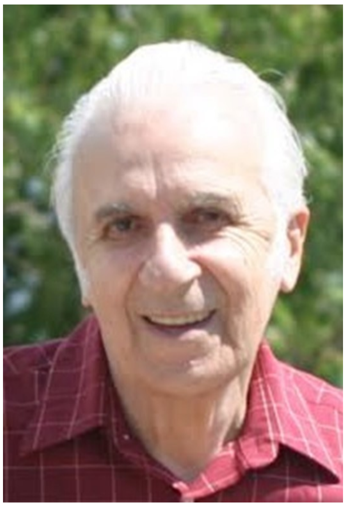
In praise and support of Year-Round Mathematical Competitions

George Berzsenyi

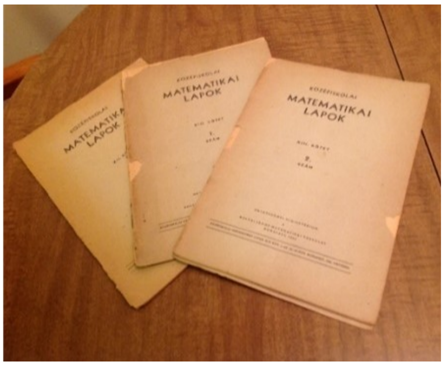


George Berzsenyi is Professor Emeritus of Mathematics at Rose-Hulman Institute of Technology (Terre Haute, IN, USA). He is a Hungarian-born American mathematician and a founding member of the WFNMC. As the first chair of the AIME (American Invitational Mathematics Examination) he is the co-author of ***The Contest Problem Book V***. He was also a co-editor of ***C2K: Century 2 of KöMaL***. The USAMTS and the IMTS (USA and the International Talent Searches), as well as the **Competition Corner** in NCTM's ***Mathematics Student***, were also initiated by Dr. Berzsenyi, resulting in 4 more compendia of problems.

Abstract
The purpose of this article is to describe Hungary's high school mathematics journal, ***KöMaL***, its young sister-journal, ***Abacus*** for students in Grades 3-8, and my own efforts in the United States to emulate these publications – thereby providing an opportunity for year-round creative and competitive problem solving for students year after year. I strongly recommend the creation of similar journals in other countries as well, especially in smaller countries, where the graders might not be overwhelmed by the huge number of responses. Conducted properly with challenging and interesting problems, one can be ensured that in 2-3 generations problem solving will become an intellectual habit among the students, strongly supported by their parents and even their grandparents. That's what happened in Hungary and that led to Hungary's excellence in mathematics and the sciences.

Preliminaries

As an immigrant to the United States, I always considered my foremost duty to introduce to my adoptive land the treasures that I brought with me from "the old country". Therefore, after I settled into the teaching profession and became familiar with the American competition scene in the area of mathematics, it was natural for me to reflect upon its weaknesses and the strengths of the Hungarian system I left behind. I was missing ***KöMaL***, Hungary's high school mathematics journal and its challenging problems month after month.



KöMaL stands for ***Középiskolai Matematikai Lapok*** (in English, High School Mathematics Journal), to which I subscribed as a high school student. It was so dear to me that even when I left Hungary, crossing the border to Austria on foot with a small bundle on the 29th of November 1956, I brought three of its issues with me since I did not yet manage to read them thoroughly. They served as my talisman during my many years of struggle to create something similar in the United States and beyond. I show them here as a reminder of those intentions.

In the present note, I will reflect on two of my attempts of 30-40 years ago to emulate ***KöMaL***. I will also introduce my readers to ***Abacus***, the sister-journal of ***KöMaL***, wishing her belatedly a happy 30th birthday. By doing so, my purpose is to encourage small countries with demographics similar to that of Hungary, to create their own **Competition Corner / USAMTS** programs. If they do so and if they keep their programs alive and well, then I can promise that in 2 or 3 generations they will rival the rest of the world in mathematical power. That's what Hungary has done ever since the birth of ***KöMaL*** more than 125 years ago.

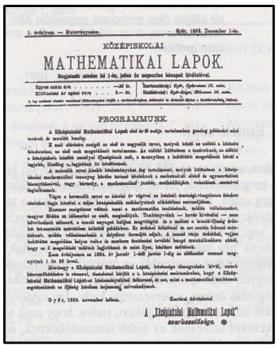
Historical sojourn

Hungary was established with the Conquest of the Carpathian Basin by the Magyars in 896. Thereafter Hungary (in Hungarian, Magyarország, i.e., the country of the Hungarians) was recognized as a sovereign country until 1526, when in the Battle of Mohács, the Ottoman Empire subdued the Kingdom of Hungary. The occupation of most of Hungary by the Turks ended in 1686, but rather than regaining its independence, Hungary became a vassal state of the Austrian Habsburg Empire. Following several unsuccessful wars for independence, it was not until the **1867 Compromise** that Hungary regained much of its independence.

At that time, huge efforts were made by Hungary to catch up with the rest of Europe in nearly every walk of life. Roads and railroads were built, bridges were erected across the Danube, and the navigation of her rivers and Lake Balaton were made possible. Hospitals and other public buildings were built, including 400 schools across the country. Nevertheless, centuries of foreign exploitation and the lack of even rudimentary industry and commerce, made Hungary a '3rd – world' agricultural country with an outdated feudal system and mentality, not much different than many countries of Africa and the Middle East, artificially created by the colonizing powers after they extracted most of the valuables of the land and disrupted the governance of the people.

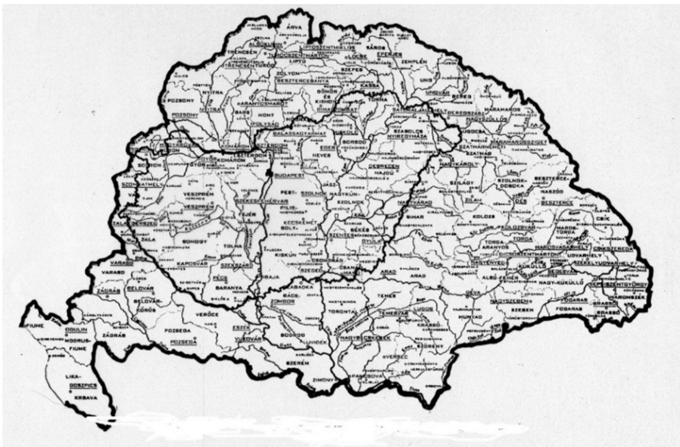
Left to her own devices, Hungary had to lift herself by her own bootstraps in order to catch up with the rest of Europe in nearly every walk of life. That's when the famous Kürschák Competition was initiated, the Eötvös College for properly trained teachers of mathematics and the sciences was established, as well as ***KöMaL*** was launched. Along with the formation of scientific organizations, these were the instruments that made Hungary into a mathematical super-power in the 20th Century. Of these, I will write about the humble beginnings of ***KöMaL***, believing that many other countries have dedicated teachers like the late Dániel Arany was, and hence other developing countries can come up with their own versions of ***KöMaL***.

The birth of *KöMaL*


KÖZÉPISKOLAI
MATHEMATIKAI LAPOK
PROGRAMMUNK.

KöMaL was launched in 1893 in the small, but progressive town of Győr by Dániel Arany, a teacher at the local science high school. Arany sent a copy of it to every high school in Hungary. Nevertheless, relative to the many other happenings, it was a small event that probably went unnoticed by everyone except for the students who responded to its problems and the teachers who subscribed to the publication.

From the outset, ***KöMaL*** appeared 10 times a year, with each issue consisting of 16 or more pages, and in its first 3 years, the publication featured 239 problems. To 208 of those problems a total of 1055 solutions were submitted by 151 students. And even in its first year, there were 132 subscribers to it due to the tireless correspondence of Dániel Arany with many teachers throughout the country. He was eminently cultured, with fluency in German, French and English and knowledge of Latin and Greek too. His knowledge of French made it possible for him to become familiar with the Journal de Mathematiques Elementaires for talented high school students. While his ***KöMaL*** emulated that publication, he went much further. For example, by featuring the matriculation examinations of the high schools across the land, he helped in the uniformization thereof.



Admittedly, Hungary was a larger country then, as indicated by the map on the right, and Budapest was not the only city of importance in the country. Pozsony (now Bratislava in Slovakia), Kolozsvár (now Cluj-Napoca in Romania), Kassa (now Kosice in Slovakia) and Nagyvárad (now Oradea in Romania), to mention just a few, were rival cultural centers. With their loss, the importance of Budapest increased, and it was fast emerging as an equal of most European capitals.

Thus, when Dániel Arany turned over the editorship to László Rátz, a highly regarded mathematics teacher in Budapest, it became possible (and necessary too) to centralize the entire operation. But it was only after its second rebirth following World War II that ***KöMaL***'s problems became the ingredients of year-round nationwide competitions. Nowadays and 4 generations later, thousands of students submit solutions to the problems of ***KöMaL***, to be graded by former successful contestants studying at the universities of Budapest. Everyone, who might start such a program must aim for such a support system in the long run.

The ‘Competition Corner’ in the *Mathematics Student* journal

In the United States it was not until 1952 that the National Council of Teachers of Mathematics (NCTM) published the first issue of the ***Mathematics Student Journal***. It was just a pamphlet of 4 pages, which, unfortunately didn’t grow into more than 6 pages over the years. Its Problems Section was edited by Mannis Charosh, who stayed with it until 1964, at which time he published a selection of its problems under the title ***Mathematical Challenges***. Later the editor of the journal became Thomas Hill, who published ***Mathematical Challenges Plus 6***, covering the problems proposed between 1965 and 1973 (the ‘plus 6’ in the title referred to 6 articles from the journal, 3 of which were authored by students). By the time my friend, Dr. David (Dave) Logothetti took over the editorship in 1978, the name of the journal had been shortened to ***Mathematics Student (MS)***; that’s how I will refer to it in the future. By naming me editor of the Problem Section and giving me a free hand with it, Dave gave me my first opportunity to emulate ***KöMaL*** in America. I renamed the Problem Section ‘Competition Corner’; that’s how I will refer to it in the sequel.

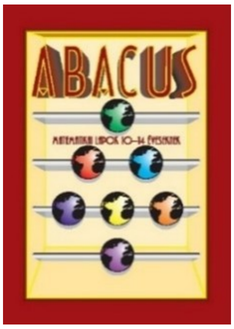
While the circulation of the ***MS*** was at 30,000, it was not available to individual student subscribers, but was sent mostly to teachers in bundles of 5 or 30. Seeing the relatively small number of submissions to my predecessor, Steve Conrad, as the editor of the Problem Section, and wanting to make sure that the best students in the country were also aware of the Competition Corner, I made arrangements to obtain the home addresses of the students who made the national Honor Roll on the American High School Mathematical Examination (AHSME), i.e., scored 100 or more out of 150 points and did not yet graduate from high school. I wrote a personal invitation to all of them and was pleased that many of them accepted the invitation. I did the same in the next two years and hence, we ended up with well over 500 participants during the 3 years of my involvement in the program

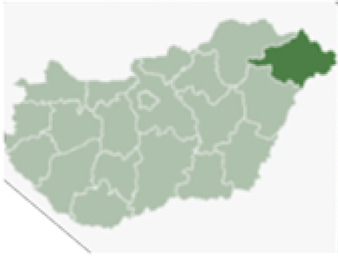
I used the space allotted to me by Dave (exactly half of the 4 or 6 pages) to conduct year-round competitions with 5 problems per round, i.e., per issue of the year, which was 8 in the first year (8 issues of 4 pages) and 6 in the next two years (6 issues of 6 pages). The students were always given a month to solve the problems and I tried to report back to them with an evaluation of their submissions in a month also, though the solutions to the problems did not appear in the***MS*** until later.

Being a one-man operation (with some essential help by my wife, Kay) in addition to a heavy teaching load at a state university, not only did I have to select the problems to be posed (with the help of a ‘Call for Problems’ to mathematical friends), but I did all the grading and correspondence, and kept the scores in a ‘hand-operated database’. After preparing the solutions, Kay typed them, and along with the new set of problems and some additional materials, I submitted them to Dave.

The arrival of *Abacus*

A decade later in Hungary, working behind the scenes in a remote region of Hungary, a young mathematician by the name of Sándor Róka decided that the students in middle schools should also have a journal. Hence, he and his wife, Bea, an award-winning teacher of physics, created ***Abacus*** – shown below, along with a picture of Sándor, a map of present-day Hungary and of the region, where they tested the prototype of ***Abacus*** on the students.





By ‘prototype’ above, I mean 4 years of sending out a set of 8 problems, different sets for students in Grade 4, in Grades 5 & 6 and in Grades 7 & 8 for students in the region, grading the submissions by the students, and sending them an evaluation of their work along with the official solutions to the problems and the new set of problems – 8 times a year. They handled it as a small business, and hence there was additional accounting, reporting and lots of correspondence as well – handled most efficiently by Sándor and Bea Róka.

Their correspondence course in problem solving became a bonified journal in 1994, just in time for the 100th anniversary of the birth of ***KöMaL***. They named it ***Abacus*** and added a number of new columns. I will comment on those new columns later; presently, I want to focus only on the columns of mathematical problems, emphasizing that the scores for the solutions of the problems in ***Abacus*** are also accumulated over the year, a report on them is published in ***Abacus***, and the pictures of the most outstanding problem solvers, separated by their grade levels are featured, just like in ***KöMaL***. At the end of the year 20 students per grade are honored in such manner.

Needless to say, the publication of ***Abacus*** was well received not only by the students and their parents, but by the educational community as well. As a consequence, the János Bolyai Mathematical Society accepted the challenge of taking over the editorial duties, as well as the numerous other responsibilities of publication in 1998, and ***Abacus*** soon grew up to be a proper sibling to ***KöMaL***. Presently, ***Abacus*** appears 9 time a year on 48 pages in each issue.

The USA Mathematical Talent Search (USAMTS)

My next opportunity to create something ***KöMaL***-like came after moving to Terre Haute, IN, in 1988 to chair the Department of Mathematics at Rose-Hulman Institute of Technology (RHIT). As I was proofreading a congratulatory piece that I wrote on the 25th anniversary of the Wisconsin Talent Search in my regular ‘Problems, Puzzles and Paradoxes’ column in ***Consortium***[4], it seemed reasonable to ponder on the possibility of launching a similar program nationwide. After discussing the matter with members of my faculty and key personnel of the school’s administration, as well as with my friends Sol Garfunkel[5] and Walter Mientka[6] and after making the appropriate mathematical preparations, we were ready to launch the USAMTS under the auspices of COMAP via a separate column in ***Consortium***.

[4] A quarterly publication by the Consortium for Mathematics and Its Applications (COMAP)

[5] Executive Director of COMAP

[6] Executive Director of the CAMC (Committee on the American Mathematics Competitions) in the MAA (Mathematical Association of America)

We decided on 4 rounds of 5 problems per year. I asked Walter Mientka for the home addresses of the participants of AIME, wrote my letters of invitation to the students, and we were 'ready to roll'.

My main regret is that I did not change the term 'Search' to 'Development' in the name of the program in order to reflect its true nature. Moreover, I also regret that in the second year, when we started to send the students a ***USAMTS Newsletter***, I didn't coin a fancy name like The ***Mathematics Competitor*** for it. Then it might have had a chance to grow into a proper journal.

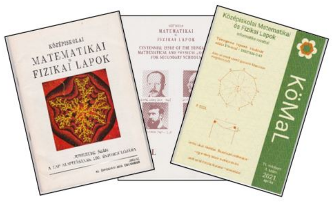
More about *KöMaL*

Since ***KöMaL*** predated the other three start-ups by 85 or more years, clearly, I must explain the situation in Hungary at the end of the 19th Century more comprehensively. While it is true that the country was jubilant after the Compromise of 1867, it is also true that there were many different nationalities living within the borders of Hungary, and not all were elated. In particular, they did not welcome the 'Magyarization' efforts of the Hungarians towards the end of the 19th Century, which can be explained only as an unfortunate imitation of centuries of unsuccessful 'Germanization' efforts in Hungary by the Austrians.

Even at the time of The Conquest of 896, the Hungarians were accompanied by tribes of other nationalities who settled in various parts of the country including the bordering areas, which they agreed to defend in case of war. Later, after the Mongolian invasion during the first decade of the 13th Century, other nationalities were invited to settle parts of the country, where the most people were lost. Hungary was also home to many Gypsies and Jews, as well as Serbs and other people of the Balkans fleeing the Turks. Many Austrians, Saxons, Swabians and other Germanic people also found a home in Hungary after the Ottoman Empire was forced to give up Hungary's occupation after 150 years but left much of the countryside torched and with hardly any population.

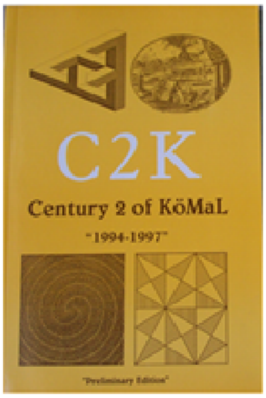
Unfortunately, the otherwise peaceful coexistence with the minorities within Hungary's borders was drastically changed by the Dictate of Trianon at the end of World War I, which robbed Hungary of more than two-thirds of its land, two-thirds of its population, much of its natural resources (forests, mines, etc.) and many of her major cities / cultural centers. Thus, the present-day Central-European countries are not very different from many of the countries of Africa and Asia whose borders were drawn arbitrarily by the former colonizing powers, and fail to reflect the national, tribal, religious, ethnic and linguistic divisions of the land.

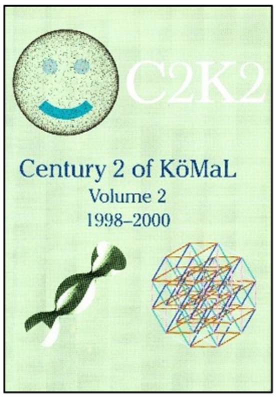
Consequently, it was near-miraculous that ***KöMaL*** could be revived and that by the 1930s it was once again the main mathematical talent-development program in Hungary.



Yet more about *KöMaL*

Jumping ahead by several years, I show on the right the Centennial Issue of ***KöMaL***, published in December 1993, along with its English equivalent (in the center) and a second English issue, published in August 1994. In view of the fact that I needed some prizes for the winners of the USAMTS, and that they were affordable, I ordered over a hundred of the English language issues, thereby subsidizing their publication. Using them as prizes, I spread the information about ***KöMaL*** among the USAMTS participants.





Later I came up with the idea of collecting into a special volume the problems and solutions that appeared in ***KöMaL*** during the first few years of its second century. Hence, ***C2K*** was born, covering the years 1994 to 1997, and once again, I ordered many copies thereof. Next, a follow-up to that was also published and called ***C2K2***, and again, I managed to make use of it as a prize for the winners of the USAMTS. In the Introduction to ***C2K***, that was addressed to the winners of the USAMTS, I gave a detailed description of ***KöMaL*** and its history in the hope that someday someone would succeed better than I did in emulating ***KöMaL***. Both of the above volumes were edited by Vera Oláh, who was the editor of ***KöMaL*** at that time. I served as one of the assistant editors to ***C2K***. Some years later, under the editorship of Gyula Nagy, several more issues of ***KöMaL*** appeared in English. Along with an article that Gyula wrote in the present publication[7], they also provide a glimpse into this wonderful publication.

The year-round problem-solving competitions in *KöMaL* and *Abacus* today

In addition to articles of interest to high school students and reports on various competitions, ***KöMaL*** presently conducts ten different year-round problem-solving competitions at different grade- and difficulty-levels. They are as follows:

- At the lowest level there are 35 problems in the year marked by K; only students in Grades less than 10 are allowed to submit solutions to them. The first 3 problems are the same as the last 3 in ***Abacus***.
- At the next level, there are 7 problems marked by C in each issue; of them the first 5 are for students in Grades 10 and less, while the last 5 are for students in Grades 11 and 12. Of the first 5, two are the same as the last two K-problems Here the students are separated by grade level into the following three groups: students in Grades less than 9, students in Grades 9 and 10 and students in Grades 11 and 12. This level has a total of 45 problems during the year for each of the three grade levels.
- At the next level there are 8 problems marked by B in each issue, but the students are restricted to submitting solutions to only 6 of them. This time the choice is theirs. They are separated by grade level into the following five groups: students in Grades less than 9, students in Grade 9, students in Grade 10, students in Grade 11 and students in Grade 12. They all have 54 problems for the year for each of the five grade levels.
- And finally, there are 2 or 3 problems marked by A in each issue of ***KöMaL***; they are for students preparing for international competitions and/or careers in mathematical research, regardless of their grades.

[7]Mathematics Competitions, Vol. 29, No. 2 (1996), pp.26-41

In its turn, ***Abacus*** features 45 problems per year for the students in Grades 3 to 6 and 54 for those in Grades 7 and 8. Since the point gathering competition is broken down by grades, there are separate competitions for Grades 3 or less, Grades 4, 5, 6, 7 and 8 – six competitions per year. Accordingly, in 7 of its 9 issues

- For students in Grades 3 & 4, there are 7 problems; of them the first 5 are for students in Grades 3 and less, while the last 5 are for students in Grade 4.
- For students in Grades 5 & 6, there are 7 problems; of them the first 5 are for students in Grade 5, while the last 5 are for students in Grade 6.
- For students in Grades 7 & 8, there are 8 problems; of them the first 6 are for students in Grade 7, while the last 6 are for students in Grade 8.

In addition to these, following the example of ***KöMaL***, there is a physics section in ***Abacus*** too, with 5 problems per issue. There are also 2 harder mathematics problems marked MP, 3 logic problems, 4 problems in chess, and 1 each in sudokus and nonograms. Furthermore, there are 3 problems in German and 2 in English in order for the students to hone their language skills by submitting solutions in the appropriate languages. In all of these, the students compete year-round for points. And whenever there is a gap, the journal is filled with a mathematical curiosity, a puzzle, a joke or a historical fact.

Naturally, ***KöMaL***'s physics problems are much more advanced and include experimental ones (marked by M), easier ones for the lower grades (G) and harder ones (P) for the upper grades, and year-round competitions in their solutions. In informatics, similarly, there are programing problem that are easier (I), harder (I/S) and hard (S) and competitions in solving them. Moreover, ***KöMaL*** has mathematical articles on topics of interest to high school students, reports on competitions as well as on other events, like the recognitions given to outstanding teachers of mathematics and physics. More specifically, ***Abacus*** reports on the results of the nationwide problem-solving competition of mathematics teachers at the elementary and middle school level, while ***KöMaL*** reports on the Distinguished Teaching Awards named after László Rátz (Rátz Tanár Úr Életműdíj) each year.

Synopsis and Recommendations

While I hugely admired the incredible riches of ***KöMaL***, I had to settle for just one set of 5 problems per round in both of my attempts to emulate their year-round mathematical competitions. Neither did I have the physical manpower to do more, nor did I have a reservoir of ingenious problems created by a standing committee of 15 superb 'problemists' utilized by ***KöMaL***. Occasional 'Calls for Problems' were a poor substitute for that.

While the problems featured in my programs were much easier than those in a national Olympiad, I followed the style of the Olympiads and that of the Wisconsin Talent Search, where similarly, all of the contestants are offered the same problems regardless of grade and maturity levels. With 5 problems per round, one can afford to have one or even two relatively easy ones, suitable for beginners and younger participants. One of the problems can also be harder to make sure that even the best and most advanced participants are challenged. It is also possible to make sure that at least one of the problems is geometrical, and that at least in every other round, the geometric problem is

3-dimensional. Five problems also allow for a healthy mix of algebraic, number theoretic, logical, trigonometric and combinatorial problems – all at the pre-calculus level.

As to the number of rounds per year, I recommend 4 at the outset, to be extended to 5 or 6, but not to be reduced to 3 or less. In Year 1 (1978-1979) of the Competition Corner, the ***MS*** appeared 8 times, and hence, I had to cope with 8 rounds. It was a lot, but doable. In Years 2 & 3 (1979-1980 & 1980-1981), it appeared only 6 times, and hence, the pace was more modest. Nevertheless, not wanting to exhaust my colleagues and since ***Consortium*** appeared 4 times, I reduced the USAMTS to 4 rounds, which we managed with relative ease.

Ideally, the grading should be done by university students, who took part and did well in the program while in high school. That's how it is done in Hungary when it comes to the ***KöMaL*** submissions, but at the outset, there are no 'graduates' of the program. Hence, at the outset one must rely on faculty help, as I did. Fortunately, thanks to Dr. Gene Berg and his successors, I could also rely on the mathematicians at the National Security Agency (NSA), when the number of submissions got huge.

Back in 1978-1981, e-mailing was not yet available, and even in 1989-1998 only a few high school students were accessible via e-mail. Nowadays, however, it should be possible to keep up with the former participants of programs via e-mail, and in more developed countries one should be able to organize grading via electronic communication with carefully selected former participants. Thereby, after the initial 4-5 years of working with the program, it should be possible to turn over – with proper supervision – the grading of the submissions to the earlier winners of the program.

The advantages of year-round competing

Based on the experiences and reflections of the former participants and on my personal views developed during my days as a student in Hungary, I summarize below some of the benefits of year-round competing

- Mathematically bright students need appropriate challenges regularly, rather than occasionally.
- Problem-solving should be made into an intellectual habit, rather than a once-a-year experience.
- Clever students are often bored in the classroom; challenging them with interesting mathematical problems gives an outlet for their creativity.
- Such programs can help the students improve their writing skills and presentation styles via developing complete, well-written solutions.
- Having a month to develop one's solutions is much more realistic then doing so in a timed situation.
- Meeting stringent deadlines is best-learned and mastered at an early age.
- The solution of an interesting problem is a wonderful event, a most satisfactory accomplishment in itself. Possibly seeing one's work in print, makes it even more special.

- Voluntarily observing an honor system in developing their own solutions will serve them well.
- Seeing the often more clever or elegant solutions of others develops an appreciation of each other, a better sense of one's own capabilities, and at times even some much-needed modesty.
- The anticipation of seeing the evaluation of one's submissions and the joy of receiving the next set of problems is also a worthwhile experience. Many parents recalled the positive reactions of their kids upon receiving all of my mailings to them. Seemingly, they disappeared with my letters and were not seen for the rest of the day and beyond.
- The students developed a sense of ownership in the program by seeing their names among the 'Commended Solvers' and/or having a solution attributed to them. They were rightly proud of their accomplishments and wanting more of the same, they worked harder.
- Creative mathematical problem solving is an excellent preparation for nearly every profession, including law, medicine, business, engineering, economics, and the other sciences.
- Mathematics is unique among the sciences in that one can state difficult problems simply and solve them without extensive technical background by applying clever ideas time and again in an unexpected manner.
- Most of the Hungarian mathematicians, physicists, engineers and scientists, in general, credit ***KöMaL*** for the basic training they received while in high school.

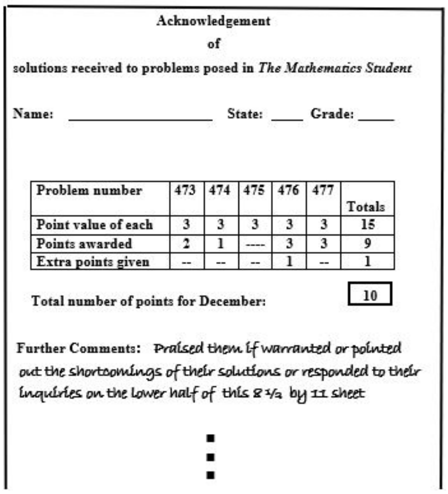
In fact, many of the 43 of us featured in a neat little book edited by Sándor Róka credited ***KöMaL*** in answer to the question:
Why did I become a mathematician?
(That is the English translation of the title of the book)

Concluding Remarks

Clearly, with the 16 different year-round competitions conducted by ***KöMaL*** and ***Abacus***, Hungary has reached the Nirvana of mathematical rivalry of all students, regardless of grade-level and prior experiences. But one must remember that it took them more than a century to reach their present status, and that more than 4 generations have grown up on ***KöMaL***. Thus, it is likely that the father or mother, or one of the grandfathers, grandmothers, aunts, or uncles of the student working on a ***KöMaL*** or ***Abacus*** problem was also a ***KöMaL*** - enthusiast a generation or two earlier. Thereby in Hungary such an involvement often is already a family-trait.

Toward that lofty goal, I recommend humble beginning with four rounds of 5 carefully chosen problems. Then, if and when a stronger support system is established, one might expand the offering to 5 or 6 rounds of 7 problems, with the first 5 for younger participants and the last 5 for students in the upper grades. As a next step, one might designate one of the problems appropriate for extensions and/or generalizations and give an extra point for such accomplishments. I found that many students love such opportunities and for most of them it is a novel experience.

I also recommend a 'personal touch' via the evaluation of the students' submissions, making them recognize that the grader is a fellow enthusiast in problem-solving. A few words of encouragement can go a long way!
A typical Evaluation Form is shown on the right, where Problem 476 allowed for an extra point for meaningful generalizations. Time and again I used the space to answer their questions, and at times I even entered into regular correspondence with some of them. They told me about their readings, about their accomplishments on other competitions, and they shared with me even some confidences.
I also recommend a pictorial tribute to the best of them at the end of the school year, as well as Certificates of Participation to the regular participants even if their results are modest.
Finally, I strongly believe in appropriate prizes to the winners, preferably, books of appropriate content.


Acknowledgement
of
solutions received to problems posed in *The Mathematics Student*

Name: __________ State: ____ Grade: ____

Problem number	473	474	475	476	477	Totals
Point value of each	3	3	3	3	3	15
Points awarded	2	1	----	3	3	9
Extra points given	--	--	--	1	--	1

Total number of points for December: 10

Further Comments: Praised them if warranted or pointed out the shortcomings of their solutions or responded to their inquiries on the lower half of this 8 1/2 by 11 sheet

I strongly believe that following Hungary's example in year-round competing in creative mathematical proboblem solving is the best approach toward developing a culture of mathematical excellence. The capital of most countries can serve as a mathemacical center, and at the outset it is perfecly suitable to use snail-mail for conducting such a program. A website should also be utilized and electronic submissions and the use of LaTeX should be encouraged from the outset.

Add-On

I was ready to submit this article when my friend, Tünde Kántor neè Varga shared with me Vojtech Bálint's excellent article on "Hungarian mathematics development stimuli"[8], which gives a much-deeper historical background to the birth of ***KöMaL*** than the one given in the present article. Professor Bálint also gives lists of the most successful solvers of the ***KöMaL*** problem. He was the leader of the Slovakian team to the IMOs 11 times between 1996 and 2013.

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[8]Antiquitates Mathematicae,Vol. 14(1) 2020, p. 1-15