

The roots of these changes however can be found in the mid-1950s. It was during this period that science acquired a high social standing, which would later be incorporated into the concept of the scientific-technical revolution.² This concept played an important role in considering the effects of science and scientific policy on society and culture, and for the first time environmental issues came up.³

The most important issue was the exchange of information, which was completely under the control of the USSR, a feature which remained in place even after 1958. Only much later – paradoxically when the USSR was reevaluating its engagement in international science – did the strictly bilateral mode of collaboration between the USSR and its satellites begin to loosen up, and scientific cooperation started to return to its standard form. For the time being however, multilateral meetings and discussions within the Eastern Bloc were held between individual countries, although even this,

¹ Zdeněk Mlynář, ‘Khrushchev’s policies as a forerunner of the Prague spring’, in Robert F. Miller and Ferenc Fehér (eds.), *Khrushchev and the communist world* (London, 1984), 232.

² Cf. Semen R. Mikulinskij and Radovan Richta (eds.), *Socialism and Science* (Prague, 1983).

³ Radovan Richta, *Civilization at the crossroad: social and human implications of the scientific and technological revolution*, 3rd expanded edn. (White Plains, NY, 1969).

in comparison with the hardline Sovietization of the early 1950s, was a sign of forward progress.

Data sharing and access to information became a key point of global infrastructuralism, and thanks to the International Geophysical Year (IGY), both superpowers soon fully realised this fact. The information in question was highly sensitive, especially in the case of the IGY, which focused on monitoring the Earth. Data provided by both blocs within this programme could help experts analyse, through geophysical observations, things such as the size of nuclear tests carried out by the opponent, or investigate the possibility of using various layers of the atmosphere for developing different kinds of weapons or surveillance devices.⁴ The first part of this paper therefore presents a brief history of the IGY and its basic features. The following part analyses the role and interests of the Soviet Union in terminating, after the 1955 Geneva negotiations, its policy of non-cooperation with Western science. This section includes an overview of the participation of the East European countries, with a focus on the specific circumstances under which these states joined the IGY when it was already in operation. The last part of the paper then deals with the different perspectives on IGY's contribution: on one hand there is the Cold War perspective, which focuses on the opinions of the two main superpowers, while on the other hand there are the vantage points of the individual countries which were part of the two blocs, in our particular case focused on three states of the Eastern Bloc. For the Eastern Bloc, the main contribution of the IGY was that it offered the closed communities of Communist states a new model of cooperation and connected them with a global network of information exchange. The period of early political de-Stalinisation thus became, somewhat surprisingly, also the first stage of globalisation of the Eastern Bloc societies.⁵

This paper seeks answers to following questions: How much did the Soviet policy shape free scientific cooperation, launched as a part of

⁴ Ronald E. Doel, 'Constituting the Postwar Earth Sciences: The Military's Influence on the Environmental Sciences in the USA after 1945', *Social Studies of Science*, xxxiii, 5 (2003), 635–66.

⁵ Cf. Simone Turchetti and Peder Roberts (eds.), *The Surveillance Imperative: Geosciences During the Cold War and beyond* (Basingstoke, 2014); John Krige and Kai-Henrik Barth (eds.), *Global Power Knowledge: Science and Technology in International Affairs* (Washington, 2006); Mark Walker, *Science and Ideology: A Comparative History* (London, 2003).

the ‘Geneva Spirit’ within the context of global scientific cooperation, and what role in the new environment was played by mechanisms implemented beforehand as tools of the hard-line Sovietization? And how much was the International Geophysical Year itself tailored and shaped by the Cold War spirit?

II ABOUT THE IGY

The International Geophysical Year, which took place from 1 July 1957 until 31 December 1958, was one of the most significant international events in scientific life during the Cold War. It took place during the period of official political de-Stalinisation, and its impact on the development of the scientific communities of the Eastern Bloc was profound. For this reason, the IGY is today generally interpreted in an idealistic spirit, in the sense that international scientific cooperation between the two superpower blocs managed to overcome Cold War divisions.⁶

This was also the tone adopted in the fundamental contribution of Lloyd V. Berkner, the instigator of the IGY who 12 September 1958, on the eve of the second United Nations International Conference on the Peaceful Uses of Atomic Energy, delivered in Geneva his ‘Four-point Plan for World Science’.⁷ In it, he highlighted several points from which the international scientific community could learn lessons for the future. He claimed that the conducting of experiments within the entire project was led from below, that is, by national communities and national governments, while planning, coordination, and organisation of the entire structure took place within the new international environment. The Special Committee (CSAGI), which stood at the head of the project, was of a non-political character and supported cooperation across national or political blocs. In this context, the

⁶ Cf. Sydney Chapman, *IGY: Year of Discovery* (Ann Arbor, 1959); Roger D. Lanuius et al. (eds.), *Globalizing Polar Science. Reconsidering the International Polar and Geophysical Years* (New York, 2010); Bernd Greiner (ed.), *Macht und Geist im Kalten Krieg* (Hamburg, 2011); Jacob D. Hamblin, *Oceanographers and the Cold War. Disciples of marine science* (Seattle, 2005); Klaus Gestwa, ‘Polarisierung der Sowjetgeschichte. Die Antarktis im Kalten Krieg’, *Osteuropa*, lxi, 2–3 (2011), 271–89.

⁷ Allan A. Needell, *Science, Cold War and the American State. Lloyd V. Berkner and the Balance of Professional Ideals* (Amsterdam, 2000).

UNESCO played an important role in that it financed this part of the programme and its administration.

From the point of view of the advancement of science, he claimed that the IGY sped up the development of the concerned scientific disciplines to a hitherto unprecedented extent, and led to new research in new disciplines (“catalysing extensive research”). He posited that its main contribution, however, was based on the fact that the IGY “captures the imagination of the world’s best research scientists”.⁸ He pointed out another important element of the IGY – the establishment of global monitoring networks. This was a first step toward their globalisation, which proceeded forward despite the fact that in the early stages of the programme the USSR managed to maintain its exclusive position in Eastern Europe as a bloc leader.

The IGY’s success in the world was unprecedented and was rightfully celebrated, but its actual course was nowhere near as idyllic as it was portrayed by Lloyd V. Berkner in his address.

According to estimates, 60,000 scientists from 66 states were involved in the IGY, with expenses reaching up to a billion dollars.⁹ Historically, the IGY was the successor to the International Polar Years, which took place in 1882–3 and 1932–3, and substantially contributed to new knowledge in atmospheric physics, particularly the high and low atmosphere, oceans, glaciers, and the magnetism of the Earth. The beginning of the IGY initiative was the proposal of Lloyd V. Berkner delivered at a meeting of the Joint Commission on the Ionosphere in 1950.

The idea of another ‘International year’ was adopted by the International Union of Geodesy and Geophysics, whose activities led to the founding in 1953 of a special committee, Comité Spécial de l’Année Géophysique Internationale 1957–1958 (CSAGI), appointed by the ICSU. This new committee was headed by British geophysicist S. Chapman, while the secretary was Belgian geophysicist M. Nicolet. The committee, with input from the scientific community, developed the original proposal and the subsequent division of the IGY into individual thematic and geographic regions and

⁸ Lloyd V. Berkner, ‘Four-point Plan for World Science’, *Scientific World*, iii, 5 (1959), 19.

⁹ Roger Revelle, ‘Some recent lessons of scientific co-operation’, *Scientific World*, iii, 3 (1962), 15.

groups.¹⁰ A total of over three thousand measuring stations across the world political map participated in measurements performed as part of the IGY.

III INVOLVEMENT OF THE EASTERN BLOC

For the first time, and without doubt in close alignment with the process of de-Stalinisation of Soviet Science, Soviet scientists and scientific institutions became involved in the IGY. Over 100 scientific institutions in the USSR pledged their participation. The Soviet leadership further supported this type of international collaboration by initiating and financing special scientific stations in Antarctica (including the *Mirnyj*, *Vostok*, *Komsomol'skaja*, and *Sovetskaja* stations), as well as financing special naval vessels (*Aurora*, *Lomonosov*, *Ob*, *Lena*, and others).

The final report of Valerie Troickaja, scientific secretary of the Soviet IGY committee, describes over 500 scientific stations and workplaces as being involved in the program, including two drifting stations, *North Pole Station 6* and *North Pole Station 7*. The Soviets further dispatched 20 expeditions with international participants, which travelled to the Arctic and Antarctic, as well as to the Pamir Mountains. Soviet expeditions were also conducted in all the oceans of the world. The assessment by Valerie Troickaja ends with the optimistic observation that “the IGY has been properly named a symphony of science in which each country has a part to play. ... Soviet scientists hope that the IGY will be a new page in both the history of the development of geophysics and the history of international scientific collaboration.”¹¹

In a certain sense, especially in hindsight, the IGY did indeed bring about a breakthrough: the scientific communities of the Eastern Bloc

¹⁰ The programme was divided in 14 subject-based sub-programmes: 1) world days and world meteorological intervals; 2) meteorology; 3) geomagnetism; 4) research into aurora and airglow; 5) investigation of the ionosphere; 6) solar activity research; 7) research in cosmic rays; 8) determination of geographical longitudes and latitudes; 9) oceanographic and glaciological research; 10) research using rockets and artificial satellites; 11) seismology; 12) gravimetric research; 13) geographic division of world-wide tasks; 14) publication activities of the IGY.

¹¹ Valerie Troickaja, “Symphony of Science”: the Soviet Union’s part in the I.G.Y., *Scientific World*, ii, 3 (1958), 12.

emerged from isolation and liberated themselves – at least partially – from their previous obligatory cooperation with Moscow. Considering that the actual period of the IGY overlapped with the turbulent beginning of the de-Stalinisation process in the whole of Central Europe, it could indeed have appeared that the previously locked gates of international cooperation were being unlocked, that barriers were disappearing, and that socialist science took its first free breath after almost a decade. On the other hand, throughout the process of de-Stalinisation – which took place after the 20th Congress of the Communist Party of the Soviet Union both in the USSR and, with a certain delay, in Soviet bloc countries – the scientific communities of Central and Eastern Europe remained firmly rooted within the framework of the Eastern Bloc and under the supervision of Moscow. It is therefore questionable whether the communist states of Central and Eastern Europe were actually involved in this international program as equals, or whether they played a part that was defined for them by the political interests of the Soviet Union.

The IGY was also effectively one of the first programmes which refreshed and followed up on the trend toward global infrastructuralism, which started in late nineteenth century with the sharing of data and scientific models across states and continents.¹² However, despite the vast progress achieved by re-establishing cooperation between the East and the West at the Geneva negotiations of July 1955, the limits of even such a large-scale research programme were determined mainly by the ideological frameworks of the two competing blocs. In consequence, and despite the initial enthusiasm, the particular participants – and more so the two blocs – did not, as recent research shows, share all their data ...¹³

Despite the celebrated scientific successes of the Eastern Bloc, and Soviet science generally, it appears that the geopolitical principle of dividing states into specific IGY zones left this ‘symphony of science’ to play only in decrescendo, and without resonance. This geographic division was doubtless the price paid so that this grandiose project

¹² Paul N. Edwards, ‘Meteorology as Infrastructural Globalism’, in Krige and Barth (eds.), *Global Power Knowledge*, 229–50.

¹³ Simone Turchetti, ‘“In God We Trust, All Others We Monitor”: Seismology, Surveillance, and the Test Ban Negotiations’, in Turchetti and Roberts (eds.), *The Surveillance Imperative*, 97.

could take place without interruption on a world-wide scale: because of the geopolitical division into individual regions, all participating socialist states found themselves in the so-called Euro-Asian region. At the first regional conference, which at the instigation of the CSAGI took place in Moscow in August 1956, the following states from the Eastern Bloc were present: Bulgaria, Czechoslovakia, China, Yugoslavia, Hungary, Mongolia, East Germany, Poland, Romania, and the Soviet Union, as well as international observers sent by the CSAGI. At this Moscow conference the involvement of individual countries in individual disciplines of research was discussed in detail, and the secretariat of this regional centre was also created in Moscow. Issues arising from this division, which was doubtless a consequence of the tendency – in the context of contemporary bipolar politics – to divide the world into blocs only emphasized the already-present features and trends of centralisation of knowledge and their transfer from periphery to centre.

IV

THE SOVIET 'INVITATION' TO PARTICIPATE IN THE IGY

The way in which the Soviets coordinated the involvement of the East-European scientific communities in this new type of global research programme clearly shows the interests of the Soviets in the IGY. The pressure of Soviets on East-European communities demonstrated the principal feature of 'restricted internationalism', as implemented and understood by the Soviet centre. According to the principle of voluntary involvement in the IGY, which the CSAGI announced at the start of the programme in accordance with the principles of operation of UNESCO and the ICSU, it was not possible to actually coerce individual states into participation in the IGY. In the Eastern Bloc countries, the decision whether or not to become involved was hence dependent on the decision of the individual leadership of the Communist Parties in the respective countries. However, the position of the Soviet Union clearly played a role in these decision-making processes. For example, in the documents from the political bureau of the Central Committee of the Czechoslovak Communist Party the sentence that 'in the USSR the IGY is afforded *exceptionally* great attention' was highlighted, leading the Central Committee to become seriously engaged with the announcement of the IGY in Czechoslovakia with an eye on its possible political and

ideological repercussions.¹⁴ Inasmuch as the position of the USSR was known to be so positive, it was highly unlikely that other communist states would not become involved in the initiative.¹⁵ Within the Stalinist culture the methods by which to compel the countries of the Eastern Bloc to cooperate were many, and in cases where the response to the idea of cooperation was not particularly positive, individual scientific communities were simply coerced by Moscow.¹⁶

The USSR's involvement in the IGY was coordinated by a national committee for the IGY, which was chaired by I.P. Bardin, Vice-Chairman of the Academy of Sciences of the USSR. The Soviet committee was one of the largest and had 35 members, with a special Antarctic Committee led by Academician D.I. Ščerbakov established for Antarctic research, which exceptionally operated under the Central Board of the Northern Sea Route, whose chairman at the time was V.F. Burxanov.¹⁷ Soviet participation and representation was precisely coordinated; the USSR was involved in all disciplines of research, with each research discipline having its own working group with its own chairman.¹⁸

¹⁴ Prague, National Archives of the Czech Republic (*Národní archiv České republiky* [hereinafter: NA]), Central Committee of the Communist Party of Czechoslovakia [hereinafter: CC CPC], Politburo 1954–1962, file 135, arch. unit 177, point 12, 3.

¹⁵ Particularly interesting is the case of Romania, which decided to become involved in the programme on the basis of intervention from Moscow only immediately before the actual start of the IGY, that is, at a time when the other national committees were already established.

¹⁶ Cf. Ethan Pollock, *Stalin and the Soviet Science Wars* (Oxford, 2006); Ernst Birke, Rudolf Neumann, and Eugen Lemberg (eds.), *Die Sowjetisierung Ost-Mittel-europas: Untersuchungen zu ihrem Ablauf in den einzelnen Ländern*, i (Frankfurt am Main, 1959); John Connelly, *Captive University: the Sovietization of East Germany, Czech, and Polish Higher Education, 1945–1956* (Chapel Hill, 2000).

¹⁷ Troickaja, “Symphony of Science”, 12.

¹⁸ The Soviet Committee: President – I.P. Bardin, Vice-presidents: V.V. Belousov, I.D. Boulanger, N.N. Puskov, F.F. Davitaja, A.M. Obuxov, I.D. Papanin, E.I. Tolstikov. Leaders of the working groups: E.I. Mogilevskij (world days), P.K. Evseev (meteorology), J.D. Kalinin (geomagnetism), A.I. Lebedinskij (aurora and airglow), E.R. Mustel (solar activity), S.N. Vernov (cosmic rays), N.P. Benkova (ionosphere), A.A. Mixailov (longitudes and latitudes), G.A. Avsiuk (glaciology), V.G. Kort (oceanography), E.P. Savarenskij (seismology), J.D. Boulanger (gravimetry). Committee Members: J.L. Alpert, M.I. Budyko, B.A. Vvedenskij, V.N. Dolgopolov, B.L. Dzerdzeevskij, G.I. Golyšev, P.A. Gordienko, A.M. Gusev, V.V. Fedynskij, E.K. Fedorov, A.G. Kalašnikov, A.A. Kopytin, V.I. Krossovskij, V.K. Prokofjev, S.V. Topuria, V.A. Troitskaja (Committee Secretary).

What, then, was the point of departure for the East-European communities? At first glance it could seem confusing that Czechoslovak scientists joined the initiative from its very inception, as the first of all the countries in the region. The possibility of continuing the pre-war engagement of Czechoslovak science in the activities of international associations was so alluring that the first state-wide conference to debate Czechoslovakia's international participation in the IGY was called as early as in March 1953, i.e. literally almost immediately after the establishment of the international committee (CSAGI). At the time, however, Czech scientists were acting without approval from Moscow, for which they were to be punished shortly thereafter. Moscow's official and definitive approval of Czechoslovak involvement took another three years.¹⁹ At fault however was not only the political leadership, which was worried about further political developments within the country, but also the Czechoslovak Academy of Sciences itself. Only in May 1955 was a committee for the management and coordination of preparations for Czechoslovak participation in the IGY established, with academician and geophysicist Alois Zátopek, founder of the 'Prague Seismic School' and from 1935 to 1954 the director of the Czechoslovak seismic service, at its head.

The committee did not last very long in its original form, as less than three months after the official meeting in Moscow (in November 1956) an internal takeover took place, placing the committee firmly in the hands of 'conscientious communists'. The result of this was that the further fate of the IGY in Czechoslovakia was negotiated solely by 'progressive' scientists from the Czechoslovak Academy of Sciences, while specialists of worldwide acclaim were completely removed from the committee. The new group took the unprecedented decision to reorganise the committee. The move was, without doubt, made both to hasten preparations and as a result of specific requests from Moscow, which favoured the appointment of trusted colleagues to the national IGY committee. Alois Zátopek, a member of many European seismic organisations, and from 1958 a sought-after member of the committee for the detection and identification of nuclear explosions in Geneva, was removed and academician Josef Novák, head of the probability theory and mathematical statistics department in the Mathematical

¹⁹ Cf. *International Geophysical Year and Cooperation in Czechoslovakia 1957–1959* (Praha, 1960).

Institute of the Czechoslovak Academy of Sciences was appointed as head of the committee.²⁰ Although Josef Novák was, according to documents, a ‘politically very progressive and socialistically thinking independent’, in reality the Czechoslovak committee for the IGY was led by a partisan core, created by the ‘conscientious members’ of the Czechoslovak Communist Party: Jan Bouška, Emil Buchar, Tibor Kolbenheyer, and František Link. Thus effectively there was a complete replacement of the original committee, which was considered politically unreliable.²¹ The result of this was that one of the first countries from the Eastern Bloc to sign up to the idea of the IGY right from the start, and which in 1953–6 worked out its own national IGY research programme, was in the autumn of 1956, under pressure from Moscow, forced to completely change its initial plan. The original research plan was, following the change in the makeup of the committee, effectively completely pushed aside and replaced by a new programme which was developed by the new committee, composed of politically reliable scientists who were chosen and approved on the recommendation of Moscow.

The German Democratic Republic (GDR) became involved quite late in preparations for the IGY programme.²² It is noteworthy, albeit unsurprising, that this happened not at the impetus of the scientific community, but due to pressure from the GDR government.²³

²⁰ Zdeněk Frolík and Václav Koutník, ‘Josef Novák osmdesátiletý’, *Časopis pro pěstování matematiky*, cx, 2 (1985), 218–19, 221–4 <<http://dml.cz/dmlcz/108592>> [Accessed: 11 July 2012].

²¹ The first preparatory conference elected the following persons in a National Committee for the 3rd IGY: Jan Bouška (Institute of Geophysics of the CAS), Guth (Skalnáte Pleso Astronomical Observatory of the CAS), Jílek (State Institute of Meteorology), Kaldrovitš (Geophysical Centre MHD Bratislava), Link (Ondřejov Astrophysical Observatory of the CAS), Ochaba (Hurbanovo Geophysical Observatory of the Slovak Academy of Sciences), Petržílka (Laboratory of Nuclear Physics of the CAS in Prague), Wittinger (group for International Measuring of Longitude). ‘Zprávy ze sekcí CAS’, *Věstník ČSAV*, lxii, 5–6 (1953), 121.

²² For more information on the specific role of the GDR in Cold War science and for the general context cf. Jens Niederhut, *Wissenschaftsaustausch im Kalten Krieg: die ostdeutschen Naturwissenschaftler und der Westen* (Köln, 2007).

²³ Berlin, Archive of the Berlin-Brandenburg Academy of Sciences and Humanities (*Archiv der Berlin-Brandenburgischen Akademie der Wissenschaften* [hereinafter: BBAW]), DAW zu Berlin, AKL, file 504, Comité Spécial de l’Année Géophysique Internationale, Letter from the ministry of Interior (Hagen) to the vice-president of the DAW (Ertel), 11 June 1955.

The Soviet Academy of Sciences first advised the German Academy of Sciences (*Deutsche Akademie der Wissenschaften*, DAW) about the opportunity to become involved. The vice chairman of the former, I.P. Bardin, in March 1955 contacted Walter Friedrich, Chairman of the German Academy of Sciences, informing him that the committee for the IGY established by the Academy of Sciences of the USSR would greatly welcome it if the German Academy of Sciences would inform them of the nature of the GDR's involvement in the planned project. This information aroused interest only in the *Klasse für Mathematik, Physik und Technik*, whose institutes primarily saw their involvement in the international project as an opportunity to establish international collaboration and to improve their technical equipment.²⁴

The Soviets were apparently impatient, and so the participation of the GDR soon became a subject dealt with by the Ministry of the Interior, which finally, pressured by a 'recommendation' from Moscow, called upon the DAW not only to become involved in the IGY, but also to be the main coordinator of the GDR national programme. The response of the presidium of the DAW at the start of July 1955 was – despite strong pressure on the part of state leadership – again negative. The main reason was, according to the presidium of the DAW, based on the structure of the IGY, according to which, in its opinion, meteorology played the main role. It therefore recommended that the government entrust the leadership of the IGY in the GDR to the Meteorological and Hydrological Service of the GDR (*Meteorologischer und Hydrologischer Dienst der DDR*).²⁵ The government, however, insisted that the DAW become the coordinator of all activities relating to the IGY, which in the end happened at the turn of 1955/6. The GDR national committee was established at the meeting of the presidium of the DAW on 21 December 1955.²⁶ At its head was, despite his initial aversion to involvement in the IGY, Professor H. Ertel, Vice-Chairman of the DAW, and Director of the Meteorological-Hydrological service. Professor H. Philipps, whom Ertel for a long time

²⁴ BBAW, DAW zu Berlin, AKL, file 504, Comité Spécial de l'Année Géophysique Internationale, Correspondence of the 'Klasse für Mathematik, Physik und Technik', May–June 1955.

²⁵ *Ibidem*, Response from the DAW, 6 July 1955.

²⁶ BBAW, DAW zu Berlin, AKL, file 329, Nationales Komitee der DDR zur Beteiligung am IGJ 1957–1958.

– and in vain – recommended for the role of chairman, became the vice chairman.²⁷

Thus in the cases of both the GDR and Czechoslovakia the strength of influence of decisions from Moscow on the formation of individual committees and their structure is apparent. While it would appear that in a natural process only the Meteorological and Hydrological Service of the GDR would have participated in the IGY, stimulating its own research, the development of which it was understandably invested in, Moscow wished for all types of research to be involved. In addition, the chronology indicates that the USSR wished for the IGY national committees of all Eastern Bloc countries to appear in Moscow in the summer of 1956, when a coordination meeting was scheduled.

The case of Poland confirms just how carefully the USSR structured the coordination of all IGY activities in Central Europe. In Poland the activity of the USSR Academy of Sciences and its interest in the coordination of the IGY expressed itself well before the start of the IGY, when a delegation of Soviet scientists under the leadership of academicians Bardin and Topčev arrived, outside of the framework of existing academic exchanges, at the Polish Academy of Sciences (*Polska Akademia Nauk*, PAN) with the goal of establishing a precise Polish research plan.²⁸ In April 1956 for example, another Soviet delegation with Professor J.D. Bulanz (vice-chairman of the Soviet committee for the IGY), Professors N.P. Benkov and P.K. Evseev arrived in Poland with the goal of critically evaluating the standard of equipment of academic institutes. As in the case of Germany, in Poland there was a relative delay in the establishment of a national committee; the academic secretariat of the PAN only established a special committee for the IGY, under the leadership of Paweł Szulkin, in May 1955. The Polish secretariat of the IGY committee officially began to function from 28 April 1956.

²⁷ The following scientists were nominated and confirmed: Prof. G. Fanselau (Dienststellenleiter des Geomagnetischen Instituts und des Observatoriums Potsdam-Niemegk), Prof. C. Hoffmeister (Direktor der Sternwarte Sonneberg), Prof. O. Hachenberg (Direktor des Heinrich-Hertz-Instituts), Dr. E.A. Lauter (Dienststellenleiter des Observatoriums Kühlungsborn), Prof. K. Reicheneder (Kommissarischer Direktor des Geodätischen Instituts Potsdam), Prof. W. Uhink (Geodätisches Institut Potsdam).

²⁸ Warsaw, Archives of the Polish Academy of Sciences (Archiwum PAN [hereinafter: APAN], Sekretariat Prezesa PAN, file 99/91, Komisja roku geofizycznego.

Szulkin's selection as chairman of the Polish national committee was somewhat surprising, as he had never paid particular attention to geophysical phenomena. While Paweł Szulkin (1911–87) was one of the best Polish post-war physicists, his main domain was radio engineering. In this field he achieved his greatest discoveries during the Second World War, when he worked in Moscow and specialised mainly in research closely related to military technology. He returned to Poland in 1944 as a major of the 1st Army of the Polish armed forces, with which he entered the liberated Lublin, where the communist government was established. He then became a key figure in the establishment of wireless broadcasting in Poland, and in 1949–51 – Rector of the Polytechnic Institute in Gdańsk. From 1952 he led the department of theoretical electrical engineering in the PAN Institute of Fundamental Technological Research (*Zakład Elektrotechniki Teoretycznej Instytutu Podstawowych Problemów Techniki PAN*). In the mid-1960s Szulkin became the Polish representative of UNESCO in Paris, and he never returned to Poland, as the People's Republic of Poland forbade him from returning in 1968. It was without doubt Szulkin's chairmanship of the committee for the IGY that elevated him to these later higher posts in scientific diplomacy.

Professors T. Olczak and W. Okołowicz became deputies to Szulkin, and Professor S. Manczarski his secretary. By all indications, Szulkin did not express much interest or own initiatives in the role itself; however in Moscow's view, thanks to his wartime activity in the USSR, he represented the prototype of a reliable scientist.

V

PRACTICAL TASKS AND THE LINKING OF CENTRAL EUROPEAN STATES

In hindsight, it is highly problematic to precisely define the role of the national committees and the role played by recommendations from Moscow in the establishment of IGY research plans in individual countries. Reconstruction of the negotiations of the time is unfortunately impossible. We do know, however, that Czechoslovakia was involved mainly in research in the areas of the ionosphere and meteorology, and to a more limited extent also in programs in the field of seismology, which it recommended at the Moscow conference, as well as in the observance of the night sky and solar

radiation.²⁹ The Czechoslovak Centre for World Days and World Intervals was established in Průhonice near Prague and carried the official title of 'IGY Communications and Warning Centre for the Czechoslovak Socialist Republic'. According to the evaluation of the chairman of the first department (world days), Professor Shapley, delivered at the Moscow conference in August 1958, this was the most reliable centre overall. Czechoslovakia enjoyed great success in the field of observing and monitoring meteors, which on the basis of existing research in the Czechoslovak Socialist Republic (Československá socialistická republika, ČSSR) and in the USA was subsequently added to the IGY programme.

This centre shared information with the regional centre in Moscow, which processed the forwarded data and made them accessible within a larger IGY monitoring network, but also made the results of its observations available to other institutions, including Western European ones. This model of international communication through so-called 'warning centres' clearly demonstrates that in Eastern Europe, data sharing was hierarchical. Moscow remained in control of all East European centres, with which it communicated directly. The Western model differed from the Eastern one mainly in the distribution of influence, which was, due to its de-centralisation, fragmented. The activity of the Průhonice centre and a diagram detailing the transmission of information within the IGY clearly illustrate the extent to which East European science was centralised and hierarchical. Nonetheless, this centre was one of the very first institutions behind the Iron Curtain to provide information to a global network.

The GDR also primarily focused on meteorology, which was entirely understandable given the overall aversion within the DAW to involvement in the IGY and the enthusiasm of the Meteorological and Hydrological Service of the GDR. The GDR, like the ČSSR, also focused on the ionosphere and gravimetry.³⁰ After its initial uncertain start, the GDR in the end became involved in many sub-projects. Plans

²⁹ Cf. Prague, Archives of the Czechoslovak Academy of Science (*Archiv Československé Akademie věd* [hereinafter: ACAS]), file: Komise pro Mezinárodní geofyzikální rok 1957–8, unit 2: 'Programme revu et augmenté de la participation tchécoslovaque', June 1956.

³⁰ ACAS, file: Komise pro Mezinárodní geofyzikální rok 1957–1958, unit 2: 'Internationales Geophysikalisches Jahr – Bericht über das Nationale Forschungsprogramm der DDR', 9 Aug. 1956.

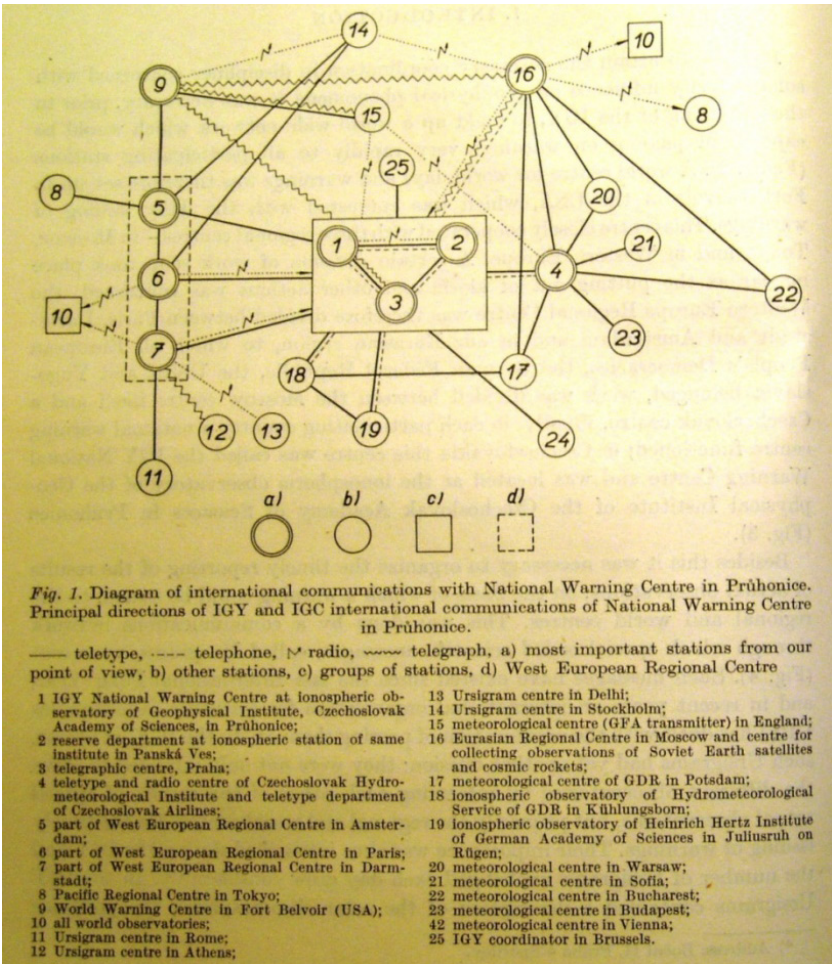


Diagram of international communications with National Warning Centre in Průhonice.³¹

included, for example, an expedition to the northern Atlantic (as part of the Soviet expedition on the cruiser Lomonosov), and cooperation was developed with Finland, Sweden, the USSR, and West Germany in the area of oceanographic measurement in the Baltic Sea, as well as other plans. Denmark and South Africa, which sharply protested the involvement of East Germany at the CSAGI assembly in Barcelona

³¹ *International Geophysical Year and Cooperation in Czechoslovakia*, 38.

in 1956, declared themselves against certain planned activities and the involvement of the GDR in wider international collaboration, including for example the planned scientific expedition to Greenland.

Another significant stimulus for the strengthening of collaboration between the socialist countries was the oceanographic conference, initiated, organized, and supported by the Baltic states, which took place in Helsinki in 1957. Following this conference, a strengthening of collaboration and collective measurement between the GDR and Poland took place in the western and central regions of the Baltic Sea, which was focused on, i.a., the presence of radioactive elements in seawater.³²

Poland focused primarily on seismology, as it was, like the ČSSR, invited to do so by Moscow, as well as on gravimetry, and it also became extensively involved in oceanographic research.³³ The Cracow PAN group, led by J. Massalski, also worked very closely with the ČSAV on research into the variation of intensity of cosmic radiation. This collaboration between smaller regional groups was negotiated between the ČSSR and Polish People's Republic (*Polska Rzeczpospolita Ludowa*, PRL), and its realisation took place in May 1957 in Prague primarily because the USSR had sent Czechoslovakia an important ionisation chamber, which was located in the High Tatras on the Czechoslovak-Polish border.³⁴

The PAN was the most active in international collaboration and the interconnection of its own research with that of other groups. Thanks to the PAN, for example, the activities of the IGY expanded outside the region of European socialist countries as far as Asia, where in the People's Democratic Republic of Vietnam (PDRV) two joint Polish-Vietnamese observatories were established in Phu-Lien and Cha-Pa, operated by both Polish and Vietnamese scientists.³⁵ Similarly to European states, the involvement in the IGY by the

³² ACAS, file: Komise pro Mezinárodní geofyzikální rok 1957–1958, unit 4: 'Resolutionen der III. Tagung der Vertreter der Länder der europäisch-asiatischen Region', 9–10.

³³ ACAS, file: Komise pro Mezinárodní geofyzikální rok 1957–1958, unit 2: 'Comité National Polonais pour l'Année Géophysique Internationale'.

³⁴ ACAS, file: Komise pro Mezinárodní geofyzikální rok, unit 1: Working meeting of the representatives of the Cracow and the Czechoslovak cosmic rays groups, Prague, 24 May 1957.

³⁵ The government of the Vietnamese Democratic Republic consented to a Polish exploratory expedition on 4 June 1956. Cf. Stefan Z. Różycki, 'Udział Polski w pracach Międzynarodowego Roku Geofizycznego', *Nauka Polska*, v, 1 (1957), 75.

Vietnamese scientific community meant a significant modernisation of their existing equipment, to which the PDRV government also contributed a relatively significant amount of funding. Beginning on 17 August 1957 (in Phu-Lien) and 1 September 1957 (in Cha-Pa), measurements took place in Vietnam under the supervision of Polish scholars in two areas: meteorology and earth geomagnetism.³⁶

Apart from equatorial regions, the PAN was also active in the Arctic. As part of its research into the Svalbard islands, Poland managed to continue research carried out there by a Polish expedition in 1934. The Polish government gained the approval of the Norwegian government in June 1956 to organise this scientific expedition. In the southern part of Svalbard, the Polish expedition, during its analysis of the Werenskiöld glacier, discovered its rapid thawing, amounting to an average of 2 metres in thickness yearly, or a total of 75 metres since its measurement in 1920. Dr. K. Birkenmajer achieved great success in the summer of 1957 when he managed to record the fauna and flora of southern Svalbard.³⁷ Also, one of the most significant bases of the entire Eastern Bloc was established in Svalbard thanks to the PAN. It was a “scientific laboratory, which simultaneously became a cultural ‘Polish House’ in the Arctic”.³⁸

In this regard it should be added that both establishments, i.e. the Vietnamese and Svalbard stations, represented very economically-demanding enterprises, which significantly increased the expenses of the Polish national committee. The purchase of specialised instruments alone amounted in 1957 to more than 850,000 roubles.³⁹ The total expenses of the Svalbard expedition in 1957 are estimated to have totalled 6.5 million złoty.⁴⁰ In 1958 PAN’s total foreign currency schedule of expenses was 830,000 roubles, while the IGY budget contributed 300,000 roubles, i.e. 36 per cent.⁴¹

³⁶ APAN, file Sekretariat Prezesa PAN, arch. unit 99/123, ‘Sprawozdanie z przebiegu prac Międzynarodowego roku geofizycznego’ (from 1 July 1957 to 31 March 1958).

³⁷ ACAS, file: Komise pro Mezinárodní geofyzikální rok, unit 4: Fifth CSAGI meeting, Moscow, 1958, Doc. nos. 133–4.

³⁸ APAN, file: Sekretariat Prezesa PAN II-70, arch. unit 112/5, ‘II-gie Sympozjum naukowe polskich wypraw na Spitsbergen 1957–8’, 1959, IV.

³⁹ Różycki, ‘Udział Polski’, 65, 67.

⁴⁰ *Ibidem*, 73.

⁴¹ APAN, file: Biuro Prezydialne PAN, II-2/1, arch. unit 128, Note (s.d.).

Poland's internationally-focused scientific IGY agenda greatly supplemented Soviet plans for scientific research in areas outside the European continent. The leadership role and dominance of the USSR was particularly evident in these areas, as for example in the field of polar research in Antarctica, where the socialist states were in fact completely dependent upon the USSR. Within the geomagnetism field of research, for example, the USSR had 20 magnetic stations on its own territory in 1955, with 3 additional stations being commissioned within the USSR at the start of the IGY (in Tomsk, Ashkhabad, and Cape Schmidt), and another 3 in Antarctica, where they were used by all the States of the Eastern Bloc. Additional 2 were established in the Arctic in the Central Polar Basic region (ice-flow stations), with more being planned in the equatorial region. A network of 200 meteorological stations was involved in polar radiation research, and ionosphere research took place at 17 observatories in the USSR and at the Antarctic *Mirnyj* station. On 3 August 1960 the *Mirnyj* station was destroyed by a hurricane in which all the scientists, who continued their measurements there after the end of the IGY, died tragically.

The hierarchical structure of the organisation of the IGY in the regions of Central Eastern Europe is characteristic, both in terms of its history and the extent of involvement of individual Soviet satellites in the course of the IGY, as well as the fact that these states had access to fields of strategic research solely through the USSR. Thanks to the regional organisation of the national research groups, the USSR managed to maintain control over data and information, which were transferred further within specialised monitoring networks. In this aspect of its operation, the IGY thus did not manage to transcend the division between the two blocs and their strategic interests, as defined by the dynamic of the Cold War. On a more general level, however, the IGY helped to bring to the fore possibly the most important aspect of future research in the second half of the twentieth century: data and information sharing. At the same time, the restart of scientific cooperation led to, among other things, making science a target of secret services' operations, and intelligence gathering became an unintended part of most large-scale global projects.⁴²

⁴² Cf. Krige and Barth (eds.), *Global Power Knowledge*; John Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe* (Cambridge, 2006).

VI

THE VIEW FROM THE BOTTOM OF THE POWER PYRAMID

Evaluation of the IGY remains highly problematic to this day. Political power on both sides of the Iron Curtain was invested in the realisation of the IGY for many different reasons, with scientific, political, and ideological reasons playing an equal role in many respects. The communists expected that the realisation of the IGY would involve them in mastering all the opportunities of contemporary technology, with rocketry measurements several kilometres above the earth, measurements from artificial satellites, radiometric monitoring of air and ocean currents and research into manmade earthquakes, including from atomic bombs, being specifically mentioned in official political documents.⁴³ Modernisation became another key word: involvement in the IGY would allow for the modernisation of existing equipment, while in many cases the very nature of the IGY made it possible to align this modern equipment with world standards and also permit, for example, the synchronisation of instruments.

The Czechoslovak regime also aimed at extending its relatively limited existing scientific contacts, and expected significant strengthening of scientific relationships with other communist states as a result of its participation as part of the Euro-Asian regional group. It is not surprising that documents from this time promise that this collaboration will “balance the sometimes one-sided orientation of individuals towards the West.”⁴⁴

The IGY probably did not contribute to the reconciliation of various scientific schools, as evidenced by the “nocturnal cloud luminescence” section, where throughout the entire IGY two schools – the Western and the so-called ‘Soviet’ school – clashed. While western theories assumed that the “dispersion of light is due to dust particles, which enter earth’s atmosphere from outer space”, the Soviet section supported the “physically more logical and supported belief that dispersion is caused by products of condensation, which can take place in certain levels of the upper part of the stratosphere”.⁴⁵ Current research leans towards an interpretation close to that of the ‘Soviet school’, however

⁴³ NA, CC CPC, Politburo 1954–1962, file 135, arch. unit 177, point 12, 4.

⁴⁴ *Ibidem*, 7.

⁴⁵ ACAS, file: Komise pro Mezinárodní geofyzikální rok, unit 4: O. Kostka, ‘Zpráva o účasti na 5. zasedání CSAGI v Moskvě’, 29 July – 12 Aug. 1958, 28.

certain aspects of this phenomenon have not yet been satisfactorily explained even to this day.⁴⁶

The main contribution of the IGY hence lies elsewhere: after the brutal Stalinist period, which overlapped with the schedule of preparations for the IGY from 1953 to 1956, the opportunity first arose in Central and Eastern Europe in 1957 to establish and shape an independent national scientific community – one which was not completely dependent on the USSR but instead managed to cooperate with all the states of the Eastern Bloc, and even with states on the other side of the Iron Curtain. The denunciation of the cult of personality at the 20th Congress of the Communist Party of the Soviet Union in February 1956 had a beneficial impact on the course of the entire IGY, the main activities of which took place in 1957–8, with a later extension to 1959.

In many aspects the IGY stimulated the scientific potential of Central European countries, and to a great extent contributed to disrupting the existing Stalinist model of managing science. This modification was indeed required by the very nature of the IGY. For many workplaces in Central Europe, participation in this programme was also a matter of prestige, which was expressed materially in improvements to the instruments with which individual workplaces were equipped, improvements which undoubtedly would not have happened without the IGY. As aptly observed by Roger Revelle,⁴⁷ very often this modernisation of existing instruments took place on the principle of ‘keeping up with the Joneses’.

Yet despite the relative successes that the IGY achieved, great caution is required in discussing the cooperation of the Eastern Bloc with the western world. Due to the geopolitical demarcation of measurement regions, the Eastern Bloc unfortunately remained completely under the dominance of the USSR, which managed to promote its political and ideological goals at the expense of the other Eastern Bloc states ruthlessly and without consideration of the long-term consequences. In the discussion of the possibility of extending the IGY, Professor Van Mieghem, who opposed the division of labour

⁴⁶ Special thanks to Alena Hadravová and Petr Hadrava, as well as to Marek Vandas from Astrological Institute of the Academy of Sciences of the Czech Republic.

⁴⁷ Revelle, ‘Some recent lessons’, 16.

in research, indirectly warned of the danger of increasing hierarchy within the research. On one hand, the geopolitical definition of the Euro-Asian bloc in a way respected the bipolar policy of the Cold War, thus also copying the original Sovietisation model of the scientific landscape in Central and Eastern Europe. Yet on the other hand, the global aspects of this project disrupted this scheme because the Moscow centre was no longer able to exert control over all the data and information. Nevertheless, despite opposition from, among others, Belgium and the USA, the Soviet Union – and with it the people’s democracies – proposed a draft resolution to extend the IGY in August 1958 at the CSAGI conference in Moscow. Loss of control within one’s own bloc was thus, as in game theory, compensated for by gaining access to data produced outside one’s bloc.

The effective dominance of the USSR was clearly obvious to all non-socialist countries. As Roger Revelle declared: “At least in certain fields, the scientific representatives of some countries at the international planning conferences had no real authority to agree to any modifications of their national programmes.”⁴⁸ This observation, made at the time, counters the contemporary tendency to view the IGY exclusively in the idealistic spirit of cooperation across the Iron Curtain. The cases of Czechoslovakia, the GDR, and Poland demonstrate that those scientists who reached and headed the national committees were primarily scientists whose loyalty to Moscow was unquestionable, rather than world-recognised specialists in their fields.

There were also further reasons for caution in making an assessment: apart from sovereign control of strategic research fields both in terms of research topics (rockets, geomagnetism of the Earth) as well as geographical coverage (the Arctic, the Antarctic, and the Equator),⁴⁹ the exchange of information became central to understanding the significance and role of the IGY during the Cold War. The Soviet Union was very well aware of the possibilities of controlling information, and promoted its interests both at the international and local levels, despite the fact that from the very beginning of the IGY everything was planned and mechanisms put in place that were intended to limit the obstruction of the exchange of information. For this reason, the

⁴⁸ *Ibidem.*

⁴⁹ One of important outcomes of the IGY is, e.g., the Antarctic Treaty System (1959/61).

CSAGI established a publication commission early on in the IGY, with representatives from France, Great Britain, Belgium, the USSR and the USA. ‘Collection Centres’ – where results were archived and, on request, copied and delivered – were created for the purposes of sharing information. In the USSR, this centre was located in Novosibirsk and construction of the new building was completed in 1957.⁵⁰ It was a natural assumption on the part of participating states that two archives with measurement results would be established in the world, with one of these being located in the USSR.⁵¹ At the same time, even the IGY preparatory committee, in its resolution before the commencement of the IGY, proclaimed that the world centres – A (Washington), B (Geneva), and C (Moscow) – would not compete over who would publish results first. The Soviet delegation was sharply reminded of this in August 1958 at the CSAGI conference in Moscow, where it criticised the late publication of radiation reports in which the USSR was immensely interested.⁵² However, current research is starting to reveal that delays in the publication of results, or even withholding measurement results from partners on the other side of the Iron Curtain, was no exception and was part of the game on both sides.

The situation at lower levels, e.g. within the framework of the Euro-Asian region, which was managed by Moscow, was, however, critical. The exchange of information here was completely under the control of the USSR, and this continued to be so even after 1958. In 1959, for example, as part of the extension of the IGY as *International Geophysical Cooperation 1959* there was no reciprocal exchange of information between individual countries directly, but again only in a bilateral mode with the USSR. Information was hence exchanged between: USSR – ČSSR; USSR – Bulgaria; USSR – Yugoslavia; USSR – Romania; and USSR – Hungary. The only exception was the cooperation between the GDR and Bulgaria, which defied this model.⁵³

⁵⁰ Paul Josephson, *New Atlantis Revisited. Akademgorodok, the Siberian city of science* (Princeton, NJ, 1997); Aleksandr B. Bezborodov, *Vlast' i naučno-techničeskaja politika v SSSR seređiny 50-x – seređiny 70-x godov* (Moskva, 1997).

⁵¹ ACAS, file: Komise pro Mezinárodní geofyzikální rok, unit 2: ‘Conférence regionale de l’Est de l’Europe du CSAGI, Moscou’, 20–25 Aug. 1956, 23.

⁵² ACAS, file: Komise pro Mezinárodní geofyzikální rok, unit 4: O. Kostka, ‘Zpráva o účasti na 5. zasedání CSAGI v Moskvě’, 29 July – 12 Aug. 1958, 13–4.

⁵³ ACAS, file: Komise pro Mezinárodní geofyzikální rok, unit 4: ‘Resolutionen der III. Tagung der Vertreter der Länder der europäisch-asiatischen Region’, 13.

VII CONCLUSIONS

The actual progress of the IGY global programme shows that even after 1955, the re-establishment of cooperation between the East and the West was running into obstacles dictated by the position of the two superpowers within the (geo)politics of their blocs. The enforced or directly-coordinated collaboration of the individual states within the Eastern Bloc was fully in line with the concept of 'restricted internationalism' which characterised the beginning of de-Stalinisation. On the other hand, despite the risk of losing control over its bloc, the relaxation of restrictions on cooperation brought sufficient compensation to the USSR, in the form of access to and acquisition of new information that it eventually decided to take part in all other global programmes.

At the same time, even despite the unambiguous contribution of a new geopolitical conception of international scientific cooperation across unfriendly blocs, due to the geopolitical division of IGY activity into individual regions, Moscow in fact retained the status of a hegemon. The contrast between the perception of the significance of the IGY in the USSR and in the Central European states is well demonstrated by a comparison of the official report of the secretary of the Soviet national committee, Valerie Troickaja, with the letter of gratitude written by the East German secretary of the national committee of the IGY in the GDR to L. Berkner. While according to the Soviet committee the IGY was a 'symphony of science', the view from the bottom of the power pyramid sounds more realistic and points out the distinct contours of the IGY. Thus while the whole world sang the praises of the model of international cooperation, Professor Philips, in his letter, did not hesitate to label the IGY as what it actually was from the point of view of the Eastern Bloc – a competition between two antagonistic blocs: "The Olympic Fire of this Olympiad of Science, which for eighteen months will not die out, inflamed in the hearts of those devoted and engaged to that magnificent work ..." ⁵⁴ Unlike a symphony, the Olympics have their victors and losers.

⁵⁴ BBAW, DAW zu Berlin, AKL file, unit 504: Philipps, the GDR secretary of the IGY, in his letter to L.V. Berkner (26 June 1957): "The Olympic Fire of this Olympiad of Science, which for eighteen months will not die out, inflamed in the hearts of those devoted and engaged to the magnificent work, be the symbol for

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the spirit of human concord, for growing reason and for the sense of the greatness of responsibility born by each of us, which no one may be released from, and which, finally, demands utilization of the forces of nature to the benefit of mankind rather than to its destruction.”

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