SCIENCE

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THE MESSAGE OF SCIENCE.[1]

IT is just forty years ago, at the York Meeting in 1881, that a committee was appointed "to arrange for a conference of delegates from scientific societies to be held at the annual meetings of the British Association, with a view to promote the interests of the societies represented by inducing them to undertake definite systematic work on a uniform plan." The association had been in existence for fifty years before it thus became a bond of union between local scientific societies in order to secure united action with regard to common interests. Throughout the whole period of ninety years it has been concerned with the advancement and diffusion of natural knowledge and its applications. The addresses and papers read before the various sections have dealt with new observations and developments of scientific interest or practical value; and, as in scientific and technical societies generally, questions of professional status and emolument have rarely been discussed. The port of science—whether pure or applied—is free, and a modest yawl can find a berth in it as readily as a splendid merchantman, provided that it has a cargo to discharge. Neither the turmoil of war nor the welter of social unrest has prevented explorers of uncharted seas from crossing the bar and bringing their argosies to the quayside, where fruits and seeds, rich ores and precious stones have been piled in profusion for the creation of wealth, the comforts of life, or the purpose of death, according as they are selected and used.

All that these pioneers of science have asked for is for vessels to be chartered to enable them to make voyages of discovery to

[1] Address by Sir Richard Gregory, president of the Conference of Delegates of Corresponding Societies, given at the Edinburgh meeting of the British Association for the Advancement of Science.

unknown lands. Many have been private adventurers, and few have shared in the riches they have brought into port. Corporations and governments are now eager to provide ships which will bring them profitable freights, and to pay bounties to the crews, but this service is dominated by the commercial spirit which expects immediate returns for investments, and mariners who enter it are no longer free to sail in any direction they please or to enter whatever creek attracts them. The purpose is to secure something of direct profit or use, and not that of discovery alone, by which the greatest advances of science have hitherto been achieved.

When science permits itself to be controlled by the spirit of profitable application it becomes merely the galley-slave of short-sighted commerce. Almost all the investigations upon which modern industry has been built would have been put aside at the outset if the standard of immediate practical value had been applied to them. To the man of science discoveries signify extensions of the field of work, and he usually leaves their exploitation to prospectors who follow him. His motives are intellectual advancement, and not the production of something from which financial gain may be secured. For generations he has worked in faith purely for the love of knowledge, and has enriched mankind with the fruits of his labors; but this altruistic attribute is undergoing a change. Scientific workers are beginning to ask what the community owes to them, and what use has been made of the talents entrusted to it. They have created stores of wealth beyond the dreams of avarice, and of power unlimited, and these resources have been used to convert beautiful countrysides into grimy centers of industrialism, and to construct weapons of death of such diabolical character that civilized man ought to hang his head in shame at their use.

Mankind has, indeed, proved itself unworthy of the gifts which science has placed at its disposal, with the result that squalid surroundings and squandered life are the characteristics of modern Western civilization, instead of social conditions and ethical ideals superior to those of any other epoch. Responsibility for this does not lie with scientific discoverers, but with statesmen and democracy. Like the gifts of God, those of science can be made either a blessing or a curse, to glorify the human race or to destroy it; and upon civilized man himself rests the decision as to the course to follow. With science as an ally, and the citadels of ignorance and self as the objective, he can transform the world, but if he neglects the guidance which knowledge can give, and prefers to be led by the phrases of rhetoricians, this planet will become a place of dust and ashes.

Unsatisfactory social conditions are not a necessary consequence of the advance of science, but of incapacity to use it rightly. Whatever may be said of captains of industry or princes of commerce, scientific men themselves can not be accused of amassing riches at the expense of labor, or of having neglected to put into force the laws of healthy social life. Power—financial and political—has been in the hands of people who know nothing of science, not even that of man himself, and it is they who should be arraigned at the bar of public justice for their failure to use for the welfare of all the scientific knowledge offered to all. Science should dissociate itself entirely from those who have thus abused its favors, and not permit the public to believe it is the emblem of all that is gross and material and destructive in modern civilization. There was a time when intelligent working men idealized science; now they mostly regard it with distrust or are unmoved by its aims, believing it to be part of a soul-destroying economic system. The obligation is upon men of science to restore the former feeling by removing their academic robes and entering into social movements as citizens whose motives are above suspicion and whose knowledge is at the service of the community for the promotion of the greatest good. The public mind has yet to understand that science is the pituitary body of the social organism, and without

it there can be no healthy growth in modern life, mentally or physically.

This Conference of Delegates provides the most appropriate platform of all those offered by the British Association from which a message of exhortation may be given. There are now 130 Corresponding Societies of the Association, with a total membership of about 52,000, and their representatives should every year go back not only strong with zeal for new knowledge, but also as ministers filled with the sense of duty to inspire others to trust in it. In mechanics work is not considered to be done until the point of application of the force is moved; and knowledge, like energy, is of no practical value unless it is dynamic. The scientific society which shuts itself up in a house where a favored few can contemplate its intellectual riches is no better than a group of misers in its relations to the community around it. The time has come for a crusade which will plant the flag of scientific truth in a bold position in every province of the modern world. If you believe in the cause of disciplined reason you will respond to the call and help to lift civilized man out of the morass in which he is now struggling, and set him on sound ground with his face toward the light.

It is not by discoveries alone, and the records of them in volumes rarely consulted, that science is advanced, but by the diffusion of knowledge and the direction of men's minds and actions through it. In these democratic days no one accepts as a working social ideal Aristotle's view of a small and highly cultivated aristocracy pursuing the arts and sciences in secluded groves and maintained by manual workers excluded from citizenship. Artisans to-day have quite as much leisure as members of professional classes, and science can assist in encouraging the worthy employment of it. This end can be attained by cooperative action between local scientific societies and representative organizations of labor. There should be close association and a common fellowship, and no suggestion of superior philosophers descending from the clouds to dispense gifts to plebeian assemblies. Above all, it should be remembered that a cause must have a soul as well as a body. The function of a mission-hall is different from that of a cinema-house or other place of entertainment, and manifestations of the spirit of science are more uplifting than the most instructive descriptive lectures.

Science needs champions and advocates, in addition to actual makers of new knowledge and exponents of it. There are now more workers in scientific fields than at any other time, yet relatively less is done to create enthusiasm for their labor and regard for its results than was accomplished fifty years ago. Every social or religious movement passes through like stages, from that of fervent belief to formal ritual. In science specialization is essential for progress, but the price which has to be paid for it is loss of contact with the general body of knowledge. Concentration upon any particular subject tends to make people indifferent to the aims and work of others; for, while high magnifying powers enable minute details to be discerned, the field of vision is correspondingly narrowed, and the relation of the structure as a whole to pulsating life around it is unperceived.

As successful research is now necessarily limited for the most part to complex ideas and intricate details requiring special knowledge to comprehend them, very special aptitude is required to present it in such a way as will awaken the interest of people familiar only with the vocabulary of everyday life. In the scientific world the way to distinction is discovery, and not exposition, and rarely are the two faculties combined. Most investigators are so closely absorbed in their researches that they are indifferent as to whether people in general know anything of the results or not. In the strict sense of the word, science can never be popular, and its pure pursuit can never pay, but where one person will exercise his intelligence to understand the description of a new natural fact or principle a thousand are ready to admire the high purpose of a scientific quest and reverence the

disinterested service rendered by it to humanity. The record of discovery or description of progress is, therefore, only one function of a local scientific society; beyond this is the duty of using the light of science to reveal the dangers of ignorance in high as well as in low places. Though in most societies there is only a small nucleus of working members, the others are capable of being interested in results achieved, and a few may be so stimulated by them as to become just and worthy knights of science, ready to remove any dragons which stand in the way of human progress, and continually upholding the virtues of their mistress.

Every local scientific society should be a training ground for these Sir Galahads, and an outpost of the empire of knowledge. The community should look to it for protection from dangers within and without the settlement, and for assistance in pressing further forward into the surrounding woods of obscurity. At present it is unusual for this civic responsibility to be accepted by a scientific society, with the result that local movements are undertaken without the guidance necessary to make them successful. A local scientific society should be the natural body for the civic authority to consult before any action is taken in which scientific knowledge will be of service. It should be to the city or county in which it is situated what the Royal Society is to the State, and not a thing apart from public life and affairs. As an example of what a local society may usefully do, the action taken by the Manchester Field Naturalists' and Archæologists' Society several years ago may be mentioned. The Society appointed a Committee for the purpose of promoting the planting of trees and shrubs in Manchester and its immediate suburbs. The idea commended itself to the Corporation, and the Committee obtained advice as to the best trees for open spaces in the district, shrubs for tubs and boxes, and tree culture in towns generally. This is the kind of guidance which a scientific society should be particularly competent to give, and which the community has a right to expect from it. Many similar questions continually arise in which ascertained knowledge can be used for the promotion of healthy individual and social life, and if scientific societies are indifferent to them they neglect their best opportunities of playing a strong part in the scheme of human progress.

When wisdom is justified of her children, and local scientific societies are no longer esoteric circles, but effective groups of enlightened citizens of all classes, they will provide the touchstone by which fact is distinguished from assertion and promise from performance. As the sun draws into our system all substantial bodies which come within its sphere of influence, while the pressure of sunlight drives away the fine dust which would tend to obscure one body from another, so a local scientific society possesses the power of attracting within itself all people of weight in the region around it and of dispersing the mist and fog which commonly prevail in the social atmosphere. Thus may the forces of modern civilization, moral and material, be brought together, and an allied plan of campaign instituted against the armies of ignorance and sloth. The service is that of truth, the discipline that of scientific investigation, and the unifying aim human well-being. Kingsley long ago expressed the democratic basis upon which this fellowship is founded. "If," he said, "you want a ground of brotherhood with men, not merely in these islands, but in America, on the Continent—in a word, all over the world—such as rank, wealth, fashion, or other artificial arrangements of the world can not give and can not take away; if you want to feel yourself as good as any man in theory, because you are as good as any man in practice, except those who are better than you in the same line, which is open to any and every man, if you wish to have the inspiring and ennobling feeling of being a brother in a great freemasonry which owns no difference of rank, of creed, or of nationality—the only freemasonry, the only International League which is likely to make mankind (as we all hope they will be some day) one—then be-

come men of science. Join the freemasonry in which Hugh Miller, the poor Cromarty stonemason, in which Michael Faraday, the poor bookbinder's boy, became the companions and friends of the noblest and most learned on earth, looked up to by them not as equals merely, but as teachers and guides, because philosophers and discoverers."

When Kingsley delivered this message artisans were crowding in thousands to lectures in Manchester and other populous places by leaders in the scientific world of that time. Labor then welcomed science as its ally in the struggle for civil rights and spiritual liberty. That battle has been fought and won, and subjects in bitter dispute fifty years ago now repose in the limbo of forgotten things. There is no longer a conflict between religion and science, and labor can assert its claims in the market-place or council house without fear of repression. Science is likewise free to pursue its own researches and apply its own principles and methods within the realm of observable phenomena, and it does not desire to usurp the functions of faith in sacred dogmas to be perpetually retained and infallibly declared. The Royal Society of London was founded for the extension of *natural* knowledge in contra-distinction to the *supernatural,* and it is content to leave priests and philosophers to describe the world beyond the domain of observation and experiment. When, however, phenomena belonging to the natural world are made subjects of supernatural revelation or uncritical inquiry, science has the right to present an attitude of suspicion towards them. Its only interest in mysteries is to discover the natural meaning of them. It does not need messages from the spirit world to acquire a few elementary facts relating to the stellar universe, and it must ask for resistless evidence before observations contrary to all natural law are accepted as scientific truth. If there are circumstances in which matter may be divested of the property of mass, fairies may be photographed, lucky charms may determine physical events, magnetic people disturb compass needles, and so on, by all means let them be investigated, but the burden of proof is upon those who believe in them and every witness will be challenged at the bar of scientific opinion.

We do not want to go back to the days when absolute credulity was inculcated as a virtue and doubt punished as a crime. It is easy to find in works of uncritical observers of mediæval times most circumstantial accounts of all kinds of astonishing manifestations, but we are not compelled to accept the records as scientifically accurate and to provide natural explanations of them. We need not doubt the sincerity of the observer even when we decline to accept his testimony as scientific truth. The maxim that "Seeing is believing" may be sound enough doctrine for the majority of people, but it is insufficient as a principle of scientific inquiry. For thousands of years it led men to believe that the earth was the center of the universe, with the sun and other celestial bodies circling round it, and controlling the destiny of man, yet what seemed obvious was shown by Copernicus to be untrue. This was the beginning of the liberation of human life and intellect from the maze of puerile description and philosophic conception. Careful observation and crucial experiment later took the place of personal assertion and showed that events in Nature are determined by permanent law and are not subject to haphazard changes by supernatural agencies. When this position was gained by science, belief in astrology, necromancy, and sorcery of every kind began to decline, and men learned that they were masters of their own destinies. The late War is responsible for a recrudescence of these mediæval superstitions, but if natural science is true to the principles by which it has advanced it will continue to bring to bear upon them the piercing light by which civilized man was freed from their baleful consequences.

There is abundant need for the use of the intellectual enlightenment which science can supply to counteract the ever-present tendency of humanity to revert to primitive ideas. Fifty years of compulsory education are but

a moment in the history of man's development, and their influence is as nothing in comparison with instincts derived from our early ancestors and traditions of more recent times grafted upon them. So little is known of science that to most people old women's tales or the single testimony of a casual onlooker are as credible as the statements and conclusions of the most careful observers. Where exact knowledge exists, however, to place opinion by the side of fact is to blow a bubble into a flame. Within its own domain science is concerned not with belief—except as a subject of inquiry—but with evidence. It claims the right to test all things in order to be able to hold fast to that which is good. It declines to accept popular beliefs as to thunderbolts; living frogs and toads embedded in blocks of coal or other hard rock without an opening, though the rock was formed millions of years ago and all fossils found in it are crushed as flat as paper; the inheritance of microbic diseases; the production of rain by explosions when the air is far removed from its saturation point; the influence of the moon on the weather or of underground water upon a twig held by a dowser, and dozens of like fallacies, solely because when weighed in the balance they have been found wanting in scientific truth. Its only interest in mysteries is that of inquiring into them and finding a natural reason for them. Mystery is thus not destroyed by knowledge but removed to a higher plane.

Never let it be acknowledged that science destroys imagination, for the reverse is the truth. "The Gods are dead," said W. E. Henley.

> The world, a world of prose,
> Full-crammed with facts, in science swathed and sheeted,
> Nods in a stertorous after-dinner doze!
> Plangent and sad, in every wind that blows
> Who will may hear the sorry words repeated:—
> "The Gods are dead."

It is true that the old idols of wood and stone are gone, but far nobler conceptions conceptions have taken their place. The universe no longer consists of a few thousand lamps lit nightly by angel torches, but of millions of suns moving in the infinite azure, into which the mind of man is continually penetrating further. Astronomy shows that realms of celestial light exist where darkness was supposed to prevail, while scientific imagination enables obscure stars to be found which can never be brought within the sense of human vision, the invisible lattice work of crystals to be discerned, and the movements of constituent particles of atoms to be determined as accurately as those of planets around the sun. The greatest advances of science are made by the disciplined use of imagination; but in this field the picture conceived is always presented to Nature for approval or rejection, and her decision upon it is final. In contemporary art, literature, and drama imagination may be dead, but not in science, which can provide hundreds of arresting ideas awaiting beautiful expression by pen and pencil. It has been said that the purpose of poetry is not truth, but pleasure; yet, even if this definition be accepted, we submit that insight into the mysteries of Nature should exalt, rather than repress, the poetic spirit, and be used to enrich verse, as it was by some of the world's greatest poets—Lucretius, Dante, Milton, Goethe, Tennyson, and Browning. With one or two brilliant exceptions, popular writers of the present day are completely oblivious to the knowledge gained by scientific study, and unmoved by the message which science is alone able to give. Unbounded riches have been placed before them, yet they continue to rake the muck-heap of animal passions for themes of composition. Not by their works shall we become "children of light," but by the indomitable spirit of man ever straining upwards to reach the stars.

Where there is ignorance of natural laws all physical phenomena are referred to supernatural causes. Disease is accepted as Divine punishment to be met by prayer and fasting, or the act of a secret enemy in communion with evil spirits. Because of these beliefs thousands of innocent people were formerly burnt and tortured as witches and

sorcerers, while many thousands more paid in devastating pestilences the penalty which Nature inevitably exacts for crimes against her. In one sense it may be said that the human race gets the diseases it deserves; but the sins are those of ignorance and neglect of physical laws rather than against spiritual ordinances. Plague is not now explained by supposed iniquities of the Jews or conjunctions of particular planets, but by the presence of an organism conveyed by fleas from rats; malaria and yellow fever are conquered by destroying the breeding places of mosquitoes; typhus fever by getting rid of lice; typhoid by cleanliness; tuberculosis by improved housing; and most like diseases by following the teachings of science concerning them. Though the mind does undoubtedly influence the resistance of the body to invasion by microbes, it can not create the specific organism of any disease, and the responsibility of showing how to keep such germs under control, and prevent, therefore, the poverty and distress due to them, is a scientific rather than a spiritual duty.

The methods of science are pursued whenever observations are made critically, recorded faithfully, and tested rigidly, with the object of using conclusions based upon them as stepping-stones to further progress. They demand an impartial attitude towards evidence and fearless judgment upon it. These are the principles by which the foundations of science have been laid, and a noble structure of natural knowledge erected upon them. A scientific inquiry is understood to be one undertaken solely with the view of arriving at the truth, and this disinterested motive will always command public confidence. It is poles apart from the spirit in which social and political subjects are discussed: it is the rock against which waves of emotion and storms of rhetoric lash themselves in vain. If political science were guided by the same methods it would present an open mind to all sides of a question, weighing objections to proposals as justly as reasons in support of them, whereas usually it sees only the views of a particular class or party, and can not be trusted, therefore, to strike a judicial balance. The methods of science should be the methods applied to social problems if sound principles of progress are to be determined. When they are so used a statesman will be judged, as a scientific man is judged, by correct observation, just inference, and verified prediction; in their absence politics will remain stranded on the shifting sands of barter, concession, and expediency.

Democracy may be politically an irrational force, but that is all the more reason why those who direct it should have full knowledge of the possibilities offered by science for construction as well as for destruction. In a chemical research an experiment is not the haphazard mixture of substances made in the hope that something good will come from it, but the deliberate test of consequences which ought to follow if certain ideas are true. So with all scientific experiment: reason is the source of action, and principles are tested by results. Social problems are perhaps more complicated than those of the laboratory, yet the only way to discover solutions of them is to apply scientific standards to the methods used and results obtained. Laws of Nature are merely expressions of our knowledge at a particular epoch, and they are more precise than those of political economy because they are investigated purely from the point of view of progress. If the general laws which constitute the science of sociology are to be discovered and accepted, their study must be as impartial as that of any other science. "The discovery of exact laws," said W. K. Clifford, "has only one purpose—the guidance of conduct by means of them. The laws of political economy are as rigid as those of gravitation; wealth distributes itself as surely as water finds its level. But the use we have to make of the laws of gravitation is not to sit down and cry 'Kismet' to the flowing stream, but to construct irrigation works."

Organized Labor has on more than one occasion pronounced a benison upon scientific research, and urged that full facilities should be afforded to those who undertake it.

Not long ago the American Federation of Labor in convention assembled resolved 'that a broad programme of scientific and technical research is of major importance to the national welfare,' and in a noteworthy document insisted upon its essential value in the development of industries, increased production, and the general welfare of the workers. The British Labor Party has also stated that it places the 'advancement of science in the forefront of its political programme,' but its manifesto refers particularly to the 'undeveloped science of society' rather than to the science of material things; and whatever labor may declare officially, it is scarcely too much to say that artisans in general show less active interest in scientific knowledge now than they did fifty years ago. Not by the study of science does a manual worker become a leader among his fellows but by the discovery of wrongs to be remedied or rights to be established, and by fertility of resource in disputations concerning them. This is natural enough, yet when we remember that many of the greatest pioneers in the fields of pure and applied science were of humble origin it is surprising that labor makes no effort to keep men of this type within its lodges.

If trades unions were true to their title, and not merely wage unions, their members would give as much attention to papers on scientific principles of their industry, craftsmanship, and possible new developments as they do to the consideration of the uttermost they can claim and secure for their members. Not a single labor organization concerns itself with actual means of industrial progress, but only with the sharing of the profits from processes or machinery devised by others. Labor may express approval of scientific and technical research, but if it wishes to be a creative force it should take part in this work instead of limiting itself to getting the greatest possible advantage from the results. Under present conditions an artisan with original ideas or inventive genius has to go outside the circle of his union to describe his work, and he thus becomes separated from his fellows through no fault of his own. His contributions are judged by a scientific or technical society purely on their merit and without any consideration as to his social position. Labor can never be great until it affords like opportunities to its own original men by accepting and issuing papers upon discoveries of value to science and industry. When it does this, and its publications occupy an honored place among those of scientific and technical societies, it will be able to command a position in national polity which can never be justly conceded to any organization concerned solely with the rights and privileges of a single class in the community.

We know, of course, that few workmen can be expected to possess sufficient knowledge and originality to make developments important enough to be recorded in papers for the benefit of science or industry generally, but every such contribution published by a trade union or other labor organization, federated or otherwise, would do far more to command respect than sheaves of pamphlets upon economic aspects of industry from the point of view of workpeople. If no fundamental or suggestive papers of this kind are forthcoming, or if organized labor persists in its policy of letting its men of practical genius find elsewhere the people who know how to appreciate them, it is tacitly acknowledged that others are expected to provide the seeds of industrial developments while labor concerns itself solely with the distribution of the fruits derived from them.

It is true that some of the leaders of the labor movement realize that close association with progressive science is essential to the expansion of industry and the consequent provision of wages in the future. What is here urged is that labor should itself take part in the scientific and industrial research which it acknowledges is necessary for existence, and should show by its own contributions that it possesses the power to produce useful knowledge as well as the dexterity to apply it. The machinery of trade unionism is capable of much more extensive use than

that to which it has hitherto been put, and when it is concerned not only with securing "for the producers by hand or by brain the full fruits of their industry," but also with the creation of new plantations by its own efforts, no one will be able to doubt its fitness to exercise a controlling influence upon modern industry.

The Workers' Educational Association has proved that very many artisans are ready to take advantage of opportunities of becoming familiar with the noblest works of literature, science, and art, with the single motive of enriching their outlook upon life. Many more attend classes in economics, and nearly all are in favor of extended facilities for further education, though there is a difference of intention between the Marxian element in labor and the more impartial supporters of the W. E. A. or of the Co-operative Education Union. "There is practically no limit," says Mr. G. D. H. Cole in "An Introduction to Trade Unionism," "to what could be done if there only existed among the national and local leaders of Labor a clear idea of the part which education must play if the working-class is ever to achieve emancipation from the wage system." To education should be added original research if labor is to signify something more than a class of hewers of wood and drawers of water. The Guild movement represents a step in this direction, but if it signifies merely a return to the mediæval system it can scarcely be so important a factor of general development as its advocates imagine, and it may mean the institution of caste in labor. Such a system no doubt leads to perfection of craftsmanship, and it is to be welcomed as an antidote to the deadening influence of specialized industry; but a caste nation at last becomes stationary, for in each caste a habit of action and a type of mind are established which can only be changed with difficulty. What is wanted to make the race strong is cross-fertilization, and not inbreeding.

Local scientific societies should provide a common forum where workers with hand or brain can meet to consider new ideas and discuss judicially the significance of scientific discovery or applied device in relation to human progress. At present such societies are mostly out of touch with these practical aspects of knowledge, and are more interested in prehistoric pottery than in the living world around them. Most of those connected with the British Association are concerned with natural history, but all scientific societies in a district should form a federation to proclaim the message of knowledge from the house-tops. Men are ready to listen to the gospel of science and to believe in its power and its guidance, but its disciples disregard the appeal and are content to let others minister to the throbbing human heart. Civilization awaits the lead which science can give in the name of wisdom and truth and unprejudiced inquiry into all things visible and invisible, but the missionary spirit which would make men eager to declare this noble message to the world has yet to be created.

This is as true of the British Association itself as it is of local scientific societies. It seems to be forgotten that one of the functions of the Association is to inspire belief and confidence in science as the chief formative factor of modern life, and not only to display discoveries or enable specialists to discuss technical advances in segregated sections. Though members of the Association may be able to live on scientific bread alone, most of the community in any place of meeting need something more spiritual to awaken in them the admiration and belief which beget confidence and hope. They ask for a trumpet-call which will unite the forces of natural and social science, and are unmoved by the parade of trophies of scientific conquests displayed to them. It was the primary purpose of Canon W. V. Harcourt, the chief founder of this Association, and General Secretary from 1831 to 1837, to sound this note for "the stimulation of interest in science at the various places of meeting, and through it the provision of funds for carrying on research," and not for "the discussion of scientific subjects in the sections." In the course of time these sectional discussions have taken

a prominent place in the Association's programme, and rightly so, for they have promoted the advancement of science in many directions; but, while we recognize their value to scientific workers, we plead for something more for the great mass of people outside the section-rooms, for a statement of ideals and of service, of the strength of knowledge and of responsibility for its use. These are the subjects which will quicken the pulse of the community and convert those who hate and fear science and associate it solely with debasing aspects of modern civilization into fervent disciples of a new social faith upon which a lever made in the workshops of natural knowledge may be placed to move the world.

Richard Gregory

A NOTABLE MATHEMATICAL GIFT

As trustee of the Edward C. Hegeler Trust fund Mrs. Mary Hegeler Carus, of La Salle, Illinois, recently promised to make the Mathematical Association of America a yearly contribution of twelve hundred dollars for five years to be used for the publication of mathematical monographs under the auspices of this association. As is well known the publication of scientific literature has been much hampered in recent years by the greatly increased cost of publication. Hence this gift is especially timely and noteworthy.

The letter confirming this gift was addressed to Professor Slaught, of the University of Chicago, and includes the following significant statement:

> If at the end of five years this project shall have proved successful it is my intention to then give to the Association a permanent endowment fund, and I will so direct my legal representatives, which will yield at least twelve hundred dollars annually.

As the great success of the project seems practically assured in view of the wide and deep interest already manifested therein on the part of leading mathematicians the Mathematical Association of America seems to have good reasons for expecting a substantial permanent endowment to aid it in the futherance of its great cause of improving collegiate mathematics.

There are now three national mathematical organizations in America. The oldest of these is the American Mathematical Society, which was organized in 1888 as the New York Mathematical Society, but was reorganized about six years later under its present name. This Society devotes most of its energies to mathematical research, and, to further this cause, Professor L. L. Conant, who died in 1916, bequeathed to it ten thousand dollars, subject to Mrs. Conant's life interest, the income of which is to be offered once in five years as a prize for original work in pure mathematics.

The Mathematical Association of America was organized in 1915 with a view towards supplementing the work of the American Mathematical Society along the line of collegiate teaching. It has always collaborated with the Society holding joint meetings with it and having a large common membership. The gift announced above will make it possible to collaborate still more effectively in promoting the interests of advanced mathematics in this country. The National Council of Teachers of Mathematics, organized in 1920, is mainly devoted to the interests of the teaching of secondary mathematics and hence represents more distinctly a separate field, but it too has already begun to cooperate with the Mathematical Association of America.

The latter organization took steps several years ago towards the publication of a modern mathematical dictionary and has a standing committee on this subject. It has, however, not yet been able to push this laudable enterprise on account of lack of funds. The difficulty of such a work is increased by the fact that at present there exists no good mathematical dictionary in any language, and hence most of the material for such a work has to be collected from original sources.

G. A. Miller

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A NEW ALASKA BASE MAP

The U. S. Coast and Geodetic Survey of the Department of Commerce reports the completion of a new outline map of Alaska on the Lambert conformal conic projection,