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Dynamic Methods of Teaching Mathematics

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Aims and objectives of education have changed. The functions of schools have changed. The modes of approaches for the teaching of various subjects have undergone a thorough change in so many countries. But some schools of our State and other States as well, resist any kind of modification in their approach to the teaching of various subjects of the curriculum. Though the modern methods of approach to subject-matter and to the attainment of knowledge are greatly acclaimed as providing and enlarging experience and modifying or modulating the learner's outlook, attitude and skills, we are not prepared to shake off our conservative ideas and traditional methods of teaching which are calculated to have a host of defects. Without entering into the serious defects of the traditional ways of teaching, I will here just touch upon the various ways by which the teaching of mathematics, among so many other subjects, can be made more meaningful and interesting, and how the procedure that we adopt, can be helpful to develop in the minds of the pupils the mathematical type of thinking. As a matter of fact, much of mathematics can be taught (1) by providing necessary experiences and activities to the pupils, and (2) by proper illustration and demonstration. In the course of my writing, I will try to explain the use of such methods and their application in the teaching of mathematics.

Experiences and Activities.—Dewey has pointed out: "Education is of experience by experience and for experience". Experience provides education, and this education prepares one for life experiences. But experience does not occur in a vacuum. Sources inside the school environment and outside it—for instance, the social environment—give rise to experiences, the proper use of which will quicken the process of learning, boom the children's imagination and interests, and answer properly their innate tendency to be active and alive. But providing such experiences and activities to the young children has not caught the fancy of most of our teachers. Particularly in the primary and elementary schools where it is of paramount importance to think of their curriculum in terms of concrete experiences and activities, rather than of knowledge to be acquired and facts to be stored, and where there must be greater visualisation to remove the abstractions, we find only the 'ought nots' followed. How profitably can we use these activity methods and provide necessary experiences for the pupils of the primary stage by posting them in groups at different 'points' to group and classify the type of vehicles that pass that way—in any one particular hour, to learn grouping, regrouping, classification, etc., in a more meaningful way! How this and similar projects like "playing shop", conducting excur-

sions, etc., yield better results through the 'play way'! Such projects like running stores or shops can even be taken up at a later stage, when the pupils have a better perspective and understanding of many mathematical concepts and notions. Further, it will also be a worthwhile experience for the pupils to visit banks, post offices, markets, income-tax offices and such other institutions, as all the problems in the Arithmetic of Citizenship are connected with earning money, saving money, investing money, then with banking, borrowing, lending, working out profit and loss, buying and selling, safeguarding through insurance, etc. Such experiences will help in acquiring practical knowledge of these things, which is the *sine qua non* for the pupils of today, who study so much about Savings Deposits, Interest, Insurance, Commission, Stocks and Shares, etc., and even solve the most recondite problems; but alas! they have not seen a passbook, a policy or premium notice, and do not know how to fill up a money order form.

Next, certain geometric ideas like the angles of elevation and depression can be understood by the pupils in a better manner, if they are taken out from the dingy classroom to a near-by flagstaff, tree or tower or *gopuram*, where a better definition of them can be got through their experience, and wherefrom they can also learn how particular points on them, if viewed from different positions and different heights, change in their angle of elevation or depression. The proper use of the clinometer can be learnt. This experience will be of immense help in solving, at a later stage, problems connected with heights and distances. Apart from these experiences, there are also plenty of opportunities to give activities to the pupils even inside the classroom, when we want to arrive at certain formulas and principles by the inductive procedure. These methods are quite in accordance with the psychological and pedagogical principles, and they also keep the pupils active and

alive. So teachers should not blindfold themselves to the right type of methods which bring knowledge through the way by which it can be easily followed and grasped, and in the way in which it will be required, Or else they will only be leading their pupils to a *cul-de-sac*, curb and quash all their bubbling enthusiasm and induce only intellectual paralysis. Here, at this stage, it is also essential to strike a note of warning that these methods should not be exalted too much, that the teachers must not carry things to extremes and that they must also see that all the experiences they choose and provide for the pupils must only be educative and not at all miseducative.

Illustration, Demonstration and other Visual Presentations.—These are methods for visualising and concretising some abstract notions in subjects like Algebra; for strengthening certain concepts and for showing how certain concepts and for showing how certain formulas for the areas of some geometrical figures, can be arrived at. It is needless to write in detail how the diagrammatic representation of the expansions of some algebraic expressions like $(a+b)^2$, $(a-b)^2$, $(a+b)(a-b)$, etc., remove the gloomy abstractions around them. Such representations bring a new and fresh light in teaching and learning these identities and also dispel the long cherished wrong notion that Algebra is an abstract subject and hence very difficult to understand. Similarly, the sum of angles of a triangle being equal to two right angles can be demonstrated by using cut-outs of three angles equal to the three angles of a triangle.

Whenever we find out the areas of some unknown geometric figures, we try to transform these areas into areas of some known figures. For instance, the area of a circle, by proper arrangement, is transformed into the area of a parallelogram or a rectangle. It can even be reduced as the area of a triangle. Take a long strip of paper of width about $1\frac{1}{2}$ " then roll it up into a cylinder of about 3"

diameter round a small matchstick. Then cut it along a radius to the centre of that circular face. Press the separated ends by two rectangular strips of cardboard, and we get a triangular face whose area is the same as that of the circular face, and whose base and height will be equal to the circumference of the circle and the radius of the circle respectively. Now, applying the formula for the area of a triangle, we get the area of the circle. These procedures provide variety for the pupils, enhance their interest and indelibly fix these ideas in the minds of the pupils.

Lastly, I intend to make a mention of the treatment of Demonstrative Geometry. This course is intended to train pupils in deductive reasoning and help them to appreciate the logical demonstration involved in it. So, we will have to keep this objective in view and give such an approach as will foster this type of reasoning and thinking, when we prove theorems and solve riders and problems. As everyone knows, we use the method of Direct Proof for proving theorems, which consists of oral analysis followed by synthesis. During the first stage of oral analysis, we start from the conclusion, keeping in close view the data given to us, and follow the 'if-then' method, in the course of which the need for making construction, if any, will be felt, the construction is made, and later the conclusion is connected with the data. Thus, the proper type of attack is made, giving ample scope for the pupils to participate in proving a particular theorem and making as much of elicitation from them as possible. Then alone comes synthesis to give a compact proof of the theorem starting from the data. This type of approach is to be encouraged in solving

riders and problems. Plainly speaking, this approach is not the prerogative of Demonstrative Geometry alone; in fact, even when we solve problems in Arithmetic and Algebra, the same course is applied. That is why it is very often said that, as soon as a problem is given for classwork, it must be analysed first. If there is such a training even from the beginning, it will not be a strange experience for the pupils to approach theorems and riders in this fashion. But how many schools follow this method in solving problems or in proving theorems? Even after so many kaleidoscopic changes have taken place in the teaching of mathematics, many of our teachers still retain the method of dictating proofs, impose on the pupils the readymade adult thinking, draw necessary conclusions themselves and do not at all furnish even an iota of mental pabulum to the pupils, thereby only confirming the traditional picture of the teacher as a solo-performer. Will pupils, from such a teaching, gain confidence to face any problem or tackle any situation unaided, using their own reasoning and resources? Will the pupils from such a teaching perceive the need for any construction, the logical chain of the proof and the deductive reasoning involved? Can these pupils any day experience the thrill of discovery? So, realising this, our teachers should not hesitate to set aside any method that subdues the expression and imagination of our pupils, that does not bring a bloom and a glow on their faces as a result of their satisfaction of achieving something of their own, that does not give room for any kind of activity, independent thinking and reasoning, that does not help for better visualisation and comprehension thereupon, and that suppresses pupils on all sides.

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Our Educational Organisation

PROF. T. K. VENKATARAMAN, M.A., L.T., Madras.

In the early 20th century, our educational organisation was hopelessly inadequate to meet the needs of the country. The schools neglected the vernaculars, disregarded the needs of industry and concentrated on a practically literary type of education. Even the universities were simply examining institutions. Their Senates consisted of fellows appointed for life by the Chancellor, and many of them were Government servants who had no touch with education.

Lord Curzon urged the importance of technical education in a comprehensive Resolution (1904), and pointed out how examinations dominated the course and how the living conditions of students were not attended to. His Universities Act of 1904 (based on the Report of the Raleigh Commission of 1902) was passed with the idea of enlarging the teaching activities of Universities. The standard was to be raised by a strict inspection of affiliated colleges and secondary schools. The Vice-Chancellors were to be appointed by the State, and the Senates were to include a majority of educationists. Universities should develop a teaching post-graduate course. The Act roused great opposition. The Commission on whose report it was based had no Indian members and was dominated by officials. It ignored the chief defect—absence of a sound structure of primary and secondary education—and hence it diagnosed wrongly. Of the 100 members of the Senate, 80 were to be chosen by the Government, and it was feared that this would curb the independence of the Universities. It was apprehended that the real intention of the Government was to check the political activity of the educated classes by lessening their number. Lord Curzon's unpopularity developed after this. The Universities still continued to be mainly

examining bodies. Secondary schools and colleges were still full of inefficient material.

It was only after the Montagu-Chelmsford Reforms of 1919 that real attention was paid to popular education. Ministries of Education in the different provinces initiated certain belated reforms. The problem was surveyed by the Hartog Committee and the field of University education was surveyed by the Sadler Commission.

The Hartog Committee advised the establishment of a Central Advisory Bureau, and it was set up in 1929. The Sargent Committee appointed by this Bureau reported in 1942. It recommended a minimum scale of salaries for teachers and employment of only well-qualified and trained teachers.

Sargent, who was the Educational Adviser to the Government of India in 1943, prepared a scheme of basic education for all children and higher education for children with special brains with the help of scholarship, etc., to be put in operation after the War. His scheme was countrywide, and direction and effort were to be centralised. His scheme included:

- (1) Free compulsory and universal education for all children from 5-14. Before this compulsory age, a reasonable provision for Nursery schools was needed.
- (2) High schools of various types to suit varying tastes and aptitudes of different pupils. This Secondary Education would be for those who show capacity for benefiting by it.
- (3) University education for picked students.
- (4) Technical, commercial and art education.
- (5) Adult education, both vocational and non-vocational.
- (6) An efficient school medical service.
- (7) Special schools for children with mental or physical defects.
- (8) Recreational facilities.
- (9) Employment

bureaus to guide those who leave schools and colleges.

Defects in the existing system were thus analysed. 80 per cent lapsed back into illiteracy. Admission to schools and colleges depended more on ability to pay fees than intellectual promise. The curriculum was determined by the requirements of university education. Universities made no serious efforts to relate

their output to the needs of the community. The examination system did not encourage original thinking and real scholarship. Few openings existed in industry and commerce. The school medical service was defective. There was lack of adequate buildings, equipment, playgrounds, etc. Many of these defects still continue, in spite of the planned efforts of our Government after independence.

Some Suggestions about Elementary Education

M. NAGASUBRAMANIA AYYAR, Papanasam.

Even now, both Basic and non-basic systems of elementary education are in existence. It is felt in some quarters that people are not keeping abreast with the educational progress and the improvements in the techniques effected in Basic education, and there is absence of contact between the new educational schools and the old-fashioned parents. The principles underlying Basic education with the recent modifications are really good in themselves. The implementation of the scheme and making it popular and effective depends on the quality and outlook of the teacher, including that of the training school. Unless there is proper selection of teachers for training, and unless the training schools do full justice to their duty by the trainees by following the time-table closely, with no room for slackness, Basic education cannot progress. The idea of craft-centred education must for some time to come give place to the system of orienting primary schools to the Basic pattern as is now being done. There is no harm, if the schools already working as Basic schools follow the integrated course of elementary education with the use of text books right royally, and with facilities for hand and eye training in rather an intensive way. There should be a common districtwise test at the end of

Standard VII revised, the term Senior Basic being merged for the present to help the parents to know the aptitude of their children for seeking the academic course or otherwise. There needs to be a viva-voce and a written test for obvious reasons at least between two or more contiguous schools at the end of Standard IV to serve as a measuring rod for the proper growth of literacy. It goes without saying that the teacher's pay must be made attractive. Even under the old system of education some decades back, provision for hand and eye training as boy scouts, girl guides or cubs or through extra-mural activities had been made. The integrated syllabus with real vocational bias may be gone through universally for some more time in the State, by which time model schools entirely on Basic lines may be started and worked, at least one in a range. Meanwhile, the salient features of Basic education are to be found in the present orientation programme of the Basic pattern with maximum good and with minimum cost.

As far as feeding in Basic training schools is concerned, instead of entrusting the trainees with the preparation, etc., of food for mass feeding, sacrificing other work all the two years, the trainees may

be divided into batches of 30 or so to attend to the entire feeding arrangement for a few weeks only, the others being fed as in the hostel. The word training school itself connotes the place for practising good and clean habits. I have had occasion to see students sitting on the bare dirty floor in the dining hall and before the teacher also in classes. This should not be.

Shift System.—The impression is gaining ground for the adoption of the shift system in the handling of standards. Considering the heavy and intensive nature of the seven years' course in place of eight, such a system need not be thought of beyond the first two years course. Standards I and II can and need to work under the shift system for various reasons. The pupils being young and in large numbers anywhere, three hours of instruction with a break of 15 minutes will quite do for them to ensure all-round progress. Taking a single or a double teacher school, for example, of which there are many (under boards' management chiefly), a school will naturally have a strength of 60 to 100 in standards I to V, the majority of the pupils being in standards I and II. How is it possible for a teacher or two to manage 35 or 70 pupils in attendance without chaos and indiscipline, granting that the teachers are earnest and dutiful? Such types of schools can work with ease and satisfaction, only if the first two Standards work in shifts. Many schools have one digit strength in Standards IV and V to satisfy Departmental requirements. As far as practicable, a central school may be formed for consolidating Standards IV and V with good attendance, no matter if the children have to walk a few furlongs, until each school grows in strength. As the present syllabus stands, no two Standards even with meagre attendance can be clubbed under a single teacher.

Payment of Salaries.—Each of the managers should be instructed to pay their

teachers by the issue of cheques to individual teachers for encashment at a nearby bank on the first working day of the month. This means that each manager should have in current deposit in a bank at least a month's pay of the staff for reimbursement on the receipt of the grant bill. This would be of great convenience and a relief also to all.

Supply of Books and Notebooks.—Steps should be taken to see that no pupil is without books and notebooks within two weeks after opening. Textbooks for the public examinations should be made available before May end. Free supply of books and slates to poor children must be made in time to be of use.

T.P.F. Accounts.—The procedure now obtaining in the matter of scrutiny of accounts and of transfer or closure of accounts leads to inordinate delay. I know of instances where there have been delays of five years and more in the transfer and closure of accounts. To avoid these, a T.P.F. register, similar to the T.S.R. with adequate columns of particulars for making monthly entries, may be supplied to each of the teachers. For the entire service of a teacher, three volumes may be necessary. As the teacher leaves a school, his register must be sent to the inspecting officer. Such a system would avoid many troubles in having to send many returns in duplicate and triplicate in a confused manner with the result that there is multiplication of work for no valid reason, and delay.

Returns.—Generally, there is no uniformity in the preparation of monthly returns. Forms with varying contents are to be had in the market. Particulars regarding leave and appointments, P.F. contributions, etc., have to be submitted to suit the whims of the inspecting officers. Managers are ignorant of the changes in the uptodate rules and regulations. The issue of a monthly bulletin bilingually at the Divisional Inspector's level would be helpful in many ways.

How Illiteracy was abolished in the Soviet Union

A. SOLOVYOV

One of the hard heritages inherited by the young Soviet Republic from Tsarism was the staggering illiteracy which prevailed in the country. Three fourths of the population of Tsarist Russia could neither read nor write, and the population of Central Asia was almost completely illiterate. In a vast country with 170 million people, there were only 280,000 school teachers, of whom no more than 200,000 were engaged in rural schools. Only one out of every four children could join three-year primary schools, while secondary school and college education was simply beyond the reach of ordinary people.

V. I. Lenin sharply criticised the policy of Tsarism in the field of public education. He pointed out that the Tsarist Government spent a meagre sum of 80 kopecks per capita of the population a year, while in advanced countries the sums spent for this purpose were much greater. Lenin attached great importance to public education. It was on his advice that his wife N. Krupskaya (who was a teacher by education) prepared several years before the October Revolution the work, "Public Education and Democracy", giving a scientific estimation of different pedagogical systems and determining what system of education the people needed. This work was approved by V. I. Lenin and proved to be of great aid to the young Soviet State in setting up its public education system. Krupskaya's work is still the reference-book of Soviet teachers.

In the very first years of its existence, the Soviet Government started with all earnestness and determination to tackle the problem of general education and elimination of illiteracy. Schools for the illiterate, libraries, and village reading-rooms were being opened everywhere, and mobile exhibitions were sent out through

the length and breadth of the country. All this was being done at a trying time for the Soviet State, when it was repulsing the attacks of foreign interventionists and internal counter-revolutionaries.

Lenin's Decree on Elimination of Illiteracy

In 1919 Lenin signed the famous decree on elimination of illiteracy in the country. By this decree, all the illiterate population aged from 8 to 50, were obliged to learn how to read and write in their native or the Russian language. It should be mentioned here that at that time dozens of nationalities in the Soviet Union that did not have alphabets of their own also had to be urgently taught.

Lenin's decree played a tremendous part in raising the Soviet people's cultural standards. This served as the beginning of the universal education for children and of the planned work aimed at liquidating illiteracy among adults. After the expiry of only one year, following Lenin's decree, illiteracy was abolished among no less than 2,500,000 people. Educated workers and peasants, students, senior-form pupils of secondary schools, public organisations such as trade-unions and YCL and various voluntary societies were drawn into the mighty crusade against illiteracy.

Extensive work among the illiterate was done by Soviet school teachers. Moreover, they trained from among workers, peasants and office-workers a whole army of instructors who carried on cultural and educational work among the population, helped to eliminate illiteracy, to set up illiteracy-liquidating schools. Such schools were opened in ordinary secondary schools, clubs, establishments and peasant homes. There was also wide-scale individual tuition. Women with children and aged people were taught how to read and write at their homes.

The "Ban Illiteracy Society"

Public education organs, which did the main work in eliminating illiteracy, were greatly aided by the broad sections of public both in towns and countryside. This was how a mass organisation called "Ban Illiteracy Society" was set up. Among its first members were V.I. Lenin, N. K. Krupskaya, People's Commissar of Education A. V. Lunacharsky, M. I. Kalinin, head of the highest organ of State power in the country, and other statesmen. M. Kalinin was elected President of this Society, which included millions upon millions of Soviet people, especially those who lived in rural areas. Almost every inhabited locality had a branch of the Society.

The Society played a great part in the elimination of illiteracy. Its means were used for the maintenance of many illiteracy-liquidating schools. It also had its own big publishing house which put out a special newspaper in bold print, so that it could be read by the neo-literates. The paper carried short items on the country's domestic affairs and international events; it also supplied useful advice for peasants. Mass editions of primary readers, popular booklets on natural sciences, agriculture, geography, history and literature were printed and circulated.

A Sweeping Movement

An overwhelming majority of illiterates eagerly came forward to acquire literacy and culture, and schools were attended even by very old people.

Great difficulties had to be overcome in eliminating illiteracy in Central Asia, where old prejudices were particularly strong. There were cases, for instance, when little girls and women did not want to attend schools for the sole reason that the women teaching at school did not wear veil. The old laws and traditions were a great obstacle, but in the long run all difficulties were overcome.

In a year of teaching, the neo-literates obtained approximately as much knowledge as was taught in two years of a primary school course. Thus in two years they covered the four-year primary school programme. The academic year in urban localities lasted for ten months. They were taking courses for eleven days every month, studying for three hours a day. Those who worked were relieved from work during the time of studies, and for such time they received full pay at the place of their employment. In rural localities, the academic year was seven months, with twelve days of studies a month and four hours of lessons a day.

Tens of millions of adults and teenagers received education and became active builders of a new life.

At present, the Soviet Union is successfully solving the problem of giving a secondary-school education to all its workers and peasants. The number of people studying in the country's colleges and technical schools grows with every year. Soviet citizens have access to all types of education free of charge.

Science in Educational Institutions

RAGHUVIR SAHAI NIGAM, Ex-Principal, Rajnandgaon (M. P.)

The Union Minister of Education has announced that the Government is going to appoint a Committee to study the position of science in the school and college teaching.

The mysterious and the out-of-way can be more easily studied than the plain and obvious.

But the State Governments have raised such a smokescreen that the real posi-

tion can be learnt by reconnoitring only. The curricula for Primary and pre-Secondary, i.e. Middle or Junior High Schools show that the teaching of this subject begins from the third or fourth class from the bottom. But the teaching is done without the teacher having had any touch with the subject in his life. It is taught without any apparatus or teaching aid. Even black boards and chalksticks are not available for any 'chalk and talk method' by a talkative teacher. Even in pre-secondary class there is rarely a teacher who has done this subject in his school career. Even in High Schools a teacher who has done this subject for his Matriculation examination is put in charge of General Science (what he had studied was Physics and Chemistry) for these classes. In schools which teach upto the Middle or Junior High School or pre-Secondary stage, there is not even apparatus worth Rupees ten. Rarely is there a teacher as said above, much less equipment or any such thing. What a fraud on students, the public (which is as dumb as anything, but is driven by catch-words and slogans only), and the nation!

If the Central Ministry is uninformed about this state of affairs, it is their fault. They do not care to know how much of the tax-payers' money is going down such drains.

Coming to High School classes, most of the schools have got laboratories or apologies for a Laboratory where students are led sometimes to perform some experiments. The Managers of private institutions get rid of teachers who spend money on such fads born of youthful enthusiasm. The Government for its own institutions provides a nominal recurring grant of a few hundreds only. The private institutions cannot, therefore, be allowed to spend more. Then huge numbers are to be tackled. Students come in good numbers from homes where bringing home things without having spent anything is regarded as acquisition. Breaking

wilfully cannot be penalised. The performing of these experiments is a drill which has to be certified before the students are admitted to the examination of the Boards. Only the Central Board of Secondary Education, Ajmer, got candidates for the High School Examination examined in Science Practical. It can be easily understood what practical work can be, and is, being done.

There is absolutely no question of trying 'to discover', to observe and then deduce laws. Most of the untrained teachers themselves do not know this. The trained teacher has to dismiss all such thoughts, if he has not left them behind in the precepts of the Training College.

In Higher Secondary Schools, some Boards have permitted even B. Sc.s to teach Higher Secondary classes. No teacher is 'more dangerous than one who knows as much as he is required to teach.' At the last Science Teachers' Conference this issue was raised to disturb the administrative and editorial consciences. For Intermediate Colleges, M.Sc's are really not available. In most cases, they come for a few months only, and then leave, in some cases, for clerical jobs which offer better prospects. Go to the offices of the Accountants-General and the Secretariats, and you will find any number. This is about the dross. The cream of Science Post-graduates goes to I. A. S. and other class I Services. Even Ph. D's go for the I. A. S. Some go to class II services and the left overs to the Degree colleges and the Universities. No All-India Scientific Service (it would be really a cadre of talented men if it offers better prospects than the I. A. S.) or All-India Medical, Engineering, and Forest Services as recommended by the States Reorganisation Commission have been constituted. It is not in the mouth of patriots to say that highly trained scientists from amongst young men returning from foreign universities go and work in foreign countries. There are no niches for them here. There

are better facilities in foreign countries, and one can do his work with little disturbance. There is no kowtowing to the politicians, their henchmen, secretaries and underlings. There are no public men and publicists barking at their heels and asking them to work in the language which their semi-educated selves can understand. This is the biggest drain going on. No effort is made to check this, while experts are invited from abroad.

In the country itself, scientific talent is thrown on waste lands. This is simple arithmetic which even the political leaders can understand.

Let us look at the state of science teaching in colleges. In the B.Sc. class they are thoroughly drilled in the prescribed amount of practical work. There is neither time nor facilities for giving them even a taste of launching on a voyage (let it be a short cruise or trip only) of discovery. There is a shortage even of B.Sc.'s, whereas about 5,000 of them are needed to teach General Science as a core subject to High School classes. As the High Schools are being converted into Higher Secondary Schools with monsoonic prolixity, the need for M.Sc.'s will soon be accentuated.

For M.Sc. classes, most of the laboratories are ill-equipped. They are insufficient for such numbers, even in teaching universities where qualitatively they are better equipped. Because of these inhibiting factors, there is not much free scope for satisfying inquisitiveness and developing initiative. They just get a glimpse of the vista.

Life's actualities drive them away from science, and this is the biggest loss to the nation, whose money has been spent on their scientific training.


The Government makes up these losses by having Vigyan Mandirs to instil science into bucolic minds. They are going to appoint Science consultants for schools. Where are the teachers in Primary and

Middle schools who will consult them? How is the advice given to be implemented? Even the University Grants Commission finds it so difficult to have its modest advice translated into reality. Do State Governments co-operate?

Even U.S.A. and U.K. find that they are not producing enough scientists and technicians, but in India the number is pitifully low even for its undeveloped economy.

Laboratories of educational institutions must be utilised three or four shifts each day and even on non-working days after stocking them well with apparatus and having separate staff. They may be treated as full-fledged institutions by themselves. Work must go on in the vacations even. Thus more students can learn science. There may not be much co-ordination with class-room teaching. Experiments may be demonstrated and shown by institutions run for profit on a one-anna ticket basis just as they arrange Revision Lessons for the examinees. Such make-shift arrangements shall have to be made to get over the shortage in a short time. Stiff and searching examinations may test whether this practical work has had some real worth or not. Even films may be pressed into service.

Last, but not least, is the question of the inculcation of the 'scientific temper' in the populace. Only the scientific method of thinking inductively, of observing objectively and analysing the data, then drawing inferences and conclusions has to be imbibed by the people in a democracy. So far they are being led by slogans and catch-phrases. It is a dangerous state. Such a rabble will land our democracy into mobocracy and chaos. Even the leaders of thought have not allowed themselves to be caught by the scientific method of reasoning. This will happen when science is taught as it should be.

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Here is the imminent problem of having enough science graduates and scientists and technicians. That has to be solved within the space of five or six years. Indian scientists and technicians should be lured back and further drain plugged. Science graduates should be put in proper places, so that money spent on their scientific education be not wasted. All this needs a reorientation in the thinking of the rulers floating on the cloud of

doctrinaire philosophies and basking in warmth and sun-shine.

The real position in science teaching is as clear as daylight to anyone who cares to see. The U.P. Government spent about Rs. 2,000 last year to study the position. It is unseen only for those who do not wish to see.

Will things be improved?

Encouraging Brilliant Talents

M. S. V. CHARI, Tindivanam.

The University Grants Commission's recommendation that admissions to universities should be restricted to those who are likely to benefit by higher education is one in the right direction, though, it is likely to be opposed from many interested quarters like the so-called backward classes who are more interested in feathering their own nest than in the overall national welfare of the country.

It is no doubt true that in a democratic country it would be good for a citizen to be even a third class graduate. But the point is this: are the average and the under average to be admitted into colleges to the detriment of students who have brilliant attainments to their credit? Naturally, we go on increasing the number of colleges, this problem will cease to be. But it is in the intermediate period that we cannot afford to elbow out students with merit and admit students on uneducational considerations.

But the States may not be willing to fall in line with the above recommendation and may even defy such a directive on the ground that education is a State subject. So, the Government of India should start one or more 'merit' colleges, in various States of India, academic, technological and professional, and admit students solely on considerations of merit.

The Central Government should also start academies dealing in various science subjects where students who exhibit rare talents in particular subjects but are not all round and hence cannot hope to have access to the University could prosecute their studies till the research stage. Here we need not insist on a pass in any examination, but may be content with the students high attainments in any particular subject. Thus we could have Academies of Mathematics, Physical Science, Natural Science, and many other similar subjects. These academies may award diplomas, and the syllabus might cover upto the Honours standard. These students may concentrate on the sole study of their optional subjects. This might be a three year course, and the minimum qualification might be 60% marks and above in the S.S.L.C. examination in his optional subject. This would enable many students to pick up a sound knowledge in their optional subjects, and that of a high standard. They will be more learned in their subjects than their University counterparts, and will become useful citizens.

Such academies may be started in every District and important Taluk Centres and may confine themselves to particular subjects, so that there may be no overlapping.

Naturally, these academics ought to have highly equipped laboratories, for considerable practical work have to be done here in addition to the necessary theoretical study. To start with, academies in physical and natural sciences and advanced mathematics may be started by the Centre in all the metropolit cities of India. In admitting the students for these academies, the student obtaining the best marks in his optional subject may alone be selected. For example, a failed S.S.L.C. candidate obtaining 100 % in mathematics may be preferred to even a B.A. mathematics in student obtaining only 40 or 50% marks. The aim of these academies should be to discover brilliant talents and give them an intensive course of study in the subject for which he has a special aptitude.

The tuition and mess fee must be minimum, if not free, the classes should be manageable and the pupil-teacher ratio must be such that it ought to be possible for the teacher to give personal attention to every student.

The starting of such academies will rob the University degrees of their glamour as the Government would prefer these brilliant diploma students to University men of the average type.

It will be noticed that technological institutes are not included in the above scheme. What is intended is to impart the highest education to brilliant young men in basic science, which will be so useful to the country at this critical juncture



மெர்கூரி

என்றால் சிறந்த

பென்சில்கள்

எல்லா ஸ்டிரைக்கர்களிலும்
எல்லா வர்ணங்களிலும்
எல்லா ஸ்டேடார்களிலும்
கிடைக்கும்.

அமரிப்பான்
மகநுல் பென்சில் பாக்ஸ்

3, ஸ்டிரீட் ரிங்கர்ஸ் தெரு, சென்னை-1

50th Madras State Educational Conference

The 50th session of the Madras State Educational Conference met at the Sowrashtta High School, Madurai on May 9th, 20th and 21st. Sri A. Chidambaranatha, Chettiar, M.L.C., Professor of Tamil, Annamalai University, presided.

WELCOME ADDRESS

Sri T. Sundaram Chettiar, Chairman of the Reception Committee, welcomed the delegates. He urged that greater impetus should be given to the spread of education in the country both by the people and the Government. He asked the Government and school managements to take early steps to implement the Sri Prakasa Committee recommendation regarding a suitable place for prayer and worship in educational curricula. He welcomed the Government's decision to introduce Tamil medium in colleges.

Better remuneration for teachers would help improve teacher-student relationship which was the key to good education.

INAUGURAL ADDRESS

Sri C. Subramaniam, Minister for Education, inaugurated. In the course of his address, he appealed to the teachers and parents to realise the implications of the constitutional directive to impart free and elementary education up to the secondary stage. Mere knowledge of arithmetic or science could not be truly called education, which comprised development of knowledge, character and personality. The problem before them was to improve the quality of education, while expanding educational facilities also. Over a lakh of teachers were now working in the elementary schools. Their strength would have to be increased by a third, and in the secondary stage the teachers' strength would have to be doubled.

For improving the quality of education they should have talented and qualified teachers, who would be available only if their emoluments were made more attractive. Educational service should not be the last resort of the educated. In this connection, the Minister said that he could tell them that the recommendations of the pay commission, which included two estwhile teachers, in regard to the emoluments of teachers from the elementary school to the University would give ample satisfaction to all parties concerned. He added that the services of teachers could not be measured by the emoluments offered to them. The Minister asked the educationists to consider the formation of a special educational service, on the lines of the I. A. S., to provide personnel for higher posts in the institutions for elementary and secondary education. About 15 to 25% of teaching posts could be manned by directly recruited specially trained young men with high qualifications. As this might affect prospects and promotions, the conference might appoint a committee to study the question. Its recommendations would be carefully considered by the Government, who had not yet taken any decision in the matter. Under socialism, they could abolish the aristocracy of wealth, but not the aristocracy of knowledge and learning.

The Minister also stressed the need for developing at least one school in a taluk or three to four schools in a district as models for others to follow.

He asked the Conference "to educate the Education Minister" on various controversial questions like syllabus and the medium of instruction in colleges.

Appealing to the teachers for co-operation, In Subramaniam said: "The

success of the Education Ministry depended on the faith the teachers reposed in the Minister and mere money would not help improve education”.

Messages

Sri S. Krishna Ayyangar read the messages received.

Sri Bishnuram Medhi, Governor of Madras, said: “After the achievement of Independence, various measures are being taken, among others, to raise the percentage of literacy in the country. The task of the teacher in imparting proper education and training to our boys and girls is difficult and delicate. The teachers’ role is also to mould the character of our younger generation, so that they become useful citizens of the country and that they will be able to discharge their responsibilities and duties well”.

Dr. P. Subbarayan, Union Minister for Transport and Communications said: “in no field of activity, in the context of changing conditions of India today, is there so much need for correct thinking and constructive endeavour as in the field of education. It is, therefore, essential that teachers, educationists and other interested workers in the field should have opportunities to come together and have a free exchange of views”.

Presidential Address

Dr. A. Chidambaranatha Chettiar, in his presidential address, dealt with the question of making Tamil the medium of instruction at the University level. In our approach to the problem, he said, we must take into consideration certain things that had taken place. The president’s orders under Article 344 (b) of the Constitution, on the recommendations of the Language Commission, had made the problem of the medium of instruction in colleges and University, in our State specially, more complicated.

He welcomed the Government’s decision to introduce the Tamil medium for the B. A. degree course. He, however, felt that the Government should not, as had been announced, withdraw the grants to private colleges retaining the English medium, at least for a time.

“A welcome option to the privately-managed colleges for continuing to private for instruction through the English medium. For one thing, it will help candidates who are anxious to qualify themselves for the All-India Services or Higher Central Services or Defence Services to proceed to the competitive examinations through that medium. In the light of this, may I ask whether it would not be desirable to continue to give the grant even in respect of courses through the English medium to the privately-managed colleges, if they are in need of such grants. By withdrawing the grant to which they might otherwise be eligible, there is reason to think that the pace of introduction of Tamil medium throughout the State is being forced.

Dr. Chidambaranathan said the implementation of the scheme of introduction of the Tamil medium might be left to the Universities. The Minister for Education has recently expressed himself in favour of this under certain conditions. There ought to be inter-university co-operation on this matter within this State, and between the Government and the universities, and between the universities, and between the universities and the Department of Education.

The Madras Government’s suggestion that Tamil medium should be introduced in the B.A. degree course in all colleges in the State by 1966 was correct. But at the same time, the Government should not fight shy of extending the deadline for introduction of Tamil medium by a few years more, in case the experiment being initiated this year in one college did not succeed. He revealed how felt that the

experiment would succeed, as great care had been taken in choosing proper authors for the preparation of text-books.

He felt that the introduction of Tamil colleges was only a corollary to the introduction of Tamil in high schools of the State during the past several years. With the medium still continuing to be English in the pre-university classes, he said one could not but think of the hiatus between the high school and university stages of education.

He agreed with the Government's policy of helping students in Tamil medium colleges with scholarships. He condemned the opposition to such aid and said that in countries like Britain and Russia, not only education was imparted in the pupils' mother tongue but 75 to 90 per cent of the students received scholarships.

On the question of nationalisation of publication of text-books, he said, while there could not be any objection to Government entering the field as one of the competitors in publishing text-books, teachers should have the freedom to choose the best among the available text-books. He was in favour of the present system of approving a certain number of books for use in schools.

The President referred to the controversy regarding interference of the Government in the affairs of the universities and said universities should not be subjected to pressure in accepting policies with which they might not be in agreement, just because they received financial aid from the State.

Qualifications for the Higher Secondary teachers had not been specified so far, and model questions for the H.S.C. examination had not yet been circulated. This should be taken up in right earnest without loss of time.

There was a sense of frustration on the part of many collegiate teachers because of the refusal of the State Government to agree to contribute an equal share

with the University Grants Commission to increase their scales of pay.

He hoped the Government would take steps to assure teachers of security of tenure. While thanking the Government for extending the pension scheme to teachers who had retired in 1955, he said that there were several other grievances like the lack of house-rent allowance etc.

"Several language pandits, manual training instructors, drawing masters, craft instructors, sewing mistresses etc., who have put in a service of not less than seven years and more, who possess the professional qualifications prescribed for the respective posts but have not been confirmed for not possessing the general educational qualifications, deserve special consideration by the Government. Having regard to their experience, they may be confirmed."

The President referred to the several grievances of the teachers of primary schools which have been converted into non-fee levying schools, and hoped that these would receive due and favourable consideration by the authorities. He requested the Government to do whatever was necessary to ensure a fair deal for the teaching staff.

Other functions

Earlier, Sri S. Devasahayam, Chairman of the Madurai Municipal Council, hoisted the national flag.

Mr. N. M. R. V. Mahadevan, Secretary, Saurashtra High School, declared open the educational exhibition organised in connection with the Conference. Mr. M. Vivekananda, Convener of the exhibition, presented a report on the exhibition.

Mr. A. V. Sankaran, M.L.A., released the souvenir brought out by the Reception Committee in connection with the Conference

Mr. T. P. Srinivasa Varadan, President, S.I.T.U., proposed a vote of thanks.

(To be continued)

EDITORIAL

The sword of damocles

Controversy has been raging in Madras State for some time past over the sensational policy decision of the Ministry of Education to withhold grants from colleges teaching through the medium of English after 1963. The swiftness of the proposed change-over can be fully appreciated, only when it is remembered that a so-called pilot project in using Tamil as the medium of instruction is to start from June this year at the Government Arts College, Coimbatore.

The criticism levelled against the decision of the Government by the Vice-chancellor of the Madras University led to the publication of a White Paper on April 26th. It traverses a great deal of recent history and claims that the Madras Government has proceeded slowly and gradually in formulating its policy in this very important matter. It is asserted that the Government has at every stage not merely consulted and taken the advice of academic experts, but has also sought and obtained a very large measure of all-party agreement on the steps to be taken in the matter. "The Vice-chancellor of the Madras University," it is stated, "has himself been associated with the decisions of several bodies to the effect that the replacement of English by regional languages as the medium at the college level is necessary."

In a press interview given on the 30th of April, Dr. Lakshmanaswamy Mudaliar denied the views attributed to him in the White Paper. "In particular, it was the understanding of the Vice-chancellor that, if the pilot scheme proved a success and then only, it might be extended to other colleges on a voluntary basis: that the question of no grants being payable by the State Government was not one on which the Vice-chancellor was consulted; and that it was not stated, as in the budget speech of the Finance Minister, that the medium of instruction in all

colleges for the B.A. course should be Tamil from 1963."

It is precisely in regard to the points of difference noted by the Vice-chancellor that there has been controversy. To him it seems obvious that "a pilot scheme is a scheme which is to be experimented and proved a success". But the College Tamil Committee of the Madras Government "felt justified in its inference that the introduction of Tamil medium in the pilot college was not in the nature of an experiment as to the feasibility or otherwise of the adoption of the regional language as the medium of instruction in the colleges, but it was in the nature of a preparatory measure to serve us with experience for largescale introduction all over the State in 1963."

This basic misunderstanding lies at the root of the differences between the University and the Ministry of Education. To experiment with the use of Tamil as a medium of instruction is one thing; to make it the sole medium compulsorily in three years is another

The Government claim that expert opinion is on their side. We do not know whether the experts are with them all the way through, or only so far as permitting Tamil as a medium of instruction is concerned. Be that as it may, there are many sound and weighty reasons why the pace should not be forced in this matter. It affects the problem of national unity, which, whether we like it or not, rests now largely on the study of English all over India. The "Balkanisation" of Universities is a peril which must be guarded against. Again, there is the danger that with the use of Tamil as the medium of instruction, our already deplorably low standards will fall further.

In the circumstances, the words of caution administered by Dr. A. Chidhambaranatha Chettiar at the State Educational Conference of Madurai on the 19th

deserve serious consideration at the hands of the Government. One of the most distinguished Tamil scholars of our days, Dr. Chettiar is eminently qualified to give an expert opinion on the matter, and he is definitely against hasty changes at the cost of the lowering of standards. He draws also pointed attention to the President's directives on the recommendations of the Language Commission and observes how, in the situation created thereby, graduates from Madras, will be handicapped by having had Tamil as the medium of instruction. They may find all avenues of employment closed against them outside the State.

Discussion at the University Education section of the Conference also ran along similar lines. Practically every speaker warned the public against neglecting English. Professors Hirudhaya wamy, K. Narayanan and R. Ramanujachari suggested that simultaneously both English and Tamil could be adopted as media of instruction in Colleges, while Professor Sankaranarayanan and Sri M. Doraiswamy opposed the adoption of Tamil as the medium of instruction.

The resolution passed by the Conference on the subject, while welcoming the introduction of Tamil as the medium of instruction at the Government Arts College, Coimbarore, urged the Government to ensure that the autonomy of

the Universities was not impaired thereby. It desired that the results of the pilot project should be carefully reviewed before extending the use of Tamil as the medium of instruction to other subjects or Colleges. It urged further that the adoption of Tamil as the medium of instruction should be optional and that in no case should financial aid be denied to Colleges continuing to give instruction through English.

This resolution is on the same lines as one adopted by the Syndicate of the Madras University in 1950 on the University Commission Report and quoted in the White Paper referred to above. Herein the Syndicate confirmed the previous recommendations that educational institutions should have freedom to choose their medium of instruction and should not be deprived of the liberty of choosing English as such medium.

Our Educational Minister was pleased to declare that he would consider carefully the views of the Conference on this question. The Conference through its president and its resolution has made its views clear. We trust that he will give due weight to them and remove the sword of Damocles hanging over our Colleges, and perhaps as the Vice-chancellor fears, over the University itself.

Our Educational Diary

"PEPYS"

19-4-60. Dr. K. L. Shrimali said in the Rajya Sabha that the Government wanted the regional languages to become the media of instruction in the Universities "as quickly as possible." At the same time he said he did not want the standard of English to go down!

[This is just rope-dancing. Why not make the study of English completely optional at all stages and leave it to the discretion of the parents and students.

I dare say that in about a decade or two, the rising generation who are today anti-English will see the folly of their enthusiasm and revert to the study of English in all seriousness.]

25-4-60. Speaking in Jaipur, Governor Gadgil suggested that all the States should strive to make the study of Sanskrit compulsory upto a certain standard.

26—4—60. The Education Minister said that the recommendations of the Pay Commission in regard to the revision of teachers' salaries were under the consideration of the Government.

27—4—60. The Education Minister maintained that the Government had a right to interfere with the autonomy of the University where certain fundamental matters were involved. He also said that the one year course in P.U.C. where the medium was English would be useful to students when they entered the degree course as it would enable them to learn scientific subjects.

28—4—60. The Central Government has decided to initiate a project of translation into Hindi and preparation of standard Hindi Text Books on sciences, technology and humanities thro' academic agencies.....*The terms approved by the Government of India will be compulsorily used in these works.*

[It is this translation of technical terms into the vernacular that will cut at the root of real scientific and technological education, for each State will have its own vernacular translation, I would suggest that all technical terms may first be transliterated in the various vernaculars.]

1—5—60. Mr. Kabir said that there was urgent need for qualitative improvement and provision for diversified courses in technical education, for it was better to produce one able and well qualified engineer than five inefficient ones.

[But all as, in practice, under the guise of giving concessional treatment to the backward classes, we are only shutting out brilliant young men from these institutions. The recent announcement that only 25% have passed in the final medical examination in Madras where 41% is reserved for backward classes has its own sorry tale to tell.]

3—5—60. Mr. Morarji warned that the States should not exercise control over educational institutions, whose duty it

was to produce in the Students, the twin virtues of fearlessness and love of truth.

5—5—60. Dr. K. L. Shrimall stated that it was the intention of the Govt. to make a year's national service compulsory for students after the completion of the secondary education before entering the colleges.

[Some time ago, it was announced that the Central Govt. intended to make a year's national service compulsory for students after completing their university course before getting their degree. Now it is announced that the completion would be after the completion of the secondary education. It is not clear whether it is the intention of the Govt. to make two year's national service compulsory before the award of a degree or whether the present suggestion is only a substitute for the former one. The wisdom of compulsory national service after the completion of the academic course is at least debatable. But the present suggestion to waste the students, precious youth for a whole year is absolutely devoid of any sense of responsibility towards the students' educational welfare]

x x x

Dr. C.P.R. Aiyar suggested that instead of closing down public schools on the ground that they catered only to the rich, these ideal schools should be started in larger numbers.

x x x

Sri P. V. G. Raju, said that the utility system of education should be introduced in India. Every student should be taught a specialised course in one subject even at his tenth year, he said.

x x x

Mr. Morarji said that while in Japan he came to know that in Japan English was taught in the medium of Japanese.

[There is no harm in this and this is the only practical and sensible way of teaching foreign language.]

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JOURNAL (MARCH, 1937)

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TAGORE AND POLAND



It is surprising to know that Rabindranath Tagore never visited Poland, although there is a common impression to the contrary. Yet his inability to visit Poland has never stood in the way of his popularity with the Polish intelligentsia nor his love for the Polish people.

Tagore had deep sympathy with the Polish people for the sufferings the Polish people had faced for the sake of their ideals: their freedom and had expressed the hope that their idealism would ultimately overcome all hurdles.

The beginning of this century was a period of flourishing development of literary life in Poland. But this interest was, at the time, confined to the civilization of old India. Till 1913 Tagore was quite unknown in Poland. The award of Nobel Prize to Tagore drew the attention of literary circles. Polish intelligentsia's acquaintance with Tagore was made through translations for there were few people acquainted with the Bengali language.

It was during his tour of the United States of America, in 1916, when he went there to raise funds for his international university at Santiniketan, that Tagore met a famous Pole, Paderewski, the Prince of Pianists and the first Premier of free Poland. At the end of this meeting the pianist played a musical farewell to the Indian poet. Another Pole to leave a deep impression on him was Stanislaw Szukalski, a sculptor. Tagore referred to him as a "Sculptor of extraordinary talents."

INTENDED VISIT

After the first world war Tagore went to Europe and it was then that he intended to visit Poland. There his arrival was awaited with immense excitement. The Polish poet Antoni Lange even wrote a Sanskrit poem of welcome for the occasion. At the eleventh hour Tagore had to put off his visit.

Even before his intended visit to Poland Tagore's name had appeared in Polish literary periodicals. The first mention came perhaps in 1914 along with translations of excerpts from *Gitanjali*. The same year the first fragments his poems were published. The full text translated by poet Kasproicz was published in 1918. The journal *Pro Arte and-studio* published in 1917 the first extensive essay dealing with the poet's work available at that time in English. Next year saw the publication of a joint volume consisting of *Gitanjali*, *The Crescent Moon*, and *The Gardener*, under the title *Gitanjali*. This translation is in prose, as is Tagore's English version, but it is rhythmical prose and conveys an impression of purest poetry.

This translation helped to consolidate Tagore's fame in Poland as chiefly a lyrical poet with strong mystic colouring but other characteristic of his literary activity remained unknown in Poland. Many essays on Tagore followed. One of the most important contributions was an article by Henryk Elzenberg, himself a philosopher specializing in problems of aesthetics. He made a thorough study of His work available in Europe stressing above all the ethical element apparent in all his poems.

A further growth of interest in Tagore's works was recorded in 1902. In that year Leopold Staff published the complete text of his translation of *Fruit Gathering* written in poetic prose. The *King of the Dark Chamber* and Tagore's article on *Nationalism*. The article aroused a wave of protest among the Polish intelligentsia. His views, taken literally, meant a blow at the very foundations of the existence of Polish nation—a mortal blow to their newly won independence. To another Polish version of the article Tagore wrote a short forward in which he emphasised the necessity to observe the Principles of ethics not only within a community but also in international relations.

However, in the following years, 1922-23, Tagore's popularity in Poland reached a culminating point. Seven volumes of Tagore's works were brought out in the series "Noble Laureate Library." In 1922, a collection of his short stories *Night of Fulfilment* was published, followed in 1923 by a new edition with some more stories added to it. The volume was reprinted in 1928. During this period, *The Wreck Sadhana*, *Whispers of the Soul* and *Stray Birds* were made available to the Polish readers. In 1923 was also published a collection of short stories under the title *Hungry Stones*. The dramas *Chitra* and *Malini* translated by Roman Fajans and lyrical poems *Lover's Gift* and *Grossing* and another version of *The Crescent Moon* also appeared in the same period.

Tagore's popularity in Poland had been so great that frequently more than one translation of single works appeared at the same time.

Tagore himself displayed keen interest on Poland. When shortly before the outbreak of the Second World War an Indo-Polish Association was formed in Calcutta, Tagore consented to be its first Honourary Chairman. The Association developed a lively activity during the war and rendered valuable assistance to Polish refugees in India. In his last message which he sent to the Association on the 150th anniversary of Poland's May Constitution he wrote:

"I warmly associate myself with the 150th anniversary of the May Constitution of Poland—may justice and humanity prevail in a peaceful reconstruction of civilization."

People's Poland, after its inception in 1945, is taking all the more interest in studies on and about India and Tagore has his due place in the hearts of the Polish people. His works are appearing in new editions. They are making appearance on the television. *Red Oleander* has already been translated into Polish and is to appear soon on the book shops. Many articles on Tagore have appeared in the literary magazine *Oriental Review*. One of new streets in Warsaw and some streets in the town of Lodz Zielona Gora were named after the great Indian poet during the *Oriental Nations* was celebrated during October 1958.

Tagore is a golden link in the friendship of the two great nations—India and Poland—and his name will always remain dear to the hearts of the Polish people.

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