

Awakening of my interest in earthsciences and how it was furthered by Gerlands Beiträge zur Geophysik, a non-periodical promoting international cooperation in geophysics [Car.G.Res.]

During elementary through highschool years geography was my favorite learn and study object. With what my teachers taught I made the Samland my personal classroom and laboratory. The Samland is located where the west-to-east shoreline of the Baltic Sea changes abruptly to the east-to-north direction. It is a nearly rectangular block of land, about 60 km from west-to east and 30 km from south-to-north. Of the southern boundary about half is the northshore of "Frisches Haff" [now *Vislinski Zaliv*, a lagoon stretching about 80 km to the SW] and the remainder the southern branch of the river Pregel. Of the northern boundary about one third is the southshore of "Kurisches Haff" [now *Kurski Zaliv*, a lagoon stretching about 90 km to the north] and the remainder is the south shore of the Baltic Sea. The eastern boundary is the "Deime", a river channel connecting Kurisches Haff and the river Pregel with flow direction determined by the Haff's waterlevel fluctuations. The western boundary is the Amber Coast of the Baltic Sea.

My class mates and I accepted willingly when the geography teacher told us that "our sea", the Baltic, was carved out by ice-age glaciers. But we found it hard to believe that the erratics -- the huge boulders strewn over the surrounding countryside and along "our beaches" -- did not come from the Scandinavian Mountain ranges in the westnorthwest but from the more distant and absurdly flat region of Finland in the northnortheast. Rowing was my highschool sport. Very convenient for our weekly round trips our river has upstream of the boathouse two arms on both sides of a wide valley. We learned that this valley was an "urstromtal" formed during the demise of the last ice-age by outburst floods of meltwater.

Dunes and Glider School Rossitten

During my last Highschoolyear

My interest in earth sciences deepened during my graduate student years. The libraries of the university departments of geophysics and meteorology became my favorite places for independent studies. All earth sciences are by nature international sciences. Advances in seismology or geomagnetism or oceanography or weather dynamics are furthered by publications in media with international

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distribution. I found out that along such lines of thought Prof. Dr. Georg Gerland began in 1887 to edit volume I of "Beiträge zur Geophysik", translated : "Contribution to Geophysics", and originally distributed as a publication by the geographic seminar of the U. of Strassburg, Alsace.

Volume VII, number 4, 1905, was especially devoted to international cooperation in seismology. "A guide to the observation of earthquakes" was published on eight pages each in english, french, and german language. In the same volume Prof Gerland devotes ten pages to a report about the foundation, organisation and programs of the international association of seismologists. An editorial note states that contributors to "Gerlands" receive a honorarium of M. 20.- [equivalent in 1907 of about 5 U.S.dollars] per sheet [16 pages] by the publishing house of Engelmann, Leipzig.

Beginning with volume XV, 1926, the title is "*Gerlands Beiträge zur Geophysik*". The new editor was Prof. Victor Conrad-Wien [U. of Vienna, Austria] and the new publishing house was the AVG [Akademische Verlagsgesellschaft M.B.H] at Leipzig. Prof. Conrad was an ardent protagonist of international cooperation in geophysics. Accepted were articles in german, english, or french language. Desired was that a "Zusammenfassung" and/or "Résumé" and/or "Summary" of 50 to 150 words should be submitted in a language other than that of the article. In several editions of "Gerlands" Prof. Conrad had voluntarily provided translations of summaries into "Esperanto". This is an artificial language invented for international use in the 1880s by a polish physician. It is constructed on word bases common to the main european languages; it has self-evident parts of speech. For example, all nouns end in -o, all adjectives end in -a, etc., with a single and regular conjunction of verbs, a few simplified inflections, etc. However, this like other artificial languages never became popular.

My graduate student years were preceded by the 1920s, the period during which political wounds from the 1914/18 world war began to heal all over Europe. The Locarno Conference and Treatises brought political leaders of Belgium, France,

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Germany, Great Britain, Italy, and Poland together. Briand [France] and Stresemann [Germany] shared the 1926 Nobel Peace Prize. Germany joined the League of Nations. The world meeting of the international aerological commission convened at Leipzig. All this may have helped Prof. Conrad when he corresponded with a host of internationally known geo-scientists and asked for "Mitwirkung" in promoting "Gerlands" as a medium of international cooperation in geophysics. What Prof. Conrad meant by the german word "Mitwirkung" is perhaps better translated by "moral support" rather than "active cooperation"

Prof. Conrad must have been convincing. On the frontispiece of Volume XV, 1926, *GERLANDS BEITRÄGE ZUR GEOPHYSIK* is followed by the phrase "*unter Mitwirkung von* " and a list of 34 names of internationally known scientists from 16 countries. I believe the best impression is provided by a list according to nations:

Austria : Brückner, Exner, Schweidler, Wien; Köppen, Graz

Croatia : A., & S. Mohorovicic, Zagreb

Dutch-Indonesia : Braak, Batavia

Finland : Johansson, Witting, Helsingfors

Germany : Einstein, Berlin; Linke, Frankfurt; Schmidt, Schweydar, Potsdam,
Weickmann, Leipzig

Great Britain : Jeffreys, Cambridge; Lord Rayleigh, Chelmsford

Hungary : v. Kövesligethy, Budapest

Italy : Palazzo, Rome

Japan : Fujiwhara, Tokyo,

Netherlands : Van Everdingen, DeBilt

Norway : Goldschmidt, Vegard, Oslo

Russia-USSR : Iwanoff, Pulkovo; Lasareff, Moscow; Stekloff †, Leningrad

Spain : Inglada-Ors, Madrid

Sweden : Ångström, Sandström, Stockholm

Switzerland : Maurer, de Quervain, Zürich

U.S.A. : Abbot, Bauer-, Washington, DC; Daly, Cambridge, MS;

Reid, Baltimore; Swann, Newhaven, Conn.

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As student of geophysics and meteorology at the universities of Königsberg [1928/29], Frankfurt [1929/30] and Leipzig [1930/31] I found "Gerlands" in each departmental library. I agreed fullest with Prof. Conrad's philosophy. I was exhilarated when my handwritten manuscript was accepted and published in "Gerlands", Vol. 31. 387-397. In translation the title was: "*The efficiency of a large city as a source of air contaminants*", it included a "Summary" for which my highschool english was just barely adequate, besides the "Zusammenfassung".

This publication resulted from personal dedication to research and my choice of independent methods which, I believe, is a trait that helped me more than once in my career. Let me explain with the aid of the timing of two episodes. During the break period in 1929 between attending the universities of Königsberg and Frankfurt I had spent some of my time as "unpaid intern" at the weather office at Königsberg's international airport. I got permission to be the observer at two of the daily ascents to the the 500 mb surface. The airplane was a somewhat antiquated double decker with open cockpits. At the peakheight of about 5 km I enjoyed viewing all of Eastprussia, bounded to the north by the Baltic Coast and the lithuanian border, and to the south and west by the polish border with separated my homeprovince since 1918 from the German "Reich". This was fascinating, but my scientific instincts were challenged by a new view of my hometown. For the first time I perceived it not just as the residence of about 300,000 inhabitants, but a city dominated by the activities in and around the harbor. This I saw in the individual smoke plumes emerging from multiple sources and converging to onequasi-uniform smoke pall during the downwind drift.

One year later, at home again during the breakperiod between attending the universities of Frankfurt and Leipzig, I decided to attempt an out-of-doors experiment. Two years before I had mail-ordered a "blue-scale" from Prof. Linke's Institut and published in 1929 a short statistical note the blueness of the sky over Königsberg. The blue-scale had been designed by Linke in cooperation with Ostwald who had won the 1909 Nobel-price in chemistry. In one of the lecture courses which I attended at Frankfurt U, Prof. Linke had mentioned a statistical relationship

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between blueness of the sky, his turbidity factor, and the content of optically effective suspensions in the lower atmosphere. I also had learned from my study of literature that Wilhelm Schmidt[Prof. at U. of Wien] had modified a solution of heat conduction theory by introducing his theory of "austausch". Schmidt applied it by estimating the intensity of the heat source by burning of fuel in houses and industrial plants and used austauch-theory for calculating the overtemperature of a city air relative to air above surrounding open country, in "reasonable" agreement with temperatures measured by thermometers carried across the city by automobiles.

I decided to reverse Schmidt's approach by measuring how the blueness of the sky changes from upwind to downwind of the town's array of smoke stacks and use "austauch" theory combined with Linke's correlation results to calculate the source-intensity by which the city contaminates the air. During a clear morning in October, cool enough to make people fire their ovens, and a moderate southwesterly breeze I criss-crossed my hometown by bicycle, pedalling about 45 km in a little more than five hours with 30 stops to determine the scale value that fitted the blueness of the sky. A mapping of the results [see Addendum A] showed a systematic pattern which I believe today was actually the item which merited the publication rather than the application of "austauch" theory even though it produced "reasonable" results. Prof. Conrad may have felt likewise but by accepting my paper he provided me as "freshman scientist" a welcome boost.

During the following years Prof. Conrad accepted for publication in "Gerlands" four articles, which I wrote 1931-33 as post-doctoral research assistant at the Geodet. Inst. Potsdam, and 1933-38, as research assistant and assistant professor at the U. of Leipzig. Let me quote year, numbers of volume and page of the title given here in translation: 1932, 37; 41: About the oscillation period [seiche-period] of a water basin [lagoon] with an outlet to the sea -- 1933, 39; 426: About the computation of the coefficient of meridional [or macro-] austauch --1933, 40; 390: Meridional [or macro-] austauch over Europe and the North Atlantic in Winter 1931 --1937, 51; 250: Diurnal and multi-diurnal oscillations of the plumb bob due to tidal forces and atmospheric forces.

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"Gerlands" was not a periodical magazine. The average rate of publication from 1926 to 1936 had been two or three volumes per year. In 1936 Prof. Conrad called for contributions to a special "Festschrift" on occasion of the ninetieth anniversary of Wladimir Köppen. The response was overwhelming and resulted in three "Köppen Volumes" in addition to the regular two or three in 1936. My colleague at the Leipzig Institute, Rudolf Penndorf, was 1936 on a visiting appointment in Great Britain and reported back home that our British colleagues spoke of "Conrad's Weeklies". We agreed that more appropriately the achievements of great personalities are honored by historians. In the case of Köppen, I believe, this was done 1936 by the German Seewarte and 6 decades later by John Lewis, 1996, "Winds over the world sea: Maury and Köppen" *Bull. AMS*, 77, 935-952

In March 1938 Hitler had his triumphant return to Vienna but with Austria's annexation Prof. Conrad was forced to emigrate. He and his wife found a home in Cambridge, Massachusetts. In 1953 Weickmann had visited the USA and during his stay at Cambridge, we had a chance to meet Prof. Conrad before he succumbed to a stroke. The Leipzig AVG [Academic Press] was one of the few Jewish firms that had been licensed to continue operation in Germany under the Hitler regime from 1933 on because the sale of their books and magazines provided a substantial income of foreign currency. British pounds, French francs, Dutch guilders, USA dollars etc. were transferred through the federal clearing bank. Prof. Weickmann's Institut at the U. of Leipzig maintained an effective cooperation with AVG. My monograph, "Atmosphärische Turbulenz" [283 pp, 58 figs] was published by AVG in 1939.

In 1938 Prof. Conrad resigned and agreed with the executive officers of AVG that Prof. Weickmann should select an editorial committee of four. Hence, volumes 54 through 60 of "Gerlands" were published 1939 to 1944 by AVG with four editors listed on the frontispiece: J. Bartels [Geophys. Inst., Potsdam], A. Defant [Inst. and Museum f. Meereskunde, Berlin], H. Lettau [Geophys. Warte, Königsberg], and L. Weickmann [Geophys. Inst., Leipzig]. The list of international "Mitwirkers"

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included B. Gutenberg, Pasadena, CA, and Störmer, Oslo. I continued to submit manuscripts to one of the other editors. Published were: 1939, 54; 179: Variation of the plumb line at the rim of a mountain chain [in the bavarian alps] during the time of snow melt — 1939, 55; 103: Content of nuclei and dust in the air near the ground in relation to atmospheric reduction of insolation in tropical Africa and along its coasts — 1941, 57, v Obituary: Gustav-Adolf Suckstorff — 1941, 57; 365 Application of recent austausch theory to two problems of atmospheric electricity — 1942, 59; 150: About the nocturnal secondary maximum of the diurnal variation of the coefficient of vertical austausch in relation to other meteorological phenomena.

Due to my appointment as head-custodian of the geomagnetic-seismological observatory [Geophys. Warte] of the Albertus University at my hometown Königsberg in November, 1938, I became a member of the german delegation to the Meeting of the International Geophysical Union, 6 to 15 September, 1939 in Washington D.C. On my request, Ms. Kauffman, Executive Assistant of the American Geophysical Union, Washington D.C. located for me the part of the program of the 1939 meeting that listed National Reports from the various nations. Listed under Germany is J. Bartels, Potsdam, as chief delegate, and among regional reporters are H. Lettau, for the Geophys. Warte, Königsberg, and L. Weickmann for the Geophys. Observatory am Collmberg of the U. of Leipzig. Prof. Weickmann and I had been booked for crossing the Atlantic in late August, but Hitler interfered by starting World War II. Our trips were canceled. Prof. Bartels had gone to the U.S.A. a few weeks earlier to finish as co-author with Sidney Chapman Vol. I of *Geomagnetism*, published 140 by Clarendon Press.

Prof. Weickmann and I were drafted by the German Air Force "GAF= Luftwaffe". Having been a WW I-weather officer Weickman was assigned as GAF Chief Meteorologist in occupied Norway. I had never been in the military service. My assignment was a desk job at GAF-headquarters near Potsdam which left me free to devote time to my science. In 1940, Prof. Bartels returned to Potsdam after crossing the Pacific Ocean on a japanese passenger steamer and the length of Asia by the trans-siberian railroad. We had a few editorial meetings which helped to

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continue publication of "Gerlands" until volume 60. War damages caused ever increasing difficulties.

International relations were interrupted but not broken. For example, as the first director of the Geophys. Inst the university of Leipzig had selected 1913 the Norwegian V. Bjerknes. At the 25th anniversary of the Inst., Bjerknes came to Leipzig and I heard him say, that the "Bergen theory of cyclones" would have been a "Leipzig theory of cyclones" if WW I would not have come. War-time restrictions caused his and his scandinavian research assistants [Bergeron, Hesselberg, Sverdrup] to leave Leipzig and return to Bergen in neutral Norway.

Weickmann had been visiting repeatedly in Bergen in the late twenties. But as german officer he abstained from visiting Hesselberg in Bergen.