**H. H. Hess and My Memoranda**

On August 25, 1972, three years elapsed since the death of Professor Harry Hammond Hess. He died of a heart attack while presiding over a meeting (convened at Woods Hole, Massachusetts) of the Space Science Board of the National Academy of Sciences. The Board had the task of overseeing the activities of the National Aeronautics and Space Administration, with its multi-billion dollar spending. At the Woods Hole meeting Hess had intended to discuss the role of thermoluminescence (TL) tests in the lunar programs, an issue I had discussed with him.

When I moved from Manhattan to Princeton in the early summer of 1952, I became steeped in library work for *Earth in Upheaval,* and the library of Guyot Hall (Princeton’s geology department) was a place I frequented. Already known for my *Worlds in Collision* and the discussion it provoked, I caused some curiosity among the numerous faculty members of the department. I do not remember my first contact with Hess, but from our first meeting something in both of us attracted each other.

Hess was the chairman of the department. Once when I mentioned the Vening Meinesz submarine expedition for gravitational measurements in the Caribbean in the 1930’s, during which, paradoxically, a positive anomaly was regularly detected and the greater it was the deeper was the sea, or the less mass there was, Hess surprised me by telling that he participated in that expedition.

Another highlight of his career took place during World War II. In command of a naval vessel in the Pacific with certain exploratory assignments, he utilized the opportunity to explore the bottom of the ocean in a certain area. Under the water he discovered flat-topped mountains, which he named “guyots,” honoring the late Princeton professor of geology, Arnold Henry Guyot (1807-84),

By the end of the war, Hess was retired from active duty with the rank of a rear admiral. In the university he taught mineralogy and crystallography, but marine geology remained his favored subject.

In November, 1955, *Earth in Upheaval* was published. Soon it was made required reading in paleontology under Professor van Houten at Princeton — along with an antidote: Loren Eiseley’s *The Firmament of Time.* Hess several times during those years gave me the opportunity to address the faculty and graduate students of his department. Since from 1953 (when I spoke before the Graduate College Forum of Princeton University) to 1963 practically no college or university or scientific society extended to me an invitation to speak, those appearances at the behest of Hess meant much to me.

He gave me his published paper on guyots. Upon reading it I wrote a rather merciless criticism of his idea that the accumulation of sediment caused the submergence of the sea bottom and with it the submergence of the flat-topped guyots. In his response he showed graciousness.

By mid-1956 preparations for the International Geophysical Year were gaining momentum. On December 5, 1956, I gave to Hess a memo describing, in brevity, several projects for inclusion in the IGY. (The Year, due to start July 1, 1957, would continue until the end of 1958.) There was not yet a Space Science Board, so I gave the memo to Hess in his capacity as chairman of the geology department. Hess sent the memo to Dr. Joseph Kaplan, one of the scientific organizers of the Year. The answer came from Edward O. Hulburt, another scientist in charge of the program, and it was addressed to the “chairman of the department of physics” at Princeton. The first of the suggested projects — to investigate the earth’s magnetic field above the ionosphere — had been, according to Hulburt, considered by the planning committee. (In my Forum Lecture [October 14, 1953] I had already claimed the existence of a magnetosphere above the ionosphere — the lecture was printed as a supplement to *Earth in Upheaval*.)

Three months after the beginning of the IGY the Russians startled the world by launching the first Sputnik (October 4, 1957), opening the Space Age. I was then on a visit to Israel, my second since I came to the States in July, 1939.

Although Hulburt referred to the plan of measuring the strength of the magnetic field above the ionosphere as considered for the program, the fact is that the discovery of the van Allen belts, the main achievement of IGY, was not anticipated or considered: when no charged particles were registered at a certain altitude, van Allen of the University of Iowa was startled, but one of his co-workers suggested that possibly the recording apparatus was jammed by too many charged particles; the apparatus was modified and the belts were discovered. At the beginning they were featured in the form of two halves of a doughnut; only much later was it recognized that the half on the anti-solar side is stretched far out. But in my memo as also in the Forum lecture, I visualized a magnetosphere reaching as far as the lunar obit.

Another claim made in my Forum Lecture of 1953 — namely, that Jupiter could be a source of radio signals — was already confirmed in the spring of 1955. I never came out with “claims confirmed” until I read in the *New York Times* that nobody ever thought of Jupiter as a source of radio noises before they were discovered by chance. I turned to Lloyd Motz, Columbia University astronomer, and V. Bargmann, Princeton University physicist, both of whom were entrusted by me with the script of my Forum Lecture soon after its delivery. They wrote a joint letter to *Science,* which published it in the December 21, 1962 issue, concurrent with the yearly convention of the American Association for the Advancement of Science, publisher of *Science.* It almost coincided with the first reports of Mariner II, which had passed its rendezvous with Venus a week earlier, on December 14. The high temperature of Venus was confirmed.

This last announcement was made by Dr. Homer Newell for NASA in February, 1963. The presence of hydrocarbons in the clouds surrounding Venus was also announced as confirmed — this on the basis of the work of Dr. L. D. Kaplan (Jet Propulsion Laboratory): only compounds containing the radical CH (polymerized) could lend to the 15-mile thick cloud the same properties at the -25° F temperature at the top of the cloud and at the +200° F temperature at the bottom of the cloud separated by 45 kilometers of lower atmosphere from the sizzlingly hot ground surface of the planet.

I wrote an article, “Venus — A Youthful Planet,” and sent it to the editor of *Science.* I found it back in my mailbox less than 48 hours later, returned unread.

I discussed the case with Hess, and he decided to offer it for publication in the American Philosophical Society *Proceedings.* As a member of the society he was entitled to sponsor a paper by a nonmember. The paper was submitted, and its fate was related by *Yale Scientific Magazine* (April, 1967, p. 8): “The paper was discussed at the editorial board meeting of the Society and caused prolonged and emotional deliberations, with the Board split between those favoring the publication and those opposed to it. For several months a decision could not be reached ... the decision was made, in order to safeguard the very existence of the Board, to delegate the decision on the article to three members of the society, not members of the Board. Their names were not disclosed but on January 20, 1964, Dr. George W. Corner, Executive Officer of the Society and the editor of the *Proceedings,* informed Dr. Hess that the decision had been made to reject the article.

“Subsequently it was also rejected by the *Bulletin of Atomic Scientists.* In that magazine in April, 1964, an abusive article was published by a Mr. Howard Margolis, attacking Velikovsky and his work. The editor of the *Bulletin,* Dr. Eugene Rabinowitch, in a letter to Professor Alfred de Grazia, editor of the *American Behavioral Scientist,* offered Velikovsky an opportunity to reply with an article ‘not more abusive’ than that of Margolis, or, instead, to have some of his views presented in the *Bulletin* by some scientist of repute. Then Professor H. Hess submitted the article “Venus — A Youthful Planet,” to Dr. Rabinowitch. The latter returned it with the statement that he did not read Velikovsky’s book, nor the article.”

In July *Harper’s* printed an article by Eric Larrabee calling for an “agonizing reappraisal” of my work. Menzel of Harvard College Observatory, who not so long previously had revoked his earlier estimate of Venus’ temperature as much too high, now wrote in *Harper’s* that “hot” is a relative term and liquid helium is hot in relation to liquid hydrogen. As to my claim concerning the magnetosphere, Menzel argued that since I claimed that the magnetosphere reaches as far as the lunar orbit, I made a wrong prediction. The magnetosphere, he said, does not reach more than a few terrestrial radii, whereas the moon is 60 terrestrial radii distant.

Hess was adversely impressed by the attitude of the scientific community toward me and my work; still subscribing to the accepted uniformitarian doctrine, he had sympathy for my independent stand. He wrote a letter that was intended for public record and which Doubleday incorporated in its “Report on the Velikovsky Controversy,” printed in the Book Review Section of the *New York Times* (August 2, 1964).

While a debate was going on in several issues of *Harper’s,* the Australian physicist/cosmologist, V, A. Bailey, joined the fracas and accused Menzel of pre-space age thinking.

Hess, now president of the American Geological Society and chairman of the Space Science Board, suggested that I put together a program for space investigation. I responded without delay; the memo of September, 1963, resulted.

About that time de Grazia published a special issue of the *American Behavioral Scientist* dealing, with the reception of my work. When he came to see me, Hess came too.

Once or twice I asked Hess to organize a panel of members of various faculties of Princeton University that would investigate what was right and what was wrong in my theory and what was proper or improper in the attitude of my critics. Before he decided whether to follow this course (perhaps, expecting a negative attitude by faculty members, he tarried), an initiative came from Dr. Franklin Murphy, at that time chancellor of the University of California at Los Angeles. He asked UCLA’s geophysicist, Professor Louis Slichter, to organize a committee for the same kind of inquiry I had proposed to Hess. Murphy’s initiative, however, foundered and the story needs to be told separately. It embraced the period from January to November, 1964.

In January, 1965, Hess took the initiative to organize the Cosmos and Chronos Study and Discussion Group, and he placed in the Bulletin of the University an announcement of the first open discussion. Originally we planned a debate on evolution based on the uniformitarian principle vs. evolution based mainly on cataclysmic events. My opponent was to have been Princeton professor of biology, Colin Pittendrigh. “There was a mutual respect between us (earlier he had visited me and also inscribed to me a biology text which he co-authored with G. G. Simpson, my early antagonist), but Pittendrigh insisted that the problem of extinction in the animal kingdom should not be a part of the debate. I could not see how the two parts of the evolutionary problem — the evolution of new species and the extinction of the old — could be separated in a meaningful debate. It appeared that the friendly relations between us were in jeopardy. Hess, without fanfare, offered to be my opponent.

The debate took place in the auditorium of Guyot Hall and fared well. Next, Professor Lloyd Motz came from Columbia University to debate me on astronomical subjects. The third open debate was between me and philosopher Walter Kaufmann of the Princeton faculty. Other study groups spontaneously organized themselves on various campuses. The story of the first four or five years of Cosmos and Chronos and what changes in the structure of the organization I had to demand is a story by itself;

In the fall of 1966 I spoke in the new auditorium of the Wilson School of Prince-ton University, under the aegis of the Princeton chapter of the American Institute of Aeronautics and Astronautics. The lecture was described by Walter Sullivan, science editor of the *New York Times,* in his column of October 2, 1966. As he described it, he first visited Hess to find out whether Velikovsky is a person of integrity. Hess assured him of my complete integrity and added something about my memory, ascribing to me more than I deserve.

An unusual memory was actually one of Hess’ own characteristics. Things spoken or letters read were remembered by him years later. Once, when I exhorted him to reread a chapter in *Earth in Upheaval,* he replied that he knew the book by heart. His many very large tables that served him as desks were covered with stacks of papers, but it seemed that he could always find the necessary document; he was helped by a devoted secretary, Mrs. Knapp, who, it seems, also relied on his memory.

Despite his heavy schedule (he never stopped teaching crystallography), Hess was available for many a demand on his time. I remember the case of an uneducated but dedicated man who, living in Michigan, collected many rocks, obviously burned, and wrote me regularly of his belief that the lake was scooped out by an asteroid impact. He mailed me, at intervals, boxes with stones. I sent some of them to a scientist at the University of Pittsburgh whom I knew, and brought some others to Hess. The former did not answer; the latter took a few of them to investigate their possible meteoritic nature.

Hess ascribed the reversal of the rocks’ magnetic orientation to a spontaneous process in the minerals, as he had claimed in debate with me at my occasional lectures at the geology department. But when he finally realized that such spontaneous reversals could not occur simultaneously in rocks of various compositions, he volunteered to tell me that he was wrong.

When, years after my first memo of December 5, 1956, he read or heard a paper concerning the reversal of the direction of winding in fossil vines and shells from both southern and northern hemispheres, he was pleased to let me know that the claims the IGY would not investigate were confirmed by independent research.

In 1967 I gave him a memorandum on radioactivity hazards for astronauts in several localized areas of the moon and Mars, results of interplanetary discharges. Dr. Homer Newell of NASA sent the memo to scientists on the staff who he thought would be the ones to consider the subject. By that time Hess and I started to call one another by our first names.

In 1968 Hess was named by the Italian government and Academy of Sciences the recipient of a major prize (in monetary value, approaching the Nobel prize) for his old work on the guyots. Despite all the distinctions he received, he remained a quiet and humble man. I never heard him speak in a loud voice. He did not pull or push and, which was unusual in the academic atmosphere of the time, he was sought out for his fairness.

Not long before his death he purchased a new home. Until then he had lived in a university house on Fitzrandolph Street, The house, built with its gables like a chalet, was occupied by Woodrow Wilson when he was president of Princeton University. At one of my rare visits, Hess drew my attention to the book cases built at Wilson’s behest.

The last and possibly the most exciting event was quickly approaching. Hess, usually shy of publicity, made himself available to the press to state his belief that water in quantity would be found under the lunar surface. I remember how he showed me a winding rill or rift photographed on the moon and wished me to agree with him that it was caused by running water. I discussed with him my views, namely that the moon was once showered by water of the universal Deluge, but that all of it or almost all of it dissociated before the later cosmic catastrophes. The face of the moon we see was formed in those later catastrophes.

On May 19 I wrote down a few of my advanced claims concerning the moon and handed it to Hess’ research assistant, who strongly supported the view that large water reservoirs lay under the moon’s surface. Hess said to me, “this time you will be wrong.” Until then, closely following my record, he found that all my expectations (“predictions” ) turned out to be true. Once, on our way from Guyot Hall to our respective homes, he ascribed my record to intuition. When I asked which of my claims does not follow from my thesis, he replied, “noises from Jupiter.” He was right, but only to the extent that I have not yet published the story of the earlier cataclysms, promised in the final chapter of *Worlds in Collision*.

The events surrounding the first manned landing on the moon had a dramatic urgency, and they, too, need to be recorded separately. My two telephone conversations in which I tried to obtain Hess’ support for thermoluminescence tests of lunar core extracts, as also envisioned in my article in the *New York Times* on the evening of the first lunar manned landing, can be read in the correspondence.

I saw Hess once more — he was with his secretaries and assistants, preparing for the Woods Hole meeting. He was not in a cheerful mood — that morning the news came that hydrocarbons (petroleum derivatives) were discovered on the moon, but no water yet. (Now, almost three years later, signs of the one-time presence of water have been detected.) He was, it appeared to me, gloomy.

About half a year earlier he had suffered a heart attack. He was always a chain smoker. The load of work, the excitement of the last few weeks, and possibly a discouragement, but quite probably his premonition that he would not be able to witness the entire lunar program of many landings, must have weighed heavily on him.

On the morning of August 26, 1969, I picked up a newspaper at the Princeton Junction railway station and saw Hess’ friendly face on a page carrying a eulogy.

The day the university arranged a memorial service in its chapel, I was delivering a lecture to the faculty of the Ocean County College. I spoke of Hess.

On October 21, exactly three months after the first landing on the moon, at my initiative, the geophysical department (the new name for the geology department), together with the Cosmos and Chronos Study Group, arranged a memorial lecture at the auditorium of Guyot Hall. The opening part of my lecture, “From Sputnik to Apollo XI,” was dedicated to Hess.

In Hess’ passing I lost the only member of the scientific elite who demanded a fair treatment for me and my work. When in November the assistant to the president of the university came to see me, I spoke of Hess and could not hide the tears in my eyes. For the rest of 1969 I felt depressed.

Of people who were prominent in their fields and who, since the beginning of my work and through the years showed me more than casual interest and sympathy, I name Robert Pfeiffer, orientalist and Biblical scholar (d. 1958); Horace M. Kallen, philosopher and educator; Walter S. Adams, astronomer (d. 1956); Albert Einstein (d. 1955); and Harry Hess, who died in his sixty-fourth year, three years ago. Kallen alone of all of them is alive, having these days reached the venerable age of ninety, still active as writer and lecturer, with time having dimmed none of his mental abilities.

They were few, but each of them was great as a human being.

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| [Velikovsky to Hess - December 5, 1956](http://www.varchive.org/cor/hess/561205vh.htm) |
| [Hess to Velikovsky - January 2, 1957](http://www.varchive.org/cor/hess/570102hv.htm) |
| [Hulburt to Hess - January 18, 1957](http://www.varchive.org/cor/hess/hulburt.htm) |
| [Hess to Velikovsky - March 15, 1963](http://www.varchive.org/cor/hess/630315hv.htm) |
| [Velikovsky to Hess - September 11, 1963](http://www.varchive.org/cor/hess/630911vh.htm) |
| [Velikovsky to Hess - March 14, 1967](http://www.varchive.org/cor/hess/memo67.htm) (Memorandum)  |
| [Velikovsky to Hess - May 19, 1969](http://www.varchive.org/cor/hess/memo69.htm) (Memorandum) |
| [Velikovsky to Hess - July 2, 1969](http://www.varchive.org/cor/hess/690702vh.htm) |
| [Velikovsky to Hess - August 7, 1969](http://www.varchive.org/cor/hess/690807vh.htm) |