GOETHE'S ATTITUDE TO SCIENCE.¹

By BARKER FAIRLEY, M.A., Ph.D.

PROFESSOR OF GERMAN LANGUAGE AND LITERATURE IN THE UNIVERSITY OF MANCHESTER.

My excuse for touching on an aspect of Goethe that I am not competent to deal with fully must be this, that in reading slowly through Goethe's works as a literary student I found to my surprise that it was the scientific writings—or, at least, those portions of the scientific writings that were less technical and more within reach of the lay mind—that threw the clearest light on him and made him most intelligible as a creative mind, as a poet.

There is this also to be said in extenuation of my rashness that the side of him which these scientific writings presents is one that English criticism has never really faced. Either Goethe has been considered as a moralist—this was Carlyle's and Matthew Arnold's position—or as a literary figure—this is the prevailing Germanists' position. Save for a chapter in Goethe and Faust by Melian Stawell and C. Lowes Dickinson, 1928, and a more recent essay on "Goethe's Phenomenological Method" by Fritz Heinemann in Philosophy, January, 1934, there is little in English criticism to direct the reader of Goethe to this approach to him.

Goethe's mind was dominated from first to last—from the time of his emotional awakening in Strassburg at the age of 21 or 22 to his death—by certain beliefs about nature. What he meant by nature is not immediately clear, and to assume that what he meant was what men meant who used the same term earlier or later is to beg the question, if not to queer it altogether. But it will be clear from that early piece of aphoristic prose, "Fragment über die Natur," which appeared in the Tiefurter Journal of 1782

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or 1783 and which is always ascribed to Goethe, though it is probably Goethe only at second hand, that he meant something deeper and more pervasive than we mean when we look out of the window and see a tree and say: "This is nature" and then at ourselves and say: "This is not." For he says here:

Nature! We are surrounded by it, enveloped in it—incapable of stepping out of nature, incapable of getting further into it... Even what is most unnatural is nature, if you can't see nature everywhere, you never see nature right... She is always setting out on the longest of journeys and she is always at her goal... It is not I who have spoken here of nature. No, whatever is true and whatever is false, she has said it. The credit for everything is hers and the blame for everything.

This is a little piece of writing—only three pages long—that is not nearly as well known as it ought to be. It may not clear our minds about the problem—Goethe himself said of it afterwards that it merely showed a stage in his development and lacked some of his final thought—but it indicates the depth of the problem and it can serve us, as it probably served Goethe, coming as it did at the beginning of his more reflective years, as a sort of spring-board from which to leap off into the philosophical element. Immature the fragment may be, but it thrusts the mind into a region where poetry, philosophy, science seem to meet and merge—the region that he spent most of his time investigating and that all must investigate with him, if they wish to get hold of him.

Some three years later we find him developing his position in a little "Philosophische Studie" (Jub. Ausg. XXXIX. 6)—a bare succession of notes and jottings—in which he—perhaps for the first time—begins to use the terms which he was to go on using for the rest of his days. Spinoza, whom he was dipping into at the time, may have helped him to them. They are simple terms and not new, and others have used them before and since, though none, I suspect, quite in his way or with quite the weight of significance that he was able to give them. For Goethe everything now begins to turn on those two simple terms—the whole and the parts—das Ganze und die Teile.

He begins now to realise that when he sees clearly or deeply into what he calls nature he is seeing something which lives as a
whole and not as a series of parts or as the sum of its parts. It is a simple thought which every one can share and does share, and none the worse for that. If we build a house of cards or bricks it may not be easy to see any deep or helpful significance in the total result that is not conveyed by the single card or the single brick that constitutes the part or by the mere addition of cards and bricks, whereas if we see a flower growing we feel at once that while it is in our power to see the thing in parts—root, stem, leaf, etc.—the whole growing thing affects us in a single and scarcely definable way which the parts taken separately could not do, or, to put it more accurately, could only do if we had seen or anticipated the whole and had the sense of the whole, the living thing, fixed in our minds. Without that sense of the whole, the part or the sum of the parts would be meaningless, misleading, or in the best case inadequate.

Goethe would not have gone the length of saying that the house of cards was not nature. What he could not include he at least refrained from excluding, in the hope, it may be, of including it later; the line between the organic and the inorganic was a line that he hesitated to draw sharply, as will be apparent in that little discussion he had with his friend Knebel about the significance of frost-leaves on the window-pane. But he would certainly have held that nature was less accessible here and would have turned to the growing plant as to something that enabled him to see nature more truly and deeply and communicated to him that sense of the whole which more and more became the key to all that was of real value to him.

In this spirit he says in the little essay: “In every living thing what we call the parts are so inseparable from the whole that they can only be understood in the whole and we can neither make the parts the measure of the whole nor the whole the measure of the parts.” And having thus stated that every living thing has something unmeasurable in it he goes on to say that, however limited it is, as compared with the universe, which includes everything, it partakes of the universe or of the infinite and has something infinite in it. Tennyson, writing at a time when the English mind was willing to learn from Goethe—it has ceased to do so now—put the idea into simple poetry in his lines on the “flower in the crannied wall”.
Goethe too was often content to leave his thoughts in this less explicit and poetic form, but here for once he formulates one of his beliefs—to my mind his fundamental belief—in the clearest way. He says: “When the impression things make on us springs from their complete existence we call it true and when this existence is limited in such a way that we can easily grasp it and when it stands in such a relation to our nature that we enjoy grasping it we call it beautiful”.

All this from the little essay of 1784-85. To realise how important this sense of the organic whole was for him we have only to remember those oft-quoted words—seldom rightly understood—about living resolutely in the whole, the good, and the beautiful:

Uns vom Halben zu entwöhnen
Und im Ganzen, Guten, Schönen,
Resolut zu leben,

where it is certain that the word “whole”—the key-word, the word which gives meaning to all the rest—is the very word that most readers and listeners slide over or ignore, whereas for the author himself, who wrote “When the impression things make on us springs from their complete existence”—their wholeness, their Ganzheit—“we call it true,” the words must have been strenuous and quite radical in meaning.

Again, think of the words he used to describe the full effect on him of seeing Rome with his eyes—the whole living thing—after seeing it partially, in imagination, in books, in engravings, for years and years. He says: “I can assure you that it is the beginning of a new life when you see with your eyes the whole thing that you know in its parts inside and out. . . . When Pygmalion’s Elise, whom he had shaped as he wished and to whom he had given as much truth and reality as the artist can, finally came up to him and said ‘Here I am,’ (XXVI. 143-4), how different was the living person from the sculptured stone,” thinking obviously of the living whole and the less living parts. How more tellingly could he at this crucial moment of his life have voiced his overpowering conviction that the sense of the living whole transcending the parts was more important than anything else. And it is interesting to see how his deepest
thought works through into what seems to be his most trivial thought by looking at that poem "Amor als Landschaftsmaler," written at the time of his visit to Italy, where this Pygmalion theme is used again and serves to connect the frivolous with the profound. From a playful, almost naughty love-poem we can work our way back to his deepest philosophy.

Remember also how his closer acquaintance with Schiller began. This was another of his life's crucial moments. He was older now, getting on for fifty, and for one reason or another he had been holding Schiller at arm's length for many years, chiefly, he tells us, because he felt that they were incompatible in outlook and best kept apart. But there was a scientific society in Jena which Goethe usually attended and on one occasion Schiller attended it too and, more than that, the two chanced to leave the meeting together, Goethe, one suspects, having got up and left early because he had heard too many things he didn't like, and Schiller, one suspects again, having engineered this little encounter by slipping away immediately after him. They began to talk about the meeting and Schiller ventured the opinion that this piecemeal way of treating nature which satisfied the Jena professors seemed very unattractive to the layman—"eine so zerstückelte Art, die Natur zu betrachten". He was referring no doubt to the common condition of science in which scientists then, as now, are content to investigate in their respective fields of geology, botany, and what not, without any controlling point of view or co-ordination with others. This was said after Goethe's own heart and he replied that perhaps even the scientists didn't like it and that there must be some other way of presenting nature, not in isolated parts but as a living active thing, working from the whole to the parts—"nicht gesondert und vereinzelt ... sondern ... wirkend und lebendig, aus dem Ganzen in die Teile strebend". This began a discussion which drew Goethe into Schiller's house and kept him there some time. They got into deep waters and did not agree. But here was the beginning of their famous literary friendship—not in a discussion about poetry, but in a discussion about science and the fundamentals of science and Goethe's deep-seated conviction, which Schiller happened to touch on, about the whole and the parts.
Goethe's divergence from the scientific conceptions that prevailed in his day and have, broadly speaking, prevailed since, must be examined in the light of this conviction. Believing as he did that the truth lay solely in the apprehension of nature in its wholeness, he was compelled to reject any findings about nature that were made in disregard of this. The famous example is his quarrel with Newton's theory about the nature of white light. Newton thought, and to the satisfaction of every one except Goethe and a few unorthodox folk like Coleridge and Schopenhauer he proved, that white light was composed of the spectral colours. Goethe objected and devoted years of his life—futile years in the learned opinion—to supporting his objection. First, he argued, how can a theory of nature be right or a truth about nature be sustained on observations so slender and so partial. "The best is and always will be," he writes, "to see a phenomenon of nature, which offers itself to us in different aspects, in its fullness and totality"—"ein Naturphänomen, das uns verschiedene Seiten bietet, in seiner ganzen Totalität zu erkennen". Newton’s procedure, he claimed, was indefensible; he used only three experiments in order to bring out a deep and secret property of nature. And in an earlier essay on experimenting—"Der Versuch als Vermittler von Objekt und Subjekt" (XXXIX. 15), he explains himself clearly. He says: "We cannot be careful enough in avoiding hasty inferences from experiments, for at the point where we proceed from an experience to a judgment, from knowledge to the application of knowledge, all our inner enemies lie in wait for us as in a mountain pass: imaginativeness, impatience, jumping to conclusions, self-satisfaction, rigidity of mind, formal thinking, preconceived opinions, taking things easy, frivolity, fickleness, and all the rest—they all lie in ambush and fall equally upon the practical man of affairs and the quiet observer who thinks he is protected from all the passions. As a warning against this danger, which is greater and nearer to us than we realise, I am tempted to make a paradox and affirm that one experiment or several experiments together prove nothing and that nothing is more dangerous than to try to prove any statement directly by experiments and that the greatest of errors have arisen in this way. . . . Every experience we have, every experi-
ment which enables us to repeat the experience, is really an isolated piece of knowledge. . . . In living nature nothing happens except what is connected with the whole and if our experiences seem isolated to us, and if we are compelled to see our experiments as isolated facts, this does not mean that they are isolated; the question is, how are we to find the connection. . . . Since everything in nature, especially the more general forces and elements, are in constant action and reaction we can say of any phenomenon that it is connected with countless others, just as we can say of a shining point of light that it radiates in every direction. So that if we have made an experiment or an experience we must as carefully as possible examine all that is immediately adjacent to it, all that comes immediately after it. This is more important than anything that can be made to relate to it "— he means, theoretically, arbitrarily. Here again his mind, as always, is running on his sense of the whole. Out of the partial experiment he wishes to make a whole experiment.

Science, so pursued and conducted, would be so different from the science we know that we should almost need a different name for it. It would not be permitted to the physicist to make pronouncements about light and colour without first collaborating with all other observers and scientists who had anything to contribute—chemists, botanists, artists, psychologists, perhaps even mere watchers of sunsets. Experimenting would be so multiplied; inference, discovery, invention so retarded, that our recent century of progress would have been impossible. If Goethe's spirit had prevailed we should scarcely have our wireless, our films, our aeroplanes, etc.; at most we might have a few tentative observations which would have had the merit, if merit it is, of being compatible with Goethe's sense of the whole and the wholeness which we apprehend in the universe about us.

But there is another aspect to consider. This continual reference to the living whole which Goethe bids us make cannot become an instrument in the usual laboratory sense. We cannot make litmus paper or a thermometer of it and mechanically test the validity of things with it. Only in so far as we translate it from physical, empirical terms into mental and spiritual and possess it in the mind as a sort of ideal or human test, almost a
character test, can we make use of it. In this way the personality of the scientist is deeply involved in the scientific practice. For the orthodox scientist this would be to introduce a capricious or subjective element—the very thing that science prides itself on avoiding. For Goethe it had the opposite value. “Man in himself,” he says, “using his healthy senses, is the greatest and most accurate physical apparatus possible; it is the great misfortune of modern physics that it has, as it were, separated experiments from man and tried to study nature merely with the help of artificial instruments and even tried to restrict nature’s performance in this way,”—a passage which forcibly reminds us of Faust’s words about nature refusing to yield up her secrets when we put her on the rack:

Geheimnisvoll am lichten Tag
Lässt sich Natur des Schleiers nicht berauben;
Und was sie deinem Geist nicht offenbaren mag,
Das zwingst du ihr nicht ab mit Hebeln und mit Schrauben.

Goethe goes to great lengths in stressing the human side of the scientific process, saying in one place that the dilettante has much to contribute to science and elsewhere that a mathematician—of all people—is only perfect in so far as he is a perfect man.

These are extreme statements, but putting the idea behind them into practice, Goethe insists that the sense of the whole and the parts, as he understands it—something that it takes much more than the intellectual man to feel—must always be brought to bear as a personal consideration in all scientific issues. Thus his belief in this ruling idea, which was for him all of a piece with the integrity of his character, led him to reject Newton outright and to insist that white light, the whole light, could not be the product or the sum of its coloured parts, but that it must be primary and fundamental—in accordance with his and perhaps with our instinctive feeling—and the coloured parts merely accidents of it. In thus insisting, his personality, even his religious impulses, his spiritual sense of light and dark, were at stake and he trusted them utterly. And the point for us to-day is not so much that he was wrong as that his notion of scientific proof was one thing and Newton’s notion of it another, Newton believing with all orthodox scientists in the objective validity of
manipulations and calculations which a part of ourselves—the
department that scientists use in laboratories—conducts with a part or
an aspect of the natural world, Goethe believing that this sort of
objectivity was a spurious and misleading one and accepting only
that other and for him deeper objectivity in which his sense of
the whole, which it took all his being, emotional as well as in-
tellectual, to sustain, squared itself somehow with his sense of the
whole of nature. His rich experience and his infinitely pain-
staking observation of colour and light in the outer world made
him distrust, instinctively distrust, Newton's conclusions and
made him counter them with others that accorded with his own
wisdom.

It so happens that this controversy with the Newtonian theory
is almost universally held to show Goethe to his least advantage
as a scientist. If it had been my purpose to vindicate him before
the bar of orthodox scientific theory it would have been more
profitable to examine discoveries and hypotheses of his which
have met with more approval and assured him a minor but
definite place in the history of science. There is, for example,
his first notable discovery, that of the intermaxillary bone in
the human skeleton which, we read, supplied a disputed link
between man and the lower animals; or his theory of the leaf-
origin of all plant forms which was also found valuable and
suggestive. But it is not here, where he may have been right for
others, that the value of his scientific pre-occupations lies. Their
value lies in the philosophical point of view, the attitude to science,
which he preserved throughout. It is in the Newtonian con-
trovery, where from the enemy's point of view he is most vulner-
able, that his attitude comes out clearest and strongest. And it
is likely enough that many who approach this optical part of
Goethe's writing as a literary curiosity will end by finding that
their established notions of scientific demonstration, objectivity,
truth will be seriously challenged.

The premises of nineteenth-century science which still
dominate the mind of average humanity require a definite philo-
sophy, a definite metaphysic, a definite working hypothesis about
reality, obscured by its own matter-of-fact-ness but not less defi-
nite for that. Without a working acceptance of the independent
reality of matter and the operation in matter of cause and effect independently of our minds and powers of apprehension the scientist of the nineteenth century would scarcely have been able to move a finger. Yet this working acceptance remains a hypothesis for any philosophical mind and a hypothesis too of doubtful practical value. For if, on the one hand, the ruthless belief in it has given man amazing new resources of a mechanical kind it has also robbed him of his oneness with things, his sense of integration with the common world, so that when he rides in an aeroplane he is compelled to subscribe to one philosophy and when he sees the sun rise he instinctively subscribes to another.

What makes Goethe's point of view so interesting in this chaotic time is that it puts forward and practises a way of science in which, whatever happened or failed to happen, that integration with the universe would have been preserved; the gap between religion and science, between matter and humanity, would never have occurred. There is no short-cut to what Goethe meant or to what this meant to Goethe, because he lacked the short-cut himself and was content to feel his way from year to year and from decade to decade. Those who study him learn to follow him in this. But there is no dull pursuit about it, as the following random extracts will show:

"A man only knows himself in so far as he knows the outer world. He only knows the outer world in himself and himself in the outer world. Every new object in the outer world, properly regarded, sets up a new organ in ourselves."

"A phenomenon, an experiment proves nothing. It is a link in a great chain that only holds good in its connection. A man who covered up a pearl necklace and wanted to show his best single pearl and expected us to believe that all the others were like that would not do much business."

"Those theoretical people who are committed to any single direction of outlook have lost their innocence and objects are no longer seen by them in their natural purity."

"Mathematicians are a kind of Frenchmen. If you say anything to them, they translate it into their language and then it is something quite different."

"Aristotle saw nature better than any modern man, but he was too quick with his opinions. You have to deal slowly and casually with nature if you want to get anything out of her."

"The false has this advantage, that you can always chatter about it; the true must be made use of at once or it isn't there."

"What is the general? The single case. What is the particular? A million cases."
"If the eye did not partake of the sun's nature, it could not see the sun. If the divine power were not in us, how should the divine delight us?"

"Wär nicht das Auge sonnenhaft,
Die Sonne könnt' es nie erblicken.
Läg' nicht in uns des Gottes eigne Kraft,
Wie sollt' uns Göttliches entzücken?"

These last two extracts take us over from prose to verse, namely at the point where in all Goethe the transition is easiest, from the prose maxims and reflections scattered through his scientific writings to the verse epigrams that poured out of him as he got older and possibly represent the ultimate kind of poetry, the only poetry, that he might have gone on writing if he had lived indefinitely.

But even without this easy inducement the transition would have to be made. It has not always been clear to Goethe's critics that his poetic and his scientific activities were in any intimate relationship. Professor J. G. Robertson was chiefly conscious of an incompatibility and felt that Goethe would have gained as a poet by the neglect of optics and suchlike. But Goethe would scarcely have agreed with this. He seldom peered into the background of his own mind, and left much unsaid about the deepest things. Nowhere to my knowledge has Goethe spoken at length about the relation of poetry and science in his inner mind, but in the second part of Faust he develops the idea in a very original way—in the figure of the Homunculus whom he introduces into his Classical adventure. Faust, you will remember, goes to the Classical underworld in search of Helena, who embodies the Greek ideal of life and represents the highest ideal of that life in art and above all in poetry. In this quest he is accompanied not only by his indispensable companion, Mephistopheles, who is not at home here and wonders what it is all about, but also by a synthetic mannikin in a glass bottle whom Professor Wagner, Faust's former pupil, has produced by a process of crystallisation in his laboratory. The homunculus feels that science has done badly by him and that there must be some better way of getting born than this. He consults the early philosopher-scientists—Thales and Anaxagoras—and decides finally to spill himself into the ocean and begin again properly with nature and natural
growth. The ocean-goddess, Galatea, is passing by in a sea-procession; old Proteus, in the form of a dolphin, takes the homunculus on his back and rides him out to her and lets him break his little bottle on her vessel. The poem needs a sympathetic reader at such points; it is easy, with Mephistopheles, to be mystified. Yet much must be clear. The homunculus represents the highest achievement of science, but there is something wrong with him; and in order to correct what is wrong he has to go to the same source in nature as Faust in his search for Helena. Both are seeking the right way of life, the one in terms of a scientific problem, the other in terms of a poetic ideal, and both go to the same place to find it. If Goethe had felt an incompatibility between his scientific and his poetic self he would scarcely have been able to write this original bit of poetry, so playful and so profound.

For Goethe, we see, science and poetry were closely connected, and every now and then in his prose writings we come upon some corroboration of this. Thus he says in one place, "No one would admit that science and poetry were reconcilable. They forgot that science developed out of poetry; they did not consider that in the revolution of time the two might meet again at a higher point, to the advantage of both." This one quotation is enough, but there is another that goes even further, "We are compelled to think of science as an art, if we expect any sort of totality from it."

Here we are back at the notion of the whole and the parts again, but seen this time not from the side of science but from the side of the arts. Art, Goethe implies here, expresses a wholeness of experience; the ideal in his conception of science proves to be an artistic ideal. An ideal, then, of poetry, of Goethe's poetry. And turning to Goethe's poetry it is surprising to discover how peculiarly this ideal fits it.

One cannot read this poetry for long without feeling that it has a psychology of its own, that it works out one of the kinds of poetry fully and for the first time. The routine processes of poetry that enable a poet to "command" his poetry seem quickly to have failed him. As a young man in his early twenties he wrote the most popular play of his day—Götz von Berlichingen—
and the most popular novel—*Werther*; and if he had been a poet of the sort we regard as typical he would have taken his cue from one or other of these two successes and written a business-like series of plays or novels. Critics have not been wanting—there are critics even to-day—who see and judge Goethe in such a light and hold that it was in his power to do this, and that if circumstances had been otherwise, if his interests had been less diverse, if he had had a simpler creative purpose, he would have settled down to the profession of poetry and made a different job of it. They point to his jungle of plans, fragments, delays, incompletenesses, and deplore it.

To my mind they are quite wrong and their view of Goethe quite misleading. I think we can satisfy ourselves that the instinct in his poetic mind which made him so slow to finish and kept *Iphigenie* and *Tasso* on the stocks for ten years or so and *Wilhelm Meister* for much longer and *Faust* for nearly six times as long was all of a piece with the slowness to finish which he so strongly urged upon scientists. Indeed, Goethe practically says as much in his note on Dr. Heinroth in 1823, “*Bedeutende Fördernis durch ein einziges geistreiches Wort*” (XXXIX. 48). Just as he wished the scientist to avoid all intellectual short-cuts to discovery and to wait and watch till the truth forced itself on him from all sides at once, so in poetry he found himself, after his first sudden and spontaneous creations, unwilling—increasingly unwilling—to take imaginative short-cuts or to empty himself of a poem until the fullness of experience drew it from him as if by no choice of his own. It would be excessive to claim that there was this check on his poetry at every turn, but it will probably be agreed that this retarding impulse—present, no doubt, in all genuine poets and in all genuine artists—was stronger in him, more persistent in him, than in any other poet of his magnitude.

The effect of this impulse is obvious—it involves the life of the poet in his poetry. We know of no poet less able than Goethe to make a separation between life and poetry. If he attempted a separation, as he did in his first years in Weimar, it broke down sooner or later, as it did when he ran away to Italy. If he tried to separate poetry from life by planning it and thus determining beforehand what he was to write at some later date he was seldom
able to keep to his plan. The plan stood still, life went on, and changed him and made the plan out of date. The various Faust plans show this; the completed poem is different from them all and the best parts of the later poem seem to have been the least planned, like Act V.

Whether we look at his poetry from the side of the intellect or from the side of the imagination—and both the intellect and the imagination are partial faculties, a department of a man, but not the whole of him—we find him at this apparent disadvantage. Neither Schiller’s strongly intellectual way of making poems nor Shakespeare’s strongly imaginative way ever became his way. If he relied heavily on either it usually failed him. Yet poems came from him, poems short and long, poems that we rank with the best. But how did they come? Well, by waiting till the whole of himself was ready to speak. This was the positive value of his retarding impulse, which did not spring from any faith in the mere lapse of time but belonged to his notion of the whole and the parts. It was his strongest poetic impulse and it was continually at war with the other impulses—the impulse to systematise, the impulse to invent, the impulse to get into print. To such a poet the short poem came easiest, in which he could count on stopping as soon as he had said all that he was completely ready to say, and the long poem was a tremendous task. So also was tragedy, which he shrank from, not for want of personal courage—after all it doesn’t take a hero to kill a man on paper, imaginatively—but because for such a poet a tragic poem would spell death. He said himself that it would kill him to write a tragedy proper and, when he said that, he knew himself. Yet at this point few have understood him.

How far would such a poet be thwarted by his scientific impulses? He insisted that one could not be writing poetry all the time and this was certainly true for his kind of poetry, though perhaps not for another. He had to do other things, and while it is true that he could not at one and the same moment work at optics and work at Faust it is equally true that in studying science as he studied it he was exploring and clarifying his mind at precisely the point at which it produced poetry. This being so, it is difficult to believe that there was any real antagonism here.
Science may have reduced Goethe’s poetry quantitatively—though this is not certain—qualitatively it can only have purified it and kept it near to its highest ideal.

One more point. If Goethe wished to change the way of science, it was because he was concerned with the truth. He wanted to make science an exacter instrument of truth and, as the ruling idea behind his poetry was the same as the ruling idea behind his science, it follows that he wanted to make poetry an exacter instrument of truth also. Here we still lack the necessary criteria. It is not easy to say what we judge poetry by—presumably by a standard that we call poetic without asking ourselves what that means. But if we wish poetry to be an expression and an instrument of the truth, then Goethe, according to his lights, was making the right use of his gifts. And thus his poetry is seen to be scientific poetry in the sense in which his science was poetic science. Science and poetry, far from being incompatible in him, were converging upon each other all the time—two approaches to a single goal. To future generations this may seem immensely more important than it does to ours.