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ON THE THIRTIETH ANNIVERSARY OF THE STATE METEOROLOGIC INSTITUTE

Dr R. Schneider, Prof
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Meteorologiche Zpravy, Vol III, No 6, 1949

The observatory in Prague, in the Klementinum, occupies a considerable position in the meteorologic history of the Czechoslovak republic. No wonder then that we encounter it right at the beginning of this brief description of the development of the State Meteorologic Institute following the revolution of 1918.

The Austrian meteorologic service was concentrated in the Central Institute for Meteorology and Earth Magnetism (later called the Central Institute for Meteorology and Geodynamics) in Vienna, which was founded in the year 1851. In 1870 an analogous institute was established in Budapest. At that time, the network of meteorologic stations in the Czech Provinces was joined to the network of the Viennese institute. At that time, they numbered more than those in all the other Austrian lands together, or 17 out of 31. From this it can be seen how great an interest there was here for meteorologic observations. The concentration in Vienna did, however, not enlarge the Czech observation network. The number of Czech stations diminished from year to year, while the others increased in number. After eight years of the combined network, Bohemia, for instance, had only one-tenth of the stations of the whole of Austria.

In an article entitled: Development of Meteorologic Organization and Meteorologic Observation in CSR, Dr St. Hanzlik, Professor, describes in more detail the evolution of meteorologic observation in the Czech Provinces, as well as the efforts of Dr F. Augustino toward the establishment of an independent institute for meteorology and hydrography in Bohemia.

When, in 1918, the Austro-Hungarian Monarchy disintegrated, it was up to the succession states to build up, in their territories, new institutes which would take over the tasks of the central institutes which had existed in Vienna and Budapest. The hydrologic services, which then also administered the network of rain measuring stations, was already partially decentralized

in Austria before World War I. This substantially facilitated its change to independent service. In the case of the general meteorologic service, the changeover to the new circumstances was more difficult.

At the time of the revolution there was only one institute for meteorology and climatology in Czechoslovakia, at the Charles University, in Prague II. It served merely for purposes of instruction. Its personnel consisted solely of Dr. St. Hanzlik, professor. Apart from this there were at this time in the territory of Czechoslovakia, two military stations in action, which performed wind direction- and strength measurements in the free air for aviation purposes. One of these stations was in Hranice, the other at the former royal observatory in Prague in the Klementinum. The Czechoslovak army took this station over after the revolution. Under the leadership of Regimental Sergeant Major Ing. Jan Urban, the station collated telegraphic reports of several Czechoslovak stations and through the application of, at that time, meager foreign bulletins, intercepted by the radio station on Petrin, compiled forcasts for military purposes.

In the first months following the revolution, the need to reorganize the state meteorologic service in a wider measure became apparent. I was commissioned with this assignment in April of 1919 by the Ministry of Education, and assigned for service at the State observatory in Prague - Klementinum. Prior to this, after completion of studies at Charles University, I worked from 1906 - 1918 as scientific clerk at the Central Institute for Meteorology and Geodynamics in Vienna. At the same time I travelled to the Czech Technical University in Brno to lecture during the summer semester beginning in 1907.

May I be permitted to recall a freak chance, which came to my mind as I was entering into service at the Klementinum observatory at the beginning of May 1919. From this observatory, its director Karel Keil, along with co-workers Fritsch and Jelinek, was called to Vienna in the year 1850. He was charged with building up and later directing the newly-established Central Institute for Meteorology and Earth Magnetism in Vienna.

Kreil had raised the meteorologic and magnetic service at the Klementinum observatory to such a high level, that it served as an example to all similar institutions in Europe. And after 69 years, one member from the institute founded by Kreil returned to the Prague-Klementinum observatory in order to organize the meteorologic service in the liberated country.

Because more regions of the State administration (agriculture, water-economy, aviation, etc.) have an interest in the meteorologic service, it is no wonder that while solving its organization there also emerged questions of competence. Their solution put off a definite decision about the new institute. An agreement was reached towards the end of 1919 and the Ministry of Education and National Enlightenement, basing its action on the decision of the cabinet council dated 9 December 1919, approved the articles of the Czechoslovak State Meteorologic Institute by a decree dated 14 January 1920. Assignments of general meteorology and forecasting service fell to the Institute. A military department was established (in the institute) whose job it was to care for the training of military students in meteorology and the use of meteorology for military purposes.

The Ministry of Public Works established the Hydrologic Institute, which incorporated the rainfall-measuring network. The Ministry of Agriculture formed the Institute for Agrometeorology, with its own network of observation stations, within the framework of experimental institutes. From the above it can be seen that the meteorologic service in the First Republic was considerably spread out, which fact often showed itself to be disadvantageous.

At the time of the approval of the statutes of the institute, the State meteorological service was still housed in the State observatory at the Klementinum. In one room, with one window, sometimes as many as twelve of us "functioned" together. There the dispatches from domestic stations were received by telephone from the Post Office, radiotelegraphic bulletins were received from Petrin, synoptic maps were drawn, reports from the stations were examined, the registrations of the autographs /autographometers?/ of the Klementinum observatory were numbered, the time signal was provided for

railroads and for other interested parties, etc. In addition to the routine meteorologic observations at the observatory, three times daily relative readings of magnetic declination and piloting were performed. Every two months I carried out the absolute measuring of magnetic declination in the Seminary gardens on the Petrin. The observatory also announced the correct time each noon by flag from the steeple of the Klementinum. /Klementine Monastery/

The meteorologic observatory at the Klementinum observatory was fairly autonomous up to the revolution and its instrumental equipment was not modern. It was, therefore, necessary to insure adjustments of the thermometers and pressure gauge in comparison with the normal instruments of the university meteorologic institute. The observatory was complemented with a self-registering heliometer, an eighty year old, rejected, barometer of Kreil (former director Karel Kreil) and a new rain-gauge was installed on the observatory platform. The existing old rain gauges overflowed during heavy rain falls and in such a case there appeared, in the publications, the laconic remark "rain gauge /ombrometer/ overflowed!"

When, at the beginning of 1920, the State Meteorologic Institute was brought to life, there arose the task of finding suitable quarters for it. It was an especially difficult assignment. After the First World War there was a still greater shortage of space in Prague than after World War II. In those times it was necessary to house all the new ministries and a mass of central bureaus and institutes.

Originally it was considered to adapt several rooms of the seminary in the Klementinum or the cloister in Brevnov, where there was at the time no connection by electric railroad.

After considerable searching the institute found a suitable provisional arrangement. It was thankful for this to the understanding of Dr St. Hanzlik, professor, and the permission of the university bureaus, which accorded the institute a number of rooms in the university meteorologic institute in Prague II. A great advantage was that here the institute could use the ideally situated observatory, which it supplemented with new instruments.

The meteorologic service moved from the Klementinum Monastery to Karlov in the middle of May, 1920.

As far as personnel of the meteorologic service is concerned, PhC Alois Gregor, at that time assistant master at the High School in Straznice, was assigned to the observatory as of 1 August 1919 as temporary assistant. In the spring of 1920, Dr Gregor was named assistant of the State Meteorologic Institute. Dr Emanuel Hoř and Dr Gustav Swoboda were nominated as further assistants. I was named director of the institute on 31 August 1920. The first appointed scientific clerks we see on the attached picture. In 1920 the first technical and office clerks were also nominated: Jan Hrdy and Marie Elisakova. In this publication the rapid development of the institute and its sections is narrated in detail and supplemented with numerous illustrations and diagrams. The speed of development did not slow down, not even after 1928; on the contrary, it was so fast that sometimes neither the number of employees nor the amount of endowments were sufficient to adapt themselves.

An important task was assigned to the institute, when in 1921 the Ministry of Public Works charged it with the organization and carrying out of protective meteorologic service for air traffic. It, (the Ministry) also endowed this service and allocated aiding (subsidiary?) personnel and later also a few specialist forces. The aviation weather service, counting the radiotelegraphic receiving and sending service, expanded to such dimensions, that soon it was no longer possible to house it in the provisional rooms of the institute on the Karlov. Therefore, in November of 1929, the service moved to newly-rented quarters on the Kral. Vinohrady, in Luxemburska 26. It remained there until February 1937, when it moved into appropriately equipped rooms on the State Airfield in Ruzyn.

In this brief review it is not possible to narrate in more detail the development of the entire function of the institute after the year 1928. This was done in detailed reports which were presented at the annual meetings of the Council Committee of the Czechoslovak State Institutes for Meteorology and Hydrology.

I want to mention here only briefly the plans for definitely housing the institute. It ispossible that the institute had reasonably advantageous provisional quarters; nevertheless, I never let the question of an independent building for the institute slip from my mind. I mostly progressed in this matter together with the director of the Prague observatory, Dr F. Nusle, professor. The first plan, soon after the revolution, consisted of placing both scientific institutes on the Petrin bastions. These were, however, not released by the military administration. The second plan placed the institutes in the neighborhood of Hanspaulka, in Dejvice /suburb of Prague./ This was, however, not approved by the regulating commission /zoning commission?/. Later a new construction on Barrandov was considered, /also part of Prague./

In the meantime the fatal situation of the occupation arose and with it the reconstruction of our meteorologic service according to the pattern of the Reich. The institute was named Central Meteorologic Institute for Bohemia and Moravia. It was transferred from the jurisdiction of the Ministry of Education and Culture to that of the Ministry of Public Works. According to its special work it was placed under the Luftamt /Air Headquarters/ in Prague. The aviation weather service on the Ruzyn airport was taken over by the German airforce. By way of a contrast, the rain-gauging service from the Hydrologic Institute and the agricultural meteorologic service along with the phenologic service were attached to the institute. The section for bioclimatology and spa meteorology was newly established.

Because the existing provisional quarters in Karlov were insufficient for the combined service, the Ministry of Public Works allocated a building in Smichov in Holeckova 8, to the institute. Prior to this the building housed offices of the Postmaster General. The building was appropriately adapted and the institute moved in in July 1940. Various specialized observations are also performed there, whereas the observatory of the Charles University Meteorologic Institute on Karlov still acts as main observatory. Similarly in the Klementinum, observations of basic meteorological elements are still maintained.

The personnel of the institute has multiplied during the time of the occupation, through allocation of employees from the related services. All this personnel coupled itself well into the framework of the existing personnel and has performed valuable services for the institute.

The combining of the rain-gauging network with the agricultural and phenologic services in one institute has proven itself. This can be seen from the fact that it stayed that way when the State Institute once again became autonomous.

In August of 1945 I retired, after 26 years of collaboration at the Institute. I am, therefore, not competent to narrate its successful post-revolutionary development. I follow it, however, with sincere interest and wish, that the institute may always maintain its honorable place among the meteorologic institutes of other nations.

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TEN YEARS OF THE STATE METEOROLOGIC INSTITUTE IN BRATISLAVA

Dr. Stefan Petrovic: State Meteorologic Institute in Prague; Meteorologic Bulletins, Vol III No 6, 1949 pp 91, 92

The breaking up of the Czechoslovak Republic by Germany in the spring of 1939 and the creation of the so-called Slovak State, brought with it much confusion in many of the Slovak services. This was felt mainly in the services which had their headquarters in Prague. Weather research in Slovakia was being carried out by several institutes prior to 1939, and meteorologic stations used to send their reports to several places. There were stations here which were organized by the Prague Meteorologic Institute, stations of the military weather service, which remained without leadership, and small monitoring bureaus of the weather service on the Bratislava air field remained almost without personnel, since a great part of the Czech employees either received notice or left Slovakia on their own accord. There remained here the network of meteorologic stations of the agricultural experimental institutes and the network of rain-gauging stations of the hydrographic section of the Federal (Slovak) bureau, only those retained their organizational framework and continued to observe, as far as their Czech personnel did not leave their positions. In May of 1939 Dr. M. Koncek, an official of the Prague Meteorologic Institute, took charge of organizing the meteorologic service in Slovakia, and in November a law was passed about the State Hydrologic and Meteorologic Institute, by which the meteorological service received a legal foundation. In matters of administration the meteorologic service joined with the hydrologic sercie, but organizationally, both services always acted independently. The Prague Meteorologic Institute had, 40 higher grade meteorologic stations, in Slovakia the hydrographic section had 518 rain-gauging stations and the experimental institutes had 52 meteorologic stations, many of which observed simultaneously for the Prague Institute. In time all of these station networks were joined together, and with hastily hired and trained personnel the service was maintained so that as far as possible research would not be interrupted. Towards the end of 1939, officials of the German weather service came to Slovakia and completely took over the synoptic service in

Slovakia, so that the activity of the institute took a direction of purely climatic research and in this direction the institute developed its activity during the raging war.

In 1939, the construction of the cable railway to the Lomnice Peak (Lomnicky Stit) hastened to completion. On the peak in the terminal of the cable railway, the Prague Institute had provided quarters for a meteorologic observatory; the Bratislava Institute continued in the effort of the Prague institute and as of October 1940, put into service a meteorologic observatory on the second highest peak of the High Tatra Mountains. In Bratislava itself, there was not a well equipped meteorologic station, and even here a meteorologic observatory was established and equipped, in the courtyard of the house occupied by the Institute.

During the war the Institute took heed that it maintained observations, and that obtained material be preserved for postwar times; therefore with the approach of the fighting, part of the instruments and observation evidences were sent to Skalnate Pleso (Rocky Lake) where it was hoped they could be concealed without damage.

The passing of the front ruined more that 80 percent of the equipment of stations. All stations on airfields were destroyed, which included main stations with the best equipment. In Slovakia there did not remain a single anemograph (anemometer), outside of Skalnate Pleso. Before retreating, the Germans forced the stripping of the meteorologic observatory on the Lomnice Peak, they blew up the cable railway to Skalnate Pleso; and in the passing of the front, the building which housed the Bratislava Institute burned down. All office equipment was burned, all calculating machines and a considerable part of observation material, which we did not carry away to the cellar.

After the liberation, which was brought to us by the Red Army, and which returned to us the severed territories of southern Slovakia, it was necessary to acutally build up the service from the foundations. However it went faster than in 1939; there were experiences here, ther was a dadre of specialist trained emplouees, there was a lively determination to build up all that was destroyed

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by the war and so to contribute to the reconstruction of the new Republic. The tasks were substantially greater than in 1939, because Slovak territory had increased by one third, Košice was returned to us, we again received the meteorologic observatory in Hurbanov (Stará Ďale). And so towards the end of 1946, there were again 81 meteorologic stations of higher grade and 512 rain-gauging stations measured humidity. From the meteorologic point of view we were making the growing air transportation safe, and we were giving weather information to the press and radio. By 1 January 1947 observation on the Lomnice Peak was resumed, administered by the Bratislav Institute, but which belonged to the Czechoslovak service, since occasionally workers from Bohemia and Moravia work there.

The liberation brought about alos the closest cooperation with the Prague Meteorologic Institute. In the eyes of foreign nations, both institutes appear as one service; at home each institute performs its own personal regional research, thus maintaining uniform observation tendencies and preserving uniform administration of material. The annual consolidations of weather observations, which embrace the entire Federal territory, are proof of this. In renovating the stations ruined by war, the brotherly Czech Institute substantially aided us by leaving behind a bigger number of all kinds of instruments; the Institute aided us in the modernization of instruments in the meteorologic observatory on the Lomnice Peak.

We utilized the opportunities offered by the two-year plan and the first year of the five-year plan, in order to extend the service, for organizational consolidation, and for expansion of the network of stations. The status of meteorologic stations in Slovakia is listed at the end in a lucid table. From it we can see that we have in Slovakia more observatories, relatively more stations of the first and fourth magnitude, and we have few stations of the second magnitude (grade). In Slovakia there are no stations of the third grade, in Bohemia there are no rain-gauging totalizators. If we are to have the same number of stations as the Czech Provinces had on 31 August 1949, the number of stations in Slovakia would

have to be increased by 60. For clarification it is added that by observatory there is meant a station in which there is a registering instrument for each, main meteorologic element, where the registrations of these instruments are evaluated fairly and where occasionally the course of the weather is studied. In Slovakia we have four observatories: In Bratislava, the traditional one at Hurbanov, the new Tatra ones in Skalnaty Ples and on the Lomnice Peak. Stations of the first grade alwayshave a mercury barometer and self-registering instruments for the main meteorologic elements. Stations of the II grade have normally equipped stations which fulfill a great observation function. Stations of the III grade observe only temperature and rain (showers, precipitations). Stations of the IV grade measure only showers (precipitation).

The status of personnel for all assignments which the times have given us, is comparatively small. Towards 31 December 1949 a total of 59 employees were at the Institute, of which 11 are at stations outside of Bratislava, in observatories and in documentary offices at airfields. So 48 people care for the corecasting and information service, control and process all meteorologic bulletins, and all inquiries and criticisms, as far as they are required of the institute.

Ten years of work of the State Meteorologic Institute in Bratislava is no provocation for some kind of festive article; but the activity of a certain section of the working collective has been summarized here, so that it would in this way aidin the reconstruction of our Republic.

The working collective of the Bratislava Institute is relatively young. Many more have studied until now than have been able to publish end results of work, but even these completed works are a good balance. Averages for precipitations for the period 1901 - 1940 are ready, average temperatures for Slovakia during that certain period are almost ready, snow conditions in the High and Low Tatra Mountains are being processed, and the work on sun radiation, according to actinometric andactinographic measurements is nearing completion in Hurbanov, Bratislava, and on the Skalnaty Ples. Our employees

strived to contribute to Meteorologic Bulletins. During the past ten years there were many hardships. The Bratislava Institute was placed under the jurisdiction of the Ministry of National Defense of the so-called Slovak State, during the war; none of its employees, however, were at the front. In order to work in the safeguarding weather service against the Soviet Union, all of this work was reserved by the German weather service, which was built for this occasion in Slovakia.

The Meteorologic Service in Czechoslovakia is about to be reorganized, but the regional research in Slovakia will remain, as is required by the decentralizing of research. The five-year plan shows us new possibilities for development in all directions. With its fulfillment, the meteorologic service in Slovakia will mature to such a status, as never existed in this field in Slovakia before. Such a perspective after the first decade of the institute is encouragement to further work for all employees.

Number of Meteorologic Stations

	Czech Provinces		Slovakia	
Type of Station	Number of Stations	Km^2 per Station	Number of Stations	Km^2 per Station
Observatories	2	39,435	1	12,239
I grade	15	5,258	15	3,264
II grade	230	343	68	725
III grade	198	398	none	—
IV grade	712	111	551	94
"Totalizators"	none	—	22	2,225
Total number of observation places	1,157	68	660	74

1) Vol III, No 3, of Meteorologiche Zpravy for status up to 31 Aug 1949.

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FIVE YEAR PLAN OF THE STATE METEOROLOGIC INSTITUTES

IN PRAGUE AND BRATISLAVA

A. Gregor
Met. Zoravy
(Czechoslovak Meteorologic Bulletin,
Vol III, No 1, Jun 1949.)

To him who has the opportunity to follow practical meteorology and climatology, which is fostered by both of the above-named institutions, it does not seem in any way unusual that the work of these institutes is now fully directed by plan and connected to the five-year plan system.

The work of both fields, meteorology and climatology, is so useful, metaphorically speaking, an "alloy" of other important national-economical spheres, that it was, for instance, absolutely difficult to name a central bureau, under whose jurisdiction they would fall. This bureau is the Ministry of Transportation

But we know, that aviation, agriculture, and technology, let alone education, information, etc., need the results of the work of this young branch of physics. Gliding circles, for instance, welcomed gratefully the fact that radio gave them, from March of this year, daily at 9:58 AM on the wave length PRAGUE I, a report of the state of the wind and temperature in the free air and the entire weather situation according to the results of measurements by radio soundings.

A whole series of important sectors of the public life are placing such increased demands on our two regions, who want to modernize and improve their projects, that there are immediately presented several planned problems of our meteorologic institutes.

It is no small task to maintain, improve, and modernize the network of weather stations of various types, to adapt their activity not only to the normal, internationally agreed upon work program, and improve their mechanical equipment, but to raise the quality of the work of observers. Difficult, because only a dwindling small cadre of stations are cared for by employees of these institutes. A great majority then (at least 90 per cent) are

volunteers whose work load is unusually high, in comparison with the remuneration offered for this activity.

If we speak here of modernising the stations, we must begin at the top. Both our institutes have construction of buildings; under the five year plan, the Prague institute, because it has no buildings of its own, and is not capable of placing all which is required by the development of meteorology in the temporary quarters, which today are very old.

Let us hope that there will be success in placing this building in the vicinity of PETRIN, where there is the most ideal, meteorologically representative layout. Even the institute in Bratislava will be reconstructed and equipped, since its building burnt down at the time of the liberation. Besides this, the successful accomplishment of the project of building the agricultural-meteorological observatory near Prague, is drawing near, on the State Farm, where useful (practical?) meteorology will be directly coupled with an environment, which agricultural research will adapt to its research purposes. And in such a case one must also study outer conditions in nature, including the climatic, or rather, bio-climatic conditions in relation to the flora.

The Bratislava institute has in its five year plan an analogous plan of human bio-climatology in the Tatra Mountains. There at LOMNICA, an observatory is to be built, where measurings /?7 will be made, whose results may be used by doctors. We well know, and foreign specialists also recognise, it well, that the Slovakian side of the High Tatra Mountains, at the elevation of the SLOBODA road, is singularly well suited for air and sun cures and that, such regions are not so easily found, not even in the very Alps themselves. There the respective measurements will be carried out.

All that has been said so far, concerns the improvement of scientific operation in the field of practical meteorology in the five-year plan and presents, at the same time, rich opportunities for initiative to all workers of both institutes. It is not only the matter of interesting work, but of ascertaining the inventiveness and capabilities of individuals. With the presently felt deficiency of instruments, escaped by the fact that

on the one hand our firms do not have the proper interest and time, on the other side that there are immense difficulties in purchasing instruments form foreign lands; our talented designers and mechanics, in cooperation with specialist clerks, can adjust instruments in their own institute work shops and manufacture prototypes, as is already being done and will develop more fully, when the new buildings are erected with new workshops and laboratories.

Further, employees who audit the reports of weather stations, should substantially contribute the proposals for betterment toward the raising of the level of their work, help the construction of new stations, and finally, through liaison with them, ease and speed up auditing work. By this they will reach the basic work faster, that is, the assignment to work out a climatography of Czechoslovakia in the whole, as well as for individual sectors. And exactly these climatographical results will then be a basis, at least in rough forms, for reviewing work /criticizing?/ in agriculture, technology, industry, trade, etc.

The second sector of the activity of the institutes is research, and in this field the institutes have taken upon themselves important, but very difficult problems of the five-year plan. Some time ago someone announced that a century of atomic energy and artificial rain was beginning.

Artificial rain is an assignment, on which meteorologists can work responsibly together to technically carry it out. It is a mistake that some years ago newspaper reports got out into the world, to the effect that artificial rain was a settled question and a regular affair in America. The public was wrongly informed by this. Specialist reports sound very sober. Successful laboratory experiments of Langmuir in Schenectady, New York, are very hard to imitate in nature. And it is not easy to state whether a cloud strewn with dry ice or with chloride of lime, rose precisely through this injection, and changed from a cloud composed of overcooled drops into an ice cloud in which the crystals fall as cores of great rain drops. These fall to earth then by gravity, especially when the rising air current does not support them anymore.

In the picture we see these two stages. The cloud on the left consists of overcooled drops, the cloud on the right has changed into ice crystals forming a basis of a thunder cloud and visibly expels precipitation, which falls as far as the earth. Such a change, as occurred on its own in the second cloud in the picture on the right, should occur also in a cloud which has been seeded with dry ice and which had the same look as the cloud on the left before seeding. But we know particularly that the clouds themselves often have a tendency towards this development.

Our assignment will be to perform experiments in nature, with the aid of aviation, in order that many details may clarify themselves. Work on this problem, recently done in South Africa, points to the necessity of great objectivity and careful preparation, so that one can establish whether the experiment was a success or not. Unfortunately, we shall, for the time being, markedly miss radar, which is a good controller of experiments because it reacts at considerable distance on those cloud particles where large drops of water and snow exist. Radar then can confirm whether it is raining or not, from that part of the cloud which the aviator has chosen and indicated by radio to the radar control station. The problem of artificial rain is really a burning question in dry times, yet according to our judgement rain can be artificially created only where half formed shower or thunder clouds are over the countryside which would form rain anyway without artificial interference.

Further important problems conform to those, for which the whole of southern Russia was mobilised. Windbreakers, ponds, and their influence on the climate, or more accurately, the fight against drought and dry storms. Drought is a dryness caused by insufficient precipitation or ground moisture; dry storms are dust storms which carry away good top soil.

Here in Czechoslovakia preparations are also being made for the planting of windbreaks and establishing ponds. We cannot, however, without consideration, transfer working methods from other countries with different climates and landscape formations, to Czechoslovakia. The question of width, height, and remoteness of forest belts must be scientifically answered,

and adapted to the landscape and above all, to our agricultural conditions. Before we deprive our farmers of valuable ground for windbreaks in order that in our dry regions the wind may be lessened and with it the chances of blowing away of top soil and evaporation be retarded, we must have scientific proof as to what m i n i m u m requirements will suffice for the appearance of the necessary result. Our meteorologists will study this on the one hand with models in wind tunnels, further with natural windbreaks which already exist, by measuring the decrease in wind velocity and finally on "green props," as they are based on state farms. The illustration shows the measuring of evaporation behind a row of sunflowers.

Further, it is necessary to find out if possible, the influence of a q u a t i c a r e a s on weather conditions in their vicinity. We try to answer all questions of this kind, in order that we can aid agro-biology and help make these far-reaching projects profitable. The fight against the weather is a difficult one! The devastation of the land during the last century is now having its revenge.

The collection of specialists of the institutes and of employees who command foreign languages have taken upon themselves the assignment of working up literature regarding long-range forecasting and of searching for a suitable method for Czechoslovakia. It is an assignment reaching in two directions. The international meteorologic organization invites all meteorologists of the world to cooperate, since that which exists now is in the complete beginning stages. But as everywhere else, even here the general public long since impatiently demands weather forecasts for periods of more than two days; even they would be only skeleton forecasts. Before the war there was an entire institute in Germany, which under the direction of Dr. B a u e r occupied itself with this problem and gave out very efficiently and completely gleaned forecasts for ten days in advance. In the USSR there is a similar institut, which according to the method of M u l t a n o v s k i y and his school occupies itself with the same assignment and gives out forecasts for a month in advance.

It is a question of an immensely difficult problem, whose solution lies still in the far distant future, and it is necessary to have great experience and to work responsibly. Detailed forecasts for a year in advance, such as still appear in Czechoslovakia, the last time for instance, the hundred year calendar in the official diary of 1949, are valueless trash, which do not have any kind of specialist foundation.

We have outlined a few assignments which appear in the five-year plan of the institutes. They are not all. We would be tempted to state far too specialized problems, which require the improvement of the aviation weather service, which develops quickly from year to year.

From that which was presented, the reader can surely gain an insight that the institutes foster a live science, absolutely geared to the needs of our public.

We intend to stimulate scientific competition in this magazine by the fact that within the framework of the five-year plan, we shall reward this year, the scientifically most suitable articles and studies with prizes besides the customary author's fees. Only not too long articles of general and practical meteorologic and climatologic origin will be rewarded; for instance, excerpts from dissertations, not, however, popular articles and references. The jury will be formed by Prof Dr St. HANZLIK, Prof Dr M. KONCEK, University Lecturer Dr GREGOR, Dr. VESELY. We shall publish results in the next volume.

EVALUATION OF THE QUALITY OF SHORT-TERM FORECASTING

On 15 January 1948, Jan Bradka gave a lecture at Charles University on evaluating the quality of short-term forecasts.

By way of introduction, the lecturer mentioned the difficulties which arise in general definition of the climate, forming an objective basis for evaluation of forecasts. Each meteorologic observation is burdened with the personal mistakes of the observer. The same is ture even in judging forecasts, which depend on many subjective characteristics of the reviewer. This way it is possible to partially explain the differences which arise in judging forecasts by specialists and laymen.

The lecture occupied itself with reviewing general forecasts publicized through radio and press. In a given case, it is necessary to evaluate separately each meteorologic element with which the forecast concerns itself. The summary of the individual evaluations gives then the percentage of correctness of the entire forecast. Uniform and understandable terminology has a great importance in the forecast. It has been ascertained that only about 50 to 60 per cent of the people correctly understand the specialised terms used in forecasts. It is therefore recommended that our weather service should also, like foreign services, publish at least once a week, explanations of these terms and so teach the layman to understand their correct meaning. Even this way, however, problems caused by purely subjective understanding of the weather, or difficulties caused by application of skeleton forecasts, good for wide regions, to weather in smaller territorial parts or even to individual places, would not be completely removed.

The aim of evaluating forecasts has changed through time. Originally evaluation was used as a weapon against astrology and hundred year calendars and to justify the importance of meteorology at all. In present times the evaluation of forecasts is more a medium for reviewing the validity of two different forecasting methods, or in other words, a controlling aid for the forecaster himself.

The lecturer pointed further to the publication of W. KLEIBER:

The Verification of Weather Forecasts, which lists all known systems of verifying forecasts. Most meteorologists occupied themselves with reviewing forecasts for only two possibilities. For instance, in the next 24 hours there will be either showers or it will be dry. These methods cannot be used for evaluating general forecasts. Some verification systems place great stress on the determination of percentages of success in using the so-called blind forecasting, which, according to Koppanev's definition, is a purely accidental forecast. Some authors like Haidke or Gilbert express the correctness of the forecast by raising of scientific methods above the results of the blind forecast. In forecasts of meteorologic elements, which may easily be expressed numerically, such as for example, temperature, wind velocity, and the like, it is possible to use the graphic method for purposes of verifying success. This method was used by Thomas and Dobson.

All listings gained by the many verification methods, give the layman mostly figures he little understands. The lecturer, therefore, tried to use ferification methods which would express directly in percentages the success of the forecast. Individual terms used in the forecase he arranged in columns according to the frequency of occurrence and he placed a value of a certain number of per cent on the difference between grades (degrees) following themselves? For cloudiness and showers the table looks like this:

5	overcast	20%	5	rainy	10%
4	partly cloudy	20%	4	occasional rain	10%
3	cloudy	20%	3	occasional light rain	15%
2	half-clear	20%	2	rain in places	5%
1	almost clear	20%	1	light rain in places	60%
0	clear		0	dry	

Forecasts and actual weather conditions are supplied with numbers belonging to individual degrees and the difference in per cent is substracted from 100 per cent. So, for instance, occasional rain is forecast; in actual fact, however, it will be dry. The difference between the degree (rating)

how far it is. This knowledge we utilize further for piloting by radar. Under the piloting balloon we suspend a conductive object such as tin foil. If the balloon rises with this "mirror," it is possible to follow it with radar and ascertain its position in space at any time. If we follow and time these changes in position, we can ascertain the speed of the balloons just as in piloting with the theodolite, and through this the wind velocity at different altitudes is determined. In piloting we can, however, not utilize radar which functions at very short wave lengths (around 10 cm), since the clouds are already a conductive obstacle for electromagnetic [illegible] of these wave lengths. We can, however, use [illegible] cm radar for cloud [illegible] means [illegible] it is suitable for [illegible] [illegible]

A further innovation, which was improved during the war, is the [illegible] working automatically without attendance for [illegible] temperature, humidity and winds. These stations were placed on islands and buoys in the American region of the Pacific and Atlantic [illegible] Arctic [illegible] on the shores [illegible] and [illegible] in the [illegible] area.

Considerable improvement and greater usage was reached in the [illegible] measuring of atmospheric disturbances and storms already in use before the war.

In climatology there appeared a need for the employment of machines for working up information because searching for the dependency among the mass of statements which are already at our disposal today, is otherwise impossible. Practically all climatic computations were arranged for the facilitating of forecasting, whether short term or long term.

Forecasting -- this most burning of all meteorologic questions -- was the target of practically all experiments and searches. For short term forecasting there continued to be used:

1. Methods of the Norwegian school, significantly supplemented of course, by utilization of altitude maps from aerologic ascents.

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2. Chicago University methods (Rossby) which also utilise altitude maps practically exclusively, and

3. Dynamic meteorologic methods.

These methods, suggested by Richardson (England) 25 years ago were worked out during the war and used for practical forecasting by Kibel (Russia).

Long range forecasting remains the greatest meteorological problem. Certain successes were reached in the five-day forecast by the US Weather Bureau, which is the logical continuation of the synoptical methods of Rossby. All other methods, especially a month or longer in advance, saw no substantial changes or improvements of results.

In the synoptical service, it would be possible to speak of the complete organization in all warring nations. But this organization has not been [illegible] since the war, and is only slowly being put in order.

Even from this fragmentary review, it can be seen that the last war substantially pushed the development of meteorology ahead, mainly by making [illegible] means available to the meteorologists, such means as our meteorologist had never dreamed of, but without which it is impossible to demand results. The chief of the Soviet Hydrometeor /Hydrometric/ Service, Gen Fedorov (known in Prague from the Papanin expedition), correctly said on [illegible] July 1946, before the Academy of Sciences USSR:

"All this is very laborious and often very expensive, but without sufficiently wide experimentation, we shall not grasp the essence of hydrometeorologic phenomena."