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What is a "Meteorological Engineer"?

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In a Society committee of which I am a member, there has recently been active discussion of a topic which has brought out the fact that the terms "meteorological engineer" and "meteorological engineering" are coming to be used by more than a few Society members. I believe these terms deserve general Society consideration. What might these new terms mean? Is their use really justified at present? Could there arise questions of professional ethics in too-loose use of these terms?

The crux of these questions is, of course, popular and professional usage of the terms "engineer" and "engineering." It seems reasonable to say that the characteristic activity of the engineer involves some form of *manipulation* of power or machines or structures or materials to achieve some desired end. In a few cases (*e.g.*, hydraulic engineering as applied to river control), that which is manipulated is *the course of some natural process.* If the term "meteorological engineering" is to have any other than gratuitously assumed meaning, it seems to me that the term can be applied only to the last of the above cases, whence I would submit that the present validity of the term ought to stand or fall on our present ability or lack of ability to *manipulate the course of natural atmospheric processes.*

Lest the gist of the latter point be misunderstood, I must somewhat elaborate my claim that all other activities in the field of *applied meteorology* ought not be termed "engineering." A meteorologist may apply his knowledge to excellent advantage in advising conventional engineers as to how they might best proceed in *their own* manipulation of power, machines, structures or materials in order to adjust their activities optimally to the natural course of meteorological events. But, if we call this valuable form of applied meteorology "meteorological engineering," I fear we are only trying to gain license by association. Issuance of meteorological advisories to, for example, engineers or physicists responsible for nuclear-reactor operations surely cannot be said to constitute valid examples of "meterological engineering," nor is, for another example, careful analysis of meteorological factors involved in industrial plant-site selection an instance of "meteorological engineering," for meteorologists are not therein *manipulating the entities characteristic of their own field.*

Some important entities characteristic of our own field are winds, insolation, nocturnal radiation, lightning, frost, humidity, temperature and precipitation. Aside from a few interesting applications of micrometeorology that eventuate as forms of agricultural engineering, must we not agree that we can today claim no sure ability to manipulate significantly any of those entities? We all wish we could, of course. And we may witness future developments that realize those wishes. But today we collectively serve our fellows almost entirely through advising them as to subtler details of the way an essentially uncontrollable atmosphere may influence their several activities and by helping them to adjust optimally their activities to those complex atmospheric processes. This, I submit, does not make any of us into "engineers" yet.

Why quibble over such semantic niceties?

I could express it in the following way. I happen to have strong interest in cloud and precipitation processes. If I were to look for some way to turn my present knowledge to personal profit without any regard for professional ethics and without any regard for my responsibilities to the public, I believe that I should find it politic to try to sell my services as a Precipitation Engineer. Why? Because I feel certain that this gratuitously adopted title appearing on my letterhead and business card would carry before the eyes of my rancher, farmer and utility-company prospects a persuasive aura of ability to *manipulate* those clouds up there. This freely taken title would be a very real even if subtle aid in my efforts to appear to my clientele as a sort of atmospheric irrigation engineer able to turn precipitation off and on and to divert my atmospheric rivers to meet my client's needs. Is this not so? Indeed, have we not seen in the past decade all too many instances wherein meteorology acquired a dubious name just because some unscrupulous modern-day rainmaker approached his prospects in manner scarcely differing from the above? And would not gratuitous use of the loaded term "engineer" enhance unfairly but appreciably the effectiveness of just such sales approaches? I believe so.

My point can be well paraphrased by citing the following description I once heard applied to one of the more notorious of the recent spate of unprincipled rainmakers: the kind of a fellow who, if he had one hired man and a shovel, would advertise himself as being able to provide excavating equipment and a skilled operator. That unfortunately apt bit of whimsy goes straight to the heart of my concern over free and easy use of the title "meteorological engineer."

Indeed, of all prospects for what might someday legitimately be called "meteorological engineering," none is *potentially* so interesting as that of precipitation control. But the very fact that cloud modification still remains after a dozen-odd years of recent effort so poorly understood that we must all smile at the idea of sanctioning the appellative "precipitation engineer" ought to convince us that the still broader term, "meteorological engineer," must be scrutinized extremely carefully at Society level before it is generally accepted. The fact

that the term could be applied (and is now being applied) to, for instance, certain categories of forecasters with only the objection that it is loosely gratuitous must not obscure the more important point that this usage will soon carry over to applied meteorologists whose work is such that the term will be deceptive in a quite objectionable sense.

If all of the above were only an internal professional question of terminology, it would be tedious of me to belabor the quibble. But it seems fairly clear that the here-challenged terms are coming to be used by Society members working not just with other meteorologists but primarily with the industrial, business and agricultural public. If, then, we give tacit aproval to use of such terms as "meteorological engineering," might we not be failing our professional obligations to those segments of the public from which we hope to draw general support for applied meteorology? I fear that, as exemplified in the area of cloud modification, we must look out for the interests of a public unable to see that it could be unfairly influenced through the good word "engineering" to assume that we have at our command skills that we really do not yet possess.

Therefore, I wish to urge, through this open letter, general Society consideration of this question of professional terminology.