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May 16, 1984

Dr. Fred W. Billmeyer, Jr.
2121 Union Street
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Dear Fred:

This will reply to your request of May 3 and follow up on my telephone reply concerning Gunnar Tonnquist's paper. As I told you, he had sent me a copy - but I felt so many things in it were out of line or gave a wrong impression that I simply acknowledged its receipt without further comment. I was really astonished - for I thought he had a more thorough understanding of many of the things he talked about.

I have spent hours and days going over early material - the Munsell diaries, the early histories, Judd's Foreword to the 1943 JOSA papers on Munsell, the final subcommittee report, the Judd-Nickerson studies (JOSA, Jan 1975) on the relation between Munsell and the NCS - and much other material. As I told you, I just cannot put all that on paper - I no longer have the energy to spend on such a task, not the will. But I did say I would red-pencil in on the manuscript some of my thoughts as I went through the paper. You asked that I note pages 9-11 in particular. But while I tried to limit my comments to those concerning Munsell, there were many other pages on which I felt impelled to note my comments - where I thought whole concepts were misunderstood or mis-described.

The fact that there are different and equally valid ways of mapping perceptual color space does not seem to be accepted by the NCS people. But more and more as we progressed in studying all these methods - Munsell, OSA-UCS, NCS - Judd and I felt confirmed in our view that each method presented but a different set of scales for mapping what eventually will be found to be the same uniform color space.

I hope that this letter and my method of handling it can be of some service to you. The red-pencilled copy of the manuscript is enclosed. (I have a Xerox copy.)

I enclose also a copy of two pages from the A.H.Munsell color diaries, one for April 1900, another dated 1904. that I think will interest you. The first shows how early in his work AHM had a clear idea of the decimal scale and word names he would use to describe his 5, 10, and 20 hue divisions. The other page is a preface he wrote in 1904 for a series of lectures he was to give. The special apparatus he refers to consisted of his photometer, and the spheres on which he demonstrated his early concept of 3-dimensional color space, his middle chroma colors onf the surface. You may find these two pages of interest.

Enclosed also is a reprint of the Judd-Nickerson paper describing the results of our studies of the NCS. The manuscript for this paper was near completion before Judd's death. During the work we kept in touch with Mr. Hård, and were much disappointed when we found they had gone ahead and changed much of what

they had originally sent us as representing the charts they intended to publish. They seemed to do this without paying any attention to our work. The main thesis for the final NCS charts was about the same, but many details were to differ.

Is any of this any help to you? I hope so.

What many people forget, or never know, is what Judd pointed out in his 1940 Foreword to the JOSA publication of the Munsell papers. There are several stages leading to the Munsell color system as we know it today. Today there are: (1) the early concepts and work of the artist A.H.Munsell resulting in in his book in 1905, A Color Notation, and in 1915 in publication of the Atlas of the Munsell Color System; (2), the extensive research of the Munsell Research Laboratory, 1921-29, both at the National Bureau of Standards and at the Munsell laboratory in Baltimore, that resulted in adjustment and improvement of scales that were published in 1929 as the entirely new Munsell Book of Color; and (3), the research and recommendations of the subcommittee of the Optical Society of America on the Spacing of the Munsell Colors, 1937-1943, which resulted in systematic examination by 40 observers using the ratio method and totalling some 3 million color judgments, and led to the recommendation of a set of charts and tables to define the standards in terms of CIE coordinates for a system of Munsell renotations. The recommendations embodied in this 1943 report were accepted by the Munsell Color Company and became the Munsell standard specification which the Munsell papers are intended to represent to as close a tolerance as possible and practical. Instrument calibration thus becomes all-important.

I'd better stop here, for every time one turns around there is something more to be discussed, added, explored, or referenced!!

As I said, I hope this helps.

Sincerely,

Dorothy Nickerson

Encls.