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INTRODUCTION

The giants of Antarctica's so-called Heroic Age—Scott, Shackleton, Amundsen, Mawson, later Byrd—are familiar figures, even among the many who know little about the desolate desert of ice at the bottom of the globe. But after the handful of larger-than-life pre-World War I heroes came the pioneers. It was they who, in mid-century, mostly anonymously, built the Antarctica of today.

Their story centers on the International Geophysical Year (IGY), 1 July 1957 through 31 December 1958—a coordinated, cooperative worldwide effort to understand the earth and its environment. Of the earth's two great unknowns at the time, one was Antarctica. (The other was space. The Soviets' orbiting of Sputnik in October 1957

marked the achievement of a shared IGY goal, though few would remember that connection.) The IGY focus on otherworldly Antarctica was fed by irresistible scientific curiosity. Just how vast and deep was the continental ice sheet? What lay beneath it? How much did frigid Antarctica influence hemispheric, if not global, weather patterns? How did the proximity of the magnetic and geomagnetic poles affect solar and atmospheric phenomena such as cosmic rays and the aurora australis?

Scientific interest in Antarctica was not new. Qualified scientists accompanied many of the earliest expeditions, whose primary impellers were wealth or glory. For some leaders, the quest for knowledge enjoyed high priority in its own right; for all, it was recognized as a way to add stature to the venture. Given that virtually nothing was known of the immense whiteness, every finding was significant no matter how limited the scope of effort. Even international polar science had precedent. The IGY began as the *Third* International Polar Year. Two earlier modest, yet remarkable, international scientific surveys—in 1882–1883 and 1932–1933—concentrated on the more accessible, more germane polar North, but they established the effectiveness and value of sharing the results of numerous nations making the same kinds of scientific observations simultaneously over a broad area. Even as the polar-year concept of the 1950s blossomed into an ambitious global endeavor, the poles remained anchor points, now especially the mystical high-latitude South. The Norwegian-British-Swedish Antarctic Expedition of 1949–1952 offered a timely model of a multinational scientific (not geographic) pursuit that employed the latest technologies for work and travel. The IGY would borrow from all of these forerunners, but its unprecedented scope, scale, and outcomes would make it something new.

The IGY fathers took their idea and enthusiasm directly to the international scientific community, embodied in the International Council of Scientific Unions (ICSU), which in turn sought the support of the dozens of national academies of science that comprised its membership. ICSU also formed a special organizing and coordinating committee, the Comité Spécial de l'Année Géophysique Internationale. But each participating country's "national program" would be planned by its own national committee, according to its own means and interests, and would be financed and implemented by its government, the only possible source of sufficient support.

The need for government funding, of course, inevitably introduced politics. Fortunately, the key science leaders, starting with American Lloyd Berkner and Britisher Sydney Chapman who conceived the IGY in the spring of 1950, were savvy and influential players in that milieu. They had the political acu-

men to promote a studiously “apolitical” program. They would welcome all nations wishing to join in without regard to political philosophy. They deliberately excluded “controversial” sciences like geology and mapping, disciplines of an obviously geophysical nature, lest they reveal valuable mineral resources—and thus set off a “rush” for territorial advantage. (Americans would not be alone in quietly pursuing these activities anyway.) The planners attempted neither financial nor program management at the international level, thus avoiding hopeless accounting complexities, not to mention political quagmires. (Their approach also minimized international overhead.) Yet concepts such as World Days and World Data Centers would demonstrate international collaboration at its best. Finally, they astutely waited to approach their respective governments until the science plans were sufficiently advanced to present a persuasive case on scientific merits. It did not hurt that they could then use other countries’ commitments as levers to pry more generous funding from potentially parsimonious legislators.

At home, the United States National Committee for the IGY was born a creature of the prestigious National Academy of Sciences (NAS), which provided much of the expertise through technical panels and special committees. It also created and housed a small bureaucracy to run the U.S. program. But only a government agency could request and dispense congressional appropriations; the private NAS could not. So the cub National Science Foundation (NSF) took on the funding management role. It was a leap: NSF’s initial IGY budget submission, though technically separate, doubled its own. These two voices of science would sometimes find it hard to harmonize their approaches and methods, while other agencies, especially the defense and diplomatic establishments, sang their own songs—ever seeking to link IGY activity to the protection and enhancement of U.S. security and strategic interests. Always, behind the facade of cooperative science lurked gut-felt fears that the Russians would preempt the polar continent if the “Free World” did not act first.

The staggering logistical challenges of mounting an ambitious, far-flung scientific enterprise in Antarctica demanded exacting care. In the United States, unlike the far-northern, ice-wise Soviet Union, no civilian entity possessed either the equipment or the expertise to fulfill a mission so large and complex under conditions so harsh. The American IGY, by necessity, turned to the U.S. Navy and other military services to identify, assemble, and transport every volunteer, every tractor, roof truss, and frozen turkey and to plan, site, construct, and maintain an infrastructure so that scientists could pursue the science they came to do. Besides technical capability, the Navy brought to the task a history of two Antarctic expeditions, a century apart—the Wilkes Expedition

of exploration and national prestige building, 1838–1842, and Operation Highjump in the austral summer of 1946–1947, the largest extreme-cold-weather naval training exercise ever. A then-classified but primary goal was to establish a basis for claiming sovereignty over as much of the polar continent as possible.

In the following decade, the Navy's Operation Deep Freeze, set up specifically to provide logistical support for the IGY in Antarctica, faced a huge charge—frenzied by a truncated time frame, the world's longest supply line, the need to provision for two years in case impenetrable ice thwarted resupply efforts, and the certain knowledge that anything left behind would be done without. But the men would come through—with diligent planning, ingenious improvisation, plenty of brute force, and “can do” spirit. Their ships negotiated hummocky pack ice, their planes soupy whiteouts. Naval Construction Battalions (the Seabees) built six scientific stations and a logistics base, each with its own problems of access, terrain, and weather. Byrd Station, deep in the so-called American sector, would owe its existence to heavy, sled-hauling tractor trains whose tortuous route through deadly crevasses was laid out and made safe by U.S. Army crevasse experts. Air Force cargo planes would air-drop onto the South Pole every great and small thing essential for life there. Admiral Dufek, the Navy man, seized ability where he found it. Wintering-over Navy support personnel would melt snow for water, cook meals of renowned quality, nurse along overworked equipment, run cranky generators, provide radio contact with the outside world, and much more. They would mourn a few dead. Their practical triumphs made possible the scientific successes that followed.

The American scientists, mostly young and inexperienced, were themselves pathfinders. With IGY leaders sometimes dismissive of their ability to perform beyond “cookbook” instrument reading and their mentors a world away, they mastered the use, maintenance, and repair of complicated equipment and conducted preliminary analyses of tons of data. They calculated the thickness of ice shelves and ice sheets and measured rates of snow accumulation and glacial flow. A few dozen of them crawled thousands of miles over the unknown continent in grumbling tracked Sno-Cats to push back the frontiers of knowledge. Some of their findings even they had trouble believing.

The Navy and IGY-science community made an odd couple; tension marked their relations from the start. Navy leaders, straining to make a home for nearly 300 men at widespread locations within the space of two short polar summers, felt little regard for scientists who set unseen sites on paper in the comfort of temperate conference halls with no idea of the actual conditions or

appreciation for the costs of prevailing over them. IGY leaders, focused on their own performance requirements and frantic to begin on time, seemed to find in every setback evidence of Navy indifference. On the ice, sailors and scientists viewed one another across divergent goals, social and educational cleavages, and differences in tastes and habits. Yet, wintering over in intimate proximity, they adjusted remarkably well to each other overall. Cultural clashes were exceptions. A dual command system, a reluctant compromise both civilian and military leaders deplored, proved generally workable and effective in the reality of polar camp life. Indeed, the most conspicuous leadership failure accompanied the one case where a single commander had charge of an entire station.

This history bears an American emphasis, an American point of view. But the story cannot be told without interfaces with the people and politics of the eleven other nations that sent IGY teams to the polar continent. The United States operated one station bilaterally. All the others feared and distrusted the Soviet Union; ongoing territorial rivalries also threatened the cooperative enterprise. One outstanding achievement of the IGY, therefore, was an international exchange of Antarctic scientists. In particular, Russian meteorologists (and those of several other countries) lived and worked at Little America's Antarctic Weather Central facility while U.S. counterparts wintered over at USSR Station Mirny, giving both sides a chance to find friendly humanity beyond the ideological walls. On the ice, distant Cold War machinations mattered little, and that fact gave one more nudge to what followed.

In fact, even before the IGY officially opened, U.S. IGY leaders proposed that the barely begun scientific work in Antarctica continue when the "Year" was over. Congress countered with reminders of a promised "one-shot" expenditure. The Navy had ambivalent feelings about continuing to pour resources into a nonmilitary effort in an area of questionable strategic importance, and the State Department was wary as always about allowing an inadvertent Communist advantage. The international response was also mixed, but when the Russians announced they were staying on, that decided it for everyone else. In the end, the participating countries agreed to extend the program for one additional year, to be called the International Geophysical Cooperation-1959, to buy time to work out more permanent arrangements.

The prickliest issue had to do with "ownership" of the polar continent. Seven nations, all of them friendly to the United States, had made pie-shaped territorial claims terminating at the Pole, some conflicting. While over the years American explorers had deposited claim sheets all over Antarctica, the government had never formally acted on them—to the consternation of many

politicians and political activists—although it retained the “right” to do so. At the same time, it did not recognize any claims of others. The Soviets, inactive since Bellingshausen’s early-nineteenth-century circumnavigations of the continent, echoed that policy. If the United States could boast the strongest “basis for a claim,” the consequences of asserting one began to appear ever more problematic, the value ever more uncertain.

Finally, after years of agonizing, U.S. policy makers found in the IGY an opportune moment and a possible path to institutionalize the scientific cooperation while putting aside the treacherous political issue of claims. Painstaking negotiations among the twelve Antarctic IGY nations at length yielded the compromises, controls, and acts of faith that became the Antarctic Treaty of 1959. A determined band of U.S. senators, passionately anti-Communist and pro-American “rights,” did their best to prevent ratification. But this small, imperfect, rather miraculous bond of peace and purposefulness in a troubled world still holds today.

It was an extraordinary time. The period in question was remarkably short. From the time the Navy ships of Operation Deep Freeze I met the ice of the Southern Ocean to the signing of the Antarctic Treaty was a scant four years. From the emergence of the IGY concept to the indefinite extension of the IGY in Antarctica was less than a decade. It was a dangerous time in history, with atomic weapons poised between two implacable adversaries—both major Antarctic players. Perhaps that backdrop of Cold War terror somehow inspired the peaceable scientific quest—a way to stay nuclear annihilation.

Altogether, this is a story of how an uncommon mix of people, representing cultures, agencies, organizations, and countries from all the inhabited continents, came together to study the last continent and then to reserve it as a continuing haven for science and peace. It is a story of how science was brought to serve politics, national interests, and humankind. Fifty years after the human and material resources of the United States and eleven other nations moved in on the puzzled penguins, it is time to take a look at their historic experience and its significance.