vations. In 1766 another effort was made, resulting in the founding of The American Philosophical Society for the Promotion of Useful Knowledge, which is still active, and of which your own Thomas Jefferson was president from 1797 to 1815, a period of eighteen years.

The thought of a scientific body to aid the government was persistent. Washington again brought the idea to the front in his farewell address, when he said, "Promote, then, as an object of primary importance, institutions for the general diffusion of knowledge. In proportion as the structure of a government gives force to public opinions it should be enlightened." To carry his idea in part to fruition, he left in his will a bequest of $25,000 for the establishment, at the seat of government, of a national university; apparently to be primarily an institution to train men in all matters having to do with the structure of the nation. A broad interpretation of this conception of Washington has led some to believe that his thought was to make available at all times experts such as are now to be found in the membership of the National Academy of Sciences.

In 1806 in a letter to Joel Barlow (Ford Ed. VIII, 424) Jefferson advocated the affiliation of local societies with a central academy at the national capital to aid in the publication of information and to promote useful information.

Passing over a long period: the American Society of Geologists and Naturalists was founded in 1840, and in 1850 broadened its scope and became the American Association for the Advancement of Science. This body paved the way for the National Academy of Sciences, for it was at the second meeting of this body in 1851 that Alexander Dallas Bache pointed out the fact that "an institution of science, supplementary to existing ones, is much needed in our country, to guide public action in reference to scientific matters." He never lost sight of the idea, and twelve years later his efforts were finally crowned with success when, with the help of Benjamin Peirce, Louis Agassiz, Joseph Henry, Admiral Charles H. Davis and Benjamin Apthorp Gould and Senator Henry Wilson, an act was unanimously passed by Congress establishing the National Academy of Sciences.

JEFFERSONIAN "FREEDOM OF SPEECH" FROM THE STANDPOINT OF SCIENCE[1]

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IN a panel over the dais in the main hall of the National Academy of Sciences at Washington there are displayed portions of the text of Aeschylus's "Prometheus Bound," which recite Prometheus's gifts to man. Permit me to recall to your minds the setting of that drama and point out its relation to our theme.

To punish Prometheus for his audacity in carrying the gift of fire to men and thus bestowing on them the power of gods, two aides named Might and Violence, acting under the mandate of angry Zeus, rivet Prometheus's chains to a rock where, as the story runs, "the anguish of thy state shall gnaw thy heart forover. . . ." Hephaestus thought Zeus implacable and dared to say, "Harsh is every king whose power is new." In answer to the lamentations of the Chorus, Prometheus states his case. He found man "witless as a babe." Though they had eyes, men saw in vain; though they had ears, they heard not; they confounded all things; and they had their dwelling like the ant in subterranean caves, living without token of the winter's cold or "herald of the flowery spring." Prometheus revealed to them

. . . the obscure
Risings and settings of the stars of heaven.
Yea, and the art of number, arch-device,
I founded, and the craft of written words . . .
And none but I devised the mariner's car
On hempen wing roaming the trackless ocean.

. . . if a man fell sick,
There was no remedy, nor shredded herb
Nor draught to drink nor ointment . . . until I
Revealed the blends of gentle medicines
Wherewith they arm themselves against disease.

When he bestowed fire and the related arts on man, Prometheus at the same time "implanted in his heart blind hopes," because he pitied man; and for this he must endure the tortures of Zeus, albeit defiantly, with "barbed and bitter words." Appalled by his audacity the Chorus asks: "Hast thou no fear to hurl such menaces?" Prometheus replies, "What would I fear predestined not to die?" The Chorus admonishes: "Nay thou art bold . . . and too unbridled is thy tongue."

. . . new the rulers . . . throned above in heaven and
the laws of Zeus are new, framed for a harsh dominion.[1]

[1] Address at the dinner of the National Academy of Sciences, Charlottesville, Virginia, November 19, 1935.

[1] Quotations from Aeschylus, "The Prometheus

In this ancient story is dramatized the play of forces that have swirled about the mind and soul of man doubtless from the time that he emerged from those "dwelling like the ant in subterranean caves." Could he go forward in the development of the arts with a free mind or must every advance be paid for in torture, and every stroke of daring end in heavier shackles? The building of the National Academy of Sciences in which this theme is displayed for the benefit of the public is but twelve years old. In those twelve years new rulers have been throned in heaven, Zeus has proclaimed new laws, and men are asking on all sides if their intent is a harsh dominion. For the fire brought down from heaven has been placed in the hands of all men and some play with it among the powder barrels, others would apply it to the arts. Some would enchain the discoverers for their impudence, others dare to proclaim new discoveries that may lead man to yet higher fields of material and spiritual conquest.

The lines in the Academy building have a vital meaning even to-day. They are not a mere archaic description of man's release from the consequences of his own ignorance. Let us inquire as to the modern forms in which this unending drama is cast. I presume it was this general theme that your committee had in mind in asking me to say something on "freedom of speech" and on the philosophy of the founder of the University of Virginia in relation thereto. Permit me to inquire, in the mode of Aeschylus, who is Zeus to-day, who the Chorus and what new chains Might and Violence may be forging wherewith to restrain within the "wintry glen" him who dares to discover a new art or defend man's right to the free use of existing arts in the promotion of human welfare?

Shall we agree that only men who have the courage to be free deserve freedom? For to enjoy the gifts of Prometheus is to share in his risks and, it may be, in his penalties. Nowadays man exercises the power of the gods, attempts to rule himself, hurls the thunderbolt, devises new arts; but in doing so he forges also his own chains and can cry neither in agony or menace to a Zeus. Once possessed of fire, magic melted away and to-night there is none of it left anywhere, at least in these United States, except perhaps in that city on the Potomac named ironically after a man who began life as a surveyor trained in the use of instruments of precision!

Jefferson's philosophy is not summed up in a sweeping declaration that we may quote as a rule of life to-day. We all know that he had what we should now call a scientific mind. His writings show clearly that he saw both the dangers that lurk in, and the liberties that spring out of, the exercise of freedom of speech and that he foresaw almost prophetically what these dangers and liberties meant of progress or retrogression in the future of the American people. His arguments are as nicely balanced as if he spoke not before but after the event. He held that freedom of the press is one of the essentials of representative government and "the school in which [men] might begin to learn the exercise of civic duties as well as rights." Though he had made the Declaration of Independence say that all men are born free and equal, he later pointed out that some people are still children and "should not be granted at once the full enjoyment of their natural rights."[2] While he thought self-government an established fact in the United States, he also thought it should remain for other peoples a reward to be obtained after a long and painful process of education. Disastrous experiment and much suffering he saw associated with the effort of some peoples to reach a point in their political evolution where they could enjoy the blessings that he considered already won for the American people.

To Jefferson the people have the government that they deserve and, if they seek improvements, these can come only through improvement of the moral qualities of every citizen—from within and not from without.

> . . . he had warned [his friends] against inflation, he opposed the formation of societies which might become so strong as "to obstruct the operation of the government and undertake to regulate the foreign, fiscal, and military as well as domestic affairs." This might be taken already as a warning against lobbying. He was fully aware that a time might come when the speeches of the Senators and Representatives "would cease to be read at all" and when the Legislature would not enjoy the full confidence of the people. He deplored the law vacating nearly all the offices of government every four years, for "it will keep in constant excitement all the hungry cormorants for office, render them as well as those in place sycophants to their Senators, engage in eternal intrigue to turn out and put in another, in cabale to swap work, and make of them what all executive directories become, mere sinks of corruption and faction."[3]

Freedom of speech Jefferson saw as a form of freedom necessarily connected with enlightenment: popular education thus becomes a necessity in a democracy. America had innate good sense, thought Jefferson, because the people had always been free. It was to that good sense that he turned for comfort under the attacks of his enemies, to which he was peculiarly

Bound," translation by George Thomson, 1932, Cambridge University Press.

[2] Quotation from Professor Gilbert Chinard, in "Thomas Jefferson, the Apostle of Americanism," 1929, page 501. Other quotations from Jefferson in this paper are from the same source.

[3] Chinard, 502.

sensitive. He strongly believed that sooner or later public opinion would do him justice and trusted that in spite of temporary errors the people, if properly educated, would distinguish between truth and falsity. This was the creed of a political philosopher, of a practical idealist, and also to some extent the creed of a gentleman. In his Revision of the Laws of Virginia, in 1779, Jefferson wrote: " . . . truth is . . . the proper and sufficient antagonist to error, and has nothing to fear from the conflict unless by human interposition disarmed of her natural weapons, free argument and debate; errors ceasing to be dangerous when it is permitted freely to contradict them."

He regretted that the Constitution, as originally adopted, did not recognize formally the freedom of the press.[4] He looked upon the press as an engine of power and held that "every man must lay his purse and his pen under contribution" in order that the public might become better informed. He opposed the monarchizing of the Constitution. Said he: "I am for a government rigorously frugal and simple, applying all the possible savings of the public revenue to the discharge of the national debt; and not for a multiplication of officers and salaries merely to make partisans." He stood for "freedom of the press, and against all violations of the Constitution to silence by force and not by reason the complaints of criticism, just or unjust, of our citizens against the conduct of their agents. And I am for encouraging the progress of science in all its branches; and not for raising a hue and cry against the sacred name of philosophy."

His reference to science was not merely a passing gesture. He predicted in that field limitless discoveries and coupled "freedom and science" as conditions of progress, having "sworn upon the altar of God eternal hostility against every form of tyranny over the mind of man." The matter was one that drew forth his most intense feelings, for he believed the American people endowed with superior wisdom, strength and opportunities.

We recall these convictions and sentiments of Thomas Jefferson, not because he was an infallible guide nor because he had the wisdom to extol freedom of thought and expression, but rather because time has proved that he was one of the great thinkers in the troubled beginnings of this nation when science was but an infant and a whole people needed guidance in the enjoyment of liberties newly won. It has been said that great causes have a "fearful frailty." Wise indeed are the far-seeing men who recognize both that greatness and that frailty and spend their strength accordingly. We recall his words at this time also because he was the founder of this university at which we have met, an institution that would not be in the university tradition if it had started its work blind to the scientific possibilities of that day or restricted by small-minded considerations. The edifice that he began men are still building, with little change in design, for many of the truths that he expounded are eternally true. Finally we recall his words, his advice and his point of view at this place and time, because the demon of intolerance is once more raising its head.

If you have thought that the cry of freedom that has been raised by scientific men and institutions is but a minor issue of the times, I venture to say that you will not long be so persuaded. That high-sounding phrase, "the oath of allegiance," is but the forerunner of other seductive phrases that represent an assault on freedom and the debasement of democratic idealism in the very terms of the charter of democracy. Confident of their strength, forces are gathering to push still further the intolerance against which Jefferson warned the people of his day. A victory for intolerance is but the signal for a fresh assault. The assault is upon one of our principles of which we should be proudest: essential freedom within the framework of public good. In 1934 I visited a number of Central European cities and in one of them strolled under an archway in a public building. Suddenly I was confronted by an armed guard and peremptorily told to take off my hat. When I inquired why I should do so, I was told that I had come within a certain statutory distance of the tomb of the Unknown Soldier, which happened to be still invisible to me from where I stood. Back and forth strode the soldier accosting people in the roughest terms and standing by to see to it that they uncovered at his command to do "honor" (God save the mark!) to the Unknown Soldier.

What a contrast is presented in London where streaming crowds pass all day the Cenotaph that stands in the midst of Whitehall. Perhaps 40 per cent. of those who pass uncover their heads and glance toward that beautiful symbol of British sacrifice. No one stops to ask of the other 60 per cent. why they pass by with apparent unconcern. In that country they deem it no man's business to ask. Perhaps the passerby has already saluted the Cenotaph a half dozen times that day. Perhaps it is the first time that he has failed to salute it in a month. Whatever the reason, no one thinks of questioning the other man's performance and no armed guard stands by. In such a people the salutations to the Unknown Soldier are from the heart. Each salute is counted an honor and a tribute, not mere reluctant obedience to a rude command.

Jefferson lived in another economy and although troubled by falsehood he could not see or foresee the

[4] In a letter to Colonel Humphreys dated 1789.

varied forms of mendacity of this complex day. The weaknesses of democracy only temporarily dimmed his bright dream of its vast possibilities if it but maintained its hold on reason and cultivated a scientific attitude of mind. How far has science really affected the public mind in matters requiring experimentation, objectivity and truth wrung from slowly accumulated facts? We are willing to concede the power of an individual to approach closely to the ideal in these respects, though when the inquiry concerns the behavior of man we sometimes hear even eminent scientists expressing opinions upon social and economic questions with the abandon and positiveness of the multitude. While Jefferson thought that the people are right in most cases he also thought them weak in that they were apt to be swayed by temporary interests and considerations and to express their lack of stability in contradictory laws. To remedy this he proposed a twelvemonth interval between the engrossing of a bill and the passing of it, or its passage in shorter time only by a two thirds vote of both houses.

We do not return to the words and wisdom of the men of an earlier day for exact or detailed guidance but for principle and for confirmation of judgment. A part of that wisdom consists in judging the times aright, in foresight and in the adaptation of the means at hand to high ends. We live not in former times but in *these* times. The current is swifter and broader now and the cross-currents are more complex. In common with the men of those times we have need, now greater than ever, for science as a mode of approach to current social problems and not as science only. Perhaps some day we shall have a meeting of the Academy to give consideration to the relation of science to the public and of ourselves in relation to society. Eventually we might even attempt at least a rough chart of certain shoals and rocks and false lights.

It was the combination of the practical and the ideal that gave an individual stamp to the thought and practice of Jefferson. This gives great weight to-day to many of his observations on the perils to principle in a democracy. What he said of the new South American republics he had said and thought of that United States that seemed to him to be destined for the high-road of liberty: they must become "trained by education and habits of freedom to walk safely by themselves"; and freedom of the press he named as one of the five essentials of free government. Knowledge in the general mass of the people, security of person and property—these are the antecedents of a capacity to estimate the value of freedom. If only a "liberty" of sorts takes root among an unprepared people, it may be tyranny still "of the many, the few, or the one."

Fire and light came to men not by one gift in a moment of time. It came and still comes into the minds and the experiences of men in an unending stream. Prometheus is a symbol of an eternal creative process. Might and Violence—the two strong-arm men who, with the aid of the implements of Hephaestus and at the command of Zeus, chained Prometheus to the rock—they too are eternal. Every man who puts fire and light into the hands of men puts also beside them a wrath and a violence, a gift and its penalty. The legislative bodies of more than a score of states have passed, or have had presented to them, bills requiring, in what Prometheus called the "craft of written words," an oath of allegiance from teachers or students or both. The flag salute controversy follows naturally. An armed soldier to tell you when to take off your hat will follow just as naturally. This is the antithesis of that "habit of freedom" which Jefferson extolled. It is the coercion of a people by fanatics, the tyranny of "the few" that Jefferson feared, the wrath of Zeus against any who would school "the race of men in every art" including the art of freedom.

In the Pythagorean mythology the primeval monsters were cleared away by Heracles, and wisdom in the person of Athena perfected the destinies of men. These are the parts of the play now in progress. For the slaying of the monsters every man is equipped with a spear called speech whose shaft is any agency that disseminates useful knowledge; and to the perfecting of our destiny we can bring united wisdom through consultation and unflinching devotion to the ideals that should animate science with respect to responsibility for public enlightenment. To-day the threat to freedom in scientific inquiry takes on a new guise. Government has taken advantage of our perilous need to give direction to the education of youth through the expenditure of public funds administered by men who are but sounding boards for political leaders. These men are not being trained as interpreters of science. Politics is training them. Let this menacing movement grow and the scientific approach is gone and scientific ideals will be not merely weakened but lost. Cast these ideals aside and lose the power to maintain our freedom through reason and the last devotee of science will be an epigrapher bending over slabs of stone and interpreting the ruins of what was once a temple of science known as the National Academy. At length he makes out a word which he pronounces "grandeur," a part of Aristotle's lines on truth that now greets the visitor as he looks upward at the frieze of that noble façade. Reflecting on the meaning of "grandeur" and on the vanity of men he will be led at length to inquire how that high enterprise of the Academicians was lost after so fair a beginning.