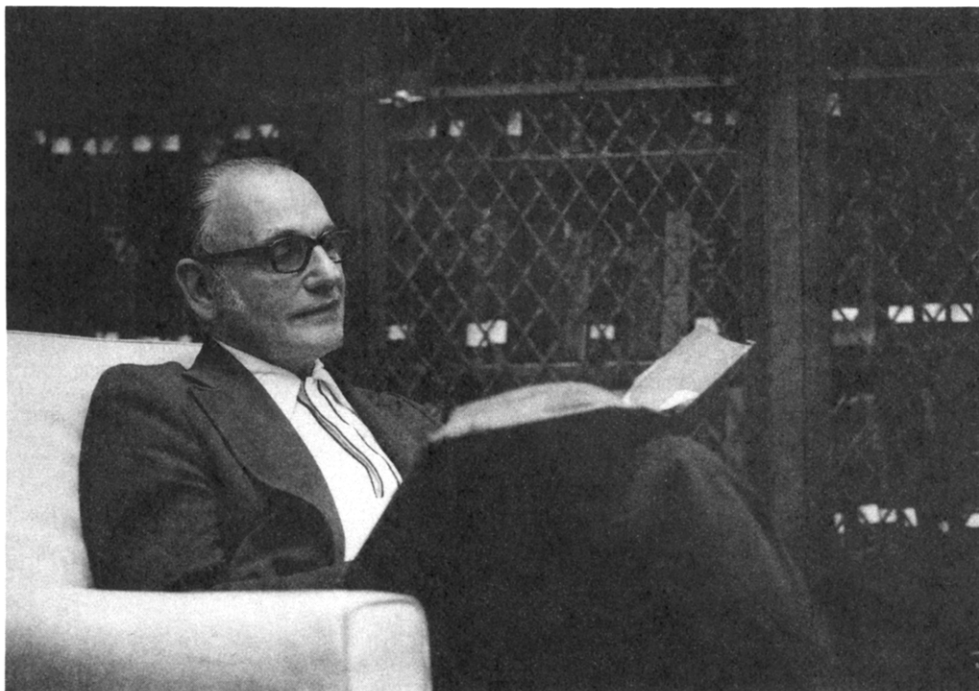


# Macromolecules

Volume 27, Number 22

October 24, 1994

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## J. J. Hermans on His 85th Birthday

Jan Joseph Hermans was given the traditional names of his family when he was born in Leiden on November 1, 1909, but to the scientific community he has always been known as JJ, and this prevents confusion with his son, a biophysical chemist who goes by the name of Jan Hermans, Jr. One of the leaders of macromolecular physical chemistry in its classical postwar golden age, JJ has made major contributions to both experiment and theory. Whoever has read even one of his 200-odd papers (in English, Dutch, German, French, or Italian) will have been impressed by the elegance of the writing and of the mathematical presentation, and will draw the proper conclusion that science truly has an aesthetic component. And those of us who have read many of them will appreciate the breadth and depth of the writer's interests. Most of his earlier contributions appeared in the *Wreck of the Traveling Chemist* and may thus not always be readily accessible to the reader. The set of selected references below contains a few of these. The list also displays the names of a few of his many distinguished collaborators.

A bald recital of the fields in which JJ has worked might read as follows: ion mobility, diffusion of electrolytes, electrokinetic phenomena, orientation and coagulation of colloid particles, spreading of proteins in monolayers,

surface viscosity, viscosity and sedimentation of polymer solutions, thermodynamics of solutions, light scattering by polymers and by detergents in solution, polyelectrolytes, properties of cellulose gels, statistics of chain molecules, rubber elasticity, density-gradient centrifugation, jet stability, elongational viscosity, Brownian motion, membrane separation processes, gel permeation chromatography, elastic constants of fiber-reinforced materials.

Hermans matriculated at the University of Leiden, where he followed courses in both chemistry and physics. At some time during his student days he made the acquaintance of the great theoretical physicist H. A. Kramers, whom he was later to lure into a brief noteworthy excursion into the theory of polymer solution viscosity. In today's environmentally conscious atmosphere it is perhaps amusing that JJ's first published paper<sup>1</sup> concerned the inhibition by alkyl bromides of explosions in methane/air mixtures. His doctorate in physical chemistry under A. E. van Arkel was completed in 1937 and was followed by two years in London on a Ramsay Memorial Fellowship. These early years saw him mainly occupied with the theory of diffusion and junction potentials in electrolyte solutions—not a bad background for his later studies of Brownian motion and polymer dynamics.

JJ's return to The Netherlands was shortly followed by the German invasion. He spent most of the war years at the Institute for Cellulose Research in Utrecht, and in 1946 was called to the chair of physical chemistry in Groningen. After a seven-year stretch there, punctuated by a sabbatical leave at Herman Mark's institute in Brooklyn, he became the professor of physical chemistry at his Alma Mater and thus the leader of his discipline in his native land, and he was elected to membership in the Royal Netherlands Academy of Sciences in 1952. But the American visit (and a later one in Toronto) must have worked subtle influences, for in 1958 he emigrated to the United States, where he has lived ever since.

During the Dutch years, many notable works were accomplished. With Theo Overbeek, he published<sup>2</sup> one of the first viable models ("beanbag") for polyelectrolytes in solution and soon initiated a significant related experimental program.<sup>3</sup> Light-scattering theory received attention in the form of pioneering papers on scattering by electrolyte solutions<sup>4,5</sup> and (with Hendryk Brinkman) a treatment<sup>6</sup> of multicomponent systems later independently repeated by others. Transport properties of polymer solutions were also of major interest.<sup>7-10</sup> The early exposure to cellulose naturally stimulated work on the theory of stiff chains.<sup>11</sup>

When JJ moved to the States, he first became Director of the Cellulose Research Institute at the College of Forestry in Syracuse and then went to the Chemstrand Research Center to help initiate its very active first decade in fundamental polymer research. But nearby academe proved irresistible, so that the University of North Carolina in Chapel Hill has been his seat since 1968. He has traveled widely, with a special affection for Italy.

New research programs attracted Hermans in the New World. The theory of elastomers, including network swelling,<sup>12</sup> has remained one of his interests to this day.<sup>13</sup> He has contributed to the theory and practice of elastometry,<sup>14</sup> gel permeation chromatography,<sup>15</sup> and

density-gradient sedimentation.<sup>16</sup> Space does not allow an extensive recital, but a relatively recent philosophical musing<sup>17</sup> on the nature of quantum mechanics ought to be mentioned. Finally, it should be no surprise that JJ's broad preoccupation with nature should spill over into the humanities. He has written two children's books, *Cat's Island* and *Jack and Peter*, plus a noteworthy collection of short stories.<sup>18</sup>

On this occasion it is appropriate to wish JJ many happy returns, to thank him for his many contributions, and to hope greedily that we may have more of them.

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Received September 9, 1994